



Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

FREEDOM OF INFORMATION ACT/PRIVACY PROGRAM

August 2, 2021

In reply refer to: FOIA #BPA-2021-00917-F

Michael Ravnitzky

(b) (6)

Dear Mr. Ravnitzky,

This communication is a final response to your request for Bonneville Power Administration (BPA) records made under the Freedom of Information Act, 5 U.S.C. § 552 (FOIA). Your request was received on July 19, 2021 and assigned tracking number BPA-2021-00917-F. Please use that tracking number in any correspondence with the agency regarding your request.

Request

“A copy of the Congressional Budget Justification/Request for each year FY2015 through FY2020.”

Acknowledgement

BPA has reviewed your request and has determined that it fulfills all of the criteria of a proper request under the FOIA and Department of Energy (DOE) regulations at Title 10, Code of Federal Regulations, Part 1004.

Response

BPA searched for and gathered 515 pages of responsive records from the agency's Capital Investment office. The records accompany this communication and are being released in full.

Fee

No fees are associated with this request.

Certification

Pursuant to 10 C.F.R. § 1004.7(b)(2), I am the individual responsible for the records search and FOIA response described above.

Appeal

The adequacy of the search may be appealed within 90 calendar days from your receipt of this letter pursuant to 10 C.F.R. § 1004.8. Appeals should be addressed to:

Director, Office of Hearings and Appeals
HG-1, L'Enfant Plaza
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585-1615

The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. You may also submit your appeal by e-mail to OHA.filings@hq.doe.gov, including the phrase "Freedom of Information Appeal" in the subject line. (The Office of Hearings and Appeals prefers to receive appeals by email.) The appeal must contain all the elements required by 10 C.F.R. § 1004.8, including a copy of the determination letter. Thereafter, judicial review will be available to you in the Federal District Court either (1) in the district where you reside, (2) where you have your principal place of business, (3) where DOE's records are situated, or (4) in the District of Columbia.

Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows:

Office of Government Information Services
National Archives and Records Administration
8601 Adelphi Road-OGIS
College Park, Maryland 20740-6001
E-mail: ogis@nara.gov
Phone: 202-741-5770
Toll-free: 1-877-684-6448
Fax: 202-741-5769

Questions about this communication or the status of your FOIA request may be directed to the agency's FOIA Public Liaison, Jason Taylor, at jetaylor@bpa.gov.

Sincerely,



Candice D. Palen
Freedom of Information/Privacy Act Officer

[Responsive records accompany this communication.](#)

Bonneville Power Administration (Bonneville, BPA)
Proposed Appropriations Language

Expenditures from the Bonneville Power Administration Fund, established pursuant to Public Law 93–454, are approved for [construction of, or participating in the construction of, a high voltage line from Bonneville's high voltage system to the service areas of requirements customers located within Bonneville's service area in southern Idaho, southern Montana, and western Wyoming; and such line may extend to, and interconnect in, the Pacific Northwest with lines between the Pacific Northwest and the Pacific Southwest, and for John Day Reprogramming and Construction, the Columbia River Basin White Sturgeon Hatchery, and Kelt Reconditioning and Reproductive Success Evaluation Research,] *the Black Canyon Trout Hatchery* and, in addition, for official reception and representation expenses in an amount not to exceed \$5,000: Provided, That during fiscal year [2014] *2015*, no new direct loan obligations may be made.

Explanation of Changes

The proposed appropriations language restricts new direct loans in FY 2015 as in FY 2014. This bill language is drafted consistent with the Credit Reform Act of 1990.

Please Note - The FY 2015 Bonneville Power Administration Congressional Budget submission includes FY 2014 budget estimates.

Bonneville finances its operations with a business-type budget under the Government Corporation Control Act, 31 U.S.C 9101-10, on the basis of the self-financing authority provided by the Federal Columbia River Transmission Act of 1974 (Transmission Act) (Public Law 93-454) and the U.S. Treasury borrowing authority provided by the Transmission Act, the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Pacific Northwest Power Act) (Public Law 96-501) for energy conservation, renewable energy resources, investment in capital fish facilities, and other purposes, the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), and other legislation. Authority to borrow from the U.S. Treasury is available to Bonneville on a permanent, indefinite basis. The amount of U.S. Treasury borrowing outstanding¹ at any time cannot exceed \$7.70 billion. Bonneville finances its approximate \$4.3 billion annual cost of operations and investments primarily using power and transmission revenues and borrowing from the U.S. Treasury at rates comparable to borrowings at open market rates for similar issues.

This budget has been prepared in accordance with the Statutory Pay-As-You-Go Act (PAYGO) of 2010. Under PAYGO, all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

¹ Amount of total bonds outstanding can be found on table BP-4 in the Additional Tables section.

Bonneville Power Administration

Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2013 Actuals	2014 Original ^{2/}	2014 Revised ^{2/}	2015 Proposed
Capital Investment Obligations				
Associated Project Costs ^{3/}	186,425	N/A	240,802	239,082
Fish & Wildlife	52,120	N/A	60,275	51,284
Conservation & Energy Efficiency ^{3/}	78,376	N/A	75,200	92,000
Subtotal, Power Services	316,921	N/A	376,278	382,367
Transmission Services	267,542		648,780	624,730
Capital Equipment & Bond Premium	47,840	N/A	46,897	47,982
Total, Capital Obligations ^{3/}	632,303	1,178,605	1,071,954	1,055,079
Expensed and Other Obligations				
Expensed	3,364,331	3,046,259	2,940,219	2,996,419
Projects Funded in Advance	230,783	60,511	58,014	46,491
Total, Obligations	4,227,417	4,285,375	4,070,187	4,097,988
Capital Transfers (cash)	223,374	132,442	183,562	209,270
BPA Total	4,450,791	4,417,816	4,253,749	4,307,258
Bonneville Net Outlays	203,000		(10,000)	(10,000)
Full-time Equivalent (FTEs)	2,998	3,100	3,200	3,200

Public Law Authorizations include:

Bonneville Project Act of 1937, Public Law No. 75-329

Federal Columbia River Transmission System Act of 1974, Public Law No. 93-454

Regional Preference Act of 1964, Public Law No. 88-552

Flood Control Act of 1944, Public Law No. 78-543

Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act), Public Law No. 96-501

Outyear Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2016	2017	2018	2019
Capital Investment Obligations				
Associated Project Costs ^{3/}	248,293	244,288	255,936	256,717
Fish & Wildlife	36,650	30,795	28,646	44,806
Conservation & Energy Efficiency ^{3/}	94,760	97,603	100,531	103,547
Subtotal, Power Services	379,703	372,686	385,113	405,070
Transmission Services	637,265	666,242	647,547	548,507
Capital Equipment & Bond Premium	49,067	50,154	49,579	49,837
Total, Capital Obligations ^{3/}	1,066,036	1,089,082	1,082,239	1,003,413
Expensed and Other Obligations				
Expensed	3,175,940	3,410,219	3,460,654	3,341,610
Projects Funded in Advance	46,253	46,477	55,480	57,153
Total, Obligations	4,288,229	4,545,778	4,598,373	4,402,176
Capital Transfers (cash)	129,819	122,300	114,840	437,360
BPA Total	4,418,049	4,668,077	4,713,213	4,839,536
Bonneville Net Outlays	(10,000)	(10,000)	(10,000)	(10,000)
Full-time Equivalent (FTEs)	3,100	3,100	3,100	3,100

These notes are an integral part of this table.

- ^{1/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.
- ^{2/} Original estimates reflect Bonneville's FY 2014 Congressional Budget Submission. Revised estimates, consistent with Bonneville's annual near-term funding review process, provide notification to the Administration and Congress of updated capital and expense funding levels for FY 2014.
- ^{3/} Includes infrastructure investments designed to address the long-term needs of the Northwest and to reflect significant changes affecting Bonneville's power and transmission markets.

Additional Notes

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

The cumulative amount of actual advance amortization payments as of the end of FY 2013 is \$2,697 million.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988 regarding Bonneville's ability to obligate funds.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

FTE outyear data are estimates and may change.

Major Outyear Considerations

Bonneville's outyear estimates reflect its ongoing efforts to achieve its long-term mission and strategic direction. The outyear estimates are developed with consideration of and support of Bonneville's multi-year performance targets that lay out the course for achieving Bonneville's long-term objectives. Outyear capital investment levels support Bonneville's infrastructure program, hydro efficiency program, conservation and energy efficiency projects, and its fish and wildlife mitigation projects.

With passage of the Energy Policy Act of 2005, Bonneville continues to incorporate the various aspects of the legislation related to its business, in particular the energy supply, conservation and new energy technologies for the future that are highlighted in the legislation.

Overview and Accomplishments

Bonneville provides electric power, transmission, and energy efficiency throughout the Pacific Northwest. Bonneville serves a 300,000 square mile area including Oregon, Washington, Idaho, Western Montana, and parts of Northern California, Nevada, Utah, and Wyoming with a population of about 12.3 million people. Bonneville markets the electric power produced from 31 Federal hydro projects in the Pacific Northwest owned by the U.S. Army Corps of Engineers (Corps) and the U.S. Department of Interior, Bureau of Reclamation (Reclamation) – known as Associated Projects. Bonneville also acquires non-Federal power, including the power from the nuclear power plant, Columbia Generating Station (CGS), to meet the needs of its customer utilities. Bonneville maintains and operates 15,239 circuit miles of transmission lines, 261 substations and associated power system control and communications facilities over which this electric power is delivered. Bonneville has capital leases for certain transmission facilities. Bonneville also supports the protection and enhancement of fish and wildlife, and promotes conservation and energy efficiency, as part of its efforts to preserve and balance the economic and environmental benefits of the Federal Columbia River Power System (FCRPS).

The organization of Bonneville's FY 2015 Budget reflects Bonneville's business services basis for utility enterprise activities. Bonneville's two major areas of activity on a consolidated budget and accounting basis include Power Services (PS) and Transmission Services (TS) with administrative costs included. The PS includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program (REP), Associated Projects Operations & Maintenance (O&M) Costs, and Northwest Power and Conservation Council (Planning Council or Council).

The mission of Bonneville is to create and deliver the best value for its customers and constituents as it acts in concert with others to assure the Pacific Northwest: (1) an adequate, efficient, economical and reliable power supply; (2) an open access transmission system that is adequate for integrating and transmitting power from Federal and non-Federal generating units, providing service to Bonneville's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and (3) mitigation of the FCRPS impacts on fish and wildlife. Bonneville is legally obligated to provide cost-based rates and public and regional preference in its marketing of power. Bonneville sets its rates as low as possible consistent with sound business principles and sufficient to ensure the full recovery of all of its costs, including timely repayment of the Federal investment in the system. Bonneville's vision is to provide: (1) high reliability; (2) low rates consistent with sound business principles; (3) responsible environmental stewardship; and (4) accountability to the region. Bonneville pursues this vision consistent with its three core values of trustworthy stewardship of the FCRPS, collaborative relationships, and operational excellence.

Alignment to Strategic Plan and President's Climate Action Plan

Bonneville contributes to the Administration's clean energy goals and aligns to Goal 1 of the Department of Energy's (DOE) Strategic Plan to *Advance foundational science, innovate energy technologies, and inform data driven policies that enhance U.S. economic growth and job creation, energy security, and environmental quality, with emphasis on implementation of the President's Climate Action Plan to mitigate the risks of and enhance resilience against climate change.* Bonneville is currently working to modernize the electric grid in the Northwest through initiatives such as the Smart Grid Demonstration Project, 15-minute Transmission Scheduling and the Syncrophaser Program as well as making significant capital investments in new transmission lines to help integrate wind power and other resources into the power system.

In addition, as part of its responsibilities, Bonneville also promotes energy efficiency, renewable resources and new technologies.

BPA also aligns to Goal 3 of the DOE Strategic Plan to *Position the DOE to meet the challenges of the 21st century and the nation's Manhattan Project and Cold War legacy responsibilities by employing effective management and refining operational and support capabilities to pursue departmental missions.* BPA contributes through Cyber Security, Sustainability, Talent Management, and Safety Policy initiatives.

To validate and verify program performance, Bonneville conducts various internal and external reviews and audits. Bonneville conducts extensive review within the region of both capital and expense programs. In addition, Bonneville's programmatic activities are subject to review by Congress, the U.S. Government Accountability Office (GAO), the DOE's Inspector General, and other governmental entities. Bonneville's financial statements are audited annually by an independent external auditor. Bonneville has received an unqualified audit opinion since the mid-1980s and no material weaknesses have been identified in controls over financial reporting.

Legislative History

The Bonneville Project Act of 1937 provides the statutory foundation for Bonneville's utility responsibilities and authorities. In 1974, passage of the Federal Columbia River Transmission System Act (Transmission Act) applied provisions of the Government Corporation Control Act (31 U.S.C. §§ 9101-9110) to Bonneville. The Transmission Act legislation provided Bonneville with "self-financing" authority, established the Bonneville Fund (a permanent, indefinite appropriation) allowing Bonneville to use its revenues from electric power and transmission ratepayers to directly fund all programs, and authorized Bonneville to sell bonds to the Treasury to finance the region's high-voltage electric transmission system requirements.

In 1980, enactment of the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) expanded Bonneville's authorities, obligations and responsibilities to encourage: electric energy conservation to meet regional electric power loads placed on Bonneville; develop renewable energy resources within the Pacific Northwest; assure the Northwest an adequate, efficient, economical, and reliable power supply; promote regional participation and planning; and protect, mitigate and enhance the fish and wildlife of the Columbia River and its tributaries. The Northwest Power Act also established the statutory framework for Bonneville's administrative rates-setting process and established judicial review of Bonneville's final decisions in the Ninth Circuit of the U.S. Court of Appeals.

As of the end of FY 2013, Congress has provided Bonneville with Treasury borrowing authority of \$7.7 billion.

The Columbia River Treaty

On December 13, 2013, the U.S. Entity delivered the final regional recommendation concerning the post-2024 future of the Columbia River Treaty to the U.S. Department of State. The final regional recommendation begins by identifying a regional goal for the future of the Treaty post-2024 that involves developing a modernized Treaty framework. The U.S. government is in the process of formally evaluating the future of the Columbia River Treaty.

Judicial and Regulatory Activity

The Energy Policy Act of 2005 authorized the Federal Energy Regulatory Commission (FERC) to approve and enforce mandatory electric reliability standards with which users, owners and operators of the bulk power system, including Bonneville, are required to comply. These standards became enforceable on June 18, 2007, and compliance is monitored by the North American Electric Reliability Corporation (NERC) and the regional reliability organizations. DOE has taken the position that financial penalties may not be imposed on federal agencies for violations of electric reliability standards.

Fish and Wildlife Program Overview

Bonneville is committed to continue funding its share of the region's efforts to protect and mitigate Columbia River Basin fish and wildlife. To the extent possible, Bonneville is integrating the actions implemented to protect listed species in response to the FCRPS Biological Opinions (BiOps), including the National Oceanic and Atmospheric Administration (NOAA) Willamette River BiOp and the United States Fish and Wildlife Service's (USFWS) 2006 Libby Dam BiOp, with projects implemented under the Council's Fish and Wildlife Program (Council's Program). Sub-basin plans and long-term agreements that include prioritized strategies for mitigation actions will help guide project selection to meet both Bonneville's Endangered Species Act (ESA) and Northwest Power Act responsibilities.

Included with the budget schedules section of this document is the current tabulation of Bonneville's fish and wildlife costs from FY 2004 through FY 2013.

Infrastructure Investment

Bonneville is moving forward with infrastructure investments in the Pacific Northwest to meet transmission needs that will also continue to support a competitive wholesale market in the Western Interconnection, which encompasses 14 western states, two Canadian provinces and one Mexican State. The McNary-John Day line – completed in FY 2012, under budget and ahead of schedule – added 79 miles, and 3 additional proposed transmission lines will add more than 140 miles of lines to the Northwest transmission grid, improving reliability. In combination with other transmission projects, these projects will allow Bonneville to provide service to about 3,881 megawatts (MWs) of requests for Bonneville transmission, including service for 3,138 MWs of additional renewable resource generation. The proposed transmission lines include Bonneville's I-5 Corridor Reinforcement Project, which is currently undergoing environmental review, Central Ferry-Lower Monumental 500kV Reinforcement, which is set to begin construction in spring of 2014, and Big Eddy-Knight 500kV transmission line and substation. If all three projects are constructed along with the McNary-John Day line they will provide almost 6,000 MW of

new transmission service. In addition, Bonneville is continuing to target transmission investments in those areas with reliability needs.

In FY 2012, Bonneville signed two agreements through which the agency agrees to participate with two investor-owned utilities in the environmental work and permitting for the Boardman-to-Hemingway 500kV line. Participation in this preliminary review keeps Bonneville's options open for serving its six southeast Idaho preference customers after the current service agreements are terminated. Bonneville has not made a decision to co-develop or purchase capacity in these projects.

These efforts will help meet the increasing demand for Bonneville's service to meet regional greenhouse gas reduction and environmental goals of western states. In support of these goals and as part of the Regional Dialogue policy implementation, Bonneville is working with stakeholders to review its role in the development and use of energy efficiency.

Bonneville has experienced significant growth within its balancing area of installed variable renewable generation, primarily in the form of wind generation. Since 2001, installed wind generation has grown from 115 MWs to 4,515 MWs through FY 2013. Bonneville estimates as much as 5,600 MWs could be in place by 2015. This substantial increase in variable renewable generation has resulted in additional uncertainties in the balance between load and generation required for maintaining a reliable grid. Wind also is a non-dispatchable source of energy, meaning it cannot be relied upon for capacity. As a result, Bonneville has implemented and continues to study operational tools for integrating this variable generation more cost effectively and reliably. In addition, Bonneville studied the feasibility of further developing storage technologies, including pump storage capabilities at the John W. Keys III Pump Generating Plant. There currently are no plans for further development and Bonneville is continuing to support maintaining the current facility.

Bonneville considers strategies other than the use of Treasury borrowing authority to sustain funding for its infrastructure investment requirements as well. These additional strategies include reserve financing of some amount of transmission investments, and seeking, when feasible, third party financing sources. See the BP-5 Potential Third Party Financing Transparency table in the budget schedules section of this document. This FY 2015 Budget assumes \$15 million of annual reserve financing in FYs 2014-2019 for transmission infrastructure capital, which is included in this budget under Projects Funded In Advance.

Radio Spectrum Communications

Bonneville's wireless communication system is used to operate and control critical national transmission grid infrastructure in a reliable, secure and safe manner. Bonneville's communication systems are designed to meet strict reliability/availability objectives as required by NERC and Western Electricity Coordinating Council (WECC) standards. Concerning proper spectrum stewardship, Bonneville designs highly efficient radio systems which use minimal radio frequency (RF) channel bandwidths to meet critical mission needs. However, in certain circumstances, efficiently designed spectrum radio systems will require broad RF channels and/or lower state RF modulation schemes to meet existing and future requirements in order to meet operational and reliability/availability objectives.

In order to meet Bonneville's mission/operational requirements, RF communication equipment approved for system use goes through a rigorous evaluation and testing process. RF spectrum efficiency factors are considered during the evaluation/testing period. RF terminal equipment approved for use is normally purchased directly from vendors and is not typically supplied through an RFP process.

Bonneville operational telecommunications and other capital equipment and systems are acquired using Bonneville's self-financing and procurement authorities. The Bonneville budget includes a system-wide electric reliability performance indicator, consistent with NERC rules, to track and evaluate performance.

Bonneville may share temporarily-available spare capacity on its RF communication system with other government agencies (both Federal and State), and with other electric utilities in the region whose power systems interconnect with Bonneville. Non-critical administrative traffic is typically supported by commercial carrier enterprises. However, to meet NERC/WECC electrical bulk transmission requirements, Bonneville exclusively operates highly critical transmission control traffic over its private telecommunication system as Bonneville has no control over the reliability/availability of the commercial enterprise nor have control on how quickly critical operational control circuits are restored to active service during an interruption.

For high capacity communication system applications, Bonneville considers and operates non-spectrum dependent alternatives such as fiber optic cable infrastructure systems.

During FY 2014, Bonneville plans to begin upgrading the VHF land mobile system and to install a number of digital SONET rings typically consisting of fiber segments in combination with point-to-point microwave hops operating in the 4 GHz and 7/8 GHz bands. These various telecommunication systems operate within Bonneville's approximate 300,000 square mile utility responsibility service territory (Oregon, Washington, Idaho, Montana) with the majority of the RF infrastructure located in low population-rural areas.

The power plants are primarily owned by the Corps and Reclamation, which also utilize federal radio spectrum to preserve very high operational telecommunications and power system reliability.

Bonneville expects to return to Treasury approximately \$8 million of excess funds remaining in the Spectrum Relocation Fund in FY 2015.

Financial Mechanisms

Bonneville's program is treated as mandatory and nondiscretionary. Bonneville is "self-financed" by the ratepayers of the Pacific Northwest and does not receive annual appropriations from Congress. Under the Transmission Act, Bonneville funds the expense portion of its budget and repays the Federal investment with revenues from electric power and transmission sales. Bonneville's revenues fluctuate primarily in response to market prices for fuels and stream flow variations in the Columbia River System due to weather conditions and fish mitigation and recovery needs. Through FY 2013, Bonneville has returned approximately \$28.8 billion to the Treasury, of which about \$3.2 billion was for payment of FCRPS O&M and other costs, \$14.4 billion for interest, and \$11.1 billion for amortization of appropriations and bonds.

In this FY 2015 Budget, the term Bonneville "bonds" refers to the debt instruments under which Bonneville receives advances of funds from the Treasury. This reference is consistent with section 13(a) of the Transmission Act (P.L. 93-454), which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold to the Treasury.

Bonneville and Treasury have a comprehensive banking arrangement that covers Bonneville's short- and long-term Federal borrowings and establishes a phased-in approach to a market-based investing program. This provides Bonneville with the ability to borrow to finance assets and, on a short-term basis, to cover Northwest Power Act-related operating expenses. This latter ability provides Bonneville with much needed liquidity to help manage within-year cash flow needs and mitigate risk. Access to this use of Treasury borrowing authority has been incorporated into and relied upon in Bonneville's rate-setting process.

Bonneville initiated a Power Prepayment Program in FY 2013 under which all Bonneville preference customers had an opportunity to submit formal offers to provide lump-sum payments to Bonneville as prepayments of a portion of their power purchases through September 30, 2028, the termination date of the Long-Term Regional Dialogue Power Sales Contracts. Bonneville accepted power prepayments from four preference customers, as described below.

Upon Bonneville's receipt of the agreed-to, lump-sum prepayments, the selected preference customers became entitled to future portions of their electricity from Bonneville without further payment. The power prepayments are and will be reflected in the customers' future power bills from Bonneville as fixed, equal monthly prepayment credits. In effect, the amount of electricity that is prepaid may vary by month, depending on Bonneville's power rates and rate schedules that apply to electricity purchases by the prepaying customers in the related month. Because this is structured as a variable amount prepayment and not as a fixed-price/fixed-amount type of prepayment, Bonneville's flexibility to establish rates for the electric power that is prepaid will not be compromised.

As a result of the Fiscal Year 2013 Prepayment solicitation, Bonneville received \$340 million in prepayments, which Bonneville will use to fund needed FCRPS hydroelectric investments. The aggregate prepayment credits are set at \$2.55 million per month through FY 2028.

Depending on a variety of factors it is possible that Bonneville may seek to implement later phases of the Power Prepayment Program in connection with future FCRPS hydroelectric investment needs.

Treasury Payments and Budget Overview

Bonneville made its full planned FY 2013 payment of \$692 million to the Treasury. Total 4(h)(10)(C) credits associated with fish mitigation and recovery and applied toward Bonneville's Treasury payment, were about \$84 million for FY 2013. For FY 2014, Bonneville plans to pay the Treasury \$658 million: \$184 million to repay investment principal, \$385 million for interest, and \$90 million for Associated Project costs and pension and post-retirement benefits. The FYs 2015 and 2016 Treasury payments are currently estimated at \$715 million and \$692 million, respectively. The FYs 2014-2015 4(h)(10)(C) credits are estimated at \$97 million and \$93 million respectively.

Estimates of interest and amortization levels for outyear Treasury payments are based on estimates from the 2014 transmission and power rate case proposals, which were transmitted to FERC on July 24, 2013, and FERC granted interim approval September 27, 2013. Bond and Appropriations Interest will continue to be revised based on upcoming capital investments and debt management actions. These estimates may change due to revised capital investment plans and actual Treasury borrowing. In recent years, Bonneville has made amortization payments in excess of those scheduled in its FERC-approved rate filings resulting in a balance of advance repayment. The cumulative amount of advance amortization payments as of the end of FY 2013 is about \$2,697 million.

Bonneville has direct funding arrangements with the Corps and Reclamation to pay the power related portion of O&M and capital investments. Direct funded capital costs, previously funded through appropriations, are now being paid through Bonneville's borrowing from the Treasury and customer prepayments. Bonneville's total direct funding was \$345 million in FY 2013.

This FY 2015 Budget proposes Bonneville accrue expenditures of \$2,996 million for operating expenses, \$46 million for Projects Funded in Advance (PFIA), \$1,055 million for capital investments, and \$209 million for capital transfers in FY 2015.

The estimated spending levels in this budget are still subject to change to accommodate competitive dynamics in the region's energy markets, debt management strategies, and the continued restructuring of the electric industry.

Current Financial Status

Bonneville is striving to enhance its competitive, cost-effective delivery of utility products and services and continued delivery of the public benefits of its operations, while ensuring its ability to make its payments to the Treasury on time and in full. Bonneville employs a strategic planning process using the balanced scorecard model to align all business units around specific goals and align resources to achieve these goals. Results from these efforts include continued efficiency gains, performance integration improvements, and a high assurance for repayment of Treasury borrowing.

Continued cost management efforts have helped Bonneville build adequate financial reserve levels to assure full recovery of its costs and long-term financial stability while meeting its overall responsibilities to the Pacific Northwest and U.S. taxpayers.

The Final Record of Decision for the FY 2014-2015 rate case was issued on July 24, 2013 and FERC granted interim approval September 27, 2013.

Budget Estimates and Planning

FY 2013 costs in this FY 2015 Budget are based on Bonneville's FY 2013 audited actuals. FY 2014-2019 expense estimates are based on Bonneville's 2012 Integrated Program Review (IPR) final report. FY 2014-2015 capital estimates are based on Bonneville's IPR2 process that took place in May 2013. FY 2016-2019 capital estimates are based on the IPR final report although Transmission capital and Fed Hydro capital estimates for FY 2016-2019 were updated for shaping.

Capital funding levels reflect Bonneville's capital asset management process and external factors such as the significant changes affecting the West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region and national energy security goals.

Capital investment levels in this FY 2015 Budget reflect executive management decisions from Bonneville's Capital Allocation Board (CAB) and the associated capital review process. Bonneville utilizes a structured capital project selection process requiring submission of a standardized business case for review by Bonneville. Each business case consists of a description of the project, a clear statement of objectives, description and mitigation of risks, and a rigorous analysis of

project costs including a status quo assumption and preferred alternatives. In addition, both annual and end of project targets are set for each project covering cost, scope, and schedule. Progress reports on these targets are provided to Bonneville's senior executives at least quarterly.

The FYs 2014-2019 revenue estimates in this budget, included in the Net Outlay formulation, are calculated consistent with cash management goals. The revenue estimates reflect assumed adjustments, which include the use of a combination of tools, including: upcoming rate adjustment mechanisms; reduced cost estimates; a net revenue risk adjustment; debt management strategies; and/or short-term financial tools to manage net revenues and cash. The revenue estimates also include depreciation and Treasury repayment credit assumptions. These Treasury repayment credits offset, among other things, Bonneville's fish and wildlife program costs allocable to the non-power project purposes of the FCRPS, consistent with the Northwest Power Act.

Overview of Detailed Justifications

Bonneville's Detailed Justification Summaries, included in this FY 2015 Budget, follow present budget requirements for budget line items on the basis of accrued expenditures. Accrued expenditure is the basis of presenting Bonneville's program funding levels in the power and transmission rate making processes and the basis upon which Bonneville managers control their resources to provide products and services. Accrued expenditures relate period costs to period performance. Traditional budget obligation requirements for Bonneville's budget are assumed on the Program and Financing Summary Schedule prepared in accordance with OMB Circular A-11.

The organization of Bonneville's FY 2015 Budget and these performance summaries reflect Bonneville's business services basis for utility enterprise activities. Bonneville's major areas of activity on a consolidated budget and accounting basis include power and transmission, with administrative costs included. Power Services includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program, Associated Projects O&M Costs, and the Council. Environmental activities are shown in the relevant Power Services and Transmission Services sections, as are reimbursable costs. Bonneville's interest expense, pension and post-retirement benefits and capital transfers to the Treasury are shown by program.

The first section of performance summaries, Capital Investments, includes accrued expenditures for investments in electric utility and general plant associated with the FCRPS generation and transmission services, energy efficiency, fish and wildlife, and capital equipment. These capital investments will require budget obligations and expected use of \$1,055 million in bonds to be sold to the U.S. Treasury in FY 2015.

The near-term forecast capital funding levels have undergone an extensive internal review as a result of the capital asset management strategy. These capital reviews encompass project cost management initiatives, capital investment assessments, and categorization of capital projects to be funded based on risk and other factors. Consistent with Bonneville's near-term capital funding review process and Bonneville's standard operating budget process, this FY 2015 Budget includes updated capital funding levels for FY 2014. Utilizing this review process helps Bonneville in its efforts to compete in the deregulated wholesale energy market. Bonneville will continue to work with the Corps and Reclamation to optimize the best mix of projects.

In addition to its internal management assessment of capital investments, Bonneville has developed and implemented an associated external capital investment review process that provides significant benefits to Bonneville. The combined internal and external processes add value by both improving direction on what the FCRPS invests in (tying investments more closely to agency strategy) and by improving how those investments are made (more detailed analysis and review of capital investments and their alternatives).

Bonneville's second section of the performance summaries, entitled Annual Operating Expenses, includes accrued expenditures for services and program activities financed by power sales revenues, transmission services revenues and projects funded in advance. For FY 2015, budget expense obligations are estimated at \$2,996 million. The total program requirements of all Bonneville programs include estimated budget obligations of \$4,098 million in FY 2015.

Evidence and Analysis in the Budget

Consistent with the President's emphasis on evidence and evaluation in the budget, Bonneville has undertaken several initiatives to determine appropriate budget expenditures.

Bonneville's strategy specifically calls out the need for its key systems and processes to employ best practices and emphasize cost performance. In order to aggressively pursue cost reductions and revenue enhancements, several years ago Bonneville, along with external contractor KEMA, embarked on the Enterprise Process Improvement Program (EPIP). KEMA looked at 70 different functions across Bonneville and, using benchmarking and prioritization, identified 23 where potential efficiencies could be found. Bonneville then launched individual EPIP projects across the agency to develop and implement specific changes in how we conduct our business.

As the EPIP projects concluded, Bonneville built on the EPIP work by focusing on institutionalizing operational excellence – continuous improvement that produces more efficient and effective ways to deliver on Bonneville's mission and vision. Bonneville has established a Strategy Execution organization which provides programs and processes to improve business operations, and the quality of outputs, while applying the tools and principles of operational excellence in alignment with the vision of the Bonneville strategic direction. In FY 2012, Bonneville embarked on an extensive assessment of utility benchmarking and elected to adopt a benchmarking program to support meaningful evidence of efficiency and cost-effectiveness. The Bonneville Benchmarking & Operational Excellence Program has comprehensively benchmarked four specific strategic focus areas around Safety, Supply Chain, Reliability Compliance, and Energy Accounting and Determination of Loads.

FTE projections for FY 2014 and FY 2015

Bonneville is committed to restoring its HR functions to full compliance with all applicable laws and regulations. The estimated FTE amounts for FY 2014 and FY 2015 are increased by 100 FTEs for flexibility to address the remedial actions that may be necessary to provide priority consideration to individuals who were disadvantaged between November 2010 and April 2013. Review of Bonneville's past hiring practices is ongoing.

**Power Services - Capital
Funding Schedule by Activity**

Funding (\$K)

	FY 2013 Current	FY 2014 Estimate	FY 2015 Estimate	FY 2015 vs FY 2014	
				\$	%
Power Services - Capital					
Associated Project Costs	186,425	240,802	239,082	-1,720	-1%
Fish & Wildlife	52,120	60,275	51,284	-8,991	-15%
Energy Efficiency	78,376	75,200	92,000	16,800	22%
Total, Power Services - Capital	316,921	376,278	382,367	6,089	2%

Outyears (\$K)

	FY 2015 Estimate	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate
Power Services - Capital					
Associated Project Costs	239,082	248,293	244,288	255,936	256,717
Fish & Wildlife	51,284	36,650	30,795	28,646	44,806
Energy Efficiency	92,000	94,760	97,603	100,531	103,547
Total, Power Services - Capital	382,367	379,703	372,686	385,113	405,070

Program Overview

Associated Project Costs provide for direct funding of additions, improvements and replacements of existing Reclamation and Corps hydroelectric projects in the Pacific Northwest. The FCRPS hydro projects produce electric power that is marketed by Bonneville.

Maintaining the availability and increasing the efficiency of the FCRPS is critical to ensuring that the region has an adequate, reliable and low-cost power system. The FCRPS represents about 80 percent of Bonneville's firm power supply and is comprised of 31 operating Federal hydroelectric projects with over 200 generating units. These projects have an average age of about 50 years, with some that exceed 60 years of age. Through direct funding and the cooperation of the Corps and Reclamation, Bonneville uses its Treasury borrowing authority and customer prepayment program to make investments needed to restore generation availability and improve efficiency, reducing demand on Corps and Reclamation appropriations for power-related investments.

Since the beginning of direct funding in FY 1997, Bonneville, along with these joint operating partners, has improved system performance. In 1999, at the direction of Congress, Bonneville issued a report that it soon began to implement called the "Asset Management Strategy for the FCRPS." Bonneville concluded in this report that it needed to invest nearly \$1 billion in the projects over the ensuing 12 to 15 years. Supplementary analyses and experience with the system have revealed additional investment needs above and beyond the levels originally planned under the 1999 Asset Management Strategy well in to the future. In 2008, 2010, and again in 2012, Bonneville updated the System Asset Strategy and refined the long-term capital investment needs to preserve the performance of the system.

These planned investments, included in the FY 2015 Budget estimates, will maintain the generation performance of the FCRPS. Moving forward with the cost-effective opportunities to expand the generation and to preserve and enhance the capability of the Federal system is a smart economic and environmental decision when compared to purchasing power from the market to serve growing Pacific Northwest electricity needs.

Bonneville's fish and wildlife capital program is directed at activities that improve Columbia River Basin fish and wildlife resources, including projects designed to increase juvenile and adult fish passage in tributaries, to increase fish production and survival through construction of hatchery and acclimation facilities, land acquisitions for resident fish and wildlife habitat that follow Bonneville's Capitalization Policy, and fish monitoring facilities. Capital project funding integrates ESA-related priorities with the region's Columbia River Basin Fish and Wildlife Program in order to efficiently meet Bonneville's legal responsibilities to provide mitigation for hydrosystem impacts to Columbia River Basin fish and wildlife and facilitate salmon and steelhead protection and recovery.

Projects recommended by the Council undergo independent review as directed by the 1996 Energy and Water Appropriations Act, which added section 4(h)(10)(D) to the Northwest Power Act. As a result, the Council appoints an Independent Scientific Review Panel (ISRP) "to review a sufficient number of projects" proposed to be funded through Bonneville's fish and wildlife budget "to adequately ensure that the list of prioritized projects recommended is consistent with the Council's program." The Northwest Power Act further states that ". . . in making its recommendations to Bonneville, the Planning Council shall consider the impact of ocean conditions on fish and wildlife populations; and shall determine whether the projects employ cost effective measures to achieve program objectives." Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council has shifted to a multi-year project review cycle during which the ISRP will review categories of projects grouped together; e.g., all anadromous fish habitat projects were recently reviewed.

Under the Northwest Power Act, the Council must develop a fish and wildlife program that protects, mitigates and enhances Columbia River Basin fish and wildlife affected by the Federal and non-Federal hydroelectric projects in the basin. Sub-basin plans and long-term agreements include prioritized strategies for mitigation actions will help guide project selection that meets both Bonneville's responsibilities under the Northwest Power Act, ESA and other laws. In order to address the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, 16 U.S.C. § 839b(h)(10)(A), Bonneville continues its ongoing work with the Council and the regional fish and wildlife managers, customers, and tribes to review projects to ensure ratepayers fund appropriate mitigation.

Fish and Wildlife Program costs provide funding to implement measures to protect fish and wildlife in the Columbia River and its tributaries that are listed as threatened or endangered under the ESA and the protection, mitigation, and enhancement, of fish and wildlife impacted by the development and operation of the FCRPS as authorized under the Northwest Power Act.

Bonneville continues a comprehensive approach to integrate the ESA requirements of the FCRPS Biological Opinions with the broad resource protection, mitigation and enhancement objectives of the Council's Program, adopted by the Council pursuant to the Northwest Power Act. Bonneville satisfies a major portion of its fish and wildlife responsibilities by funding projects and activities that implement the Program. This includes a number of wildlife mitigation settlements for dam impacts, most recently a 2010 agreement addressing the Willamette Basin in Oregon. It includes the construction and operation of hatcheries to offset fish habitat lost from the development and operation of the FCRPS. Bonneville also implements measures addressed to avoid jeopardizing listed salmon and steelhead as required under the ESA.

The ESA measures are part of the most recent BiOps issued by NOAA in 2008/2010 and USFWS in 2006.

- In February 2006, USFWS issued a new BiOp for Libby Dam for the Kootenai River white sturgeon and bull trout. A subsequent Settlement Agreement between USFWS and the Center for Biological Diversity was memorialized by modifying the BiOp in 2008. Discussions are ongoing as to when and whether additional consultation is necessary as the Action Agencies (Corps, Reclamation, and Bonneville) move forward with finalizing the consultation on bull trout.
- In 2010 USFWS designated critical habitat for bull trout (following USFWS's issuance in 2000 of a BiOp for FCRPS impacts on bull trout). The action agencies have begun to prepare a biological assessment covering FCRPS operational effects on bull trout critical habitat.
- In May 2008, NOAA issued a new FCRPS BiOp for 13 listed species of salmon and steelhead, augmented in a 2010 Supplemental BiOp and Adaptive Management Implementation Plan, which continue to be challenged in Oregon District Court. Additional species included in the 2008 consultation included North American green sturgeon and Southern Resident killer whales. On August 2, 2011, the Federal District Court issued an opinion and order rejecting the 2008/2010 BiOp because it failed to identify specific and verifiable mitigation plans beyond 2013. However, the Federal District Court left the BiOp in place through 2013 while ordering a new supplemental BiOp. As required by the 2008 BiOp and to facilitate NOAA's development of a supplemental 2014 BiOp, on January 10, 2014, the Action Agencies released, among other documents, a 2014-2018 Implementation Plan describing the mitigation actions that will be implemented to achieve BiOp objectives.
- In July 2008, USFWS and NOAA issued Willamette River BiOps to address impacts from 13 federal dams on salmon, steelhead, Oregon chub, and bull trout. Implementation of a BiOp measure related to hatchery fish in the McKenzie River is the subject of current litigation in Federal District Court, and also related to formal consultation with NOAA regarding operation of the McKenzie hatchery.
- On January 17, 2014, NOAA released its 2014 Supplemental BiOp. In the BiOp, NOAA indicates that it is encouraged to find that improvements at the federal dams on the lower Columbia and Snake rivers as well as rehabilitation of habitat and other actions are benefitting federally protected salmon and steelhead as much or more than anticipated five years ago.

These BiOps collectively require the action agencies (Corps, Reclamation, and Bonneville) to implement hydro, habitat, hatchery and other actions throughout the Columbia River Basin to address impacts stemming from the operation of the Federal hydro-electric dams on ESA-listed fish, and to ensure that operations of the Federal dams do not jeopardize the continued existence of the listed species or adversely modify their designated critical habitat.

In addition to the 2008 NOAA FCRPS BiOp, the action agencies also signed the 2008 Columbia Basin Fish Accords (Fish Accords or Accords) with five Northwest Tribes, and the states of Idaho and Montana. In 2009, an agreement was signed with the state of Washington and federal agencies (the state of Washington Estuary agreement). And in 2012 the federal agencies signed an agreement with the Kalispell Tribe of Indians covering Albeni Falls Dam and FCRPS operations. The Fish Accords supplement the activities encompassed within the 2008/2010 BiOp and the Council's Program by providing firm commitments to prioritized mitigation actions and securing funding for 10 years. As a result of the 2008 FCRPS BiOp, the Supplemental FCRPS BiOps issued in 2010 and 2014, and the Fish Accords, as discussed below, expenditures above those planned in FY 2009 are required in FY 2011 and beyond.

These BiOps and Fish Accord commitments, and other projects undertaken to implement the Council's Program pursuant to the Northwest Power Act, are the basis for the Bonneville Fish and Wildlife Program's planned capital investment.

Energy Efficiency is an important part of Bonneville's diverse portfolio of resources that provides a reliable approach to meeting Bonneville's load obligations. When acquiring resources to meet planned future loads, the Northwest Power Act requires the Administrator to first consider and acquire cost-effective conservation that the Administrator determines is consistent with the Council's Power Plan. The Council's 6th Power Plan, finalized in February 2010, established a regional target of 1,200 aMW of energy efficiency in 2010 through 2014. Bonneville, in collaboration with its Public Power Customers, has taken responsibility for Public Power's share of the regional target, approximately 42 percent (504 aMW) of that target. Bonneville anticipates that between 250 and 300 aMW of this amount will be acquired under its capital energy efficiency program. Beginning in FY 2012 at least 70% of this energy efficiency budget was allocated to utilities to fund energy efficiency incentives with the remainder going to support regional programs. Program performance measurements (\$/aMW) indicate that Bonneville is realizing value for these investments relative to other resources.

In general, long-term investments in energy efficiency help buffer the FCRPS against future resource uncertainties and during periods of price volatility, energy efficiency reduces financial risk associated with relying on the market for energy purchases in the future.

Accomplishments

- Issued final Record of Decision for the FY 2014-2015 rate case on July 24, 2013.
- Facilitated integration of 4,515 MW of wind generation through FY 2013.
- Completed high voltage cable replacement, governor and exciter replacement, and all other pre-overhaul work in the Grand Coulee Third Power Plant.
- Completed T6 transformer replacement at Ice Harbor.
- Completed DC system upgrades at The Dalles.
- Completed refurbishment of the spillway tainter gates at Dexter.
- The returns of adult salmon and steelhead to the Columbia River system from 2009 to 2013 vary by species, but many stocks (especially Snake River fall Chinook and Snake River sockeye) have returned at the highest numbers in decades. Research shows that survival of juvenile salmon and steelhead migrating down the Snake and Columbia rivers has improved in recent years and is on track to meet performance standards of 96 percent survival per dam for spring-migrating fish and 93 percent survival for summer migrants.

Explanation of Changes

Bonneville's budget includes \$382 million in FY 2015 for Power Services capital, which is a 1.6 percent increase over the FY 2014 forecasted level. The FY 2015 level reflects a continuing need for investment in the hydro electric system assets, funding necessary to implement the BiOp, Fish Accords, Columbia Basin Fish and Wildlife activities, and a continued commitment to energy efficiency initiatives by public power within the region.

The FY 2015 budget decreases the levels for Associated Projects (-\$1.7 million), decreases Fish & Wildlife (-\$8.9 million), and increases Energy Efficiency (+\$16.8 million) relative to FY 2014.

Strategic Management

Bonneville provides electric power while supporting the achievement of its vital responsibilities for fish and wildlife, energy efficiency, renewable resources and low-cost power in the Pacific Northwest. Bonneville will continue to implement the following strategies to serve the region:

1. Bonneville coordinates its power operational activities with the Corps, Reclamation, NERC, regional electric reliability councils, its customers, and other stakeholders to provide the most efficient use of Federal assets.
2. Ongoing work with the Corps and Reclamation is focused on improving the reliability of the FCRPS, increasing its generation efficiency, and optimization of hydro facility operation.
3. Bonneville is committed to continue funding efforts to protect listed fish and wildlife species in the Columbia Basin under the ESA and to work closely with the Council, regional fisheries managers, and other Federal agencies to prioritize and manage fish and wildlife program projects.
4. Bonneville's utility customers have been and continue to be a critical part of Bonneville's collaborative efforts to promote and foster efficient use of energy.

5. Bonneville has partnered and assisted with a DOE Wind Power crosscutting initiative to strengthen energy security by adding alternative sources of renewable energy.

The following external factors present the strongest impact to overall achievement of the program's strategic goal:

1. Continually changing economic and institutional conditions
2. Competitive dynamics
3. Ongoing changes in the electric industry

Associated Projects

Overview

Bonneville will work with both the Corps and Reclamation to reach mutual agreement on those capital improvement projects that need to be budgeted and scheduled, are cost-effective and provide system or site-specific enhancements, increase system reliability, or provide generation efficiencies.

The work is focused on improving the reliability of the FCRPS, increasing its generation efficiency or capacity through turbine runner replacements, optimizing hydro facility operation and new unit construction. Also, limited investments may be made in joint use facilities that are beneficial to both the FCRPS operations and to other Corps and Reclamation project purposes.

Corps of Engineers Projects

FY 2013	(\$K) FY 2014	FY 2015
124,912	177,026	166,343

Bonneville Dam:

- **FY 2013.** Completed protective relay replacements, Powerhouse 2 gantry crane rehabilitation, and additional crane and deck refurbishments. Continued elevator replacement, main unit breakers, station service upgrades, headgate refurbishment/replacements, fire protection upgrades, governor replacements, vibration and air gap monitoring, and transformer improvements. Began Powerhouse 2 transformer refurbishment.
- **FY 2014.** Continue governor replacements, headgate refurbishment/replacements, vibration and air gap monitoring, transformer improvements, main unit breakers, replacement, station service upgrades, Powerhouse 2 transformer refurbishment, and fire protection upgrades. Begin Generator Step Up (GSU) transformer instrumentation and governor oil filtration system.
- **FY 2015.** Complete governor replacements. Continue main unit breakers, governor oil filtration system, vibration and air gap monitoring, GSU transformer instrumentation, and fire protection upgrades. Continue Powerhouse 2 transformer refurbishment, and station service upgrades.

John Day Dam:

- **FY 2013.** Completed elevator rehabilitation and protective relay replacements. Continued fire protection upgrades, governor replacements, Baldwin Lima Hamilton (BLH) turbine hub upgrades, DC system upgrades and station service transformer replacements. Began draft tube bulkhead refurbishment.
- **FY 2014.** Continue governor replacements, DC system upgrades, BLH turbine hub upgrades, station service transformer replacements, draft tube bulkhead refurbishment, and fire protection upgrades.
- **FY 2015.** Continue governor replacements, DC system upgrades, BLH turbine hub upgrades, draft tube bulkhead, station service transformer replacements, and fire protection upgrades. Begin transformer and powerhouse oil/water separator.

The Dalles Dam:

- **FY 2013.** Completed DC system upgrades, powerhouse roof replacement, elevator rehabilitation, and spare 230 kV transformer purchase. Continued governor replacement, preferred AC system upgrades, and fire protection design and upgrades. Began Station Control Console (SCC) control replacement and tailrace gantry crane rehabilitation.
- **FY 2014.** Complete preferred AC upgrades and continue governor replacements, fire protection upgrades, SCC control replacement, and tailrace gantry crane refurbishment. Begin transformer replacements.
- **FY 2015.** Complete fire protection upgrades and governor replacements. Continue SCC control replacements, tailrace gantry crane and transformer replacements.

Willamette Plants:

- **FY 2013.** Completed protective relay replacements at Green Peter and Foster, digital governor replacement at Hills Creek and spillway tainter gate work at Dexter. Continued transformer oil/water separator installation at Cougar and Hills Creek, electric reliability upgrades at Dexter, and emergency engine generator at Lookout Point. Continued governor replacement at Foster, Green Peter, and Lost Creek. Continued turbine runner replacements

at Hills Creek and Lookout Point, penstock roller gate work at Lookout Point, spillway tainter gate work at Big Cliff. Began governor replacements at Big Cliff, Cougar, Detroit, Lost Creek and Dexter. Began spillway tainter gate work at Green Peter.

- **FY 2014.** Complete spillway tainter gate repair at Big Cliff. Complete transformer oil/water separation at Cougar and Hills Creek. Continue turbine runner replacement at Lookout Point and Hills Creek. Continue governor replacement at Lookout Point, and electrical reliability at Dexter. Continue governor replacements at Big Cliff, Cougar, Dexter, Detroit, Foster, and Green Peter. Continue butterfly valve replacement at Lost Creek. Begin transformer oil/water separation at Green Peter, Dexter, and Foster. Begin main unit breaker replacement at Foster. Begin Generic Data Acquisition and Control System (GDACS) installation at all Willamette Valley plants.
- **FY 2015.** Complete spillway tainter gate repair at Lookout Point and butterfly valve replacement at Lost Creek. Complete turbine runner replacements at Hills Creek and Lookout Point. Complete governor replacements at Cougar, Dexter, Detroit, Foster, Green Peter, and Lookout Point. Complete electrical reliability upgrades at Dexter. Continue transformer oil/water separation at Green Peter, Dexter, and Foster and spillway tainter gate repair at Green Peter. Continue main unit breaker replacement at Foster. Continue GDACS installation at all Willamette Valley plants. Begin main unit breaker replacement at Green Peter.

Albeni Falls:

- **FY 2013.** Completed DC system boards and breaker replacement, continued intake and spillway crane modernization and spillway gate modifications. Began tailrace stoplogs.
- **FY 2014.** Complete DC system boards and breaker replacement, spillway crane modernization, spillway gate modifications, intake crane modernization and tailrace stoplogs.
- **FY 2015.** Begin transformer replacement.

Libby Dam:

- **FY 2013.** Completed exciter replacement and continued governor replacement. Began powerhouse and dam electrical distribution equipment replacement.
- **FY 2014.** Begin governor installation. Continue powerhouse and dam electrical distribution equipment replacement.
- **FY 2015.** Continue governor installation and powerhouse and dam electrical distribution equipment replacement. Begin station service Motor Control Center (MCC) replacement.

Chief Joseph Dam:

- **FY 2013.** Completed 480-V upgrade/SQO substation replacement and automatic synchronizer replacement. Continued exciter replacements, protective relay replacements, DC and preferred AC upgrades and turbine replacements. Began governor replacement and generator cooling system upgrades.
- **FY 2014.** Complete DC and preferred AC upgrades and protective relay replacements. Continue exciter replacements, generator cooling system upgrades, and turbine replacements. Begin governor installation.
- **FY 2015.** Complete powerhouse HVAC upgrades. Continue exciter replacement, governor installation, generator cooling system upgrades, and turbine replacements.

Dworshak Dam

- **FY 2013.** Completed unit 2 thrust bearing replacement. Continued unit 3 standby generator guide bearing and oil cooler assemblies and powerhouse HVAC upgrade. Began governor replacement design.
- **FY 2014.** Complete unit 3 standby generator guide bearing and oil cooler assemblies and powerhouse HVAC upgrade. Begin governor replacement.
- **FY 2015.** Continue governor replacement.

McNary Dam

- **FY 2013.** Completed protective relay replacements, generator winding replacements on units 3 and 8, and fishway exit cranes replacement. Continued station service rehabilitation, heat pump replacement, potable water system upgrade, turbine design and replacement, and levee drainage pump station upgrades. Began main unit governor replacement.
- **FY 2014.** Complete generator rewinds for units 4 and 11 and heat pump replacement. Continue generator winding replacements, station service rehabilitation, turbine design and replacement, potable water system upgrade and

levee drainage pump station upgrades. Continue main unit governor replacement design. Begin exciter replacement.

- **FY 2015.** Complete generator winding replacements. Continue turbine design and replacement, station service rehabilitation, exciter replacement potable water system upgrade and levee drainage pump station upgrades. Begin governor installation.

Ice Harbor

- **FY 2013.** Completed T6 transformer replacement. Continued units 2 and 3 runner replacements, 480 voltage switchgear (SQ) board replacements, DC system upgrade, and drainage and dewatering pump upgrade. Started main unit governor replacement, and unit 1 runner replacement.
- **FY 2014.** Complete low voltage switchgear SQ board replacements and DC system upgrade. Continue units 1-3 runner replacements and governor replacement. Begin oil storage and handling upgrade.
- **FY 2015.** Complete main unit governor install and oil storage and handling upgrade. Continue units 1-3 runner replacements. Begin HVAC controls upgrade.

Little Goose

- **FY 2013.** Completed thrust bearing shoes, runner and oil coolers replacement and diesel generator replacement. Continued exciter replacements, powerhouse bridge crane rehabilitation, wastewater treatment plant upgrades and intake crane replacement. Began governor replacement design.
- **FY 2014.** Complete exciter replacements. Continue powerhouse bridge crane rehabilitation. Continue wastewater treatment plant upgrades. Begin governor installation.
- **FY 2015.** Continue governor installations and powerhouse bridge crane rehabilitation. Begin spare tailrace stoplogs.

Lower Granite

- **FY 2013.** Completed SQ2 replacement, exciter replacements, diesel generator replacement and intake crane replacement. Continued powerhouse bridge crane refurbishment, powerhouse HVAC upgrade, unit 1 linkage repair, and sewage treatment plant upgrade. Began governor replacement design.
- **FY 2014.** Complete sewage treatment plant upgrade. Continue powerhouse HVAC upgrade and powerhouse bridge crane refurbishment. Begin governor replacement and unit 1 linkage replacement.
- **FY 2015.** Complete powerhouse HVAC upgrade and sewage treatment plant upgrade. Continue powerhouse bridge crane refurbishment and unit 1 linkage replacement. Continue governor replacement.

Lower Monumental

- **FY 2013.** Completed intake crane replacement, SQ2 replacement, diesel generator replacement, and exciter replacements. Continued unit 1 linkage replacement. Began governor replacement design and unit 1 rewind.
- **FY 2014.** Continue unit 1 linkage replacement and generator rewind. Begin governor replacement.
- **FY 2015.** Continue unit 1 linkage replacement and generator rewind, continue governor replacement.

Bureau of Reclamation Projects

(\$K)

FY 2013	FY 2014	FY 2015
61,513	63,776	72,739

Grand Coulee

- **FY 2013.** Completed air housing cooler replacements, material storage building, third power plant elevator rehabilitation, third power plant crane rehabilitation, exciter and governor replacement, fixed wheel gate chamber modifications, and high voltage cable replacement. Continued Supervisory Control and Data Acquisition (SCADA) replacement, 500 kV switchyard relay replacements, units 19-24 wear ring replacements, left power plant transformer replacements, units 19-21 upgrades including winding replacements, purchase of another left and right powerhouse spare winding, and hydro optimization investigations with related equipment installations.
- **FY 2014.** Continue SCADA replacement, 500 kV switchyard relay replacements, left power plant transformer replacements, purchase of another left and right powerhouse spare winding, units 19-21 upgrades including winding replacements, units 19-24 wear ring replacements, and hydro optimization investigations with related equipment installations.
- **FY 2015.** Continue SCADA replacement, left powerplant transformer replacement, 500 kV switchyard relay replacements, purchase of another left and right powerhouse spare winding, units 19-21 upgrades including winding replacements, G19-24 wear ring replacements, and hydro optimization investigations with related equipment installations. Begin right powerplant transformer replacements.

Hungry Horse

- **FY 2013.** Completed powerhouse roof replacement, and continued SCADA replacement, main unit transformer fire protection system replacement, and Station Service and MCC upgrades.
- **FY 2014.** Continue SCADA replacement, main unit transformer fire protection system replacement, and SS and MCC upgrades.
- **FY 2015.** Complete SCADA replacement and SS and MCC upgrades, continue main unit transformer fire protection system replacement, and begin exciter and governor replacement.

Chandler

- **FY 2013.** Continued transformer replacement.
- **FY 2014.** Complete transformer replacement.

Palisades

- **FY 2013.** Continued turbine runner replacement.
- **FY 2014.** Continue turbine runner replacement.
- **FY 2015.** Continue turbine runner replacement.

Green Springs

- **FY 2013.** Continued transformer replacement and began exciter replacement.
- **FY 2014.** Continue exciter replacement and transformer replacement.
- **FY 2015.** Continue exciter replacement.

Black Canyon

- **FY 2013.** Continued additional unit, units 1 and 2 upgrades, and trash rake system design.
- **FY 2014.** Continue additional unit, units 1 and 2 upgrades, and trash rake system designs.
- **FY 2015.** Continue additional unit, units 1 and 2 upgrades, and trash rake system designs.

Fish & Wildlife		
(\$K)		
FY 2013	FY 2014	FY 2015
52,120	60,275	51,284

Overview

Bonneville continues to develop budgets based on the suite of mitigation projects it adopted in FY 2007 based on recommendations from the Council. Bonneville reaffirmed many project-specific commitments in subsequent agreements and processes, including BiOps and Fish Accords. These funding decisions embrace the management objectives and priorities in the Council's Program and integrate ESA responsibilities as described in the NOAA Fisheries' and USFWS's FCRPS BiOps. Coordination continues among Bonneville, Council, Federal resource management agencies, states, tribes and others to support projects to satisfy Bonneville's mitigation responsibilities.

Bonneville intends to continue implementing the kinds of projects listed below. These projects are based upon the best available science and are regionally important in that they provide high priority mitigation and recovery actions for fish and wildlife populations as affected by the construction and operation of the FCRPS power facilities. Projects and facilities listed below deliver direct on-the-ground benefits to both ESA listed and non-listed fish and wildlife throughout the Columbia River Basin and have been evaluated and coordinated with the Council, state, Federal and tribal fish and wildlife resource managers, local governments, watershed and environmental groups and other interested parties. Specifically, as capital construction projects, these facilities typically go through the Council's three-step process, which includes development of a Master Plan, environmental compliance, ESA consultation, value engineering analysis, and review by the Independent Science Review Panel.

Implementation of reforms to FCRPS hatchery programs that help reduce impacts on ESA-listed species, as called for under NOAA Fisheries' FCRPS BiOp, is done following ESA consultations with NOAA, and USFWS where appropriate, on the development of hatchery genetic management plans, which will establish both specific reforms to individual facilities, as well as priorities for sequencing implementation.

Bonneville also may capitalize the investment in some fish and wildlife habitat acquisitions if such investment provides a creditable and quantifiable benefit against a defined obligation for Bonneville and follows Bonneville's Capitalization Policy.

The three types of projects that Bonneville capitalizes are as follows:

- 1) Tributary passage -- Activities that enhance fish passage to tributary rivers. For the purpose of capitalization, a tributary is defined by the Council designated sub-basin of the tributary. Functionally interdependent work elements could contain the following: wells, ladders, screens, pumping, culverts, diversion (irrigation) consolidation, piping to reduce water loss, irrigation efficiencies (drip irrigation), lining of ditches (seepage reduction), removal of damming objects or pushup dams in conjunction with related construction, and construction related habitat restoration.
- 2) Hatchery facility construction -- Projects and activities relating to the construction of fish hatcheries, including related satellite facilities (acclimation ponds and collection weirs). This may also include construction-related habitat restoration.
- 3) Land acquisition -- Land acquisition projects protect, enhance, and maintain instream wetland and riparian habitat and provide credit to Bonneville, such as habitat units (HUs) or acres for wildlife or instream miles for resident fish, to fulfill the legal obligation of Bonneville to mitigate the impacts from construction and operation of the FCRPS power facilities.

Anadromous fish supplementation, production and related facilities that may require capital funds in FY 2015 include the following:

Requesting Expenditure Authority for the following project:

-Black Canyon Trout Hatchery: The Shoshone Paiute Tribes of the Duck Valley Reservation propose that Bonneville fund the purchase and renovation of an existing privately-owned trout hatchery near Pocatello, Idaho, just outside the boundaries of the Columbia River Basin. The purchase could occur as early as FY 2015. The Tribes would own and operate the hatchery to produce trout for stocking in reservoirs located on the Duck Valley Reservation. Bonneville would fund the capital renovation at the hatchery to meet contemporary aquaculture standards and achieve fish production goals. The Tribe

believes it can reduce federal reservoir stocking costs if it owns and operates the hatchery.

The FY 2014 Omnibus Appropriations Act (Public Law No. 113-76) provided expenditure for the following projects:

- John Day Reprogramming and Construction: This project is being proposed by the Columbia River Inter-Tribal Fish Commission (CRITFC) under the Accords to work on the balance between upriver and down river salmon hatchery production mitigating for John Day and The Dalles Dams. Final reprogramming facilities and locations are still being analyzed by the Tribes, the Corps and Bonneville. The project area encompasses the mainstem Columbia River from the base of McNary Dam downstream to The Dalles Dam. Capital dollars for this project will help fund constructing additions to new or existing FCRPS hatchery facilities to accommodate the reprogramming of hatchery fish.

- Columbia River Basin White Sturgeon Hatchery: The Columbia River Basin White Sturgeon Hatchery, proposed by the CRITFC under the Accords, will mitigate for white sturgeon population declines due to consistent poor recruitment upstream of Bonneville Dam. Expected production at a new or existing facility will be 15,000 - 20,000 yearling white sturgeon per year. The final project may include broodstock collection and holding, rearing wild-spawned juveniles, and acclimating juveniles prior to release. A location for the facility has not yet been determined, but it will likely be located within 60 miles of the confluence of the Columbia and Snake Rivers.

- Kelt Reconditioning and Reproductive Success Evaluation Research: CRITFC, under the Accords, is proposing a relatively small holding tank facility to recondition female steelhead (kelts) after they have spawned. The fish will be held and fed until they have rematured and then be released into the Snake River where they will contribute to the spawning run. The capital portion of the project is expected to be constructed in the Snake River Basin, potentially at Lower Granite Dam. As specified in the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, Bonneville will implement the kelt reconditioning plan to improve the productivity of Snake River basin B-run steelhead populations that are listed for protection under the ESA. NOAA's analysis of Prospective Actions indicates that a combination of transportation, kelt reconditioning, and in-stream passage improvements (e.g. spill-flow modifications) could increase kelt returns enough to increase the number of returning Snake River B-run steelhead spawners to Lower Granite Dam by a target of 6% as specified under the BiOp.

Ongoing Projects:

- Kootenai River Native Fish Conservation Aquaculture Program: The Kootenai Tribe of Idaho has started the construction of a new hatchery on tribally owned land at the confluence of the Moyie and Kootenai rivers (Twin Rivers). This new facility will address current physical space limitations that has challenged expansion of the existing Tribal Sturgeon Hatchery located near Bonners Ferry. The Twin Rivers site offers high quality ground and surface water needed to support the aquaculture objectives for Kootenai River white sturgeon and burbot. This location may also help to extend the river reaches where Kootenai sturgeon imprint and ultimately return to spawn. Bonneville completed an Environmental Assessment with findings of no significant impact in April 2013.

Facilities under construction include dual water supplies and filtration, incubation rooms, juvenile rearing tanks and ponds, spawning channels, support facilities and staff housing. The Tribe is also proposing the experimental use of remote streamside incubation and early rearing facilities to imprint Kootenai sturgeon upstream of the new hatchery site. The improvements the Tribe proposed for the existing Tribal Sturgeon Hatchery would enhance sturgeon handling and rearing capabilities. A new spawning room would eliminate the current need to relocate large fish from one building to another. A safer means to transport large adults to and from the river would be provided, in addition to a number of measures to improve fish culture practices and program efficiency and success.

- Crystal Springs Hatchery Facilities: This project is for facilities for rearing and out-planting resident and anadromous fish in central and southern Idaho. The facility is located near the American Falls Reservoir in Idaho. Resident fish that may be produced include Yellowstone Cutthroat. The anadromous fish may include Snake River spring Chinook salmon Snake River steelhead, and Snake River sockeye. The facility is sponsored by the Shoshone-Bannock Tribes under their Accord, who are expected to operate and manage the facility once it is complete. A final Environmental Impact Statement is expected to be complete in 2015-2016.

- Snake River Spring Chinook Salmon artificial propagation facilities (known as the Northeast Oregon Hatchery or NEOH): to be located on the Upper Grande Ronde River near La Grande, Oregon, on Catherine Creek near Union, Oregon, and on Lostine River near Enterprise, Oregon. While design has been ongoing for this project for several years, the decision to proceed with construction is pending ESA consultations and approval by NOAA Fisheries of a Hatchery and Genetic Management Plan for the facility. This project, as a measure in the Council's Fish & Wildlife Program, would also identify and develop artificial propagation facilities to protect and enhance salmon and steelhead native to the Imnaha and Grande Ronde River Basins.

- Redfish Lake Sockeye Salmon program: The Snake River sockeye salmon Evolutionarily Significant Unit (ESU) was listed under the Endangered Species Act in 1991 (56 FR 58619). The Snake River Sockeye Salmon Captive Broodstock Program has prevented extinction of endangered sockeye salmon. The program has been able to help successfully conserve the genetic resources of the founding population and begun producing fish for rebuilding the naturally spawning population in Redfish Lake. The program uses state of the art hatchery facilities and fish husbandry protocols, genetic support, and monitoring and evaluation to continue rebuilding numbers of fish. Currently, the program retains replicate, captive broodstock within multiple facilities (Eagle Fish Hatchery (FH) located in Idaho State and Burley Creek FH and Manchester Research Station both located in Washington State). Eggs produced from these locations are transferred to other facilities (Oxbow FH, located in Oregon State and/or Sawtooth FH located in Idaho State) for release programs. The project continues to expand by increasing the capacity of existing facilities and also acquired a new facility under the Idaho Columbia Basin Fish Accord, the newly constructed Springfield FH located in Idaho for additional smolts as called for in the 2008 FCRPS BiOp. The expanded smolt releases are expected to result in an increase in the abundance and productivity of the naturally-spawning population. This strategy will greatly increase the likelihood of higher adult returns. Additional expansions may include improvements at the Redfish Lake Creek trap and Sawtooth FH weir for holding/trapping an increased number of adults as a result of the increased smolt production from Springfield Hatchery. The biological goals are to increase the number of adults spawning naturally in the Sawtooth Valley and transition the captive broodstock to a conventional hatchery production program that uses anadromous adults as broodstock.

- Chief Joseph Dam Hatchery: Bonneville has funded the construction of Chief Joseph Dam Hatchery Program, primarily a comprehensive management program for supplementing Chinook salmon to increase the abundance, productivity, distribution, and diversity of naturally spawning populations of summer/fall Chinook in the Okanogan River and in the Columbia River below Chief Joseph Dam, Washington (between the confluence of the Okanogan River and Chief Joseph Dam). Project includes a new hatchery facility (at the base of the Chief Joseph Dam). In addition, the Colville Tribes as sponsor will use the facility to reintroduce extirpated spring Chinook back into the Okanogan Sub-basin. This Accord project includes the new hatchery facility and acclimation ponds (throughout the Okanogan River sub-basin), broodstock collection, egg incubation, rearing, release, and selective broodstock collection method development. Planned production levels are 2 million summer/fall Chinook and 0.9 million spring Chinook smolts. Bonneville has entered into an agreement with one public utility where that utility will pay a portion of the capital and operation and maintenance costs associated with this hatchery. In addition, Bonneville has agreed with three public utilities to share the operation and maintenance costs. Construction on the hatchery facility was completed in May 2013 and turned over to the Colville Tribes in June 2013.

- Klickitat Production Expansion: The Klickitat River Master Plan was submitted by the Yakama Nation, reviewed by the ISRP, recommended with comments by the Council, and approved by Bonneville in 2008. The plan's goal is to protect and increase naturally producing populations of spring Chinook and steelhead while protecting the biological integrity and the genetic diversity of indigenous fish stocks in the sub-basin. The Klickitat Master Plan includes three main elements: Lyle Falls Fishway upgrades; construction of the Castile Falls enumeration facility; upgrades to the Klickitat hatchery with the potential for constructing a new facility in the lower Klickitat River to accommodate the ongoing production of coho and fall Chinook; and an acclimation site in the upper watershed at McCreedy Creek. In early 2009 Bonneville completed the Lyle Falls Environmental Impact Statement (EIS) and ROD. Upgrades to enumeration and collection facilities at Lyle and Castile have been completed. Certain upgrades at the Klickitat Hatchery have also been done to maintain existing fish and wildlife program activities and to address hatchery safety concerns. Lyle and Castile Falls fishways have PIT tag interrogation capability, and the Lyle Falls facility includes a lamprey passage structure. A new Klickitat Hatchery Complex EIS initiated in July 2009 will examine options for the development and operation of new production and supplementation facilities and acclimation alternatives, and additional upgrades to the existing hatchery facility. The Yakama Nation issued a revised Master Plan, July 2012, providing updates to their fish management plans. The EIS and Master Plan will be available for Council review and for their recommendation to move from Step 2 to Step 3 in the Council 3-Step Review process. The

Final EIS is anticipated to be complete by fall 2014 and Bonneville will issue a ROD once NMFS completes the Biological Opinion for the Klickitat Production/Fish Management plans. Bonneville is working with Yakama Nation to identify the highest priority construction actions in the Klickitat Watershed to focus on, given the limited capital budget under the Accord.

- Hood River Production Facility: This project includes expansion of existing Parkdale fish hatchery to accommodate spring Chinook rearing, construction of new Hood River adult salmonid trapping facilities, and development of alternative adult trapping sites. The Powerdale Dam Fish Trap formerly provided the foundation for many of the activities associated with implementation of the Hood River Production Program. These include: monitoring escapement, collecting life history characteristics, and broodstock acquisition. Pacific Corps' demolition of its Powerdale Dam and the associated fish trapping facility in 2010 necessitated the development of alternative adult broodstock trapping sites. One permanent fish trap on the West Fork of the Hood River was completed in 2013, and a temporary trapping site is operational on the East Fork Hood River. A permanent trap site on the East Fork is currently being evaluated. The Hood River Production Program has four primary goals: 1) re-establish naturally sustaining runs of spring Chinook in the Hood River; 2) re-build naturally sustaining runs of summer and winter steelhead in the Hood River; 3) maintain genetic characteristics of Hood River fish populations; and 4) provide fish for sustainable harvest by both sport and tribal fishers.

- Mid-Columbia Coho Restoration: Indigenous naturally spawning coho salmon no longer occupy the mid-Columbia River basins. Columbia coho salmon populations were decimated by the early 1900s. For several reasons, including the construction and operation of mainstem Columbia River hydropower projects, habitat degradation, release locations, harvest management, and hatchery practices and genetic guidelines, self-sustaining coho populations have not been re-established in mid-Columbia basins. This Yakama Accord project's vision is to re-establish naturally reproducing coho salmon populations in the Wenatchee and Methow sub-basins at biologically sustainable levels which provide significant harvest in most years. This program will construct a facility on the Wenatchee River for holding and spawning broodstock, incubating eggs, and rearing juveniles. Additional semi-natural ponds will also be constructed in the Wenatchee and Methow sub-basins for acclimating smolts prior to their release. The phased approach, including associated facilities, incorporates development of a mid-Columbia hatchery broodstock, local adaptation to tributaries in the Wenatchee and Methow Basins, and habitat restoration that will benefit coho as well as ESA-listed spring Chinook, steelhead, and bull trout.

- Walla Walla Hatchery: The Walla Walla Hatchery is proposed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) under their Accord. The tribe would own and operate the hatchery, which will produce up to 500,000 spring Chinook smolts annually for release into the Walla Walla River. Pre-design has been completed. The next phase of the project, final-design started in the summer of 2013, upon finalization of an NPCC/BPA/CTUIR agreement to proceed. An environmental impact statement, which was started in January 2013, is expected to be completed in the summer of 2014. Construction will likely commence in late 2015. The facility will hold, spawn, incubate and rear spring Chinook on the South Fork Walla Walla River near Milton-Freewater, Oregon.

- Yakima Coho restoration: The goal of this restoration project, including associated facilities, is to restore extirpated Coho salmon to the Yakima River basin at biologically sustainable levels. Before the ocean and lower Columbia exploitation of salmon and steelhead in the late 19th century and early 20th century, and before the Yakima River valley was developed with extensive agricultural irrigation systems, the Yakima Sub-basin supported large runs of spring, summer and fall Chinook, summer steelhead, Coho and sockeye. Historical returns of Coho to the Yakima River Basin have been estimated in the range of 44,000 to more than 100,000 fish annually. Cumulative effects from the disruption of the Yakima Sub-basin ecosystem functions and processes, out of sub-basin impacts, and harvest of salmon have resulted in a significant decline of fish and wildlife abundance from historic levels.

Potential non-construction capital Wildlife and Resident Fish Habitat Acquisitions (including Conservation Easements) eligible for capitalization are:

- Albeni Falls Wildlife Mitigation
- Palisades and Minidoka Wildlife Habitat Acquisitions
- Black Canyon, Boise Diversion, Anderson Ranch Wildlife Habitat Acquisitions
- Willamette Wildlife Habitat Acquisitions
- Libby and Hungry Horse Reservoirs Resident Fish Acquisitions

Energy Efficiency (\$K)		
FY 2013	FY 2014	FY 2015
78,376	75,200	92,000

Overview

Bonneville's energy efficiency program offers several ways for customer utilities to participate in regional energy efficiency. Program components including: (1) standard offer efficiency measures and custom projects, which result in customer proposals to conserve energy through such programs as residential weatherization, commercial lighting, Heating, Ventilation, and Air Conditioning (HVAC), industrial processes and lighting, irrigated agriculture, etc.; (2) third party delivery programs, such as residential lighting, the Energy Smart Grocer, Energy Smart Industrial, and Green Motors programs; and, (3) programs to help Federal installations in the region reduce energy use, including Federal Hatcheries, irrigation districts and work at various dams to help the Corps and Reclamation in their efforts to reduce energy use.

Bonneville's energy efficiency budgets reflect a need to meet aggressive targets from the 6th Power Plan and anticipated targets in the 7th Power Plan. Specifically, Bonneville's energy efficiency targets have increased from about 280 aMW under the Council's 5th Power Plan (2005-09) to 504 aMW under its 6th Power Plan (2010-14). The 504 aMW reflects conservation that is achievable in the service territories of Bonneville's preference customers. Bonneville established a five-year target and plan to meet these goals. In FY 2012, Bonneville remained on track to reach the next two-year goal under the Council's 6th Power Plan. The five-year Energy Efficiency Action Plan has been adjusted to account for faster-than-expected energy efficiency savings in FY 2010-2011. The cost of energy efficiency is expected to increase. Some low cost measures are reaching high levels of market penetration and maturity or are impacted by increasing federal standards, leading to these measures being phased out of Bonneville's program. For example, standard twister compact fluorescent lamps (CFLs) were the largest single contributor to past savings. As federal lighting standards increase, CFLs will phase out of Bonneville's program. The shift away from these particularly low-cost measures increases overall energy efficiency costs. The front-loaded shape of these budgets (starting in FY 2011) reflects a push to acquire as much low-cost conservation as possible before the change in lighting and other standards. In meeting its energy efficiency goals Bonneville may employ resource acquisition agreements, authorized by Northwest Power Act section 6, as well as customer self-funded conservation.

Activities and Explanation of Changes

FY 2014	FY 2015	Explanation of Changes FY 2015 vs FY 2014 (Dollars in Thousands)
<p>Associated Projects</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Complete DC and preferred AC upgrades and protective relay replacements at Chief Joseph Dam. • Complete low voltage switchgear SQ board replacements and DC system upgrade at Ice Harbor. • Complete preferred AC system upgrades at The Dalles. • Complete exciter replacements at Little Goose. • Complete generator rewinds for units 4 and 11 and heat pump replacement at McNary Dam. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Complete governor replacements at Bonneville dam. • Complete spillway tainter gates at Willamette plants. • Complete generator winding replacements at McNary Dam. • Complete main unit governor install and oil storage and handling upgrade at Ice Harbor. • Complete powerhouse HVAC upgrade and sewage treatment plant upgrade at Lower Granite. • Complete SCADA replacement and SS and MCC upgrades at Hungry Horse. 	<p align="right">-\$1,720/-0.7%</p> <p>The decrease reflects a reshaping of funding needs for investment in the hydro electric system assets.</p>
<p>Fish & Wildlife</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue implementation of the BiOp and Fish Accords. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue implementation of the BiOp and Fish Accords. 	<p align="right">-\$8,991/-14.9%</p> <p>The decrease reflects a long-term, planned effort to reshape funding necessary to implement the BiOp, Fish Accords, Columbia River Basin Fish and Wildlife activities.</p>
<p>Energy Efficiency</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue to support utility incentive programs. • Continue to support regional energy efficiency programs. • Continue supporting energy efficiency at direct serve federal agencies. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to support utility incentive programs. • Continue to support regional energy efficiency programs. • Continue supporting energy efficiency at direct serve federal agencies. 	<p align="right">+\$16,800/+22.3%</p> <p>The increase reflects a continuing focus on energy conservation initiatives within the region.</p>

**Transmission Services – Capital
Funding Schedule by Activity
Funding (\$K)**

	FY 2013 Current	FY 2014 Estimate	FY 2015 Estimate	FY 2015 vs FY 2014	
				\$	%
Transmission Services - Capital					
Main Grid	42,335	139,801	106,683	-33,118	-24%
Area & Customer Services	10,108	26,790	38,341	11,552	43%
Upgrades & Additions	85,303	280,842	268,621	-12,220	-4%
System Replacements	129,796	201,347	211,084	9,737	5%
Projects Funded in Advance	230,783	58,014	46,491	-11,523	-20%
Total, Transmission Services - Capital	498,325	706,793	671,220	-35,573	-5%

Outyears (\$K)

	FY 2015 Estimate	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate
Transmission Services - Capital					
Main Grid	106,683	218,541	298,046	297,257	177,297
Area & Customer Services	38,341	14,676	13,402	12,955	13,013
Upgrades & Additions	268,621	202,092	159,133	134,920	138,460
System Replacements	211,084	201,957	195,661	202,415	219,737
Projects Funded in Advance	46,491	46,253	46,477	55,480	57,153
Total, Transmission Services - Capital	671,220	683,519	712,718	703,027	605,659

Overview

Transmission Services (TS) is responsible for about 75 percent of the Pacific Northwest's high-voltage transmission. TS provides funding for all additions, upgrades and replacements to the Bonneville transmission system, resulting in reliable service to northwest generators and transmission customers. The Bonneville transmission system also facilitates the sale and exchange of power to and from the region.

TS continues to make significant infrastructure improvements and additions to the system to assure reliable transmission in the Northwest. These improvements and additions will help the Bonneville transmission system continue to comply with national reliability standards, replace aging equipment, allow for interconnection of needed new generation, and remove constraints that limit economic trade or the ability to maintain the system.

Bonneville's completed infrastructure investments in the last decade that further strengthen the network consist of the following projects: Puget Sound Area Additions, North of Hanford/ North of John Day, Celilo Modernization, Eastern Washington Reinforcement, Grand Coulee-Bell, Kangley-Echo Lake, Shultz-Wautoma, McNary-John Day, and Portland Area Additions.

In 2005, with the Congressional approval of wind tax credits, a number of potential wind generation companies made requests for interconnection to the Bonneville transmission grid. The states of Oregon, Washington, and California have implemented Renewable Portfolio Standards. As of 2013, Bonneville has a total installed wind capability of 4,515 MW. Bonneville has more than 13,000 MW in additional wind project interconnection requests presently in the study queue. The current projections are 5,600 MW interconnected by 2015 and possibly 8,500 interconnected MW total by 2025. Much of the wind generation demand is the result of the Renewable Portfolio Standards enacted by California and Pacific Northwest states that require utilities to acquire more than 8,000 MW of renewable energy in the Northwest by 2015. Exports to California could add another 2,000-2,500 MW during the same period. Also in the interconnection queue is approximately 800 MW of natural gas, solar, bio-mass and geothermal fueled generation proposed for connection between 2014 and 2021.

In June 2008, Bonneville's first Network Open Season (NOS) received 153 requests from 28 customers for 6,410 MW of new service, about three-fourths for wind energy integration. Bonneville subsequently offered 1,782 MW of new transmission service on its existing system. Bonneville identified four new Main Grid capital projects from the 2008 NOS: (1) McNary-John Day 500 kV transmission line (part of West of McNary Reinforcements Group 1); (2) Big Eddy-Knight 500 kV transmission line and substation (part of West of McNary Reinforcements Group 2); (3) Central Ferry- Lower Monumental 500 kV Reinforcement (formerly Little Goose Area Reinforcement); and (4) I-5 Corridor 500 kV Reinforcement. Construction of the McNary-John Day 500 kV transmission line is complete and Bonneville has begun construction on the Big Eddy-Knight project. The Central Ferry-Lower Monumental 500 kV Reinforcement project is set to begin in the spring of 2014 and the I-5 Corridor project is in the planning stage. If all four projects are constructed they will provide almost 6,000 MW of new transmission service.

Bonneville's second NOS window for new transmission service requests in 2009 resulted in 82 service requests resulting in 34 contracts totaling 1,553 MW. Of that amount, approximately 923 MW represent wind project interconnection requests.

Bonneville's third NOS window in 2010 resulted in new requests totaling 3,759 MW, of which 2,993 MW represent wind integration requests. The 2010 process saw the addition of two more Main Grid capital projects – the Montana to Washington project and the Northern Intertie project.

After a two- year pause, Bonneville re-started a new NOS process in spring 2013. Currently, almost 8,000 MW of new long-term requests could be included in the Cluster Study delivered in January 2014.

As noted, Bonneville's capital program for TS includes a wide variety of specific investments that are determined after internal review and, in some cases, external review. In 2009, Bonneville's Transmission Services organization began implementing Asset Management based upon best practice Asset Management frameworks that provide a standardized structure and approach to Asset Management. As a result, Transmission Services Asset Strategies, which are derived from Agency Strategies, drive our Asset Plans, which determine our capital and expense needs. On occasion, capital investments must be made on short notice because of unexpected needs, because of the identification of obsolete, worn out, failed, failing, or at-risk systems and facilities, because of system reliability requirements, and because near-term opportunities to

install or construct facilities arise as outages occur or as schedules for outages change. For these and other reasons, Transmission Services capital program is fluid and subject to change. Thus, Bonneville is unable to predict with specificity many of the new capital investments in the transmission system. Nonetheless the types of investments can be identified in general. These items may include but are not limited to: arrester, bus and bus pedestal, circuit breaker, circuit switcher, communication tower, concrete pole, control center mapboard and video wall displays, control house, converter grading capacitors, converter harmonic filters, converter smoothing reactors, converter transformers, current limiting reactor, current limiting resistor, current transformer, digital fault locator, digital cross-connect system (DCS), disconnect switch, engine generator, engineered steel pole, fiber optic cable, fiber terminal, fuel dispensing facility, grounding system, grounding transformer, microwave multiplex transmitter, network management system (NMS), overhead conductor, overhead ground wire, power transformer, relay, revenue meter, series capacitor, shunt capacitor, shunt reactor, station service transformer, station service inverter, substation dead end tower, substation perimeter fence, switchyard lighting, thyristor, transfer switch, transmission steel tower, voltage regulator, voltage transformer, water/sewer system, wood pole and cross-arm, and other similar items consistent with Bonneville's capitalization policy determinations (such as spacer damper replacements).

Notwithstanding that the capital program for TS is subject to change, Bonneville has identified several general areas where capital program investment will occur.

Bonneville will continue to fund fiber optic communications facilities needed to meet Bonneville's projected operational needs. To the extent that these investments create temporary periods of excess fiber optic capacity, such dark fiber capacity can be made available to telecommunications providers and to non-profits to meet public benefit internet access needs for rural areas and other needs in Bonneville's service area. Bonneville's investments in fiber optics, including the role of the private sector in building fiber optic networks, is consistent with the "Fiber Optic Cable Plan" submitted to Congress on May 24, 2000, accompanying the FY 2000 Energy and Water Development Appropriations Act. In accordance with this plan, when possible, Bonneville will establish partnerships with fiber optic facility and service providers to meet its needs.

In December 2004, the Congress passed and the President signed the Commercial Spectrum Enhancement Act (CSEA, Title II of P.L. 108-494), creating the Spectrum Relocation Fund (SRF) to streamline the relocation of Federal systems from certain spectrum bands to accommodate commercial use by facilitating reimbursement to affected agencies of relocation costs. The Federal Communications Commission has auctioned licenses for reallocated Federal spectrum, which will facilitate the provision of Advanced Wireless Services to consumers. Funds were made available to agencies in FY 2007 for relocation of communications systems operating on the affected spectrum. These funds are mandatory and will remain available until expended, and agencies will return to the SRF any amounts received in excess of actual relocation costs. The estimated Bonneville cost of this relocation is \$48.7 million. The project was completed in November 2013 and the operational system performance is being observed during fiscal year 2014 to determine that it has achieved comparable capability as defined under the CSEA.

As part of the Homeland Security Presidential Directives, Bonneville has completed a physical security assessment of all critical facilities and is implementing security enhancements at these facilities. These security enhancements increase access control to Bonneville's facilities and provide video surveillance and monitoring capabilities.

In order to centralize staff and reduce reliance on leasing a multiplicity of commercial office and related space, and to meet the evolving staff needs of Bonneville's Transmission Services, Bonneville has executed a study and design of a new Transmission Services Facility to be located on Bonneville's Ross Campus. This future of this building will be subject to continuing conversations with Bonneville's customers and regional stakeholders.

Accomplishments

- Continued construction of the Big Eddy-Knight project
- Integrated 4,515 MW of wind by FY 2013 on Bonneville's transmission system
- Continued the design for major renovations at Celilo (PDCI Project)
- Continued development, implementation and refinement of Asset Management Strategies for Sustain and Expand Programs

Explanation of Changes

Bonneville's budget includes \$671 million in FY 2015 for TS (including non-borrowing authority capital) which is a 5 percent decrease from the FY 2014 forecasted level. The decrease reflects reduced investment in Main Grid and Upgrades and Additions categories driven by a reduction in requests to incorporate and deliver new generation throughout the Northwest as well as increases in System Replacements to address numerous issues with aging electric and telecom infrastructure.

The FY 2015 budget decreases the levels for Main Grid (-\$33.1 million), Upgrades & Additions (-\$11.6 million) and PFIA (-\$12.2 million). The budget increases levels for Area & Customer Services (+\$11.6 million) and System Replacements (+\$9.7 million).

Strategic Management

Bonneville provides transmission and energy services while supporting integration of renewable resources and low-cost transmission in the Pacific Northwest. Bonneville will continue to implement the following strategies to serve the region:

1. To improve system adequacy, reliability and availability, Bonneville has embarked on major transmission infrastructure projects. The projects shore up the region's transmission system and help deliver the region's future power needs. These projects address multiple challenges, such as integration of renewable energy, the need to relieve a number of congested transmission paths, the pressure to keep up with growing energy demands and the need to meet Bonneville's open access policy in support of competitive markets. Specific strategies for these efforts are outlined in the TS Load Service and Generation Integration strategies.
2. Bonneville will continue to replace aging assets that are vital to the reliability of the existing transmission system. To that end, TS has developed specific long term strategies for the following asset categories:
 - a. Substations AC
 - b. Power System Control/Telecom
 - c. Wood Lines
 - d. Steel Lines
 - e. Rights of Way (ROW), (Land Rights and Access Roads)
 - f. System Protection and Control(A long term strategy is under development for Control Center assets)

The following external factors present the strongest impact to overall achievement of the program's strategic goal

1. Continually changing economic and institutional conditions
2. Competitive dynamics
3. Ongoing changes in the electric industry
4. Different siting issues

Main Grid (\$K)		
FY 2013	FY 2014	FY 2015
42,335	139,801	106,683

Overview

Bonneville's strategic objectives for Main Grid projects are to assure compliance with the NERC planning standards and Western Electricity Coordinating Council (WECC) reliability criteria, provide voltage support, provide a reliable transmission system for open access, and provide for relief of transmission system congestion. During this budgeting period, projects are planned that will provide transmission reinforcement and voltage support to major load areas that are primarily west of the Cascade Mountains. In addition, transmission reinforcements are planned for load centers in central Oregon, central Washington, the Willamette Valley, and along the I-5 Corridor, as well as projects to provide transmission access for new generation projects.

Continued investments in Main Grid assets include:

I-5 Corridor Reinforcement

- **FY 2013.** Continued environmental analysis and continue design.
- **FY 2014.** Continue route analysis and gathering of customer input.
- **FY 2015.** Continue route analysis and gathering of customer input.

McNary-John Day (West of McNary Reinforcements Group 1)

- **FY 2013.** Completed construction.

Big Eddy-Knight (West of McNary Reinforcements Group 2)

- **FY 2013.** Continued construction.
- **FY 2014.** Continue construction.
- **FY 2015.** Complete construction.

Central Ferry-Lower Monumental 500 kV Reinforcement (formerly Little Goose Area Reinforcement)

- **FY 2013.** Completed design.
- **FY 2014.** Begin construction.
- **FY 2015.** Continue construction.

Ponderosa substation

- **FY 2013.** Completed construction of 2nd 500/230 kV transformer.

Longhorn Annex for UEC

- **FY 2013.** Began design.
- **FY 2014.** Complete design, purchase materials, begin construction.
- **FY 2015.** Continue construction.

Midway- Grandview 115 kV Line upgrade

- **FY 2014.** Begin design.
- **FY 2015.** Begin construction.

Bonanza Substation

- **FY 2014.** Begin design and construction.
- **FY 2015.** Complete construction.

Puget Sound Area Northern Intertie (PSANI)

- **FY 2014.** Begin design and construction.
- **FY 2015.** Continue construction.

-Tucannon, LaPine, Franklin, White Bluffs, Monroe and McNary (6 separate Capacitor projects)

- **FY 2013.** Continued design and began construction (Tucannon, Franklin, White Bluffs), began design (Monroe, McNary), began construction (LaPine).
- **FY 2014.** Continue design and begin construction (Monroe, McNary); complete construction (Tucannon, LaPine, Franklin, White Bluffs).
- **FY 2015.** Complete construction (Monroe, McNary).

Alvey Substation

- **FY 2014.** Design the 230 kV and 500 kV Reactor installations.
- **FY 2015.** Install shunt reactor.

Raver Substation

- **FY 2014.** Upgrade the 500 kV Reactor.

Schultz Series Caps

- **FY 2015.** Begin design.

Monroe-Echo Lake 500 kV Line Re-termination #2

- **FY 2015.** Begin design.

Continue Planning Studies to: (all years)

- Identify infrastructure additions.
- Identify projects driven by NERC planning standards and WECC reliability criteria.
- Identify system reactive needs to mitigate unacceptable low or high voltage problems and other system additions.
- Relieve transmission system congestion and for integrating potential new generation facilities.
- Design for projects related to the NOS.

Area & Customer Service		
(\$K)		
FY 2013	FY 2014	FY 2015
10,108	26,790	38,341

Overview

Bonneville's strategic objective for Area and Customer Service projects is to assure that Bonneville meets any reliability standards and our contractual obligations.

Continued investments in Area & Customer Service assets include:

Hooper Springs Substation

- **FY 2013.** Began design.
- **FY 2014.** Complete the design and begin construction.
- **FY 2015.** Continue construction.

Capacitor Bank at Kalispell

- **FY 2013.** Began design.
- **FY 2014.** Complete the design and begin construction.
- **FY 2015.** Complete construction.

Aberdeen

- **FY 2015.** Begin Capacitor design.

Continuous Activities (all years)

- Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for Bonneville's service area. (all years)

Upgrades & Additions (\$K)		
FY 2013	FY 2014	FY 2015
85,303	280,842	268,621

Overview

Bonneville's strategic objectives for Upgrades and Additions are to replace older communications and controls with newer technology including fiber optics in order to maintain or enhance the capabilities of the transmission system; to implement special remedial action control schemes to accommodate new generation and mitigate immediate operational and market constrained paths; and to support communications and remedial action schemes, among other proposals.

During this budget period, Bonneville will complete design, material acquisition, construction and activation of several fiber optics facilities to provide bandwidth capacity and high-speed data transfers to eventually replace microwave analog radios, which are technologically obsolete and nearing the end of their useful life. Temporarily, in some areas, excess dark fiber capacity is being offered for a term to telecommunications providers or to public entities such as public utilities, schools, libraries, and hospitals, providing them access to high-speed telecommunication services as a public benefit.

Continued investments in Upgrades & Additions assets include:

VHF Radio System Upgrade

- **FY 2013.** Continued design and began construction.
- **FY 2014.** Continue construction.
- **FY 2015.** Continue construction.

Synchrophasor Project

- **FY 2013.** Completed design and continued construction at multiple sites.
- **FY 2014.** Continue construction at multiple sites.
- **FY 2015.** Continue construction at multiple sites.

Pacific DC Inertie to 3,800 MW Project

- **FY 2013.** Completed studies and began design for upgrade.
- **FY 2014.** Complete design and begin construction for upgrade.
- **FY 2015.** Continue construction for upgrade.

Ross-Schultz Fiber Circuit Upgrade

- **FY 2013.** Continued the design and began material procurement.
- **FY 2014.** Begin construction.
- **FY 2015.** Continue construction.

Bell-Boundary #DC SONET Ring Upgrade

- **FY 2013.** Continued the design and began material procurement.
- **FY 2014.** Begin construction.
- **FY 2015.** Continue construction.

Operational Megabit Ethernet (OMET) System

- **FY 2013.** Began design.
- **FY 2014.** Continue design and begin construction.
- **FY 2015.** Continue construction.

Power Control Assembly (PCAs) for smaller substations

- **FY 2013.** Began program development, initiated Proof of Concept, design and ordered units 1-2.
- **FY 2014.** Install units 1-2, design and order units 3-9, install units 3-7.
- **FY 2015.** Install units 8-9, design and order units 10-15, install units 10-14.

500 kV Spares at Wind Integration Substations

- **FY 2015.** Begin design for site 1.

Continuous Activities (all years)

- Upgrading two miles of fiber between Bonneville Power House and Bonneville Control House.
- Planning, design, material acquisition and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths.
- Planning, design, material acquisition and construction of various system additions and upgrades necessary to maintain a reliable system for Bonneville's service area.
- Construction of secondary fiber related projects and digital radio system upgrades to improve the operational telecommunication system.
- Material procurement and construction to upgrade the main fiber optic backbone system (#KC and #NC systems).

System Replacements

(\$K)

FY 2013	FY 2014	FY 2015
129,796	201,347	211,084

Overview

Bonneville's strategic objectives for the Sustain Program are to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: (1) replacing high voltage transformers and power circuit breakers which are at or near the end of their useful life; (2) replacing risky, outdated and obsolete control and communications equipment and systems, and includes mandated replacements due to legislation; and (3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system.

Continued investments in System Replacements assets include:

-Continuous Activity (all years)

Non-Electric Replacements

- Continue non-electric replacements as necessary.
- Continue the design, material acquisition, and construction for the Access Road program capital component and the Land Rights program capital component in support of the Lines and ROW Programs.
- Continue design and construction of capital improvements for identified existing facilities.

Electric Replacements

- Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. Such replacements include relays, annunciators, oscillographs, metering and various types of communication related equipment replacing and migrating analog to digital technology and SCADA equipment.
- Continue replacement of under-rated and high maintenance substation equipment.
- Continue replacing spacer dampers on various 500 kV lines.
- Continue replacing critical, operational tools and marketing business systems at the Dittmer and Munro Control Centers.
- Continue replacing deteriorating wood pole transmission line structures, spacer dampers and insulators with NCI.

Projects Funded in Advance (\$K)		
FY 2013	FY 2014	FY 2015
230,783	58,014	46,491

Overview

This category includes those facilities and/or equipment where Bonneville retains control or ownership but which are funded or financed by a third party or with reserves, either in total or in part. This program also includes investments associated with the Commercial Spectrum Enhancement Act (CSEA).

Continued investments in PFIA assets include:

Continuous Activity (all years)

- Continue to integrate various new generation and line/load projects into Bonneville transmission grid based on requests placed and processed in accordance with transmission tariff.
- Continue planning studies to identify system impacts and needs regarding proposed new generation projects.
- Engineer and begin construction of several large wind generation interconnection substations.
- Complete environmental cleanup and other work necessary for the sale of Bonneville facilities.
- Continue the design and construction for various radio replacements at accessible sites associated with the CSEA.

California-Oregon Intertie Improvement Project

- **FY 2013.** Completed construction.

Central Ferry Substation

- **FY 2013.** Completed design.
- **FY 2014.** Begin construction.
- **FY 2015.** Continue construction.

Activities, Milestones, and Explanation of Changes

FY 2014	FY 2015	Explanation of Changes FY 2015 vs FY 2014 (Dollars in Thousands)
<p>Main Grid Milestones:</p> <ul style="list-style-type: none"> • Continue route analysis and gathering of customer input for I-5 Corridor project. • Begin construction of the Central Ferry-Lower Monumental 500 kV Reinforcement project. • Begin design and construction of Bonanza Substation. • Continue construction of the Big Eddy-Knight project. • Begin design and construction of the Puget Sound Area Northern Intertie (PSANI) project. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue route analysis and gathering of customer input for I-5 Corridor project. • Begin construction of Midway- Grandview 115Kv Line upgrade. • Complete construction of the Big Eddy-Knight project. • Continue construction of the PSANI project. • Complete construction of Bonanza Substation. 	<p style="text-align: center;">-\$33,118/-23.7%</p> <p>The decrease reflects the reduced level of funding to support Central Oregon Capacity expansion for Data Centers and NOS projects.</p>
<p>Area & Customer Service Milestones:</p> <ul style="list-style-type: none"> • Complete the design and begin construction of Hooper Springs Substation and the Capacitor Bank at Kalispell. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue construction of Hooper Springs Substation. • Begin Capacitor design at Aberdeen. 	<p style="text-align: center;">+\$11,552/+43.1%</p> <p>The increase reflects the addition of the Hooper Springs project.</p>

FY 2014	FY 2015	Explanation of Changes FY 2015 vs FY 2014 (Dollars in Thousands)
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Upgrades & Additions

Milestones:

- Complete design and begin construction for the upgrading of the Pacific DC Intertie to 3,800 MW project.
- Begin construction of the Ross-Schultz fiber circuit upgrade and begin material procurement.
- Begin construction of the Bell-Boundary #DC SONET Ring Upgrade.

Milestones:

- Begin design for site 1 for 500Kv spares at wind integration substations.
- Continue construction at multiple sites of the Synchrophasor project.
- Continue construction for the upgrading of the Pacific DC Intertie to 3,800 MW project.

-\$12,220/-4.4%

The decrease reflects reductions in the Pacific Direct Current Line (PDCI) project.

Systems Replacements

Milestones:

- Continue design and construction of capital improvements for identified existing facilities.
- Continue non-electric replacements as necessary.
- Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria.

Milestones:

- Continue design and construction of capital improvements for identified existing facilities.
- Continue non-electric replacements as necessary.
- Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria.

+\$9,737+4.8%

The increase is due to an increase in the number of replacement projects.

PFIA

Milestones:

- Central Ferry Substation– Begin Construction.
- Engineer and begin construction of several large wind generation interconnection substations.

Milestones:

- Central Ferry Substation– Continue construction.
- Engineer and begin construction of several large wind generation interconnection substations.

-\$11,523/-19.9%

The decrease reflects reduced requests by wind generators to interconnect new projects.

**Capital Information Technology & Equipment/Capitalized Bond Premium
Funding Schedule by Activity
Funding (\$K)**

	FY 2013 Current	FY 2014 Estimate	FY 2015 Estimate	FY 2015 vs FY 2014	
				\$	%
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	47,840	44,897	45,982	+1,085	+2%
Capitalized Bond Premium	0	2,000	2,000	0	0%
Total, Capital IT & Equipment/Capitalized Bond Premium	47,840	46,897	47,982	+1,085	+2%

Outyears (\$K)

	FY 2015 Estimate	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	45,982	47,067	48,154	47,579	47,837
Capitalized Bond Premium	2,000	2,000	2,000	2,000	2,000
Total, Capital IT & Equipment/Capitalized Bond Premium	47,982	49,067	50,154	49,579	49,837

Overview

Capital IT provides for the acquisition of general and some dedicated special purpose capital information technologies, and acquisition of special-use capital and IT equipment in support of Bonneville's strategic objectives. This category also includes Bonneville's on-going efforts to facilitate delivery of a highly resilient organization, able to anticipate, withstand and effectively respond to disruptive events affecting it and its partners in the Northwest region. The four main areas of resiliency focus continue to include asset management, emergency management, crisis management and continuity of operations.

Bonneville continues to move its IT infrastructure to a more efficient architecture. This FY 2015 Budget supports this effort. IT continues to eliminate redundancies in tools and applications, establish an agency-wide IT architecture with standardized IT purchasing criteria, standardize software licensing processes and minimize agency liabilities through stronger contracts, apply continuous improvement practices to IT project management, and implement an agency IT portfolio cost management strategy. The IT estimates in this FY 2015 Budget, under Capital IT and Equipment include all IT functions within the agency except TS grid operations. See the Capital Program – TS section of this budget for additional discussion of grid operations-related IT requirements acquisitions.

Capital equipment provides for the acquisition of general and some dedicated special purchases of capital office furniture and equipment.

Bonneville can incur a bond premium when it repays a Treasury bond before the due date. When bonds are refinanced and premiums are incurred, the bond premiums can be capitalized. Historically, Bonneville generally has chosen to finance capitalized bond premiums with bonds issued to the Treasury, as was envisioned in the Transmission Act.

**Capital IT & Equipment
(\$K)**

FY 2013	FY 2014	FY 2015
47,840	44,897	45,982

Overview

This category includes enhancements to Bonneville’s information technology processes to provide cost effective efficiencies for secure, timely and accurate information. Investments will enable continued enhancements to Bonneville’s Enterprise systems that are designed to link key information systems throughout Bonneville and improve business processes. Current efforts include continued functional process improvements in areas not included in the initial development phase. Other investments include acquisition of capital office furniture and equipment, capital automated data processing (ADP) based administrative telecommunications equipment, ADP equipment (hardware), and support of capital software development for certain Bonneville programs.

Continued investments in Capital IT & Equipment assets include:

Continuous Activity (all years)

Capital system developments in support of:

- Corporate IT Projects
- IT Infrastructure Projects
- Power IT Project
- Transmission Services IT Projects

**Capitalized Bond Premium
(\$K)**

FY 2013	FY 2014	FY 2015
0	2,000	2,000

Overview

Continue to assess financial market and when cost-effective, refinance available bonds as prudent.

Activities, Milestones, and Explanation of Changes

FY 2014	FY 2015	Explanation of Changes FY 2015 vs FY 2014 (Dollars in Thousands)
<p>Capital Equipment and IT Milestones: Capital system developments in support of:</p> <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	<p>Milestones: Capital system developments in support of:</p> <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	<p style="text-align: right;">+\$1,085/+2.4%</p> <p>The increase reflects ongoing emphasis on business resiliency efforts.</p>
<p>Capital Bond Premiums Milestones:</p> <ul style="list-style-type: none"> • Possible refinancings of outstanding Federal bonds. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Possible refinancings of outstanding Federal bonds. 	<p style="text-align: right;">\$0/-%</p> <p>No change in funding.</p>

**Power Services - Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2013 Current	FY 2014 Estimate	FY 2015 Estimate	FY 2015 vs FY 2014	
				\$	%
Power Services - Operating Expenses					
Production	1,667,167	1,165,809	1,165,155	-653	-.1%
Associated Projects Costs	386,033	418,096	428,078	9,982	+2%
Fish & Wildlife	238,984	254,000	260,000	6,000	+2%
Residential Exchange Program	201,933	203,900	203,900	-	0%
NW Power & Conservation Council	10,118	10,568	10,799	231	+2%
Energy Efficiency & Renewable Resources	66,541	88,206	89,466	1,260	+1%
Total, Power Services - Operating Expenses	2,570,776	2,140,579	2,157,399	16,820	+1%

Outyears (\$K)

	FY 2015 Estimate	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate
Power Services - Operating Expenses					
Production	1,165,155	1,246,543	1,395,485	1,358,890	1,183,058
Associated Projects Costs	428,078	454,869	464,286	480,028	488,365
Fish & Wildlife	260,000	267,000	274,000	281,000	288,000
Residential Exchange Program	203,900	213,190	213,190	213,190	213,190
NW Power & Conservation Council	10,799	11,002	11,209	11,419	11,634
Energy Efficiency & Renewable Resources	89,466	90,840	92,033	92,959	94,349
Total, Power Services - Operating Expenses	2,157,399	2,283,444	2,450,203	2,437,486	2,278,596

Overview

Production includes all Bonneville non-Federal debt service (including Energy Northwest debt service), O&M costs for power system generation resources (including a large nuclear plant, business operations, short- and long-term power purchases²), electric utility marketing of power, and oversight of hydro and nuclear projects. Bonneville develops products and services to meet the needs of Bonneville customers and stakeholders, and acquires resources as needed. This FY 2015 Budget includes anticipated expenses for new long-term power purchases to meet the needs of Bonneville customers that may include no more than 30 MW of waste energy recovery power.

In FY 2010, Bonneville completed a long-term Resource Program to guide potential future resource acquisitions needed to meet customer loads. In the event that Bonneville does acquire a resource, Bonneville will modify its budget to reflect the acquisition.

Associated Projects represents funding for operation and maintenance costs for the FCRPS, minor additions, improvements and replacements, and liabilities of the Corps and Reclamation hydroelectric projects in the Pacific Northwest, which serve many purposes. All agencies emphasize efficient power production from existing facilities and improvement of the performance and availability of power generating units. Bonneville pays additional financing costs of the FCRPS facilities through its Interest Expense and Capital Transfer budget programs. Bonneville provides funding for the operations and maintenance costs that are part of the Lower Snake River Compensation Plan (LSRCP) hatcheries. Bonneville is responsible for annual payments to the Confederated Tribes of the Colville Reservation for their claims concerning their contribution to the production of hydropower by the Grand Coulee Dam in accordance with the Settlement Agreement between the United States and the Tribes (April 1994).

Bonneville's Fish and Wildlife program provides for extensive protection, enhancement, and mitigation of Columbia River Basin fish and wildlife adversely affected by the development and operation of Federal hydroelectric projects on the Columbia River and its tributaries from which Bonneville markets power. Bonneville satisfies most of its fish and wildlife responsibilities by funding projects and activities designed to be consistent with the Council's Program developed pursuant to Section 4(h) of the Northwest Power Act. Through the Council's Program Bonneville also implements measures to aid in the protection of fish in the Columbia River and its tributaries, listed as threatened or endangered under the ESA. Bonneville pursues a comprehensive approach to integrate the ESA requirements of the FCRPS biological opinions with the broad resource protection, mitigation and enhancement objectives of the Council's Program (see ESA discussion in the Power Capital Overview section).

Bonneville's mitigation and recovery expenditures will focus on activities that benefit Columbia River Basin fish and wildlife resources, following priorities established through ESA consultations and the Council's Program, including:

- increase survival of ESA-listed and non-listed fish at FCRPS dams and reservoirs;
- increase survival of ESA-listed and non-listed fish throughout their life cycle by protecting and enhancing important habitat areas;
- reform hatchery practices that affect ESA-listed populations and use hatcheries to contribute to conservation and recovery of ESA-listed and non-listed fish;
- provide for offsite mitigation projects and habitat, passage, and other improvements that address limiting factors for target species;
- reduce harvest-related mortality on ESA-listed and non-listed fish and encourage sustainable fisheries; and
- support a focused and well-coordinated research, monitoring, and evaluation program.

To the extent possible, Bonneville is integrating the actions implemented in response to the FCRPS BiOps with projects implemented under the Council's Program. Sub-basin plans and Accords that include prioritized strategies for mitigation actions will help guide project selection that meets both Bonneville's ESA and Northwest Power Act responsibilities. In order to address the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that

² Including expenses associated with the use of power financial instruments to hedge Bonneville's exposure to market price risk and certain index sales contract provisions as permitted by Bonneville's Power Transacting Risk Management Policy.

other entities are authorized or required to undertake, Bonneville continues its ongoing work with the Council and the regional fish and wildlife managers, customers, and Tribes to review projects to ensure ratepayers fund appropriate mitigation. For example, Bonneville established a cost sharing Memorandum of Understanding (MOU) with the U.S. Forest Service in 2005, and renewed it in 2010, that requires a programmatic 30 percent cost share for fish mitigation projects funded by Bonneville on U.S. Forest Service lands. Bonneville continues to operate in a cooperative manner with the U.S. Forest Service.

The Energy and Water Development Appropriations Act of 1996 added section 4(h)(10)(D) to the Northwest Power Act, directing the Council to appoint an ISRP “to review a sufficient number of projects” proposed to be funded through Bonneville’s fish and wildlife budget “to adequately ensure that the list of prioritized projects recommended is consistent with the Council’s Program.” The Northwest Power Act further states that “in making its recommendations to Bonneville, the Council shall consider the impact of ocean conditions on fish and wildlife populations and shall determine whether the projects employ cost effective measures to achieve program objectives.” Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council has shifted to a multi-year project review cycle during which the ISRP reviews categories of projects grouped together; e.g., all anadromous fish habitat projects were recently reviewed.

The Council’s major activities include the periodic preparation of a Northwest Conservation and Electric Power Plan (a 20-year electric energy demand and resources forecast and energy efficiency program – known as the Power Plan) and a Columbia River Basin Fish and Wildlife Program. The Northwest Power Act directs that expenses of the Council, subject to certain limits based on forecasted Bonneville power sales, shall be included in Bonneville’s annual budget to Congress. Funding for the Council is provided by Bonneville and is recovered through Bonneville power rates.

Bonneville will acquire conservation resources consistent with the Council’s Power Plan and act as a catalyst for energy efficiency. Such action will: 1) meet energy efficiency targets; 2) achieve a least cost resource mix; 3) lessen the cost impacts of power purchases; 4) avoid the costs of ramping programs and infrastructure up and down; 5) extend the value of the FCRPS to customers; and 6) build the region’s resource portfolio with energy efficiency. Bonneville is also exploring how best to integrate demand-side management, distributed generation, and other leading edge technologies (i.e., Energy Web and Smart Grid applications) into its generation and transmission planning processes.

The Residential Exchange Program (REP) was created by the Northwest Power Act to extend the benefits of low-cost Federal power to the residential and small farm customers of Pacific Northwest electric utilities that have high average system costs. Currently, the region’s six investor-owned utilities (IOUs) and two of the region’s consumer-owned utilities are actively participating in the REP. Payments under the REP are made to individual IOUs based on the difference between Bonneville’s utility-specific PF Exchange rates and each utility’s average system cost (ASC), times a utility’s residential and farm loads. The process and calculation of ASCs are governed by the 2008 Average System Cost Methodology (ASCM). Participating utility ASCs are established in a public process that occurs prior to and during Bonneville’s power rate case. Bonneville’s utility-specific Priority Firm (PF) Exchange rates are determined each rate period. As described below, Bonneville and regional parties reached a settlement of the REP in 2011 in which the total amount of REP benefits available to the IOUs has been settled for the next 17 years. Payments are made monthly based on historical invoiced exchange loads.

On July 26, 2011, Bonneville adopted a regionally supported settlement, referred to as the 2012 REP Settlement, which resolves or moots out many legal challenges to Bonneville’s implementation of the REP. The settlement reduces a significant element of litigation uncertainty and risk from Bonneville’s power rates for the vast majority of utilities in the region. Under the Settlement, the Region’s six IOUs will receive about \$4.1 billion in REP payments over the 17-year term of the settlement, beginning at \$182.1 million in FY 2012 and increasing to \$286.1 million in FY 2028. Distribution of the REP payments among the IOUs will be determined each rate period based on the difference between the utilities’ respective ASCs and Bonneville’s utility-specific PF Exchange rates. In addition to this settlement, Bonneville has reached related REP settlements with the two participating consumer-owned utilities. A single challenge to the 2012 REP Settlement was rejected by the U.S. Court of Appeals for the Ninth Circuit.

Explanation of Changes

Bonneville's budget includes \$2,157 million in FY 2015 for Power Services operating expenses, which is a .8 percent increase over the FY14 forecasted level. The increase reflects continuing emphasis on operation and maintenance of hydro generation projects on the FCRPS.

The FY15 budget decreases the level for Production (-\$0.7 million), and increases the levels for Associated Projects (+\$10.0 million), Fish & Wildlife (+\$6.0 million), Planning Council (+\$0.2 million) and Energy Efficiency & Renewable Resources (+\$1.3 million). There is no change to the level for Residential Exchange.

Production (\$K)		
FY 2013	FY 2014	FY 2015
1,667,167	1,165,809	1,165,155

Overview

Power Purchases: Includes purchased power to cover power supply obligations as well as balancing the hydro system. These purchases can be made in the form of long-term purchases to meet supply obligations based on long-term planning requirements or they can be made within the year due to the monthly shape of the loads and the monthly shape of the hydro electric generation. Also, purchases can be made within the month and within the day to fill shortages due to fluctuations in the hydro system and load changes.

Power Scheduling/Marketing: Schedule and market (buy/sell) electric energy with Bonneville customers and the Pacific Northwest's interconnected utilities. Scheduling includes Power Services' implementation of physical and memo power schedules and associated transmission schedules, implementation of Electronic Tagging (ETag) in accordance with NERC and in accordance with FERC, implementation of electronic scheduling and the ColumbiaGrid as it evolves.

Columbia Generating Station (formerly WNP-2): Continue to acquire full capability of CGS. CGS is on a 24-month fuel and outage cycle. A maintenance and refueling outage is planned for the Spring of calendar year 2015.

Continued investments in Production include:

-Continuous Activity (all years)

- Provide oversight of all signed contracts including oversight of large thermal generating plants from which Bonneville purchases capability to ensure that all Bonneville approval rights are protected; coordinate, communicate, and administer agreements, issues, and programs between Bonneville and the project owners.
- Continue to provide wind resource integration services for customer wind generation.
- Power Purchases. Power expenditures could increase somewhat due to the implementation of the Oversupply Management Protocol.
- Power Scheduling/Marketing.
- Continue to provide oversight of all contracts signed to date. Pursue cost-effective means to mitigate capacity demands associated with interconnecting large amounts of wind into the Bonneville system. Pursue acquisition of additional cost-effective renewable generation to meet load growth. Continue to provide oversight on the wind resource integration services currently purchased by public power customers and offer additional renewable resource shaping services to such customers using wind generation to serve their load.

Associated Projects		
(\$K)		
FY 2013	FY 2014	FY 2015
386,033	418,096	428,078

Overview

Support FCRPS project costs and work to strengthen interagency and regional relationships to improve project performance, supporting functions, and to better understand project resource requirements and costs. This helps to maintain FCRPS reliability and system performance, as well as to attain Bonneville’s strategic business objectives.

Continued investments in Associated Projects include:

-Continuous Activity (all years)

Bureau of Reclamation:

- Continue direct funding Reclamation O&M power activities.

Corps of Engineers:

- Continue direct funding Corps O&M power activities.

Fish & Wildlife		
(\$K)		
FY 2013	FY 2014	FY 2015
238,984	254,000	260,000

Overview

Bonneville now implements a stable, mature fish and wildlife mitigation program based on recommendations made by the Council. Several recent Council reviews have made additional fish and wildlife project recommendations to Bonneville. Bonneville, in coordination with the Council, reviews new and on-going projects for consistency with the Program. Bonneville reviews and resets project-specific funding commitments annually, including projects under the FCRPS BiOps, Fish Accords, and Washington Estuary Agreement. Bonneville bases its funding decisions on the management objectives and priorities in the Council’s Program (including Sub-basin Plans and ISRP reviews), and the Accords as it integrates their implementation with actions necessary to fulfill ESA responsibilities as described in the NOAA Fisheries’ and USFWS’s BiOps. Regular coordination continues among Bonneville, Council, Federal resource management agencies, states, tribes and others to plan for additional projects to fill the few specific gaps remaining in Bonneville’s mitigation portfolio through targeted solicitations.

Continued investments in Fish & Wildlife include:

-Continuous Activity (all years)

- **Anadromous Fish:** Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, and the Willamette Agreement. Prioritize projects that address the factors that limit mitigation success as identified in the Sub-basin Plans and that fulfill Bonneville’s responsibility for mitigating the impacts from the FCRPS power facilities. Implement and develop activities that protect and enhance tributary and estuary habitat; improve mainstream habitat on an experimental basis; reduce potentially harmful hatchery practices on ESA-listed populations; and contribute to sustainable fisheries.
- **Resident Fish:** Implement activities to determine the impacts of the FCRPS on lamprey and bull trout and mitigate for those impacts, and promote the reproduction and recruitment of Kootenai River white sturgeon. These activities have been selected in response to the USFWS’s 2006 Libby BiOp, the Council’s Program, and the Fish Accords.
- **Continue mitigation using resident fish to offset anadromous fish losses (substitution);** mitigate for reservoir power operation impacts to resident fish; and continue to refine, quantify, and delineate the difference between the two. Those resident fish habitat acquisition projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget.
- **Wildlife:** Use existing Bonneville policies to continue the current effort to mitigate wildlife in a manner consistent with the Council’s Program and fulfill commitments in wildlife agreements such as the Kalispell Agreement and the Willamette Wildlife Agreement. These activities have been selected in response to the Northwest Power Act requirement to protect, mitigate and enhance fish and wildlife including related spawning grounds and habitat on the Columbia River and its tributaries. Those wildlife projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited according to Bonneville’s crediting policy and applicable mitigation contracts.

Residential Exchange, Northwest Power and Conservation Council, and Energy Efficiency & Renewable Resources
(\$K)

FY 2013	FY 2014	FY 2015
278,593	302,674	304,165

Overview

Residential Exchange Program

- Includes forecasted REP benefits based on the 2012 REP Settlement.

Northwest Power and Conservation Council

- Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities.

Energy Efficiency & Renewable Resources

- Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville's contractual obligation to serve customer load growth.
- Provide credible, unbiased information, and technical and financial support to energy efficiency purposes. Bonneville has a statutory responsibility to encourage and support the development of energy efficiency in the Pacific Northwest. Bonneville is participating with other regional entities to support market transformation and development activities that meet the needs of Bonneville customers and create business opportunities for the private sector in the Pacific Northwest. Toward that end, Bonneville has been helping create a delivery infrastructure to ensure conservation savings are installed efficiently and effectively throughout the region.
- Continue to purchase the output from renewable resources such as wind and solar.

Activities, Milestones, and Explanation of Changes

FY 2014	FY 2015	Explanation of Changes FY 2015 vs FY 2014 (Dollars in Thousands)
<p>Production</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue to provide oversight of all signed contracts. Continue to provide wind resource integration services for customer wind generation. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue to provide oversight of all signed contracts. Continue to provide wind resource integration services for customer wind generation. 	<p>-\$653/-0.1%</p> <p>The decrease reflects lower Columbia Generating Station (CGS) O&M costs along with decreased power purchases.</p>
<p>Associated Project Costs</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue direct funding of Corps and Reclamation O&M power activities. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue direct funding of Corps and Reclamation O&M power activities. 	<p>+\$9,982/+2.4%</p> <p>The increase reflects changes to security, biological opinion requirements, non-routine extraordinary maintenance, WECC/NERC compliance activities, and improvements, replacements, and minor additions at the projects.</p>
<p>Fish & Wildlife Costs</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 and 2010 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispell Agreement, and the Willamette Agreement. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 and 2010 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispell Agreement, and the Willamette Agreement. 	<p>+\$6,000/+2.4%</p> <p>The increase reflects funding associated with Biological Opinions, Fish Accord commitments and Northwest Power Act activities.</p>
<p>Residential Exchange Program</p> <p>Milestones:</p> <ul style="list-style-type: none"> (See Detailed Justification) 	<p>Milestones:</p> <ul style="list-style-type: none"> (See Detailed Justification) 	<p>\$0/0%</p> <p>No change in funding.</p>

FY 2014	FY 2015	Explanation of Changes FY 2015 vs FY 2014 (Dollars in Thousands)
<p>NW Power & Conservation Council</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	<p>+\$231/2.2%</p> <p>The increase reflects continuing emphasis on NW Power and Conservation Council.</p>
<p>Energy Efficiency & Renewable Resources</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer load growth. Continue to purchase the output from renewable resources such as wind and solar. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer load growth. Continue to purchase the output from renewable resources such as wind and solar. 	<p>+\$1,260/+1.4%</p> <p>The increase reflects continuing emphasis on energy efficiency program consistent with the Power Plan and increased Renewable Resource acquisition costs.</p>

**Transmission Services - Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2013 Current	FY 2014 Estimate	FY 2015 Estimate	FY 2015 vs FY 2014	
				\$	%
Transmission Services - Operating Expense					
Engineering	54,801	49,052	49,307	256	1%
Operations	148,641	175,800	180,528	4,728	3%
Maintenance	187,210	192,221	197,133	4,911	3%
Total, Transmission Services - Operating Expense	390,652	417,073	426,968	9,985	2%

Outyears (\$K)

	FY 2015 Estimate	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate
Transmission Services - Operating Expense					
Engineering	49,307	49,701	50,436	51,373	51,959
Operations	180,528	178,320	181,721	184,890	185,254
Maintenance	197,133	202,104	206,132	210,296	211,353
Total, Transmission Services - Operating Expense	426,968	430,125	438,289	446,559	448,566

Overview

This activity provides for the transmission system services of engineering, operations, and maintenance for Bonneville's electric transmission system, and the associated power system control and communication facilities, with an invested cost of more than \$6.0 billion. Primary strategies of this program are: 1) maintain the safety and reliability of the transmission system; 2) increase the focus on meeting customers' needs; 3) optimize the transmission system; 4) provide open and non-discriminatory transmission access; and 5) improve Bonneville's cost effectiveness.

Explanation of Changes

Bonneville's budget includes \$427 million in FY 2015 for TS expense which is a 2 percent increase over the FY 2014 forecasted level. The increase reflects continuing operation and maintenance of Bonneville's transmission assets.

The FY 2015 budget increases the levels for Engineering (+\$0.3 million), Operations (+\$4.7 million), and Maintenance (+\$4.9 million)

Engineering (\$K)		
FY 2013	FY 2014	FY 2015
54,801	49,052	49,307

Overview

Continue efforts to identify best methods for improving system reliability and maintenance practices, and continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system.

Continued investments in Engineering include:

Continuous Activity (all years)

- **Asset Management:** Continue deploying the Asset Management approach to sustain the existing assets and expanding the system to meet Agency objectives using PAS-55 as a methodology for improving Asset Management.
- **R&D:** Conduct research focused on technologies related to business challenges Bonneville faces including reliability, energy efficiency, and integration of renewable energy resources. Technologies of interest are identified in Bonneville's Technology Roadmaps. A portfolio of research is selected every year through Bonneville's Portfolio Decision Framework.
- **Technical Support:** Provide technical support activities, such as transmission system planning and studies to optimize portions of the system. Provide support for non-wires solutions studies and pilot projects.
- **Capital-to-Expense Adjustments:** Conduct annual analysis of Bonneville's outstanding capital work orders to assess whether they should be expensed. As obsolete inventory is identified and disposed of, it is expensed.
- **Regulatory Fees:** WECC dues and loop flow payments, DOC/NTIA licensing costs for radio frequencies and NERC Critical Infrastructure Protection (CIP) compliance program costs. Includes membership in ColumbiaGrid.
- **Reimbursable Transactions:** Enter into written agreements with Federal and non-Federal entities that have work or services to be performed by Bonneville staff at the expense of the benefiting entities. The projects must be beneficial, under agreed upon criteria, to Bonneville operations and to the Federal or non-Federal entity involved or otherwise be aligned with or supportive of Bonneville's strategic objectives. Additionally, these activities generally contribute to more efficient or reliable construction of the Federal transmission system or otherwise enhance electric service to the region.
- **Leased and Other Costs:** Includes leases and other costs of financing transmission, delivery and voltage support facilities when such arrangements are operationally feasible and cost effective to deliver power. Capitalized leases enable Bonneville to continue to invest in infrastructure to support a safe and reliable system for the transmission of power. Other costs included are the accrued interest costs associated with Large Generator Interconnection Agreements (LGIA).

Operations		
(\$K)		
FY 2013	FY 2014	FY 2015
148,641	175,800	180,528

Overview

Substation Operations: Perform operations functions necessary to provide electric service to customers and to protect the Federal investment in electric equipment and other facilities. Includes equipment adjustments, switching lines and equipment during emergencies or maintenance, isolating damaged equipment, restoring service to customers, inspecting equipment, reading meters, etc.

Power System Dispatching and Supporting Functions: Perform central dispatching, control, and monitoring of the electric operation of the Federal transmission system. Also includes load, frequency and voltage control of Federal generating plants, and coordinating long- and short-term outages of system equipment. In addition, provides technical engineering support of dispatching function and provides all technical and systems support for Dittmer Control Center (DCC) and Munro Control Center (MCC).

Marketing and Sales: Provide management and direction of transmission rates, and provide business strategy in marketing of transmission and ancillary products and services of Transmission Services. Involve customers and constituents in the process of product and rate development. Maintain accurate and complete historical records of current and past legacy transmission agreements. Provide guidance for current and future transmission contract negotiations. Provide financial analysis of market strategies. Monitor and report on the financial health of Transmission Services. Support cost management by effective reporting and analysis of current expenditures. Ensure official budget submittals reflect current management financial strategies and adequately fund transmission programs.

Transmission Scheduling: Provide non-discriminatory, open access to the Bonneville transmission system consistent with the Open Access Transmission Tariff (OATT). Schedule transmission capacity to eligible Bonneville customers, which include customers acquiring services under Use of Facilities (UFT), Formula Power Transmission (FPT), Integration of Resources (IR), and Part II, or Part III, of the OATT. Manage the reservations and scheduling of all transmission services associated with the OATT. Ensure commercial compliance for all transmission commercial functions. Update practices, policies and commercial systems to accommodate a large diversity of resources, including wind.

Continuous Activity (all years):

- Continue to operate within parameters of NERC and WECC.
- Continue support of increased compliance activities related to the reliability of the transmission system including cyber security.
- Continue developing facilities, policies, procedures and implementing systems to support the diversity of resources, including wind into the transmission grid.
- Continue preparation for increased complexity of transmission scheduling, power system operations and dispatching, including congestion management and outage scheduling.
- Continue developing facilities to support network operations center and one transmission scheduling operations facility.
- Continue developing a long-term approach to optimize transmission availability through streamlined, cost-effective, and sustainable processes.
- Continue to address succession planning issues across key functions.
- Continue development and implementation of business systems and tools.

Maintenance		
(\$K)		
FY 2013	FY 2014	FY 2015
187,210	192,221	197,133

Overview

In all aspects of maintenance, Bonneville is continuing the use of Reliability Centered Maintenance (RCM) practices. The use of RCM practices is focused on improving system reliability, increasing availability and meeting new and existing compliance regulations at lowest lifecycle costs. In addition Bonneville is deploying Asset Management to optimize maintain/replace decision making. Maintenance costs are expected to increase as Bonneville addresses the aging transmission system, meeting Reliability Standards including Vegetation Management, and environmental constraints associated with construction, enhancement, and maintenance of the system. The Bonneville transmission system encompasses 15,276 circuit miles on over 8,500 right-of-way miles (many of these miles are through rugged, inaccessible terrain).

Continued investments in Maintenance include:

-Continuous Activity (all years)

- Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets.
- Continue refining processes and procedures for monitoring and tracking compliance activities related to the reliability of the transmission system.
- Continue to improve system availability performance through new maintenance procedures and work practices.
- Continue to develop and implement work practices and procedures for implementation of a new specialty crew using bare-handing live line practices for maintenance of high-voltage transmission lines.
- Continue increased emphasis on replacement of line hardware (life extension programs for insulators, connectors, dampers & fiber optic cable hardware).
- Continue to prepare for the impact of an expected high attrition rate among Bonneville's aging workforce by recruiting apprentices and replacements for critical minimum crew size workload positions.
- Increase outage-scheduling planning and coordination to increase customer satisfaction and system availability.
- Maintain vegetation management levels to ensure system reliability.
- Continue access road work to provide reliable access to facilities and ensure environmental compliance.
- Continue improving environmental stewardship.

Transmission Line Maintenance: Maintain and repair 15,276 circuit miles (24,523 km) of high voltage transmission lines, of which over 7,617 km (4,734 circuit miles) are 500 kV transmission extra-high voltage (EHV). Maintenance of EHV lines is two and one-half times more labor-intensive than maintenance of lower transmission voltages, although more efficient in transmission of power. This responsibility includes maintaining transmission rights-of-way to ensure system reliability, safety, and environmental compliance. Adopt work practices that improve system availability, reliability, and compliance.

Right-of-Way Maintenance: Maintain and manage vegetation from over 8,500 of Bonneville's right-of-way miles. This responsibility includes vegetation management, danger tree management, and access road maintenance to ensure system reliability, safety, and environmental compliance. Adopt procedures and processes that improve system availability, reliability, environmental compliance, and reliability compliance. Continue to deploy new technologies such as LiDAR (Light Detection and Ranging) to reliably and cost-effectively manage vegetation.

Substation Maintenance: Maintain and repair the transmission system power equipment located in Bonneville's 262 substations. Work includes inspections, diagnostic testing and predictive and condition based maintenance.

System Protection Maintenance: Maintain relaying metering and remedial action scheme equipment used to control and protect the electrical transmission system and to meter energy transfers for the purpose of revenue billing. Additionally,

field-engineering services provide technical advice and assure the correct operation of power system relaying and special control systems used to support interregional energy transmission capabilities.

Power System Control Maintenance: Test, repair, and provide field engineering support of Bonneville's highly complex equipment, communications, and control systems, including seven major microwave systems, fiber optic systems, and other critical communications and control equipment that support the power system.

Non-Electric Plant Maintenance: Maintain and manage Bonneville's non-electric facilities. Includes site, building, and building utility maintenance; custodial services; station utility; and other maintenance service activities, as well as, facilities asset management on Bonneville-owned or Bonneville-leased non-electric facilities.

Maintenance Standards and Engineering: Establish, monitor, and update system maintenance standards, policies, and procedures, and review and update long-range plans for maintenance of the electric power transmission system.

Activities, Milestones, and Explanation of Changes

FY 2014	FY 2015	Explanation of Changes FY 2015 vs FY 2014 (Dollars in Thousands)
<p>Engineering Milestones:</p> <ul style="list-style-type: none"> • Continue efforts to identify best methods for improving system reliability and maintenance practices. • Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue efforts to identify best methods for improving system reliability and maintenance practices. • Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	<p>+\$256/+0.5% The increase reflects emphasis on system reliability standards compliance and research and development.</p>
<p>Operations Milestones:</p> <ul style="list-style-type: none"> • Continue to operate within parameters of NERC and WECC. • Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to operate within parameters of NERC and WECC. • Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	<p>+\$4,728/+2.7% The increase reflects continued emphasis on reliability compliance activities, wind integration activities, security, and control center systems support.</p>
<p>Maintenance Milestones:</p> <ul style="list-style-type: none"> • Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	<p>+\$4,911/+2.6% The increase reflects implementation of facilities asset management plans, continued implementation of live-line crew, NERC/WECC compliance activities related to land rights and vegetation management, continuing maintenance program activities, including system protection, right-of-way, line maintenance, and performance improvements.</p>

**Interest, Pension and Post-retirement Benefits –
Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2013 Current	FY 2014 Estimate	FY 2015 Estimate	FY 2015 vs FY 2014	
				\$	%
Interest, Pension and Post-retirement Benefits					
BPA Bond Interest (Net)	130,516	108,718	139,500	30,782	28%
BPA Appropriation Interest	18,641	14,540	14,257	-283	-2%
Corps of Engineers Appropriation Interest	158,056	162,255	160,606	-1,650	-1%
Lower Snake River Comp Plan Interest	16,525	16,525	16,525	-	0%
Bureau of Reclamation Appropriation Interest	43,525	43,526	43,526	-	0%
Subtotal, Interest – Operating Expense	367,263	345,565	374,414	28,849	8%
Additional Pension and Post-retirement Benefits	35,641	37,002	37,638	636	2%
Total, Interest, Pension and Post-retirement Benefits	402,904	382,567	412,052	29,485	8%

Outyears (\$K)

	FY 2015 Estimate	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate
Interest, Pension and Post-retirement Benefits					
BPA Bond Interest (Net)	139,500	194,548	256,290	308,428	343,516
BPA Appropriation Interest	14,257	7,145	291	-	-
Corps of Engineers Appropriation Interest	160,606	162,340	165,870	168,904	171,655
Lower Snake River Comp Plan Interest	16,525	16,525	16,525	16,525	16,525
Bureau of Reclamation Appropriation Interest	43,526	43,526	43,526	43,526	43,526
Subtotal, Interest – Operating Expense	374,414	424,085	482,502	537,383	575,222
Additional Pension and Post-retirement Benefits	37,638	38,286	39,226	39,226	39,226
Total, Interest, Pension and Post-retirement Benefits	412,052	462,371	521,728	576,609	614,448

Overview

Interest expense provides for the payment of interest due on Federal debt. This consists of capital investment in FCRPS hydroelectric generating and transmission facilities of Bonneville, the Corps and Reclamation. Investments were financed by Congressional appropriations and Bonneville borrowings from the Treasury. Bonneville repays Federal debt through its power sales and transmission services revenues.

Since receiving Treasury borrowing authority in 1974 under the Transmission Act, all Bonneville borrowing has been at market rates. As of October 1, 1996, all of Bonneville's repayment obligations on FCRPS appropriated investment (Corps and Reclamation FCRPS investment and Bonneville investment financed with appropriations prior to the Transmission Act that were unpaid as of September 30, 1996) were restructured and assigned new current-market interest rates. The Bonneville Appropriations Refinancing Act of 1996 (Refinancing Act) called for resetting (reducing) the unpaid principal of FCRPS appropriations and reassigning (increasing) interest rates. New principal amounts were established as of the beginning of FY 1997 at the present value of the principal and annual interest payments Bonneville would make to the Treasury for these obligations in the absence of the legislation, plus \$100 million. The new principal amounts were assigned prevailing market interest rates as of October 1, 1996. Bonneville's outstanding repayment obligations on appropriations at the end of FY 1996 were \$6.6 billion with a weighted average interest rate of 3.4 percent. The refinancing reduced the principal amount to \$4.1 billion with a weighted average interest rate of 7.1 percent. Implementation of the refinancing took place in 1997 after audited actual financial data were available. As called for in the legislation, Bonneville submitted its calculations and interest rate assignments implementing the Refinancing Act to Treasury for its review and approval. Treasury approved the implementation calculations in July 1997. The Refinancing Act also calls for all future FCRPS appropriations to be assigned prevailing Treasury yield curve interest rates.

Interest estimates are a direct function of costs of Treasury borrowing to Bonneville, repayment status of outstanding FCRPS investments, and projected additions to FCRPS plant in service. These estimates may change over time depending on forecasted market conditions. The interest cost estimates include the impact of Bonneville's appropriation refinancing legislation.

Federal employees associated with the operation of the FCRPS participate in either the Civil Service Retirement System or the Federal Employees Retirement System. Employees may also participate in the Federal Employees Health and Benefit Program and the Federal Employee Group Life Insurance Program. All such postretirement systems and programs are sponsored by the Office of Personnel Management; therefore, Bonneville does not record any accumulated plan assets or liabilities related to the administration of such programs. Bonneville makes additional annual contributions to the General Fund of the U.S. Treasury (receipt account 892889) related to the Federal post-retirement benefit programs provided to employees associated with the operation of the FCRPS. These payments are consistent with the FY 2001 Administration's budget which assumed Bonneville would prospectively cover the unfunded liability that accrues in fiscal years after FY 1997 of the Civil Service Retirement and Disability Fund (Disability Fund), the Employees Health Benefits Fund (Health Fund), and the Employees Life Insurance Fund (Insurance Fund) that it had not covered prior to FY 1998. Bonneville's additional annual contributions include amounts relating to pension and post-retirement benefits for Bonneville and the power-related portion of the Corps and Reclamation projects.

**Capital Transfers
Funding Schedule by Activity
Funding (\$K)**

	FY 2013 Current	FY 2014 Estimate	FY 2015 Estimate	FY 2015 vs FY 2014	
				\$	%
Capital Transfers					
BPA Bond Amortization ¹	167,000	103,661	111,151	7,490	7%
Reclamation Appropriation Amortization	0	0	0	0	0%
BPA Appropriation Amortization	56,374	3,901	98,119	94,218	2,415%
Corps Appropriation Amortization	0	76,000	0	(76,000)	-100%
Total, Capital Transfers	223,374	183,562	209,270	25,708	14%

Outyears (\$K)

	FY 2015 Estimate	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate
Capital Transfers					
BPA Bond Amortization ¹	111,151	34,888	118,266	114,838	437,360
Reclamation Appropriation Amortization	0	0	0	0	0
BPA Appropriation Amortization	98,119	94,924	4,034	0	0
Corps Appropriation Amortization	0	7	0	2	0
Total, Capital Transfers	209,270	129,819	122,300	114,840	437,360

Overview

This activity conveys funds to the Treasury for repayment of certain FCRPS costs not included in the Associated Project Costs budget. Since capital transfers are cash transactions, they are not considered budget obligations.

¹ Bonneville "Bond(s)" in this FY 2015 Budget refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act (P.L. 93-454), which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

Additional Tables

**BONNEVILLE POWER ADMINISTRATION
TOTAL OBLIGATIONS/OUTLAYS**

Current Services
(in millions of dollars)

BP-1 SUMMARY^{1/3/}

	2013		2014		2015		2016	2017	2018	2019
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	202	202	204	204	204	204	213	213	213	213
2 Power Services ^{2/}	2,053	2,053	1,584	1,584	1,593	1,593	1,701	1,860	1,839	1,671
3 Transmission Services	658	658	1,066	1,066	1,052	1,052	1,067	1,105	1,094	997
4 Conservation & Energy Efficiency	145	145	163	163	181	181	186	190	193	198
5 Fish & Wildlife	291	291	314	314	311	311	304	305	310	333
6 Interest/ Pension ^{4/}	403	403	383	383	412	412	462	522	577	614
7 Associated Project Cost - Capital	186	186	241	241	239	239	248	244	256	257
8 Capital Equipment	48	48	45	45	46	46	47	48	48	48
9 Planning Council	10	10	11	11	11	11	11	11	11	12
10 Misc. Accounting Adjs.	0	0	0	0	0	0	0	0	0	0
11 Projects Funded in Advance	231	231	58	58	46	46	46	46	55	57
12 Capitalized Bond Premiums	0	0	2	2	2	2	2	2	2	2
TOTAL OBLIGATIONS/ OUTLAYS ^{3/}	4,227	4,227	4,070	4,070	4,098	4,098	4,288	4,546	4,598	4,402

REVENUES AND REIMBURSEMENTS

Current Services
(in millions of dollars)

BP-1 SUMMARY		FISCAL YEAR									
		2013		2014		2015		2016	2017	2018	2019
		Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
14	Revenues ^{5/}	3,503	3,503	4,026	4,026	4,064	4,064	4,251	4,508	4,554	4,355
15	Project Funded in Advance	231	231	58	58	46	46	46	46	55	57
16	TOTAL	3,734	3,734	4,084	4,084	4,110	4,110	4,297	4,554	4,609	4,412
	BUDGET AUTHORITY (NET) ^{6/}	545		888		846		936	967	967	566
17	OUTLAYS (NET) ^{6/7/}	203		(10)		(10)		(10)	(10)	(10)	(10)

These notes are an integral part of this table.

^{1/} This FY 2015 budget includes capital and expense estimates based on IPR and IPR2 forecasted data for FYs 2014-2019.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

^{4/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{5/} Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

^{6/} BPA received \$48.7 million of additional budget authority in FY 2007 to accommodate the work necessary to relocate the radio spectrum consistent with the Commercial Spectrum Enhancement Act (P.L. 108-494). BPA anticipates returning the forecasted unused balance of approximately \$8 million to the U.S. Treasury in FY 2015.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

EXPENSED OBLIGATIONS/OUTLAYS ^{1,4/}
Current Services
(in millions of dollars)
FISCAL YEAR

BP-2

	2013		2014		2015		2016	2017	2018	2019
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	202	202	204	204	204	204	213	213	213	213
2 Power Services ^{2/}	2,053	2,053	1,584	1,584	1,593	1,593	1,701	1,860	1,839	1,671
3 Transmission Services	391	391	417	417	427	427	430	438	447	449
4 Conservation & Energy Efficiency	67	67	88	88	89	89	91	92	93	94
5 Fish & Wildlife	239	239	254	254	260	260	267	274	281	288
6 Interest/ Pension ^{3/}	403	403	383	383	412	412	462	522	577	614
7 Planning Council	10	10	11	11	11	11	11	11	11	12
8 TOTAL EXPENSE	3,364	3,364	2,940	2,940	2,996	2,996	3,176	3,410	3,461	3,342
9 Projects Funded in Advance	231	231	58	58	46	46	46	46	55	57

CAPITAL OBLIGATIONS/OUTLAYS ^{1/}

Current Services

(in millions of dollars)

FISCAL YEAR

	2013		2014		2015		2016	2017	2018	2019
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
BP-2 continued										
10 Conservation & Energy Efficiency	78	78	75	75	92	92	95	98	101	104
11 Transmission Services	268	268	649	649	625	625	637	666	648	549
12 Associated Project Cost	186	186	241	241	239	239	248	244	256	257
13 Fish & Wildlife	52	52	60	60	51	51	37	31	29	45
14 Capital Equipment	48	48	45	45	46	46	47	48	48	48
15 Capitalized Bond Premiums	0	0	2	2	2	2	2	2	2	2
16 TOTAL CAPITAL INVESTMENTS	632	632	1,072	1,072	1,055	1,055	1,066	1,089	1,082	1,003
17 TREASURY BORROWING AUTHORITY TO										
18 FINANCE CAPITAL OBLIGATIONS ^{4/}	632		1,072		1,055		1,066	1,089	1,082	1,003

These notes are an integral part of this table.

^{1/} This FY 2015 budget includes capital and expense estimates based on IPR and IPR2 forecasted data for FYs 2014-2019.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{4/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

CURRENT SERVICES
(in millions of dollars)

CAPITAL TRANSFERS

Amortization:
 19 BPA Bonds
 20 Reclamation Appropriations
 21 BPA Appropriations
 22 Corps Appropriations
 23 **TOTAL CAPITAL TRANSFERS**

2013 Pymts
167
0
56
0
223

FISCAL YEAR

2014 Pymts	2015 Pymts	2016 Pymts	2017 Pymts	2018 Pymts	2019 Pymts
104	111	35	118	115	437
0	0	0	0	0	0
4	98	95	4	0	0
76	0	0	0	0	0
184	209	130	122	115	437

24 **FULL-TIME EQUIVALENT (FTE)**

2,998

STAFFING

3,200	3,200	3,100	3,100	3,100	3,100
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PROGRAM & FINANCING SUMMARY

Current Services
(in millions of dollars)

Identification Code: 89-4045-0-3-271

	est.						
	2013	2014	2015	2016	2017	2018	2019
Program by activities:							
Operating expenses:							
0.01 Power Services	1,666	1,166	1,165	1,246	1,396	1,359	1,183
0.02 Residential Exchange Program	202	204	204	213	213	213	213
Associated Project Costs:							
0.05 Bureau of Reclamation	127	141	143	157	158	165	165
0.06 Corps of Engineers	208	226	232	244	251	259	266
0.07 Colville Settlement	22	21	21	22	22	23	23
0.19 U.S. Fish & Wildlife Service	29	31	32	32	33	34	34
0.20 Planning Council	10	11	11	11	11	11	12
0.21 Fish & Wildlife	239	254	260	267	274	281	288
0.23 Transmission Services	391	417	427	430	438	447	449
0.24 Conservation & Energy Efficiency	67	88	89	91	92	93	94
0.25 Interest	367	346	374	424	483	537	575
0.26 Pension and Health Benefits ^{1/}	36	37	38	38	39	39	39
0.91 Total operating expenses ^{2/}	3,363	2,940	2,996	3,175	3,411	3,461	3,342
Capital investment:							
1.01 Power Services	186	241	239	248	244	256	257
1.02 Transmission Services	268	649	625	637	666	648	549
1.03 Conservation & Energy Efficiency	78	75	92	95	98	101	104
1.04 Fish & Wildlife	52	60	51	37	31	29	45
1.05 Capital Equipment	48	45	46	47	48	48	48
1.06 Capitalized Bond Premiums	0	2	2	2	2	2	2
1.07 Total Capital Investment ^{3/}	632	1,072	1,055	1,066	1,089	1,082	1,003
2.01 Projects Funded in Advanced	231	58	46	46	46	55	57
10.00 Total obligations ^{4/}	4,227	4,070	4,098	4,287	4,547	4,598	4,402

These notes are an integral part of this table.

^{1/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{2/} Assumes expense obligations, not accrued expenses.

Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} Assumes capital obligations, not capital expenditures.

^{4/} This FY 2015 budget includes capital and expense estimates based on IPR and IPR2 forecasted data for FYs 2014-2019.

For purposes of this table, this FY 2015 budget reflects, for FY 2013, actual third party financing expense only for PFIA.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988 regarding Bonneville's ability to obligate funds.

Program and Financing (continued)

Current Services
(in millions of dollars)

	est.						
	2013	2014	2015	2016	2017	2018	2019
Financing:							
1000 Unobligated balance available, start of year. ^{5/}	15	9	8	0	0	0	0
1050 Unobligated balance available, end of year. ^{5/}	9	8	8	0	0	0	0
1900 Budget authority (gross)	4,528	4,969	4,953	5,233	5,523	5,578	4,978
Budget Authority:							
1400 Permanent Authority: Authority to borrow from Treasury (indefinite) ^{6/}	632	1,072	1,055	1,066	1,089	1,082	1,003
1800 Spending authority from off-setting collections	3,734	4,084	4,110	4,297	4,556	4,609	4,412
1825 Portion applied to debt reduction	(168)	(184)	(209)	(130)	(122)	(115)	(437)
1850 Spending authority from offsetting collections (adjusted)	2,139	3,900	3,901	4,167	4,434	4,494	3,975
900 Total obligations	4,227	4,070	4,098	4,287	4,547	4,598	4,402
4100 Outlays (gross)	4,227	4,070	4,098	4,287	4,547	4,598	4,402
Adjustments to budget authority and outlays:							
Deductions for offsetting collections:							
4120 Federal funds	(53)	(90)	(90)	(90)	(90)	(90)	(90)
4121 Interest on Federal Securities	(3)	(3)	(3)				
4123 Non-Federal sources	(3,691)	(3,991)	(4,017)	(4,207)	(4,466)	(4,519)	(4,332)
4130 Total, offsetting collections	(3,734)	(4,084)	(4,110)	(4,297)	(4,556)	(4,609)	(4,412)
4160 Budget authority (net)	545	888	846	936	967	967	566
4170 Outlays (net) ^{7/}	203	(10)	(10)	(10)	(10)	(10)	(10)

These notes are an integral part of this table.

^{5/} Reflects estimated cost for radio spectrum fund.

^{6/} The Permanent Authority: Authority to borrow (indefinite) from Treasury amounts reflect both Bonneville's capital program financing needs and either the use of, or creation of, deferred borrowing. Deferred borrowing is created when, as a cash and debt management decision, Bonneville uses cash from revenues to liquidate capital obligations in lieu of borrowing from Treasury. This temporary use of cash on hand instead of borrowed funds creates the ability in future years to borrow money, when fiscally prudent. The FY 1989 Energy and Water Development Appropriations Act (P.L. 100-371 Of 7/19/88) clarified that Bonneville has authority to incur obligations in excess of Treasury borrowing authority and cash in the BPA fund.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4A

	Fiscal Year							
	2013				2014			
	Net Capital		Net Capital		Net Capital		Net Capital	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	2,625	2,083	3,524	3,420	3,090	2,548	3,989	3,885
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	632	632	632		1,072	1,072	1,072	
Treasury Borrowing (Cash)				632				1,072
Less:								
BPA Bond Amortization	167	167	167	167	104	104	104	104
Net Increase/(Decrease):	465	465	465	465	968	968	968	968
Cum.-End-of-Year: Total	3,090	2,548	3,989	3,885	4,059	3,517	4,958	4,854
Total Remaining Treasury Borrowing Amount				3,815				2,846
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue less debt than forecast depending on net revenues, Treasury interests rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2015 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act (PL 93-454), which defines BPA bonds as all bonds, notes, and other evidences of indebtednesses issued and sold to the U.S. Treasury.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2013-2019.

The cumulative amount of actual advance amortization payments as of the end of FY 2013 is \$2,697 million.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4B

	2015				2016			
	Net Capital		Net Bonds		Net Capital		Net Bonds	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out-Standing	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out-Standing
Start-of-Year: Total	4,059	3,517	4,958	4,854	5,003	4,461	5,902	5,798
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	1,055	1,055	1,055		1,066	1,066	1,066	
Treasury Borrowing (Cash)				1,055				1,066
Less:								
Total BPA Bond Amortization	111	111	111	111	35	35	35	35
Net Increase/(Decrease):								
Total	944	944	944	944	1,031	1,031	1,031	1,031
Cum.-End-of-Year: Total	5,003	4,461	5,902	5,798	6,034	5,492	6,933	6,829
Total Remaining Treasury Borrowing Amount				1,902				871
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue less debt than forecast depending on net revenues, Treasury interests rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2015 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act (PL 93-454), which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold to the U.S. Treasury.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2013-2019.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4C

Fiscal Year

	2017				2018			
	Net Capital				Net Capital			
	Net Capital	Obs Subject	Net Capital	Bonds Out-	Net Capital	Obs Subject	Net Capital	Bonds Out-
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
Start-of-Year: Total	6,034	5,492	6,933	6,829	7,003	6,461	7,902	7,798
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	1,088	1,088	1,088		1,081	1,081	1,081	
Treasury Borrowing (Cash)				1,088				1,081
Less:								
Total BPA Bond Amortization	118	118	118	118	115	115	115	115
Net Increase/(Decrease):								
Total	970	970	970	970	966	966	966	966
Cum.-End-of-Year: Total	7,003	6,461	7,902	7,798	7,970	7,428	8,869	8,765
Total Remaining Treasury Borrowing Amount				(98)				(1,065)
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue less debt than forecast depending on net revenues, Treasury interests rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2015 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act (PL 93-454), which defines BPA bonds as all bonds, notes, and other evidences of indebtednesses issued and sold to the U.S. Treasury.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2013-2019.

**BONNEVILLE POWER ADMINISTRATION
BPA STATUS of TREASURY BORROWING
CURRENT SERVICES**
(in millions of dollars)

BP-4D

	Fiscal Year			
	2019			
	Net Capital Obs	Net Capital Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	7,970	7,428	8,869	8,765
Plus: Annual Increase				
Cum.-Annual Treasury Borrowing	1,003	1,003	1,003	
Treasury Borrowing (Cash)				1,003
Less:				
Total BPA Bond Amortization	437	437	437	437
Net Increase/(Decrease):				
Total	566	566	566	566
Cum.-End-of-Year: Total	8,536	7,994	9,435	9,331
Total Remaining Treasury Borrowing Amount				(1,631)
Total Legislated Treasury Borrowing Amount				7,700

These notes are an integral part of this table.

In any given year, BPA may issue less debt than forecast depending on net revenues, Treasury interests rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2015 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act (PL 93-454), which defines BPA bonds as all bonds, notes, and other evidences of indebtednesses issued and sold to the U.S. Treasury.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2013-2019.

BONNEVILLE POWER ADMINISTRATION
POTENTIAL THIRD PARTY FINANCING TRANSPARENCY
(in millions of dollars)

BP-5

		Fiscal Year						
		2013	2014	2015	2016	2017	2018	2019
Transmission Services - Capital								
Requirements	Main Grid	42	140	107	219	298	297	177
	Area & Customer Services	10	27	38	15	13	13	13
	Upgrades & Additions	85	281	269	202	159	135	138
	System Replacements	130	201	211	202	196	202	220
	Projects Funded in Advance	231	58	46	46	46	55	57
	Total, Transmission Services - Capital	498	707	671	684	713	703	606

Associated Project Costs - Capital

Requirements	Associated Project Costs	186	241	239	248	244	256	257
	Total, Associated Project Costs - Capital	186	241	239	248	244	256	257

Federal and Non-Federal Funding

Sources	Projects Funded in Advance	231	58	46	46	46	55	57
	Treasury Borrowing Authority	454	890	864	886	911	903	805

Scenario

Scenario	Projects Funded in Advance ^{1/}	20	150	170	100	100	100	100
	Third Party Financing	144	250	250	250	250	250	250
	Alternate Treasury Borrowing Authority	290	490	444	536	561	553	455

These notes are an integral part of this table.

^{1/}In this scenario the Projects Funded in Advance represents potential prepayment of Power customers' bills reimbursed by future credits and third party non-federal financing for Conservation initiatives. Power Prepays will be included in this category in the future, depending on customer interest in participation. The table above shows both the potential use of Treasury borrowing authority for transmission capital projects based on this FY 2015 budget and the use adjusted for potential third-party financing to fund appropriate capital expenditures when feasible in lieu of Treasury borrowing. Estimates included in this FY 2015 budget are uncertain and may change due to revised capital investment plans, changing economic conditions, and an evolving financial market environment. The estimates of third-party financing included in the table show a reduction in the use of Treasury borrowing and do not reflect the actual notional third party financing commitment BPA may enter into in that particular year. The difference of reduction in use of Treasury borrowing and the actual notional third party financing commitment is primarily due to the difference in the timing of financing transactions between Treasury and third-party financing for capital projects with multi-year construction schedules.

Bonneville's Third Party Financing for Transmission Services consists primarily of lease-purchase agreements, which are capitalized leases that enable BPA to acquire the use of transmission facilities over time. BPA also undertakes the construction and installation of facilities from funds that customers advance to BPA for construction of BPA-owned facilities that assist the customers in obtaining necessary transmission service from BPA. These customers receive monetary payment credits in bills for transmission services from BPA up to the amount of funds advanced to BPA, plus interest.

BPA's historical Third Party Financing amounts may vary over time due to re-assignment of certain lease-purchase agreements to Treasury Financing.

BPA Status of Treasury Borrowing with Potential Third Party Financing & PFIA Scenario

With the potential use of third party financing assumed in the scenario above, BPA's total remaining Treasury Borrowing Amount would be extended to the following amounts. See BP-4 BPA Status of Treasury Borrowing- Current Services.

	Fiscal Year						
	2013	2014	2015	2016	2017	2018	2019
Start-of-Year: Total Bonds Outstanding	3,420	3,885	4,454	4,978	5,659	6,278	6,895
Plus:							
Treasury Borrowing (Cash)	632	1,072	1,055	1,066	1,088	1,081	1,003
Less:							
Potential Third Party Financing & PFIA	NA	400	420	350	350	350	350
BPA Bond Amortization	167	104	111	35	118	115	437
Net Increase/(Decrease) Bonds Outstanding:	465	568	524	681	620	616	216
Cum.-End-of-Year: Total	3 885	4 454	4 978	5 659	6 278	6 895	7 111
Total Remaining Treasury Borrowing Amount	3,815	3,246	2,722	2,041	1,422	805	589
Total Legislated Treasury Borrowing Amount	7,700	7,700	7,700	7,700	7,700	7,700	7,700

TREASURY PAYMENTS

(in millions of dollars)

	FISCAL YEAR						
	2013	2014	2015	2016	2017	2018	2019
A. INTEREST ON BONDS & APPROPRIATIONS							
Bonneville Bond Interest							
1 Bonneville Bond Interest (net)	93	109	140	195	256	308	344
2 AFUDC ^{1/}	38	39	41	39	33	29	27
Appropriations Interest							
3 Bonneville	19	15	14	7	0	0	0
4 Corps of Engineers ^{2/}	157	162	161	162	166	169	172
5 Lower Snake River Comp.	17	17	17	17	17	17	17
6 Bureau of Reclamation ^{3/} Bond Premium paid	44	44	44	44	44	44	44
7 Total Bond and Approp. Interest	367	385	416	463	516	566	602
B. ASSOCIATED PROJECT COST							
8 Bureau of Reclamation Irrigation Assistance	59	53	52	61	51	28	57
9 Bureau of Rec. O & M ^{4/}	6	0	0	0	0	0	0
10 Corps of Eng. O & M ^{4/}	0	0	0	0	0	0	0
11 L. Snake River Comp. Plan O & M ^{4/}	0	0	0	0	0	0	0
12 Total Assoc. Project Costs	65	53	52	61	51	28	57
C. CAPITAL TRANSFERS							
Amortization							
13 Bonneville Bonds ^{6/}	167	104	111	35	118	115	437
13a BPA Bond Amortization dependent on ..debt optimization	0	0	0	0	0	0	0
13b BPA Bond Amortization dependent on ...net secondary revenues	0	0	0	0	0	0	0
14 Bureau of Reclamation Appropriations	0	0	0	0	0	0	0
15 Corps of Engineers Appropriations	0	76	0	0	0	0	0
16 Lower Snake River Comp. Plan	0	0	0	0	0	0	0
17 Bonneville Appropriations	57	4	98	95	4	0	0
Total Capital Transfers	224	184	209	130	122	115	437
D. OTHER PAYMENTS							
18 Unfunded CSRS Liability ^{5/}	36	37	38	38	39	39	39
21 TOTAL TREASURY PAYMENTS	692	658	715	692	729	748	1,136

These notes are an integral part of this table.

^{1/} This interest cost is capitalized and included in BPA's Transmission System Development, System Replacements, and Associated Projects Capital programs. AFUDC is financed through the sale of bonds.

^{2/} Includes interest on construction funding for Corp of Engineers (Corps) fish bypass facilities at Corps dams in the Columbia River Basin, including Lower Monumental, Ice Harbor, and The Dalles.

^{3/} Includes payments paid by Reclamation to Treasury on behalf of Bonneville.

^{4/} Costs for power O&M is funded directly by Bonneville as follows (in millions):

	FISCAL YEAR	2013	2014	2015	2016	2017	2018	2019
Bureau of Reclamation		127	141	143	157	158	165	165
Corps of Engineers		208	226	232	244	251	259	266
Subtotal Bureau and Corps		335	366	375	401	409	424	431
Lower Snake River Comp. Plan		29	31	32	32	33	34	34
Total		364	397	407	433	442	457	465

^{5/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete

^{6/} In this FY 2015 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act (PL Law 93-454), which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold to the U.S. Treasury.

Does not include Treasury bond premiums on refinanced Treasury bonds.

Status of Treasury Principal Repayment

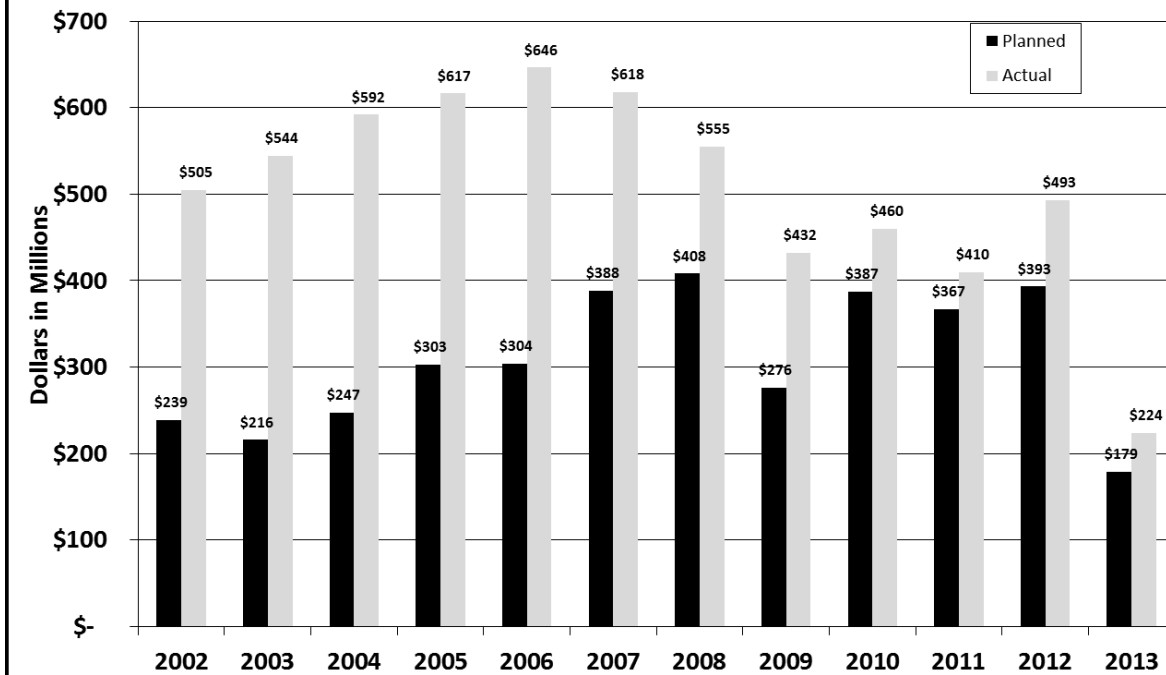


Chart Notes

^{1/} This chart displays principal repayment only.

^{2/} Treasury payment outyear estimates for planned amortization of principal are based on rate case estimates when available and planned amortization for future rate case periods. These estimates may change due to revised capital investment plans, actual Treasury borrowing, and advanced amortization payments. Bonneville made its full scheduled FY 2013 payment responsibility to the Treasury. Bonneville's aggregate Treasury payment was \$692 million, comprised of \$224 million in amortization, \$367 million in interest, and \$36 million of unfunded CSRS liabilities and other costs.

^{3/} FYs 2000-2012 payments include portions of future planned amortization amounts consistent with Bonneville's capital strategy plan and the Bonneville /Energy Northwest debt optimization program.

^{4/} Advance amortization due to sale of low-voltage transmission facilities includes \$13 million and \$5.3 million in FYs 2003 and 2006, respectively.

^{5/} The cumulative amount of actual advance amortization payments as of the end of FY 2013 is \$2,697 million.

OBJECT CLASSIFICATION STATEMENT
(in millions of dollars)

ESTIMATES

	2013 act.	2014	2015
11.1 Full-time permanent	381	367	369
11.3 Other than full-time permanent	-	-	-
11.5 Other personnel compensation	24	23	24
11.9 Total personnel compensation	405	390	393
12.1 Civilian personnel benefits	125	120	121
13.0 Benefits for former personnel	-	-	-
21.0 Travel and transportation of persons	20	19	19
22.0 Transportation of things	3	3	3
23.1 Rental payments to GSA	12	11	11
23.2 Rents, other	34	33	33
23.3 Communication, utilities & misc. charges	9	9	9
25.1 Consulting Services	211	203	204
25.2 Other Services	2,536	2,441	2,458
25.5 R & D Contracts	16	16	16
26.0 Supplies and materials	56	54	55
31.0 Equipment	148	142	143
32.0 Lands and structures	286	276	278
41.0 Grants, subsidies, contributions	62	60	60
43.0 Interest and dividends	304	292	294
99.0 Total obligations	4,227	4,070	4,098

Estimate of Receipts

(in millions of dollars)

	Fiscal Year						
	2013	2014	2015	2016	2017	2018	2019
Reclamation Interest	44	44	44	44	44	44	44
Reclamation Amortization	0	0	0	0	0	0	0
Reclamation O&M		0	0	0	0	0	0
Reclamation Irrig. Assist.	59	53	52	61	51	28	57
Revenues Collected by Reclamation Distributed in Treasury Account (credit)	-7	-7	-7	-7	-7	-7	-7
Colville Settlement (credit)	-5	-5	-5	-5	-5	-5	-5
Total 1/ Reclamation Fund	90	84	84	92	83	59	89
Corps O&M							
CSRS	36	37	38	38	39	39	39
Total 2/ Repayments on misc.costs	36	37	38	38	39	39	39

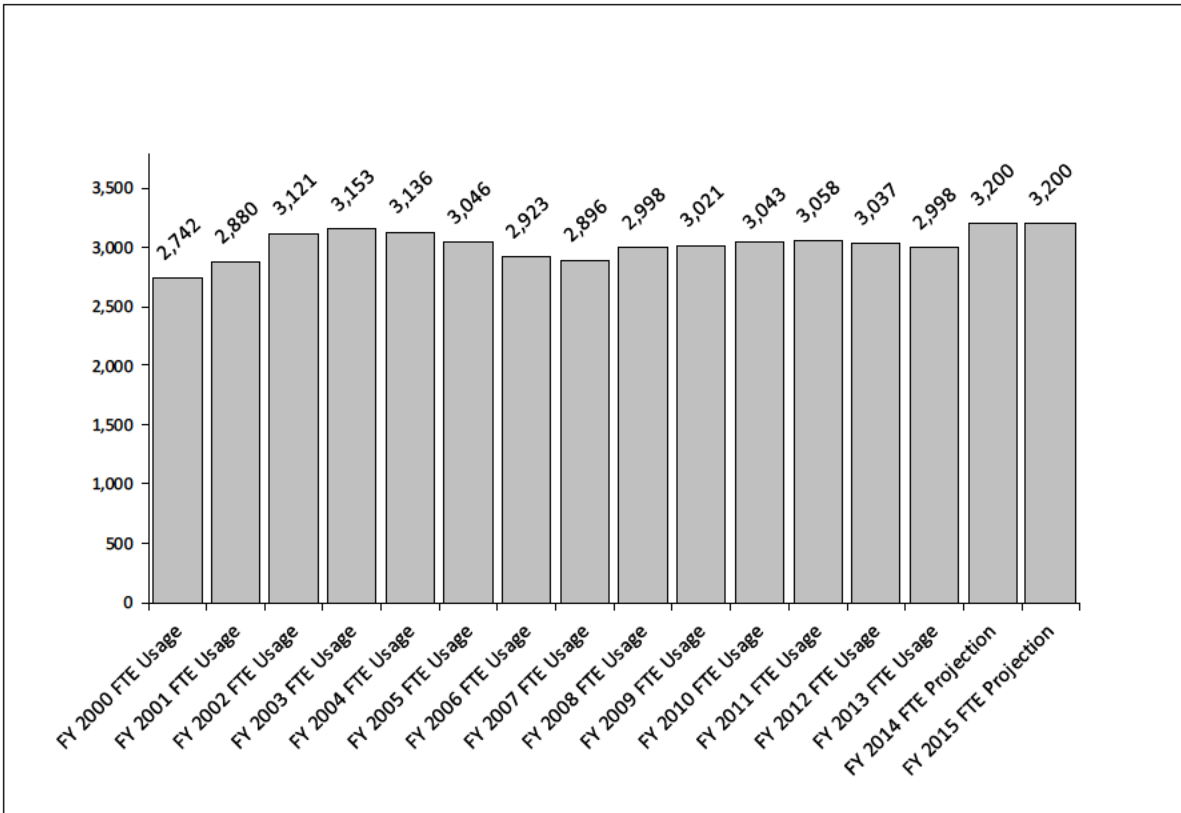
1/ Includes amortization of appropriations and irrigation assistance, and interest costs for Reclamation. The cost of power O&M for Reclamation is no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfer to Account #895000.26

2/ The costs of power O&M for the Corps and Lower Snake Comp. Plan are no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfers to Account #892889, Repayments on misc. recoverable costs, not otherwise classified. Costs for power O&M is funded directly by Bonneville as follows (in millions)

	2013	2014	2015	2016	2017	2018	2019
Bureau of Reclamation	127	141	143	157	158	165	165
Corps of Engineers	208	226	232	244	251	259	266
Lower Snake River Comp. Plan	29	31	32	32	33	34	34

See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

BONNEVILLE FTE



Actual FTE data is consistent with DOE personnel reports.

FTE outyear data are estimates and may change.

Total Cost of BPA Fish & Wildlife Actions

COST ELEMENT	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
CAPITAL INVESTMENTS ^{1/}										
BPA FISH AND WILDLIFE	8.5	12.2	35.4	35.2	25.5	27.4	40.0	90.2	57.5	52.1
BPA SOFTWARE DEVELOPMENT COSTS	-	-	0.9	1.0	1.3	0.6	1.2	0.8	0.4	0.0
ASSOCIATED PROJECTS (FEDERAL HYDRO)	75.9	53.8	360.0	60.4	37.3	135.7	56.4	103.0	114.5	103.6
TOTAL CAPITAL INVESTMENTS	84.4	66.0	396.3	96.6	64.2	163.7	97.6	193.9	172.3	155.7
PROGRAM EXPENSES										
BPA DIRECT FISH AND WILDLIFE PROGRAM	137.9	135.8	137.9	139.5	148.9	177.9	199.6	221.1	248.9	239.0
FISH & WILDLIFE SOFTWARE EXPENSE COSTS										0.2
SUPPLEMENTAL MITIGATION PROGRAM EXPENSES ^{2/}	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
REIMBURSABLE/DIRECT-FUNDED PROJECTS ^{3/}										
O & M LOWER SNAKE RIVER HATCHERIES	17.3	17.2	20.1	19.3	19.4	20.8	23.3	24.5	22.0	28.7
O & M CORPS OF ENGINEERS	32.3	32.5	31.8	32.9	34.4	34.3	36.5	40.3	41.1	39.2
O & M BUREAU OF RECLAMATION	3.9	3.9	4.5	3.9	4.3	4.5	5.2	5.0	5.3	5.6
NW POWER AND CONSERVATION COUNCIL ALLOCATED @ 50%	3.7	4.3	4.3	4.2	4.1	4.7	4.7	4.5	4.6	5.0
SUBTOTAL (REIMB/DIRECT-FUNDED)	57.2	57.9	60.7	60.3	62.2	64.3	69.7	74.3	73.0	78.5
TOTAL OPERATING EXPENSES	202.9	193.7	198.6	199.7	211.1	242.1	269.3	295.3	321.9	317.70
PROGRAM RELATED FIXED EXPENSES ^{4/}										
INTEREST EXPENSE	53.3	56.4	53.4	76.0	76.9	78.7	80.5	79.2	80.6	89.1
AMORTIZATION EXPENSE	17.5	17.4	17.4	22.9	24.4	24.6	25.0	28.3	30.2	35.7
DEPRECIATION EXPENSE	14.6	15.9	16.7	14.0	14.9	16.7	18.0	19.6	20.7	18.6
TOTAL FIXED EXPENSES	85.4	89.7	87.5	112.9	116.2	120.0	123.5	127.2	131.5	143.4
GRAND TOTAL PROGRAM EXPENSES	288.3	283.4	286.1	312.7	327.3	362.1	392.8	422.5	453.4	461.1
FORGONE REVENUES AND POWER PURCHASES										
FOREGONE REVENUES	21.7	182.1	397.4	282.6	273.5	142.8	99.4	156.7	152.2	135.5
BPA POWER PURCH. FOR FISH ENHANCEMENT	191.0	110.8	168.2	120.7	274.9	240.3	310.1	70.7	38.5	85.8
TOTAL FOREGONE REVENUES AND POWER PURCHASES	212.7	292.9	565.6	403.3	548.5	383.1	409.5	227.4	190.7	221.3
TOTAL PROGRAM EXPENSES, FOREGONE REVENUES, & POWER PURCHASES	501.0	576.3	851.7	716.0	875.8	745.3	802.3	649.9	644.1	682.4
CREDITS										
4/(h)(10)(C)	(77.0)	(57.7)	(76.4)	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)
TOTAL CREDITS	(77.0)	(57.7)	(76.4)	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)

1/ Capital Investments include both BPA's direct Fish and Wildlife Program capital investments, funded by BPA's Treasury borrowing, and "Associated Projects", which include capital investments at Corps of Engineers' and Bureau of Reclamation projects, funded by appropriations and repaid by BPA. The negative amount in FY 1997 reflects a decision to reverse "plant-in-service" investment that was never actually placed into service. The annual expenses associated with these investments are included in "Program-Related Fixed Expenses", below.

2/ Includes High Priority and Action Plan Expenses and other supplemental programs.

3/ "Reimbursable/Direct-Funded Projects" includes the portion of costs BPA pays to or on behalf of other entities that is determined to be for fish and wildlife purposes.

4/ "Fixed Expenses" include depreciation, amortization and interest on investments on the Corps of Engineers' projects, and amortization and interest on the investments associated with BPA's direct Fish and Wildlife Program.

Bonneville Power Administration (Bonneville, BPA)
Proposed Appropriations Language

Expenditures from the Bonneville Power Administration Fund, established pursuant to Public Law 93-454, are approved for [the Black Canyon Trout Hatchery] *the Shoshone Paiute Trout Hatchery, the Spokane Tribal Hatchery, the Snake River Sockeye Weirs* and, in addition, for official reception and representation expenses in an amount not to exceed \$5,000: Provided, that during fiscal year [2015] *2016*, no new direct loan obligations may be made.

Explanation of Changes

The proposed appropriations language restricts new direct loans in FY 2016 as in FY 2015. This bill language is drafted consistent with the Credit Reform Act of 1990.

Please Note - The FY 2016 Bonneville Power Administration Congressional Budget submission includes FY 2015 budget estimates.

Bonneville finances its operations with a business-type budget under the Government Corporation Control Act, 31 U.S.C 9101-10, on the basis of the self-financing authority provided by the Federal Columbia River Transmission System Act of 1974 (Transmission Act) (Public Law 93-454) and the U.S. Treasury borrowing authority provided by the Transmission Act, the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Pacific Northwest Power Act) (Public Law 96-501) for energy conservation, renewable energy resources, investment in capital fish facilities, and other purposes, the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), and other legislation. Authority to borrow from the U.S. Treasury is available to Bonneville on a permanent, indefinite basis. The amount of U.S. Treasury borrowing outstanding at any time cannot exceed \$7.70 billion.¹ Bonneville finances its approximate \$4.3 billion annual cost of operations and investments primarily using power and transmission revenues, and borrowing from the U.S. Treasury at rates comparable to borrowings at open market rates for similar issues.

This budget has been prepared in accordance with the Statutory Pay-As-You-Go Act (PAYGO) of 2010. Under PAYGO, all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

¹ Amount of total bonds outstanding can be found in tables BP-4A – 4D in the Additional Tables section.

Bonneville Power Administration

Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2014 Actuals	2015 Original ^{2/}	2015 Revised ^{2/}	2016 Proposed
Capital Investment Obligations				
Associated Project Costs ^{3/}	58,187	N/A	211,829	240,790
Fish & Wildlife	37,353	N/A	51,807	54,807
Conservation & Energy Efficiency ^{3/}	77,887	N/A	92,000	94,800
Subtotal, Power Services	173,427	N/A	355,637	390,398
Transmission Services	340,825		704,254	621,816
Capital Equipment & Bond Premium	30,204	N/A	34,669	39,356
Total, Capital Obligations ^{3/}	544,456	1,055,079	1,094,559	1,051,569
Expensed and Other Obligations				
Expensed	3,262,726	2,996,419	2,911,588	3,040,716
Projects Funded in Advance	384,689	46,491	30,000	30,000
Total, Obligations	4,191,871	4,097,988	4,036,147	4,122,285
Capital Transfers (cash)	567,000	209,270	209,270	206,900
BPA Total	4,758,871	4,307,258	4,245,417	4,329,185
Bonneville Net Outlays	262,365		156,739	56,365
Full-time Equivalents (FTEs)	2,893	3,200	3,100	3,100

Public Law Authorizations include:

Bonneville Project Act of 1937, Public Law No. 75-329

Federal Columbia River Transmission System Act of 1974, Public Law No. 93-454

Regional Preference Act of 1964, Public Law No. 88-552

Flood Control Act of 1944, Public Law No. 78-543

Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act), Public Law No. 96-501

Outyear Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2017	2018	2019	2020
Capital Investment Obligations				
Associated Project Costs ^{3/}	269,908	281,266	313,981	334,067
Fish & Wildlife	30,795	18,646	34,806	35,033
Conservation & Energy Efficiency ^{3/}	97,600	100,500	103,600	106,700
Subtotal, Power Services	398,303	400,412	452,387	475,800
Transmission Services	544,479	445,678	444,746	416,256
Capital Equipment & Bond Premium	30,794	12,896	8,477	6,141
Total, Capital Obligations ^{3/}	973,576	858,986	905,609	898,197
Expensed and Other Obligations				
Expensed	3,160,449	3,223,081	3,107,629	3,180,861
Projects Funded in Advance	30,000	30,000	50,000	50,000
Total, Obligations	4,164,025	4,112,067	4,063,239	4,129,058
Capital Transfers (cash)	221,279	264,151	558,916	502,938
BPA Total	4,385,304	4,376,218	4,622,154	4,631,996
Bonneville Net Outlays	50,266	(1,734)	(50,734)	(25,871)
Full-time Equivalentents (FTEs)	3,100	3,100	3,100	3,100

These notes are an integral part of this table.

- ^{1/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.
- ^{2/} Original estimates reflect Bonneville's FY 2015 Congressional Budget Submission. Revised estimates, consistent with Bonneville's annual near-term funding review process, provide notification to the Administration and Congress of updated capital and expense funding levels for FY 2015.
- ^{3/} Includes infrastructure investments designed to address the long-term electric power related needs of the Northwest and to reflect significant changes affecting Bonneville's power and transmission markets.

Additional Notes

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Cumulative advance amortization payments as of the end of FY 2014 are \$3,060 million.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

FY 2015 Net Outlays are calculated using Bonneville's revenue forecast from the BP-14 rate case. FYs 2016 & 2017 Net Outlays are calculated using Bonneville's revenue forecast from the BP-16 rate case. FYs 2018 & 2019 assume no growth in Offsetting Collections compared to FYs 2016 & 2017. FY 2020 assumes a 1% growth in Offsetting Collections.

FTE outyear data are estimates and may change.

Major Outyear Considerations

Bonneville's outyear estimates reflect its ongoing efforts to achieve its long-term mission and strategic direction. The outyear estimates are developed with consideration and support of Bonneville's multi-year performance targets that lay out the course for achieving Bonneville's long-term objectives. Outyear capital investment levels support Bonneville's infrastructure program, hydro efficiency program, conservation and energy efficiency projects, and its fish and wildlife mitigation projects.

With passage of the Energy Policy Act of 2005, Bonneville continues to incorporate the various aspects of the legislation related to its business, in particular the energy supply, conservation, and new energy technologies for the future that are highlighted in the legislation.

Overview and Accomplishments

Bonneville provides electric power, transmission, and energy efficiency throughout the Pacific Northwest. Bonneville serves a 300,000 square mile area including Oregon, Washington, Idaho, western Montana, and parts of northern California, Nevada, Utah, and Wyoming with a population of about 12.9 million people. Bonneville markets the electric power produced from 31 federal hydro projects in the Pacific Northwest owned by the U.S. Army Corps of Engineers (Corps) and the U.S. Department of Interior, Bureau of Reclamation (Reclamation) – known as Associated Projects. Bonneville also acquires non-federal power, including the power from the nuclear power plant, Columbia Generating Station (CGS), to meet the needs of its customer utilities. Bonneville maintains and operates 15,169 circuit miles of transmission lines, 260 substations, and associated power system control and communications facilities over which this electric power is delivered. Bonneville has capital leases for certain transmission facilities. Bonneville also supports the protection and enhancement of fish and wildlife, and promotes conservation and energy efficiency, as part of its efforts to preserve and balance the economic and environmental benefits of the Federal Columbia River Power System (FCRPS).

The organization of Bonneville's FY 2016 Budget reflects Bonneville's business services basis for utility enterprise activities. Bonneville's two major areas of activity on a consolidated budget and accounting basis include Power Services (PS) and Transmission Services (TS) with administrative costs included. The PS includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program (REP), Associated Projects Operations & Maintenance (O&M) Costs, and Northwest Power and Conservation Council (Planning Council or Council).

The mission of Bonneville is to create and deliver the best value for its customers and constituents as it acts in concert with others to assure the Pacific Northwest: (1) an adequate, efficient, economical and reliable power supply; (2) an open access transmission system that is adequate for integrating and transmitting power from federal and non-federal generating units, providing service to Bonneville's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and (3) mitigation of the FCRPS impacts on fish and wildlife. Bonneville is legally obligated to provide cost-based rates and public and regional preference in its marketing of power. Bonneville sets its rates as low as possible consistent with sound business principles and sufficient to ensure the full recovery of all of its costs, including timely repayment of the federal investment in the system. Bonneville's vision is to provide: (1) high reliability; (2) low rates consistent with sound business principles; (3) responsible environmental stewardship; and (4) accountability to the region. Bonneville pursues this vision consistent with its four core values of trustworthy stewardship of the FCRPS, collaborative relationships, operational excellence, and safety.

Alignment to Strategic Plan and President's Climate Action Plan

Bonneville contributes to the Administration's clean energy goals and aligns to Goal 1 of the Department of Energy's (DOE) Strategic Plan to *Advance foundational science, innovate energy technologies, and inform data driven policies that enhance U.S. economic growth and job creation, energy security, and environmental quality, with emphasis on implementation of the President's Climate Action Plan to mitigate the risks of and enhance resilience against climate change.* Bonneville is currently working to modernize the electric grid in the Northwest through initiatives such as the Smart Grid Demonstration Project, 15-minute Transmission Scheduling and the Syncrophaser Program as well as making significant capital investments in new transmission lines to help integrate wind power and other resources into the power system.

In addition, as part of its responsibilities, Bonneville promotes energy efficiency, renewable resources, and new technologies.

Bonneville also aligns to Goal 3 of the DOE Strategic Plan to *Position the DOE to meet the challenges of the 21st century and the nation's Manhattan Project and Cold War legacy responsibilities by employing effective management and refining operational and support capabilities to pursue departmental missions.* Bonneville contributes through Cybersecurity, Sustainability, Talent Management, and Safety Policy initiatives.

To validate and verify program performance, Bonneville conducts various internal and external reviews and audits. Bonneville conducts extensive review within the region of both capital and expense programs. In addition, Bonneville's programmatic activities are subject to review by Congress, the U.S. Government Accountability Office (GAO), the DOE's Inspector General, and other governmental entities. Bonneville's financial statements are audited annually by an independent external auditor. Bonneville has received an unqualified audit opinion since the mid-1980s and no material weaknesses have been identified in controls over financial reporting.

Legislative History

The Bonneville Project Act of 1937 provides the statutory foundation for Bonneville's utility responsibilities and authorities. In 1974, passage of the Federal Columbia River Transmission System Act (Transmission Act) applied provisions of the Government Corporation Control Act (31 U.S.C. §§ 9101-9110) to Bonneville. The Transmission Act provides Bonneville with "self-financing" authority, establishes the Bonneville Fund (a permanent, indefinite appropriation) allowing Bonneville to use its revenues from electric power and transmission ratepayers to fund all programs without further appropriation, and authorizes Bonneville to sell bonds to the U.S. Treasury to finance the region's high-voltage electric transmission system requirements.

In 1980, enactment of the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) expanded Bonneville's authorities, obligations and responsibilities to encourage: electric energy conservation to meet regional electric power loads placed on Bonneville; develop renewable energy resources within the Pacific Northwest; assure the Northwest an adequate, efficient, economical, and reliable power supply; promote regional participation and planning; and protect, mitigate and enhance the fish and wildlife of the Columbia River and its tributaries. The Northwest Power Act also established the statutory framework for Bonneville's administrative rate-setting process and established judicial review of Bonneville's final decisions in the U.S. Court of Appeals for the Ninth Circuit.

As of 2014, Congress has provided Bonneville with revolving U.S. Treasury borrowing authority of \$7.7 billion.

The Columbia River Treaty

On December 13, 2013, the U.S. Entity, which includes Bonneville and the Corps, delivered a regional recommendation concerning the post-2024 future of the Columbia River Treaty to the National Security Council and the U.S. Department of State.

Judicial and Regulatory Activity

The Energy Policy Act of 2005 authorized the Federal Energy Regulatory Commission (FERC) to approve and enforce mandatory electric reliability standards with which users, owners, and operators of the bulk power system, including Bonneville, are required to comply. These standards became enforceable on June 18, 2007, and compliance is monitored by the North American Electric Reliability Corporation (NERC) and the regional reliability organizations. DOE and the Department of Justice took the position that financial penalties may not be imposed on federal agencies for violations of electric reliability standards. On August 22, 2014, the U.S. Court of Appeals for the District of Columbia Circuit concurred with this in a case when it upheld the position that federal agencies have sovereign immunity with regard to financial penalties.

Fish and Wildlife Program Overview

Bonneville is committed to continue funding its share of the region's efforts to protect and mitigate Columbia River Basin fish and wildlife. To the extent possible, Bonneville is integrating the actions implemented to protect listed species in response to the FCRPS Biological Opinions (BiOps), including the National Oceanic and Atmospheric Administration (NOAA) Willamette River BiOp and the United States Fish and Wildlife Service's (USFWS) 2006 Libby Dam BiOp, with projects implemented under the Council's Fish and Wildlife Program (Council's Program). The sub-basin plans developed as part of the Council's Program and long-term agreements that include prioritized strategies for mitigation actions will help guide project selection to meet both Bonneville's Endangered Species Act (ESA) and Northwest Power Act responsibilities.

Included with the budget schedules section of this document is the current tabulation of Bonneville's fish and wildlife costs from FY 2005 through FY 2014.

Infrastructure Investment

Bonneville is moving forward with infrastructure investments in the Pacific Northwest to meet transmission needs that will also continue to support a competitive wholesale market in the Western Interconnection, which encompasses 14 western states, two Canadian provinces, and one Mexican state. The McNary-John Day line— completed in FY 2012, under budget and ahead of schedule— added 79 miles, and three additional transmission lines would add more than 140 miles of lines to the Northwest transmission grid, improving reliability. In combination with other transmission projects, these projects would allow Bonneville to provide service to about 3,881 megawatts (MWs) of requests for Bonneville transmission, including service for 3,138 MWs of additional renewable resource generation. The proposed transmission lines include Bonneville's I-5 Corridor Reinforcement Project, which is currently undergoing environmental review. The Big Eddy-Knight

500kV transmission line and substation project resumed construction in 2014. In addition, Central Ferry-Lower Monumental 500kV Reinforcement began construction in May 2014. If all three projects are constructed along with the McNary-John Day line they will provide almost 6,000 MW of new transmission service. In addition, Bonneville is continuing to target transmission investments in those areas with reliability needs.

In FY 2012, Bonneville signed two agreements through which the agency agreed to participate with two investor-owned utilities in the environmental work and permitting for the proposed Boardman-to-Hemingway 500kV line. Participation in this preliminary review keeps Bonneville's options open for serving its six southeast Idaho preference customers after the current service agreements are terminated. Bonneville has not made a decision to co-develop or purchase capacity in these projects. On January 17, 2014, Public Law 113-76 was enacted into law and it provided Bonneville with requested expenditure authority approval to proceed with either one of these options.

These efforts will help meet the increasing demand for Bonneville's service to meet regional greenhouse gas reduction and environmental goals of western states. In support of these goals and as part of the Regional Dialogue policy implementation, Bonneville is working with stakeholders to review its role in the development and use of energy efficiency.

Bonneville has experienced significant growth within its balancing area of installed variable renewable generation, primarily in the form of wind generation. Since 2001, installed wind generation has grown from 115 MWs to 5,085 MWs through December 2014. Bonneville estimates an additional 20 MWs of wind generation could be in place in 2015. This substantial increase in variable renewable generation has resulted in additional uncertainties in the balance between load and generation required for maintaining a reliable grid. Wind also is a non-dispatchable source of energy, meaning it cannot be relied upon for capacity. As a result, Bonneville has implemented and continues to study operational tools for integrating this variable generation more cost effectively and reliably. In addition, Bonneville studied the feasibility of further developing storage technologies, including pump storage capabilities at the John W. Keys III Pump Generating Plant. There currently are no plans for further development and Bonneville is continuing to support maintaining the current facility.

Bonneville considers approaches in addition to the use of U.S. Treasury borrowing authority to sustain funding for its infrastructure investment requirements as well. These approaches include reserve financing of some amount of transmission investments, and seeking, when feasible, third party financing sources. See the BP-5 Potential Third Party Financing Transparency table in the budget schedules section of this document. This FY 2016 Budget assumes \$15 million of annual reserve financing in FYs 2015-2020 for transmission infrastructure capital, which is included in this budget under Projects Funded In Advance.

Radio Spectrum Communications

Bonneville's wireless communication system is used to operate and control critical national transmission grid infrastructure in a reliable, secure, and safe manner. Bonneville's communication systems are designed to meet strict reliability/availability objectives required by NERC and Western Electricity Coordinating Council (WECC) standards. Concerning proper spectrum stewardship, Bonneville designs highly efficient radio systems that use minimal radio frequency (RF) channel bandwidths to meet critical mission needs. However, in certain circumstances, efficiently designed spectrum radio systems will require broad RF channels and/or lower state RF modulation schemes to meet existing and future requirements in order to meet operational and reliability/availability objectives.

In order to meet Bonneville's mission/operational requirements, RF communication equipment approved for system use goes through a rigorous evaluation and testing process. RF spectrum efficiency factors are considered during the evaluation/testing period. RF terminal equipment approved for use is normally purchased directly from vendors and is not typically supplied through an RFP process.

Bonneville's operational telecommunications and other capital equipment and systems are acquired using Bonneville's self-financing and procurement authorities. The Bonneville budget includes a system-wide electric reliability performance indicator, consistent with NERC rules, to track and evaluate performance.

Bonneville may share temporarily-available spare capacity on its RF communication system with other government agencies (both Federal and State), and with other electric utilities in the region whose power systems interconnect with Bonneville. Non-critical administrative traffic is typically supported by commercial carrier enterprises. However, to meet NERC/WECC electrical bulk transmission requirements, Bonneville exclusively operates highly critical transmission control

traffic over its private telecommunication system as Bonneville has no control over the reliability/availability of the commercial enterprise or on how quickly critical operational control circuits are restored to active service during an interruption.

For high capacity communication system applications, Bonneville considers and operates non-spectrum dependent alternatives such as fiber optic cable infrastructure systems.

During FY 2014, Bonneville began upgrading the VHF land mobile system and to install a number of digital SONET rings typically consisting of fiber segments in combination with point-to-point microwave hops operating in the 4 GHz and 7/8 GHz bands. These various telecommunication systems operate within Bonneville's approximate 300,000 square mile utility responsibility service territory (Oregon, Washington, Idaho, Montana) with the majority of the RF infrastructure located in low population-rural areas.

The hydro power plants, primarily owned by the Corps and Reclamation, also utilize federal radio spectrum to preserve very high operational telecommunications and power system reliability.

In FY 2015, Bonneville expects to return to the U.S. Treasury, via the Spectrum Relocation Fund, approximately \$8.2 million of excess funds remaining following completion of work costing approximately \$40 million to relocate its operational telecommunication systems from the 1710-55 MHz radio spectrum bands to alternative federal radio spectrum bands. Bonneville also is participating with other federal agencies in the planned relocation from federal radio systems from the 1755-80MHz radio spectrum bands. The National Telecommunications Information Administration (NTIA) of the U.S. Commerce Department has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The Federal Communications Commission (FCC) held an auction of this spectrum on November 13, 2014. Bonneville is expected to receive an additional \$5.2 million from the Spectrum Relocation Fund in FY 2015 to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment.

Financial Mechanisms

Bonneville's program is treated as mandatory and nondiscretionary. Bonneville is "self-financed" with its own revenues and does not rely on annual appropriations from Congress. Under the Transmission Act, Bonneville funds the expense portion of its budget and repays the federal investment with revenues from electric power and transmission sales. Bonneville's revenues fluctuate primarily in response to variations in market prices for fuels and water stream flow in the Columbia River System due to weather conditions and fish mitigation needs. Through FY 2014, Bonneville has returned approximately \$29.8 billion to the U.S. Treasury, of which about \$3.4 billion was for payment of FCRPS O&M and other costs, \$14.8 billion for interest, and \$11.7 billion for amortization of appropriations and bonds.

In this FY 2016 Budget, the term Bonneville "bonds" refers to the debt instruments under which Bonneville receives advances of funds from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act (P.L. 93-454), which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

In August 2014, the three major credit rating agencies affirmed the ratings on Bonneville-backed debt.

Bonneville and the U.S. Treasury have a comprehensive banking arrangement that covers Bonneville's short- and long-term federal borrowings and establishes a phased-in approach to a market-based investing program. This provides Bonneville with the ability to borrow to finance assets and, on a short-term basis, to cover Northwest Power Act-related operating expenses. This latter ability provides Bonneville with much needed liquidity to help manage within-year cash flow needs and mitigate risk. Access to this use of U.S. Treasury borrowing authority has been incorporated into and relied upon in Bonneville's rate-setting process.

Bonneville initiated a Power Prepayment Program in FY 2013 under which all Bonneville preference customers had an opportunity to submit formal offers to provide lump-sum payments to Bonneville as prepayments of a portion of their power purchases through September 30, 2028, the termination date of the Long-Term Regional Dialogue Power Sales Contracts. Bonneville accepted power prepayments from four preference customers, as described below.

Upon Bonneville's receipt of the agreed-to, lump-sum prepayments, the selected preference customers became entitled to future portions of their electricity from Bonneville without further payment. The power prepayments are and will be recognized in the customers' future power bills from Bonneville as fixed, equal monthly prepayment credits. In effect, the amount of electricity that is prepaid may vary by month, depending on Bonneville's power rates and rate schedules that apply to electricity purchases by the prepaying customers in the related month. Because this is structured as a variable amount prepayment and not as a fixed-price/fixed-amount type of prepayment, Bonneville maintains flexibility to establish rates for the electric power that is prepaid.

As a result of the Fiscal Year 2013 Prepayment solicitation, Bonneville received \$340 million in prepayments, which Bonneville will use to fund needed FCRPS hydroelectric investments. The aggregate prepayment credits are set at \$2.55 million per month through FY 2028.

Depending on a variety of factors it is possible that Bonneville may seek to implement later phases of the Power Prepayment Program in connection with future FCRPS hydroelectric investment needs.

Treasury Payments and Budget Overview

Bonneville made its full planned FY 2014 payment of \$991 million to the U.S. Treasury (which included advanced repayment of \$321 million). Total 4(h)(10)(C) credits associated with fish mitigation and recovery and applied toward Bonneville's Treasury payment, were about \$104 million for FY 2014. For FY 2015, Bonneville plans to pay the U.S. Treasury \$713 million: \$209 million to repay investment principal, \$414 million for interest, and \$90 million for Associated Project costs and pension and post-retirement benefits. The FYs 2016 and 2017 Treasury payments are currently estimated at \$710 million and \$741 million, respectively. The FY 2015 4(h)(10)(C) credit is estimated at \$91 million. The FYs 2016-2017 4(h)(10)(C) credits are currently estimated at \$96 million and \$93 million respectively.

Estimates of interest and amortization levels for outyear U.S. Treasury payments are based on estimates from the 2014 transmission and power rate case proposals, which were transmitted to FERC on July 24, 2013, and FERC issued final approval on April 16, 2014. Bond and Appropriations Interest will continue to be revised based on upcoming capital investments and debt management actions. These estimates may change due to revised capital investment plans and actual U.S. Treasury borrowing. In recent years, Bonneville has made amortization payments in excess of those scheduled in its FERC-approved rate filings resulting in a balance of advance repayment. The cumulative amount of advance amortization payments as of the end of FY 2014 is about \$3,060 million.

Bonneville has direct funding arrangements with the Corps and Reclamation to pay the power related portion of O&M and capital investments. Direct funded capital costs, previously funded through appropriations, are now being paid through Bonneville's borrowing from the U.S. Treasury and customer prepayments. Bonneville's total direct funding was \$358 million in FY 2014.

This FY 2016 Budget proposes estimated accrued expenditures of \$3,041 million for operating expenses, \$30 million for Projects Funded in Advance (PFIA), \$1,052 million for capital investments, and \$207 million for capital transfers in FY 2016.

The estimated spending levels in this budget are still subject to change to accommodate competitive dynamics in the region's energy markets, debt management strategies, and the continued restructuring of the electric industry.

Current Financial Status

Bonneville is striving to enhance its competitive, cost-effective delivery of utility products and services and continued delivery of the public benefits of its operations, while ensuring its ability to make its payments to the U.S. Treasury on time and in full. Bonneville employs a strategic planning process using the balanced scorecard model to align all business units around specific goals and align resources to achieve these goals. Results from these efforts include continued efficiency gains, performance integration improvements, and a high assurance for repayment of U.S. Treasury borrowing.

Continued cost management efforts have helped Bonneville build adequate financial reserve levels to assure full recovery of its costs and long-term financial stability while meeting its overall responsibilities to the Pacific Northwest and U.S. taxpayers.

Bonneville published the initial proposal for the FYs 2016-2017 rates on December 10, 2014.

Budget Estimates and Planning

This FY 2016 Budget includes capital and expense estimates based on initial spending proposals in Bonneville's 2014 Capital Investment Review (CIR) and Integrated Program Review (IPR) processes. FY 2014 costs are based on Bonneville's FY 2014 audited actuals.

Capital funding levels reflect Bonneville's capital asset management process and external factors such as the significant changes affecting the West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region and national energy security goals.

Capital investment levels in this FY 2016 Budget reflect executive management decisions from Bonneville's Capital Allocation Board (CAB) and the associated capital review process. Bonneville utilizes a structured capital project selection process requiring submission of a standardized business case for review by Bonneville. Each business case consists of a description of the project, a clear statement of objectives, description and mitigation of risks, and a rigorous analysis of project costs including a status quo assumption and preferred alternatives. In addition, both annual and end of project targets are set for each project covering cost, scope, and schedule. Progress reports on these targets are provided to Bonneville's senior executives at least quarterly.

The FYs 2015-2020 revenue estimates in this budget, included in the Net Outlay formulation, are calculated consistent with cash management goals. The revenue estimates reflect assumed adjustments, which include the use of a combination of tools, including: upcoming rate adjustment mechanisms; reduced cost estimates; a net revenue risk adjustment; debt management strategies; and/or short-term financial tools to manage net revenues and cash. The revenue estimates also include depreciation and U.S. Treasury repayment credit assumptions. These U.S. Treasury repayment credits offset, among other things, Bonneville's fish and wildlife program costs allocable to the non-power project purposes of the FCRPS, consistent with the Northwest Power Act and other laws.

Overview of Detailed Justifications

In Bonneville's Detailed Justification Summaries, accrued expenditure is the basis of presenting Bonneville's program funding levels in the power and transmission rate making processes and the basis upon which Bonneville managers control their resources to provide products and services. Accrued expenditures relate period costs to period performance. Traditional budget obligation requirements for Bonneville's budget are assumed on the Program and Financing Summary Schedule prepared in accordance with Office of Management & Budget (OMB) Circular A-11.

The organization of Bonneville's FY 2016 Budget and these performance summaries reflect Bonneville's business services basis for utility enterprise activities. Bonneville's major areas of activity on a consolidated budget and accounting basis include power and transmission, with administrative costs included. Power Services includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program, Associated Projects O&M Costs, and the Council. Environmental activities are shown in the relevant Power Services and Transmission Services sections, as are reimbursable costs. Bonneville's interest expense, pension and post-retirement benefits and capital transfers to the Treasury are shown by program.

The first section of performance summaries, Capital Investments, includes accrued expenditures for investments in electric utility and general plant associated with the FCRPS generation and transmission services, energy efficiency, fish and wildlife, and capital equipment. These capital investments are estimated to require budget obligations and expected use of \$1,052 million in bonds to be issued and sold to the U.S. Treasury in FY 2016.

The near-term forecast capital funding levels have undergone an extensive internal review as a result of the capital asset management strategy. These capital reviews encompass project cost management initiatives, capital investment assessments, and categorization of capital projects to be funded based on risk and other factors. Consistent with Bonneville's near-term capital funding review process and Bonneville's standard operating budget process, this FY 2016 Budget includes updated capital funding levels for FY 2015. Utilizing this review process helps Bonneville in its efforts to compete in the deregulated wholesale energy market. Bonneville will continue to work with the Corps and Reclamation to optimize the best mix of projects.

In addition to its internal management assessment of capital investments, Bonneville has developed and implemented an associated external capital investment review process that provides significant benefits to Bonneville. The combined internal and external processes add value by both improving direction on what the FCRPS invests in (tying investments more closely to agency strategy) and by improving how those investments are made (more detailed analysis and review of capital investments and their alternatives).

Bonneville's second section of the performance summaries, entitled Annual Operating Expenses, includes accrued expenditures for services and program activities financed by power sales revenues, transmission services revenues and projects funded in advance. For FY 2016, budget expense obligations are estimated at \$3,041 million. The total program requirements of all Bonneville programs include estimated budget obligations of \$4,122 million in FY 2016.

Evidence and Analysis in the Budget

Consistent with the President's emphasis on evidence and evaluation in the budget, Bonneville has undertaken several initiatives and processes to determine appropriate budget expenditures.

Bonneville's Integrated Program Review (IPR) process allows interested parties to see all relevant FCRPS expense and capital spending level estimates in the same forum. The IPR occurs every two years, or just prior to each rate case, and provides participants with an opportunity to review and comment on Bonneville's program level estimates prior to spending levels being set for inclusion in rate cases. In addition, Bonneville's Capital Investment Review (CIR) process allows interested parties to review and comment on Bonneville's draft Asset Strategies and 10-year capital forecasts. The CIR occurs every two years prior to the IPR. The 2014 IPR and CIR processes concluded in 2014.

Bonneville also is focused on institutionalizing operational excellence – continuous improvement that produces more efficient and effective ways to deliver on Bonneville's mission and vision. Bonneville's Strategy Execution organization provides programs and process support to improve business operations, and the quality of outputs, while applying the tools and principles of operational excellence in alignment with the vision of Bonneville's strategic direction. In FY 2012, Bonneville embarked on an extensive assessment of utility benchmarking and elected to adopt a benchmarking program to support meaningful evidence of efficiency and cost-effectiveness. In FY 2013, the Bonneville Benchmarking & Operational Excellence Program comprehensively benchmarked four specific strategic focus areas around Safety, Supply Chain, Reliability Compliance, and Energy Accounting and Determination of Loads. As a result of those efforts, in FY 2014 Bonneville took the data collected and implemented process improvement actions to move its business units towards becoming top quartile performers.

Progress in Human Capital Management

Bonneville's Human Capital Management staff completed the necessary training to regain its delegated examining credentials from the Office of Personnel Management (OPM) and completed its job reconstruction process three months ahead of schedule and under budget. On September 30, 2014, the Department of Energy reinstated all of Bonneville's delegated human resource authorities. This brings to closure 13 months of extensive work to re-establish a fully compliant, high-performing human resource function at Bonneville.

**Power Services - Capital
Funding Schedule by Activity**

Funding (\$K)

	FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate	FY 2016 vs FY 2015	
				\$	%
Power Services - Capital					
Associated Project Costs	58,187	211,829	240,790	28,961	14%
Fish & Wildlife	37,353	51,807	54,807	3,000	6%
Energy Efficiency	77,887	92,000	94,800	2,800	3%
Projects Funded in Advance ¹	114,700	N/A	N/A	N/A	N/A
Total, Power Services - Capital	288,127	355,637	390,398	34,761	10%

Outyears (\$K)

	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate
Power Services - Capital					
Associated Project Costs	240,790	269,908	281,266	313,981	334,067
Fish & Wildlife	54,807	30,795	18,646	34,806	35,033
Energy Efficiency	94,800	97,600	100,500	103,600	106,700
Projects Funded in Advance	N/A	N/A	N/A	N/A	N/A
Total, Power Services - Capital	390,398	398,303	400,412	452,387	475,800

¹ Amount is attributable to Bonneville's Prepayment Program.

Program Overview

Associated Project Costs provide for direct funding of additions, improvements, and replacements of existing Reclamation and Corps hydroelectric projects in the Pacific Northwest. The FCRPS hydro projects produce electric power that is marketed by Bonneville.

Maintaining the availability and increasing the efficiency of the FCRPS is critical to ensuring that the region has an adequate, reliable, and low-cost power system. The FCRPS represents about 80 percent of Bonneville's firm power supply and includes 31 operating federal hydroelectric projects with over 200 generating units. These projects have an average age of about 50 years, with some that exceed 60 years of age. Through direct funding and the cooperation of the Corps and Reclamation, Bonneville uses its U.S. Treasury borrowing authority and customer prepayment program to make investments needed to restore generation availability and improve efficiency, reducing demand on Corps and Reclamation appropriations for power-related investments.

Since the beginning of direct funding in FY 1997, Bonneville, along with its joint operating partners, the Corps and Reclamation, has improved system performance. In 1999, at the direction of Congress, Bonneville issued a report that it soon began to implement called the "Asset Management Strategy for the FCRPS." In this report, Bonneville concluded that it needed to invest nearly \$1 billion in the hydroelectric projects over the ensuing 12 to 15 years. Supplementary analyses and experience with the system have revealed additional and ongoing investment needs above and beyond the levels originally planned under the 1999 Asset Management Strategy. In 2008, 2010, 2012, and again in 2014, Bonneville updated the System Asset Strategy and refined its understanding of the long-term capital investments needed to preserve system performance.

These planned investments, included in the FY 2016 Budget estimates, will maintain the generation performance of the FCRPS. Moving forward with the cost-effective opportunities to expand the generation and to preserve and enhance the capability of the FCRPS is a smart, economic, and environmentally beneficial decision when compared to purchasing power from the market to serve growing Pacific Northwest electricity needs.

Bonneville's fish and wildlife capital program is directed at activities that improve Columbia River Basin fish and wildlife resources. It includes projects designed to increase juvenile and adult fish passage in tributaries and to increase fish production and survival through construction of hatchery and acclimation facilities, land acquisitions for wildlife and resident fish, and fish monitoring facilities. Capital projects support both Northwest Power Act and ESA-related priorities, integrated with the region's Columbia River Basin Fish and Wildlife Program in order to efficiently meet Bonneville's legal responsibilities to mitigate hydrosystem impacts to Columbia River Basin fish and wildlife and to facilitate salmon and steelhead protection and mitigation.

Bonneville implements projects consistent with the Northwest Power and Conservation Council's (Council) Fish and Wildlife program. Most projects recommended by the Council undergo independent review as directed by the 1996 Energy and Water Appropriations Act, which added section 4(h)(10)(D) to the Northwest Power Act. As a result, the Council appoints an Independent Scientific Review Panel (ISRP) "to review a sufficient number of projects" proposed to be funded through Bonneville's fish and wildlife budget "to adequately ensure that the list of prioritized projects recommended is consistent with the Council's program." The Northwest Power Act further states that "in making its recommendations to Bonneville, the Planning Council shall consider the impact of ocean conditions on fish and wildlife populations; and shall determine whether the projects employ cost effective measures to achieve program objectives." Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council has shifted to a multi-year project review cycle during which the ISRP will review categories of projects grouped together; e.g., all fish and wildlife projects were recently reviewed.

Under the Northwest Power Act, the Council must develop a fish and wildlife program that protects, mitigates, and enhances Columbia River Basin fish and wildlife affected by the federal and non-federal hydroelectric projects in the basin. The Program, including BiOps and Bonneville's long-term agreements, includes prioritized strategies for mitigation actions that help guide project selection to meet Bonneville's responsibilities under the Northwest Power Act, ESA, Clean Water Act, and other laws. When issues arise that potentially trigger the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, 16 U.S.C. § 839b(h)(10)(A), Bonneville works with the Council and the regional fish and wildlife managers, customers, and tribes, as appropriate, to ensure ratepayers only fund appropriate mitigation.

Bonneville continues a comprehensive approach to integrate the ESA requirements of the FCRPS Biological Opinions with the broad resource protection, mitigation and enhancement objectives of the Council's Program. Bonneville satisfies a major portion of its fish and wildlife responsibilities through projects and activities that implement the Program. These projects include wildlife mitigation settlements for dam impacts, most recently a 2014 agreement addressing impacts in southern Idaho. Projects also include hatcheries and habitat improvements to mitigate for and offset fish habitat lost from the development and operation of the FCRPS. As required under the ESA, Bonneville implements additional measures to avoid jeopardizing listed salmon and steelhead.

The ESA measures are part of the most recent BiOps issued by NOAA in 2008 as supplemented in 2010 and 2014 and USFWS in 2006/2010.

- In February 2006, USFWS issued a BiOp for Libby Dam for the Kootenai River white sturgeon and bull trout. A subsequent Settlement Agreement between USFWS and the Center for Biological Diversity was memorialized by modifying the BiOp in 2008. Additional consultation is occurring as part of the larger USFWS bull trout consultation.
- In 2010 USFWS designated critical habitat for bull trout (following USFWS's issuance in 2000 of a BiOp for FCRPS impacts on bull trout). The Action Agencies (Corps, Reclamation, and Bonneville) are preparing a biological assessment covering FCRPS operational effects on bull trout and designated bull trout critical habitat.
- In May 2008, NOAA issued a FCRPS BiOp for 13 listed species of salmon and steelhead, supplemented in a 2010 Supplemental BiOp that incorporated the Action Agency's Adaptive Management Implementation Plan, and further supplemented in a 2014 Supplemental BiOp. On January 17, 2014, NOAA released its 2014 Supplemental BiOp. The 2008/2010/2014 BiOp is now under legal review.
- In July 2008, USFWS and NOAA issued Willamette River BiOps to address impacts from 13 federal dams on salmon, steelhead, Oregon chub, and bull trout. Implementation of a BiOp measure related to hatchery fish in the McKenzie River was the subject of litigation in Federal District Court. The Action Agencies are currently engaged in discussion with NOAA related to BiOp implementation for downstream passage and for hatchery consultations.

These BiOps collectively require the Action Agencies to implement hydro, habitat, hatchery, and other actions throughout the Columbia River Basin to address impacts stemming from the operation of the federal hydro-electric dams on ESA-listed fish, and to ensure that operations of the federal dams do not jeopardize the continued existence of the listed species or adversely modify their designated critical habitat.

The Action Agencies also signed the 2008 Columbia Basin Fish Accords (Fish Accords or Accords) with five Northwest Tribes, and the states of Idaho and Montana. In 2009, an agreement was signed with the state of Washington and federal agencies (the state of Washington Estuary agreement). And in 2012, the Action Agencies signed an agreement with the Kalispel Tribe of Indians covering Albeni Falls Dam and FCRPS operations. The Fish Accords complement the 2008/2010/2014 BiOp and provide firm commitments to prioritize mitigation actions and secure funding for 10 years. As a result of the 2008 FCRPS BiOp, the Supplemental FCRPS BiOps issued in 2010 and 2014, and the Fish Accords, as discussed below, expenditures above those planned in FY 2009 are required in FY 2011 and beyond.

These BiOps and Fish Accord commitments are integrated along with other projects and implemented through the Council's Program under the Northwest Power Act and are the basis for the Bonneville Fish and Wildlife Program's planned capital investment.

Energy Efficiency is an important part of Bonneville's diverse portfolio of resources that provides a reliable approach to meeting Bonneville's load obligations. When acquiring resources to meet planned future loads, the Northwest Power Act requires the Administrator to first consider and acquire cost-effective conservation that the Administrator determines is consistent with the Council's Power Plan. The Council's 6th Power Plan, finalized in February 2010, established a regional target of 1,200 aMW of energy efficiency in 2010 through 2014. Bonneville, in collaboration with its Public Power Customers, has taken responsibility for Public Power's share of the regional target, approximately 42 percent (504 aMW) of that target. Bonneville anticipates that between 250 and 300 aMW of this amount will be acquired under its capital energy efficiency program. Beginning in FY 2012, at least 70 percent of this energy efficiency budget was allocated to utilities to fund energy efficiency incentives with the remainder going to support regional programs. Program performance measurements (\$/aMW) indicate that Bonneville is realizing value for these investments relative to other resources.

In general, long-term investments in energy efficiency help buffer the FCRPS against future resource uncertainties. During periods of price volatility, energy efficiency reduces financial risk associated with relying on the market for energy purchases.

Accomplishments

- Published initial rate proposal for the FYs 2016-2017 rates on December 10, 2014.
- Facilitated integration of 5,085 MW of wind generation through December 2014.
- Completed left powerplant transformer replacements at Grand Coulee.
- Completed turbine runner replacements at Lookout Point and spillway tainter gate rehabilitation at Big Cliff.
- Completed exciter replacements at Little Goose and powerhouse bridge crane rehabilitation at Lower Monumental.
- Completed KY1A transformer, breaker, and exciter replacement at Chandler.
- Completed preferred AC system upgrades and governor replacement at The Dalles.
- The returns of adult salmon and steelhead to the Columbia River system from 2009 to 2013 vary by species, but many stocks (especially Snake River fall Chinook and Snake River sockeye) have returned at the highest numbers in decades. Research shows that survival of juvenile salmon and steelhead migrating down the Snake and Columbia rivers has improved in recent years and is on track to meet performance standards of 96 percent survival per dam for spring-migrating fish and 93 percent survival for summer migrants.

Explanation of Changes

Bonneville's budget includes \$390 million in FY 2016 for Power Services capital, which is a 9.8 percent increase over the FY 2015 forecasted level. The FY 2016 level reflects a continuing need for investment in the hydro electric system assets, funding necessary to implement the BiOps, Fish Accords, Columbia Basin Fish and Wildlife activities, and a continued commitment to energy efficiency initiatives by public power within the region.

The FY 2016 budget increases the levels for Associated Projects (+\$28.9 million), Fish & Wildlife (+\$3.0 million), and Energy Efficiency (+\$2.8 million) relative to FY 2015.

Strategic Management

Bonneville provides electric power while supporting the achievement of its vital responsibilities for fish and wildlife, energy efficiency, renewable resources, and low-cost power in the Pacific Northwest. Bonneville will continue to implement the following strategies to serve the region:

1. Bonneville coordinates its power operational activities with the Corps, Reclamation, NERC, regional electric reliability councils, its customers, and other stakeholders to provide the most efficient use of federal assets.
2. Ongoing work with the Corps and Reclamation is focused on improving the reliability of the FCRPS, increasing its generation efficiency, and optimizing hydro facility operation.
3. Bonneville is committed to continue funding efforts to protect listed fish and wildlife species in the Columbia Basin under the ESA and to work closely with the Council, regional fisheries managers, and other federal agencies to prioritize and manage fish and wildlife program projects.
4. Bonneville's utility customers have been, and continue to be, a critical part of Bonneville's collaborative efforts to promote and foster the efficient use of energy.
5. Bonneville has partnered and assisted with a DOE Wind Power crosscutting initiative to strengthen energy security by adding alternative sources of renewable energy.

The following external factors present the strongest risk and impact to overall achievement of the program's strategic goals:

1. Continually changing economic and institutional conditions.
2. Competitive dynamics.
3. Ongoing changes in the electric industry.

Associated Projects

Overview

Bonneville will work with both the Corps and Reclamation to reach mutual agreement on budgeting and scheduling those capital improvement projects that are cost-effective and provide system or site-specific enhancements, increase system reliability, or provide generation efficiencies.

The work is focused on improving the reliability of the FCRPS and on increasing its generation efficiency or capacity through turbine runner replacements, optimizing hydro facility operation, and new unit construction. Also, limited investments may be made in joint-use facilities that are beneficial to both the FCRPS operations and to other Corps and Reclamation project purposes.

Corps of Engineers Projects

(\$K)		
FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
40,629	160,989	154,324

Bonneville Dam:

- **FY 2014.** Completed gantry crane 7 rehabilitation and headgate refurbishment/replacements. Continued governor replacements, vibration and air gap monitoring installation, main unit breaker and station service reconfiguration, Powerhouse 2 transformer refurbishment, and control room fire protection upgrades. Began Generator Step Up (GSU) transformer instrumentation and governor oil filtration system installation.
- **FY 2015.** Complete governor replacements and vibration and air gap monitoring installation. Continue main unit breaker and station service reconfiguration, governor oil filtration system installation, GSU transformer instrumentation, Powerhouse 2 transformer refurbishment and control room fire protection upgrades.
- **FY 2016.** Complete governor oil filtration system installation. Continue control room fire protection upgrades, Powerhouse 2 transformer refurbishment, GSU transformer instrumentation, main unit breaker and station service reconfiguration. Begin Powerhouse 1 DC and preferred AC upgrades.

John Day Dam:

- **FY 2014.** Completed elevator rehabilitation. Continued governor replacements, DC system upgrades, BLH turbine hub upgrades, station service transformer replacements, and control room fire protection upgrades. Began draft tube bulkhead refurbishment.
- **FY 2015.** Continue governor replacements, DC system upgrades, BLH turbine hub upgrades, draft tube bulkhead refurbishment, station service transformer replacements, and control room fire protection upgrades. Begin transformer and powerhouse oil/water separator and rotor pedestal installation.
- **FY 2016.** Complete governor replacements, DC system upgrades, and draft tube bulkhead refurbishment. Continue BLH turbine hub upgrades, control room fire protection upgrades, transformer and powerhouse oil/water separator, rotor pedestal installation, and station service transformer replacements. Begin 500kV disconnect replacement.

The Dalles Dam:

- **FY 2014.** Completed preferred AC system upgrades and governor replacements. Continued control room fire protection upgrades, SCC control replacement, elevator refurbishments, and tailrace gantry crane refurbishment. Began transformer replacements.
- **FY 2015.** Complete control room fire protection upgrades, SCC control replacement, and elevator refurbishments. Continue tailrace gantry crane refurbishment, and transformer replacements.
- **FY 2016.** Continue transformer replacements and tailrace gantry crane refurbishment. Begin emergency crane rehabilitation.

Willamette Plants:

- **FY 2014.** Completed spillway tainter gate rehabilitation at Big Cliff and turbine runner replacement at Lookout Point. Continued transformer oil/water separator installation at Cougar and Hills Creek. Continued turbine runner replacement at Hills Creek and electrical reliability upgrades at Dexter. Continued governor replacements at Big Cliff, Cougar, Dexter, Detroit, Foster, Lookout Point, and Green Peter. Continued spillway tainter gate

rehabilitation at Dexter and Lookout Point. Continued butterfly valve replacement at Lost Creek. Began electrical reliability upgrades at Foster. Began Generic Data Acquisition and Control System (GDACS) installation and communication system upgrade at all Willamette Valley plants.

- **FY 2015.** Complete spillway tainter gate repair at Lookout Point and Dexter and butterfly valve replacement at Lost Creek. Complete turbine runner replacements at Hills Creek and governor replacement at Green Peter and Foster. Continue governor replacements at Big Cliff, Cougar, Dexter, Detroit, and Lookout Point. Continue electrical reliability upgrades at Dexter and Foster. Continue spillway tainter gate rehabilitation at Green Peter. Continue GDACS installation and communication system upgrade at all Willamette Valley plants. Begin main unit breaker replacement at Green Peter. Begin Hills Creek and Detroit spillway tainter gate rehabilitation.
- **FY 2016.** Complete governor replacements at Big Cliff, Cougar, Dexter, Detroit, and Lookout Point. Complete spillway tainter gate rehabilitation at Green Peter and Hills Creek. Complete electrical reliability upgrades at Dexter. Continue Detroit spillway tainter gate rehabilitation and electrical reliability upgrades at Foster. Continue GDACS installation and communication system upgrade at all Willamette Valley plants. Begin electrical reliability upgrades at Lookout Point.

Albeni Falls Dam:

- **FY 2014.** Completed tailrace stoplogs. Continued spillway crane modernization, spillway gate modifications, and intake crane modernization.
- **FY 2015.** Complete spillway crane modernization, spillway gate modification, and intake crane modernization. Begin transformer replacement and station service switchgear replacement.
- **FY 2016.** Continue transformer replacement and station service switchgear replacement. Begin generator fire suppression system upgrade.

Libby Dam:

- **FY 2014.** Continued powerhouse and dam electrical distribution equipment replacement. Began governor installation.
- **FY 2015.** Continue governor installation and powerhouse and dam electrical distribution equipment replacement. Begin powerhouse DC emergency lighting system installation.
- **FY 2016.** Complete governor installation and powerhouse and dam electrical distribution equipment replacement. Continue powerhouse DC emergency lighting system installation. Begin generator fire suppression system upgrade.

Chief Joseph Dam:

- **FY 2014.** Completed protective relay replacements. Continued exciter replacements, generator cooling system upgrades, DC and preferred AC upgrades, and turbine replacements. Began governor installation and SCC board replacement.
- **FY 2015.** Complete exciter replacement. Continue governor installation, generator cooling system upgrades, DC and preferred AC upgrades, SCC board replacement, and turbine replacements. Begin upgrades for station service units SS01 and SS02.
- **FY 2016.** Complete SCC board replacement. Continue governor installation, generator cooling system upgrades, DC and preferred AC upgrades, upgrades for station service units SS01 and SS02, and turbine replacements. Begin Units 17-27 generator rewinds.

Dworshak Dam

- **FY 2014.** Completed Unit 3 standby generator guide bearing and oil cooler assemblies. Continued powerhouse HVAC upgrade. Began governor replacement and Unit 3 rehabilitation.
- **FY 2015.** Complete powerhouse HVAC upgrade. Continue governor replacement and Unit 3 rehabilitation. Begin upgrade RO valve.
- **FY 2016.** Continue governor replacement and Unit 3 rehabilitation. Continue upgrade RO valve. Begin exciter replacement and tailrace crane rehabilitation.

McNary Dam

- **FY 2014.** Completed generator rewinds for units 4 and 11 and heat pump replacement. Continued generator winding replacements, 4160-480V station service rehabilitation, turbine design and replacement, potable water

system upgrade, and levee drainage pump station upgrades. Begin exciter replacement.

- **FY 2015.** Continue generator winding replacements. Continue turbine design and replacement, 4160-480V station service rehabilitation, exciter replacement potable water system upgrade, and levee drainage pump station upgrades. Begin governor installation.
- **FY 2016.** Complete generator winding replacements and potable water system upgrade. Continue turbine design and replacement, 4160-480V station service rehabilitation, exciter replacement, levee drainage pump station upgrades, and governor installation. Begin isophase bus upgrade.

Ice Harbor Dam

- **FY 2014.** Completed low voltage switchgear SQ board replacements and DC system upgrade. Continued Units 1-3 runner replacements and governor replacement. Continued drainage and dewatering pump upgrade. Began oil storage and handling upgrade and Units 1-3 stator winding replacement.
- **FY 2015.** Complete governor replacement, drainage and dewatering pump upgrade, and oil storage and handling upgrade. Continue Units 1-3 runner replacements and stator winding replacement. Begin HVAC controls upgrade.
- **FY 2016.** Continue Units 1-3 runner replacements, stator winding replacement, and HVAC controls upgrade.

Little Goose Dam

- **FY 2014.** Completed exciter replacements. Continued powerhouse bridge crane rehabilitation. Began governor installation.
- **FY 2015.** Continue governor installations and powerhouse bridge crane rehabilitation. Begin tailrace gantry crane replacement.
- **FY 2016.** Complete governor installation and powerhouse bridge crane rehabilitation. Continue tailrace gantry crane replacement. Begin DSP1 switchgear replacement.

Lower Granite Dam

- **FY 2014.** Continued powerhouse HVAC system upgrade, sewage treatment plant upgrade, and powerhouse bridge crane refurbishment. Began governor replacement and Unit 1 BLH linkage upgrade.
- **FY 2015.** Complete sewage treatment plant upgrade and powerhouse bridge crane refurbishment. Continue governor replacement, powerhouse HVAC system upgrade, and Unit 1 BLH linkage upgrade.
- **FY 2016.** Complete powerhouse HVAC system upgrade. Continue Unit 1 BLH linkage upgrade and governor replacement.

Lower Monumental Dam

- **FY 2014.** Completed powerhouse bridge crane rehabilitation. Continued Unit 1 BLH linkage upgrade and generator rewind. Began governor replacement.
- **FY 2015.** Continue Unit 1 BLH linkage upgrade and generator rewind. Continue governor replacement.
- **FY 2016.** Continue Unit 1 BLH linkage upgrade and generator rewind. Continue governor replacement. Begin isophase bus rehabilitation.

Bureau of Reclamation Projects

(\$K)

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
17,558	50,841	86,466

Grand Coulee Dam

- **FY 2014.** Completed left powerplant transformer replacements. Continued Supervisory Control and Data Acquisition (SCADA) replacement, 500 kV switchyard relay replacements, purchase of another left and right powerhouse spare winding, units 19-21 upgrades including winding replacements, and Units 22-24 wear ring replacements. Began right powerplant transformer replacements, Units 1-18 stator windings, cores, and spare replacement program, Units 1-18 exciter and governor replacement, and drumgate floating bulkhead. Began station service compressed air system upgrades, powerplant battery replacement, and Units 21-24 transformer replacement.
- **FY 2015.** Complete 500 kV switchyard relay replacements. Continue SCADA replacement, purchase of another left and right powerhouse spare winding, Units 19-21 upgrades including winding replacements, G22-24 wear ring replacements, and right powerplant transformer replacements. Continue powerplant battery replacement, drumgate floating bulkhead, Units 1-18 stator windings, cores, and spare replacement program, Units 1-18 exciter and governor replacement, station service compressed air system upgrades, and Units 21-24 transformer replacement.
- **FY 2016.** Complete powerplant battery replacement. Continue SCADA replacement, G22-24 wear ring replacements, drumgate floating bulkhead, Units 1-18 stator windings, cores, and spare replacement program, Units 1-18 exciter and governor replacement. Continue purchase of another left and right powerhouse spare winding, Units 19-21 upgrades including winding replacements, station service compressed air system upgrades, and Units 21-24 transformer replacement.

Keys

- **FY 2014.** Began P1-P6 exciters, relays and unit controls, PG7-PG12 governors, exciters, relays and unit controls. Began PG7-PG12 circuit breaker replacement, and P5 and P6 impeller and core replacement and rewinds.
- **FY 2015.** Continue P1-P6 exciters, relays and unit controls, PG7-PG12 governors, exciters, relays and unit controls. Continue PG7-PG12 circuit breaker replacement, and P5 and P6 impeller and core replacement and rewinds.
- **FY 2016.** Continue P1-P6 exciters, relays and unit controls, PG7-PG12 governors, exciters, relays and unit controls. Continue PG7-PG12 circuit breaker replacement, and P5 and P6 impeller and core replacement and rewinds. Begin phase reversal switch replacement.

Hungry Horse Dam

- **FY 2014.** Continued SCADA replacement, main unit transformer fire protection system replacement, and station service and MCC upgrades. Began exciter and governor replacement, and powerhouse crane controls.
- **FY 2015.** Continue SCADA replacement and station service and MCC upgrades, main unit transformer fire protection system replacement, powerhouse crane controls, and exciter and governor replacement.
- **FY 2016.** Continue SCADA replacement, main unit transformer fire protection system replacement, station service and MCC upgrades, powerhouse crane controls, and exciter and governor replacement.

Chandler Dam

- **FY 2014.** Completed KY1A transformer and breaker replacement. Completed exciter replacement.
- **FY 2015.** Begin Units 1 and 2 generator rewinds.
- **FY 2016.** Continue Units 1 and 2 generator rewinds.

Palisades Dam

- **FY 2014.** Continued turbine runner replacement and fire detection and alarm system.
- **FY 2015.** Complete fire detection and alarm system. Continue turbine runner replacement.
- **FY 2016.** Continue turbine runner replacement.

Green Springs Dam

- **FY 2014.** Continued exciter and transformer replacement.
- **FY 2015.** Continue and transformer exciter replacement.
- **FY 2016.** Complete exciter and transformer replacement.

Black Canyon Dam

- **FY 2014.** Continued additional unit, units 1 and 2 upgrades, and trash rake system.
- **FY 2015.** Continue additional unit, units 1 and 2 upgrades, and trash rake system.
- **FY 2016.** Continue additional unit, units 1 and 2 upgrades, and trash rake system.

Anderson Ranch Dam

- **FY 2014.** Began station service upgrade.
- **FY 2015.** Continue station service upgrade.
- **FY 2016.** Complete station service upgrade.

Roza Dam

- **FY 2014.** Began switch rehab and breaker upgrade.
- **FY 2015.** Continue switch rehab and breaker upgrade.
- **FY 2016.** Complete switch rehab and breaker upgrade.

Minidoka Dam

- **FY 2014.** Began Units 8 and 9 governor replacement.
- **FY 2015.** Continue Units 8 and 9 governor replacement.
- **FY 2016.** Continue Units 8 and 9 governor replacement.

**Fish & Wildlife
(\$K)**

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
37,353	51,807	54,807

Overview

Bonneville continues to develop budgets for the suite of mitigation projects originally adopted in FY 2007 based on recommendations from the Council. Bonneville reaffirmed many project-specific commitments in subsequent agreements and processes, including BiOps and Fish Accords, and since then, virtually all these projects received independent science review through the Council and its categorical review processes. Bonneville’s funding decisions embrace many of the management objectives and priorities in the Council’s Program and continue to integrate ESA responsibilities as described in the NOAA Fisheries’ and USFWS’s FCRPS BiOps. Coordination continues among Bonneville, Council, federal resource management agencies, states, tribes and others to support the projects that satisfy Bonneville’s mitigation responsibilities.

Bonneville intends to continue implementing the kinds of projects listed below. These projects are based upon the best available science and are regionally important in that they provide high priority mitigation and protection actions for fish and wildlife populations affected by the construction and operation of the FCRPS projects. Projects and facilities listed below deliver direct on-the-ground benefits to both ESA listed and non-listed fish and wildlife throughout the Columbia River Basin and have been evaluated and coordinated with the Council, state, federal and tribal fish and wildlife resource managers, local governments, watershed and environmental groups and other interested parties. Specifically, as capital construction projects, these facilities typically go through the Council’s three-step process, which includes development of a Master Plan, environmental compliance, ESA consultation, value engineering analysis, and review by the Independent Science Review Panel.

Implementation of reforms to FCRPS hatchery programs that help reduce impacts on ESA-listed species, called for under NOAA Fisheries’ FCRPS BiOp, is done with hatchery and fisheries managers who join Bonneville in ESA consultations with NOAA, and USFWS where appropriate, on the development of hatchery genetic management plans, which will establish both specific reforms to individual facilities, as well as priorities for sequencing implementation.

Bonneville also may capitalize investment in some fish and wildlife habitat acquisitions if it provides a creditable and quantifiable benefit against a defined obligation for Bonneville and follows Bonneville’s Capitalization Policy.

The three types of fish and wildlife projects that Bonneville capitalizes are as follows:

- 1) Tributary passage -- Activities that enhance fish passage to tributary rivers. For the purpose of capitalization, a tributary is defined by the Council designated sub-basin of the tributary. Functionally interdependent work elements could contain the following: wells, ladders, screens, pumping, culverts, diversion (irrigation) consolidation, piping to reduce water loss, irrigation efficiencies (drip irrigation), lining of ditches (seepage reduction), removal of objects impeding fish passage, or pushup dams in conjunction with related construction, and construction related habitat restoration.
- 2) Hatchery facility construction -- Projects and activities relating to the construction of fish hatcheries, including related satellite facilities (acclimation ponds and collection weirs). This may also include construction-related habitat restoration.
- 3) Land acquisition -- Land acquisition projects protect, enhance, and maintain instream wetland and riparian habitat and provide credit to Bonneville, such as habitat units (HUs) or acres for wildlife or instream miles for resident fish, to fulfill the legal obligation of Bonneville to mitigate the impacts from construction and operation of the FCRPS power facilities.

Anadromous fish supplementation, production, and related facilities that may require capital funds in FY 2016 include the following:

Expenditure Authority requested for the following projects:

- Shoshone Paiute Trout Hatchery: The Shoshone Paiute Tribes of the Duck Valley Reservation propose that Bonneville fund the purchase and/or construction of a trout hatchery. The Tribes would own and operate the hatchery to produce trout for stocking in reservoirs located on the Duck Valley Reservation. Bonneville would fund the capital expenditure to meet contemporary aquaculture standards and achieve fish production goals. The Tribes believe they can reduce federal reservoir stocking costs—some of which Bonneville pays now on an annual basis.

- Spokane Tribal Hatchery: The Spokane Tribal Hatchery, funded by Bonneville in 1989 as partial mitigation for the impacts of the FCRPS, is owned and operated by the Spokane Tribe of Indians. The facility spawns, incubates, and rears Kokanee Salmon and Rainbow Trout near Wellpinit, WA. A 25-year lease agreement for the operation and maintenance of the hatchery expires in 2015. Bonneville has begun work to renew the lease agreement with the Spokane Tribe and expects to renew the lease agreement and plan for potential upgrades for aging infrastructure, including ground water pumps and rearing containers. The work could begin in FY 2016.

-Snake River Sockeye Weirs: Bonneville funds efforts of both the Idaho Department of Fish and Game and the Shoshone Bannock Tribes to rebuild Snake River sockeye throughout their historic range. The combination of substantially increased numbers of returning adults as well as the completion of the Springfield Sockeye Hatchery in 2013 and its associated increased production has created the need for Bonneville to fund the construction, operation, and maintenance of weirs to further sockeye management objectives.

The FY 2014 Omnibus Appropriations Act (Public Law No. 113-76) provided Expenditure Authority for the following projects:

- John Day Reprogramming and Construction: This project is being proposed by the Columbia River Inter-Tribal Fish Commission (CRITFC) under the Accords to work on the balance between upriver and down river salmon hatchery production mitigating for John Day and The Dalles Dams. Final reprogramming facilities and locations are still being analyzed by the Tribes, the Corps, and Bonneville. The project area encompasses the mainstem Columbia River from the base of McNary Dam downstream to The Dalles Dam. Capital dollars for this project will help fund constructing additions to new or existing FCRPS hatchery facilities to accommodate the reprogramming of hatchery fish.

- Columbia River Basin White Sturgeon Hatchery: The Columbia River Basin White Sturgeon Hatchery, proposed by the CRITFC under the Accords, will mitigate for white sturgeon population declines due to consistent poor recruitment upstream of Bonneville Dam. Expected production at a new or existing facility will be 15,000 - 20,000 yearling white sturgeon per year. The final project may include broodstock collection and holding, rearing wild-spawned juveniles, and acclimating juveniles prior to release. A location for the facility has not yet been determined, but it will likely be located within 60 miles of the confluence of the Columbia and Snake Rivers.

- Kelt Reconditioning and Reproductive Success Evaluation Research: CRITFC, under the Accords, is proposing a relatively small holding tank facility to recondition female steelhead (kelts) after they have spawned. The fish will be held and fed until they have rematured and then be released into the Snake River where they will contribute to the spawning run. The capital portion of the project is expected to be constructed in the Snake River Basin, potentially at Lower Granite Dam. As specified in the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, Bonneville will implement the kelt reconditioning plan to improve the productivity of Snake River basin B-run steelhead populations that are listed for protection under the ESA. NOAA's analysis of Prospective Actions indicates that a combination of transportation, kelt reconditioning, and in-stream passage improvements (e.g., spill-flow modifications) could increase kelt returns enough to increase the number of returning Snake River B-run steelhead spawners to Lower Granite Dam by a target of 6 percent as specified under the BiOp.

Ongoing Projects (Expenditure Authority previously received):

- *Kootenai River Native Fish Conservation Aquaculture Program: The Kootenai Tribe of Idaho has completed the construction of a new hatchery on tribally owned land at the confluence of the Moyie and Kootenai rivers (Twin Rivers). This new facility will address current physical space limitations that has challenged expansion of the existing Tribal Sturgeon Hatchery located near Bonners Ferry. The Twin Rivers site offers high quality ground and surface water needed to support the aquaculture objectives for Kootenai River white sturgeon and burbot. This location may also help to extend the river reaches where Kootenai sturgeon imprint and ultimately return to spawn. Facilities include dual water supplies and filtration, incubation rooms, juvenile rearing tanks and ponds, spawning channels, support facilities and staff housing. The Tribe is also proposing the experimental use of remote streamside incubation and early rearing facilities to imprint Kootenai sturgeon upstream of the new hatchery site. The improvements the Tribe proposed for the existing Tribal Sturgeon Hatchery would enhance sturgeon handling and rearing capabilities. A new spawning room would eliminate the current need to relocate large fish from one building to another. A safer means to transport large adults to and from the river would be provided, in addition to a number of measures to improve fish culture practices and program efficiency and success.*

- Crystal Springs Hatchery Facilities: This project is for facilities for rearing and out-planting resident and anadromous fish in central and southern Idaho. The facility is located near the American Falls Reservoir in Idaho. Resident fish that may be produced include Yellowstone Cutthroat. The anadromous fish may include Snake River spring Chinook salmon, Snake River steelhead, and Snake River sockeye. The facility is sponsored by the Shoshone-Bannock Tribes under their Accord, who are expected to operate and manage the facility once it is complete. A final Environmental Impact Statement is expected to be complete in 2016.

- Snake River Spring Chinook Salmon artificial propagation facilities (known as the Northeast Oregon Hatchery or NEOH): This project is proposed by the Nez Perce Tribe and is to be located on the Upper Grande Ronde River near La Grande, Oregon, on Catherine Creek near Union, Oregon, and on Lostine River near Enterprise, Oregon. While design has been ongoing for this project for several years, the decision to proceed with construction is pending ESA consultations and approval by NOAA Fisheries of a Hatchery and Genetic Management Plan for the facility. This project, as a measure in the Council's Fish & Wildlife Program, would also identify and develop artificial propagation facilities to protect and enhance salmon and steelhead native to the Imnaha and Grande Ronde River Basins.

- Redfish Lake Sockeye Salmon program: The Snake River sockeye salmon Evolutionarily Significant Unit (ESU) was listed under the Endangered Species Act in 1991 (56 FR 58619). The Snake River Sockeye Salmon Captive Broodstock Program has prevented extinction of endangered sockeye salmon. The program has been able to help successfully conserve the genetic resources of the founding population and begun producing fish for rebuilding the naturally spawning population in Redfish Lake. The program uses state of the art hatchery facilities and fish husbandry protocols, genetic support, and monitoring and evaluation to continue rebuilding numbers of fish. Currently, the program retains replicate, captive broodstock within multiple facilities (Eagle Fish Hatchery (FH) located in Idaho State and Burley Creek FH and Manchester Research Station, both located in Washington State). Eggs produced from these locations are transferred to other facilities (Oxbow FH, located in Oregon State and/or Sawtooth FH located in Idaho State) for release programs. The project continues to expand by increasing the capacity of existing facilities and also acquired a new facility under the Idaho Columbia Basin Fish Accord, the newly constructed Springfield FH located in Idaho for additional smolts as called for in the 2008 FCRPS BiOp. The expanded smolt releases are expected to result in an increase in the abundance and productivity of the naturally-spawning population. This strategy will greatly increase the likelihood of higher adult returns. Additional expansions may include improvements at the Redfish Lake Creek trap and Sawtooth FH weir for holding/trapping an increased number of adults as a result of the increased smolt production from Springfield Hatchery. The biological goals are to increase the number of adults spawning naturally in the Sawtooth Valley and transition the captive broodstock to a conventional hatchery production program that uses anadromous adults as broodstock.

- Chief Joseph Dam Hatchery: Bonneville has funded the construction of Chief Joseph Dam Hatchery Program, primarily a comprehensive management program for supplementing Chinook salmon, to increase the abundance, productivity, distribution, and diversity of naturally spawning populations of summer/fall Chinook in the Okanogan River and in the Columbia River below Chief Joseph Dam, Washington (between the confluence of the Okanogan River and Chief Joseph Dam). Project includes a new hatchery facility (at the base of the Chief Joseph Dam). In addition, the Colville Tribes as sponsors will use the facility to reintroduce extirpated spring Chinook back into the Okanogan Sub-basin. This Accord project includes the new hatchery facility and acclimation ponds (throughout the Okanogan River sub-basin), broodstock collection, egg incubation, rearing, release, and selective broodstock collection method development. Planned production levels are two million summer/fall Chinook and 0.9 million spring Chinook smolts. In 2014-15, the Tribes will complete a three-year experiment testing a temporary weir for capturing adult salmon on the Okonogan River, and Bonneville will work with them and other project partners to decide whether to construct a permanent weir. Bonneville has entered into an agreement with one public utility where that utility will pay a portion of the capital and operation and maintenance costs associated with this hatchery. In addition, Bonneville has agreed with three public utilities to share the operation and maintenance costs. Construction on the hatchery facility was completed in May 2013 and turned over to the Colville Tribes in June 2013.

- Klickitat Production Expansion: The Klickitat River Master Plan was submitted by the Yakama Nation, reviewed by the ISRP, recommended with comments by the Council, and approved by Bonneville in 2008. The plan's goal is to protect and increase naturally producing populations of spring Chinook and steelhead while protecting the biological integrity and the genetic diversity of indigenous fish stocks in the sub-basin. The Klickitat Master Plan includes three main elements: Lyle Falls Fishway upgrades; construction of the Castile Falls enumeration facility; upgrades to the Klickitat hatchery with the potential for constructing a new facility in the lower Klickitat River to accommodate the ongoing production of coho and fall

Chinook; and an acclimation site in the upper watershed at McCreedy Creek. In early 2009 Bonneville completed the Lyle Falls Environmental Impact Statement (EIS) and ROD. Upgrades to enumeration and collection facilities at Lyle and Castile have been completed. Certain upgrades at the Klickitat Hatchery have also been done to maintain existing fish and wildlife program activities and to address hatchery safety concerns. Lyle and Castile Falls fishways have PIT tag interrogation capability, and the Lyle Falls facility includes a lamprey passage structure. A new Klickitat Hatchery Complex EIS initiated in July 2009 will examine options for the development and operation of new production and supplementation facilities and acclimation alternatives, and additional upgrades to the existing hatchery facility. The Yakama Nation issued a revised Master Plan, July 2012, providing updates to their fish management plans. When the EIS is complete and Master Plan accepted, the Council will review the Step 3 recommendation in the Council 3-Step Review process. The final EIS has been held up while the Yakama Nation determines whether it will allow construction on the proposed lower river acclimation site. The EIS is anticipated to be completed shortly after that decision is made and Bonneville will issue a ROD once the NMFS completes the Biological Opinion for the Klickitat Production/Fish Management plans. Bonneville is working with Yakama Nation to identify the highest priority construction actions in the Klickitat Watershed to focus on, given the limited capital budget under the Accord.

- Hood River Production Facility: This project includes expansion of existing Parkdale fish hatchery to accommodate spring Chinook rearing, construction of new Hood River adult salmonid trapping facilities, and development of alternative adult trapping sites. The Powerdale Dam Fish Trap formerly provided the foundation for many of the activities associated with implementation of the Hood River Production Program. These include: monitoring escapement, collecting life history characteristics, and broodstock acquisition. Pacific Corps' demolition of its Powerdale Dam and the associated fish trapping facility in 2010 necessitated the development of alternative adult broodstock trapping sites. One permanent fish trap on the West Fork of the Hood River was completed in 2013, and a temporary trapping site is operational on the East Fork Hood River. A permanent trap site on the East Fork is currently being evaluated. The Hood River Production Program has four primary goals: 1) re-establish naturally sustaining runs of spring Chinook in the Hood River; 2) re-build naturally sustaining runs of summer and winter steelhead in the Hood River; 3) maintain genetic characteristics of Hood River fish populations; and 4) provide fish for sustainable harvest by both sport and tribal fishers.

- Mid-Columbia Coho Restoration: Indigenous naturally spawning coho salmon no longer occupy the mid-Columbia River basins. Columbia coho salmon populations were decimated by the early 1900s. For several reasons, including the construction and operation of mainstem Columbia River hydropower projects, habitat degradation, release locations, harvest management, and hatchery practices and genetic guidelines, self-sustaining coho populations have not been re-established in mid-Columbia basins. This Yakama Accord project's vision is to re-establish naturally reproducing coho salmon populations in the Wenatchee and Methow sub-basins at biologically sustainable levels which provide significant harvest in most years. This program will construct a facility on the Wenatchee River for holding and spawning broodstock, incubating eggs, and rearing juveniles. Additional semi-natural ponds will also be constructed in the Wenatchee and Methow sub-basins for acclimating smolts prior to their release. The phased approach, including associated facilities, incorporates development of a mid-Columbia hatchery broodstock, local adaptation to tributaries in the Wenatchee and Methow Basins, and habitat restoration that will benefit coho as well as ESA-listed spring Chinook, steelhead, and bull trout.

- Walla Walla Hatchery: The Walla Walla Hatchery is proposed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) under their Accord. The Tribes would own and operate the hatchery, which will produce up to 500,000 spring Chinook smolts annually for release into the Walla Walla River. Pre-design has been completed. The next phase of the project, final-design started in the summer of 2013, upon finalization of an NPCC/BPA/CTUIR agreement to proceed. An environmental impact statement, which was started in January 2013, is expected to be completed in 2015. Construction may commence as early as 2015. The facility will hold, spawn, incubate and rear spring Chinook on the South Fork Walla Walla River near Milton-Freewater, Oregon.

- Yakima Coho Facility: This hatchery is proposed by the Confederated Tribes and Bands of the Yakima Nation (YN) under their Accord, and is presented in the Yakima Subbasin Summer and Fall Run Chinook and Coho Salmon Hatchery Master Plan. The Tribe would own and operate the hatchery which will produce 500,000 parr and 200,000 smolts using broodstock collected at Roza and Sunnyside dams. Pre-design is completed. Bonneville will hold the design and construction contract on behalf of the YN, and a Request for Offers is expected to be issued by early 2015. Shortly afterward, Bonneville expects to begin scoping an environmental impact statement. Construction is not expected to begin until 2017.

Potential non-construction capital Wildlife and Resident Fish Habitat Acquisitions (including Conservation Easements) eligible for capitalization are:

- Albeni Falls Wildlife Mitigation
- Palisades and Minidoka Wildlife Habitat Acquisitions
- Black Canyon, Boise Diversion, Anderson Ranch Wildlife Habitat Acquisitions
- Willamette Wildlife Habitat Acquisitions
- Libby and Hungry Horse Reservoirs Resident Fish Acquisitions
- Southern Idaho Habitat Acquisitions

Energy Efficiency (\$K)		
FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
77,887	92,000	94,800

Overview

Bonneville’s energy efficiency program offers several ways for customer utilities to participate in regional energy efficiency. Program components include: (1) standard offer efficiency measures and custom projects, which result in customer proposals to conserve energy through such programs as residential weatherization, commercial lighting, Heating, Ventilation, and Air Conditioning (HVAC), industrial processes and lighting, irrigated agriculture, etc.; (2) third party delivery programs, such as residential lighting, the Energy Smart Grocer, Energy Smart Industrial, and Green Motors programs; and, (3) programs to help regional federal installations reduce energy use, including federal hatcheries, irrigation districts and work at various dams to help the Corps and Reclamation in their efforts to reduce energy use.

Bonneville’s energy efficiency budgets reflect a need to meet aggressive targets from the Council’s 6th Power Plan and anticipated targets in the 7th Power Plan. Specifically, Bonneville’s energy efficiency targets increased from about 280 aMW under the Council’s 5th Power Plan (2005-09) to 504 aMW under its 6th Power Plan (2010-14). The 504 aMW reflects conservation that was expected to be achievable in the service territories of Bonneville’s preference customers. In FY 2013, Bonneville was on track to reach the five-year target and FY 2014 performance maintained that momentum. Because the 7th Power Plan is expected late in 2015, Bonneville has examined its level of energy efficiency performance and associated budget against the 6th Power Plan’s later years, which call for an incremental 400 aMW of energy efficiency between 2015 and 2017. In meeting its energy efficiency goals Bonneville may employ resource acquisition agreements and billing credits for independent conservation, both authorized by Northwest Power Act section 6, as well as customer self-funded conservation.

Bonneville is considering implementing a resource acquisition proposal to acquire energy savings from a third party that will issue debt to fund the energy savings measures. If adopted, this proposed conservation acquisition would begin in FY 2016.

Activities and Explanation of Changes

FY 2015 Estimate	FY 2016 Estimate	Explanation of Changes FY 2016 vs FY 2015 Estimate (Dollars in Thousands)
Power Services – Capital \$355,637,000		\$390,398,000
Associated Projects		+\$34,761,000
<p>Milestones¹:</p> <ul style="list-style-type: none"> • Complete 500 kV switchyard relay replacements at Grand Coulee. • Complete governor replacements and vibration and air gap monitoring installation at Bonneville dam. • Complete spillway tainter gate repair at Lookout Point and Dexter and butterfly valve replacement at Lost Creek. • Complete fire detection and alarm system at Palisades. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Complete powerplant battery replacement at Grand Coulee. • Complete governor oil filtration system installation at Bonneville dam. • Complete governor replacements at Big Cliff, Cougar, Dexter, Detroit, and Lookout Point. • Complete governor installation and powerhouse bridge crane rehabilitation at Little Goose. • Complete generator winding replacements and potable water system upgrade at McNary dam. 	<p>+\$28,961/+13.7%</p> <p>The increase reflects a reshaping of funding needs for investment in the hydro electric system assets.</p>
Fish & Wildlife		+\$3,000/+5.8%
<p>Milestones:</p> <ul style="list-style-type: none"> • Continue implementation of the Council’s Program, BiOps and Fish Accords. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue implementation of the Council’s Program, BiOps and Fish Accords. 	<p>The increase reflects a long-term, planned effort to reshape funding necessary to implement the BiOps, Fish Accords, Columbia River Basin Fish and Wildlife activities.</p>
Energy Efficiency		+\$2,800/+3.0%
<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to support utility incentive programs. • Continue to support regional energy efficiency programs. • Continue supporting energy efficiency at direct serve federal agencies. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to support utility incentive programs. • Continue to support regional energy efficiency programs. • Continue supporting energy efficiency at direct serve federal agencies. 	<p>The increase reflects a continuing focus on energy conservation initiatives within the region.</p>

¹ FY 2015 milestones have been updated from the FY 2015 Congressional submission due to updated forecasts.

**Transmission Services – Capital
Funding Schedule by Activity
Funding (\$K)**

	FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate	FY 2016 vs FY 2015	
				\$	%
Transmission Services - Capital					
Main Grid	46,531	128,970	132,664	3,694	3%
Area & Customer Services	10,019	17,538	33,983	16,445	94%
Upgrades & Additions	140,943	310,460	168,129	-142,331	-46%
System Replacements	143,331	247,285	287,040	39,756	16%
Projects Funded in Advance	269,989	30,000	30,000	-	-
Total, Transmission Services - Capital	610,814	734,254	651,816	-82,436	-11%

Outyears (\$K)

	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate
Transmission Services - Capital					
Main Grid	132,664	184,100	151,891	153,785	124,910
Area & Customer Services	33,983	14,352	966	307	238
Upgrades & Additions	168,129	113,028	63,131	58,448	54,304
System Replacements	287,040	232,999	229,690	232,206	236,804
Projects Funded in Advance	30,000	30,000	30,000	50,000	50,000
Total, Transmission Services - Capital	651,816	574,479	475,678	494,746	466,256

Transmission Services – Capital

Overview

Transmission Services (TS) is responsible for about 75 percent of the Pacific Northwest's high-voltage transmission. TS provides funding for all additions, upgrades and replacements to the Bonneville transmission system, resulting in reliable service to northwest generators and transmission customers. The Bonneville transmission system also facilitates the sale and exchange of power to and from the region.

TS continues to make significant infrastructure improvements and additions to the system to assure reliable transmission in the Northwest. These improvements and additions will help the Bonneville transmission system continue to comply with national reliability standards, replace aging and obsolete equipment, allow for interconnection of needed new generation, and remove constraints that limit economic trade or the ability to maintain the system. Many of the proposed TS project will be funded through Bonneville lease-purchase agreements.

Bonneville's completed infrastructure investments in the last decade that further strengthen the network consist of the following projects: Puget Sound Area Additions, North of Hanford/ North of John Day, Celilo Modernization, Eastern Washington Reinforcement, Grand Coulee-Bell, Kangley-Echo Lake, Shultz-Wautoma, McNary-John Day, and Portland Area Additions.

Congressionally-approved Production Tax Credits (PTC) for renewable energy enacted in 2005 were extended in 2009 to 2012 and most recently again in 2013 and 2014. The incentives created by these credits, along with Renewable Portfolio Standards (RPS) implemented by the states of Oregon, Washington, and California, have spurred a large number of renewable interconnection requests to the Bonneville transmission grid. As of 2014, Bonneville has interconnected a total of 5,085 MW of new renewable qualified generation. Bonneville has more than 10,000 MW in additional renewable (wind, solar, biomass, geothermal, etc.) interconnection requests still remaining in the study queue. The current projections are 5,105 MW interconnected by 2015 and possibly 8,500 interconnected MW total by 2025. Much of the remaining generation demand is the result of the Renewable Portfolio Standards enacted by Oregon and Washington that require utilities to acquire more than 8,000 MW of renewable energy in the Northwest by 2015. Exports to California are limited now by California laws and are expected to remain at 2,000 to 2,500 MW during the same period. Also in the interconnection queue is approximately 800 MW of natural gas fired generation. Efficiency improvements to the FCRPS hydro units that qualify as renewable are also proposed between 2015 and 2021.

In June 2008, Bonneville's first Network Open Season (NOS) received 153 requests from 28 customers for 6,410 MW of new service, about three-fourths for wind energy integration. Bonneville subsequently offered 1,782 MW of new transmission service on its existing system. Bonneville identified four new Main Grid capital projects from the 2008 NOS: (1) McNary-John Day 500 kV transmission line (part of West of McNary Reinforcements Group 1); (2) Big Eddy-Knight 500 kV transmission line and substation (part of West of McNary Reinforcements Group 2); (3) Central Ferry- Lower Monumental 500 kV Reinforcement (formerly Little Goose Area Reinforcement); and (4) I-5 Corridor 500 kV Reinforcement. Construction of the McNary-John Day 500 kV transmission line is complete and Bonneville has begun construction on the Big Eddy-Knight project. The Central Ferry-Lower Monumental 500 kV Reinforcement project began in the spring of 2014 and the I-5 Corridor project is currently undergoing environmental review. If all four projects are constructed they will provide almost 6,000 MW of new transmission service.

Bonneville's second NOS window for new transmission service requests in 2009 resulted in 82 service requests resulting in 34 contracts totaling 1,553 MW. Of that amount, approximately 923 MW represent wind project interconnection requests.

Bonneville's third NOS window in 2010 resulted in new requests totaling 3,759 MW, of which 2,993 MW represent wind integration requests. The 2010 process identified one additional Main Grid capital project, the Montana to Washington project, for which environmental review was begun but is being paused at this time pending review of updated information related to supporting transmission service requests.

After a two- year pause, Bonneville re-started the NOS process in the Spring of 2013. Bonneville's 2013 NOS included 50 transmission service requests from 18 customers for 3,673 MW demand (2,839 MW of Point-to-Point and 834 MW Network) of which 95 MW represent new wind integration requests in the Pacific Northwest. The 2013 NOS did not identify the addition of any new Main Grid capital projects beyond those previously recommended under the prior NOS processes.

As noted, Bonneville's capital program for TS includes a wide variety of specific investments that are determined after internal review and, in some cases, external review. In 2009, TS began implementing best practice frameworks that provide a standardized structure and approach to Asset Management. As a result, TS's Asset Management Strategies, derived from Agency Strategies, drive Bonneville's Asset Plans, which determine its capital and expense needs. On occasion, capital investments must be made on short notice because of unexpected needs, because of the identification of obsolete, worn out, failed, failing, or at-risk systems and facilities, because of system reliability requirements, and because near-term opportunities to install or construct facilities arise as outages occur or as schedules for outages change. For these and other reasons, TS's capital program is fluid and subject to change. Thus, Bonneville is unable to predict with specificity some of the new capital investments in the transmission system. The types of investments may include but are not limited to: arrestor, bus and bus pedestal, circuit breaker, circuit switcher, communication tower, concrete pole, control center mapboard and video wall displays, control house, converter grading capacitors, converter harmonic filters, converter smoothing reactors, converter transformers, current limiting reactor, current limiting resistor, current transformer, digital fault locator, digital cross-connect system (DCS), disconnect switch, engine generator, engineered steel pole, fiber optic cable, fiber terminal, fuel dispensing facility, grounding system, grounding transformer, microwave multiplex transmitter, network management system (NMS), overhead conductor, overhead ground wire, phase measuring unit (PMU), power control assembly (PCA), power transformer, relay, revenue meter, series capacitor, shunt capacitor, shunt reactor, station service transformer, station service inverter, substation dead end tower, substation perimeter fence, switchyard lighting, thyristor, transfer switch, transmission steel tower, voltage regulator, voltage transformer, water/sewer system, wood pole and cross-arm, and other similar items consistent with Bonneville's capitalization policy determinations (such as spacer damper replacements).

Notwithstanding that the capital program for TS is subject to change, Bonneville has identified several general areas where capital program investment will occur.

Bonneville will continue to fund fiber optic communications facilities needed to meet Bonneville's projected operational needs. To the extent that these investments create temporary periods of excess fiber optic capacity, such dark fiber capacity can be made available to telecommunications providers and to non-profits to meet public benefit internet access needs for rural areas and other needs in Bonneville's service area. Bonneville's investments in fiber optics, including the role of the private sector in building fiber optic networks, is consistent with the "Fiber Optic Cable Plan" submitted to Congress on May 24, 2000, accompanying the FY 2000 Energy and Water Development Appropriations Act. In accordance with this plan, when possible, Bonneville will establish partnerships with fiber optic facility and service providers to meet its needs.

In December 2004, the Congress passed and the President signed the Commercial Spectrum Enhancement Act (CSEA, Title II of P.L. 108-494), creating the Spectrum Relocation Fund (SRF) to streamline the relocation of federal systems from certain spectrum bands to accommodate commercial use by facilitating reimbursement to affected agencies of relocation costs. The Federal Communications Commission has auctioned licenses for reallocated federal spectrum, which will facilitate the provision of Advanced Wireless Services to consumers. Funds were made available to agencies in FY 2007 for relocation of communications systems operating on the affected spectrum. These funds are mandatory and will remain available until expended, and agencies will return to the SRF any amounts received in excess of actual relocation costs. The estimated Bonneville cost of this relocation is \$48.7 million. The project was completed in November 2013 and the operational system performance was being observed during FY 2014 and early FY 2015 to determine that it has achieved comparable capability as defined under the CSEA. Bonneville determined in December 2014 that comparable capability had been achieved.

As part of the Homeland Security Presidential Directives, Bonneville has completed a physical security assessment of all critical facilities and is implementing security enhancements at these facilities. These security enhancements increase access control to Bonneville's facilities and provide video surveillance and monitoring capabilities.

Bonneville executed a framework planning study to help guide the future development of its Ross Campus. The study identified opportunities to support efficient operations through the creation of functional specialization areas and scalable office strategies to meet current and evolving business needs. Future development of the Ross Campus will be subject to continuing conversations with Bonneville's customers and regional stakeholders.

Accomplishments

- Published initial rate proposal for the FYs 2016-2017 rates on December 10, 2014.
- Integrated 5,085 MW of wind by December 2014 on Bonneville's transmission system.
- Continued construction of the Big Eddy-Knight project.
- Began construction of the Central Ferry-Lower Monumental project.
- Completed the design and began site work for major renovations at Celilo (PDCI Project).
- Continued development, implementation and refinement of Asset Management Strategies for Sustain and Expand Programs.

Explanation of Changes

Bonneville's budget includes \$652 million in FY 2016 for TS (including non-borrowing authority capital) which is an 11 percent decrease from the FY 2015 forecasted level. The decrease reflects reduced investment in Upgrades and Additions driven by a reduction in PDCI projected spending needs as construction nears completion offset by increases in Area and Customer Services and System Replacements to address customer requests and numerous issues with aging and obsolete electric and telecom infrastructure.

The FY 2016 budget decreases the levels for Upgrades & Additions (-\$142.3 million). The budget increases levels for Main Grid (+\$3.7 million), Area & Customer Services (+\$16.4 million) and System Replacements (+\$39.8 million). There is no change in funding for PFIA.

Strategic Management

Bonneville provides transmission and energy services while supporting integration of renewable resources in the Pacific Northwest. Bonneville will continue to implement the following strategies to serve the region:

1. To improve system adequacy, reliability and availability, Bonneville has embarked on major transmission infrastructure projects. The projects shore up the region's transmission system and help deliver the region's future power needs. These projects address multiple challenges, such as integration of renewable energy, the need to relieve a number of congested transmission paths, the pressure to keep up with growing energy demands and the need to meet Bonneville's open access policy in support of competitive markets. Specific strategies for these efforts are outlined in the TS Load Service and Generation Integration strategies.
2. Bonneville will continue to replace aging assets that are vital to the reliability of the existing transmission system. To that end, TS has developed specific long term strategies for the following asset categories:
 - a. Substations AC
 - b. Power System Control/System Telecommunications
 - c. Wood Lines
 - d. Steel Lines
 - e. Rights of Way (ROW), (Land Rights, Access Roads and Vegetation Management)
 - f. System Protection and Control
 - g. Control Center

The following external factors present the strongest impact to overall achievement of the program's strategic goal :

- Continually changing economic and institutional conditions
- Competitive dynamics
- Ongoing changes in the electric industry
- Siting issues

Main Grid (\$K)		
FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
46,531	128,970	132,664

Overview

Bonneville’s strategic objectives for Main Grid projects are to assure compliance with the NERC and Western Electricity Coordinating Council (WECC) reliability criteria, provide voltage support, provide a reliable transmission system for open access, and provide for relief of transmission system congestion. During this budgeting period, projects are planned that will provide transmission reinforcement and voltage support to major load areas that are primarily west of the Cascade Mountains. In addition, transmission reinforcements are planned for load centers in central Oregon, central Washington, the Puget Sound area, the Willamette Valley, and along the I-5 Corridor, as well as projects to provide transmission access for new generation projects.

Continued investments in Main Grid assets include:

I-5 Corridor Reinforcement

- **FY 2014.** Continued route analysis and gathering of customer input.
- **FY 2015.** Conclude route analysis and begin design.
- **FY 2016.** Begin construction.

Big Eddy-Knight (West of McNary Reinforcements Group 2)

- **FY 2014.** Continued construction.
- **FY 2015.** Complete construction.

Central Ferry-Lower Monumental 500 kV Reinforcement (formerly Little Goose Area Reinforcement)

- **FY 2014.** Began construction.
- **FY 2015.** Continue construction.
- **FY 2016.** Complete construction.

Midway- Grandview 115 kV Line upgrade

- **FY 2014.** Completed design.
- **FY 2015.** Begin construction.
- **FY 2016.** Continue construction.

Puget Sound Area Northern Intertie (PSANI)

- **FY 2014.** Began design and construction.
- **FY 2015.** Continue construction.
- **FY 2016.** Continue construction.

Tucannon, LaPine, Franklin, White Bluffs, Monroe and McNary (6 separate Capacitor projects)

- **FY 2014.** Continued design and begin construction (Monroe, McNary); completed construction (Tucannon, LaPine, Franklin, White Bluffs).
- **FY 2015.** Complete construction (Monroe, McNary).
- **FY 2016.** Complete remaining projects.

Alvey Substation

- **FY 2014.** Designed the 230 kV and 500 kV Reactor installations.
- **FY 2015.** Begin construction.
- **FY 2016.** Complete construction.

Raver Substation

- **FY 2014.** Completed design of the 500 kV Reactor upgrade.
- **FY 2015.** Complete construction of the 500 kV Reactor upgrade.

Schultz Series Capacitors

- **FY 2015.** Begin design.
- **FY 2016.** Begin construction.

Monroe-Echo Lake 500 kV Line Re-termination #2

- **FY 2015.** Begin design.
- **FY 2016.** Begin construction.

McNary Substation 500/230 Bank Addition

- **FY 2014.** Began design.
- **FY 2015.** Complete design and begin construction.
- **FY 2016.** Continue construction.

Paul Substation 500kV Shunt Reactor Addition

- **FY 2014.** Began design.
- **FY 2015.** Complete design and begin construction.
- **FY 2016.** Complete construction.

Continue Planning Studies to: (all years)

- Identify infrastructure additions.
- Identify projects driven by NERC and WECC reliability criteria.
- Identify system reactive needs to mitigate unacceptable low or high voltage problems and other system additions.
- Relieve transmission system congestion and integrate new generation facilities.
- Design projects related to the NOS.

Area & Customer Service

(\$K)

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
10,019	17,538	33,983

Overview

Bonneville’s strategic objective for Area and Customer Service projects is to assure that Bonneville meets reliability standards and contractual obligations.

Continued investments in Area & Customer Service assets include:

Hooper Springs Substation

- **FY 2014.** Completed design.
- **FY 2015.** Begin construction.
- **FY 2016.** Continue construction.

Capacitor Bank at Kalispel

- **FY 2014.** Completed the design and began construction.
- **FY 2015.** Complete construction.

Continuous Activities (all years)

- Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for Bonneville’s service area.

**Upgrades & Additions
(\$K)**

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
140,943	310,460	168,129

Overview

Bonneville’s strategic objectives for Upgrades and Additions are to replace older communications and controls with newer technology including fiber optics in order to maintain or enhance the capabilities of the transmission system; to implement special remedial action control schemes to accommodate new generation and mitigate immediate operational and market constrained paths; and to support communications and remedial action schemes, among other proposals.

During this budget period, Bonneville will complete design, material acquisition, construction and activation of several fiber optics facilities to provide bandwidth capacity and high-speed data transfers to eventually replace microwave analog radios, which are technologically obsolete and nearing the end of their useful life. Temporarily, in some areas, excess dark fiber capacity is being offered for a term to telecommunications providers or to public entities such as public utilities, schools, libraries, and hospitals, providing them access to high-speed telecommunication services as a public benefit.

Continued investments in Upgrades & Additions assets include:

VHF Radio System Upgrade

- **FY 2014.** Continued construction.
- **FY 2015.** Continue construction.
- **FY 2016.** Continue construction.

Synchrophasor Project

- **FY 2014.** Continued construction at multiple sites.
- **FY 2015.** Continue construction at multiple sites.
- **FY 2016.** Continue construction at multiple sites.

Pacific DC Intertie from 3,100 MW to 3,800 MW Project

- **FY 2014.** Completed design and began site work for upgrade.
- **FY 2015.** Begin construction for upgrade.
- **FY 2016.** Continue construction.

Ross-Schultz Fiber Circuit Upgrade

- **FY 2014.** Began construction.
- **FY 2015.** Continue construction.
- **FY 2016.** Continue construction.

Bell-Boundary #DC SONET Ring Upgrade

- **FY 2014.** Began construction.
- **FY 2015.** Continue construction.
- **FY 2016.** Continue construction.

Operational Megabit Ethernet (OMET) System

- **FY 2014.** Continued design and began construction.
- **FY 2015.** Continue construction.
- **FY 2016.** Continue construction.

Power Control Assembly (PCAs) for smaller substations

- **FY 2014.** Installed units 1-2, design and ordered units 3-9.
- **FY 2015.** Install units 3-9, design and order units 10-15.
- **FY 2016.** Install units 10-15.

Longhorn Annex for UEC

- **FY 2014.** Completed design, purchased land and materials, began construction.
- **FY 2015.** Continue construction.
- **FY 2016.** Complete construction.

500 kV Spares at Wind Integration Substations

- **FY 2015.** Begin design for site 1.
- **FY 2016.** Begin construction for site 1 and design for site 2.

Continuous Activities (all years)

- Upgrading two miles of fiber between Bonneville Power House and Bonneville Control House.
- Planning, design, material acquisition and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths .
- Planning, design, material acquisition and construction of various system additions and upgrades necessary to maintain a reliable system for Bonneville's service area.
- Construction of secondary fiber related projects and digital radio system upgrades to improve the operational telecommunication system.
- Material procurement and construction to upgrade the main fiber optic backbone system (#KC and #NC systems).
- Continue to upgrade control houses and standby engine generators at various locations.

System Replacements

(\$K)

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
143,331	247,285	287,040

Overview

Bonneville's strategic objectives for the Sustain Program are to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: (1) replacing high voltage transformers and power circuit breakers which are at or near the end of their useful life; (2) replacing risky, outdated and obsolete control and communications equipment and systems, and includes mandated replacements due to legislation; and (3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system. Transmission Services uses a total economic cost (TEC) model to determine priorities for replacement.

Continued investments in System Replacements assets include:

Continuous Activity (all years)

Non-Electric Replacements

- Continue non-electric replacements as necessary.
- Continue the design, material acquisition, and construction for the Access Road program capital component and the Land Rights program capital component in support of the Lines and ROW Programs.
- Continue design and construction of capital improvements for identified existing facilities.

Electric Replacements

- Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. Such replacements include relays, annunciators, oscillographs, metering and various types of communication related equipment replacing and migrating analog to digital technology and SCADA equipment.
- Continue replacement of under-rated and high maintenance substation equipment.
- Continue replacing spacer dampers on various 500 kV lines.
- Continue replacing critical, operational tools and marketing business systems at the Dittmer and Munro Control Centers.
- Continue replacing deteriorating wood pole transmission line structures, spacer dampers and insulators with NCI.

**Projects Funded in Advance
(\$K)**

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
269,989	30,000	30,000

Overview

This category includes those facilities and/or equipment where Bonneville retains control or ownership but which are funded or financed by a third party or with reserves, either in total or in part. This program also includes investments associated with the Commercial Spectrum Enhancement Act (CSEA).

Continued investments in PFIA assets include:

Continuous Activity (all years)

- Continue to integrate various new generation and line/load projects into Bonneville transmission grid based on requests placed and processed in accordance with transmission tariff.
- Continue planning studies to identify system impacts and needs regarding proposed new generation projects.
- Engineer and begin construction of several large wind generation interconnection substations.
- Complete environmental cleanup and other work necessary for the sale of Bonneville facilities.
- Continue the design and construction for various radio replacements at accessible sites as associated with the CSEA.

Central Ferry Substation

- **FY 2014.** Completed construction.

Activities, Milestones, and Explanation of Changes

FY 2015 Estimate	FY 2016 Estimate	Explanation of Changes FY 2016 vs FY 2015 Estimate (Dollars in Thousands)
Transmission Services – Capital \$734,254,000	\$651,816,000	-\$82,436,000
<p>Milestones:</p> <ul style="list-style-type: none"> • Begin construction of Midway- Grandview 115kV Line upgrade. • Complete construction of the Big Eddy-Knight project. • Continue construction of the PSANI project. • Continue construction of Central Ferry Lower Monumental. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue construction of Midway- Grandview 115kV Line upgrade. • Continue construction of the PSANI project. • Complete construction of Central Ferry Lower Monumental. 	<p>The decrease reflects reduced investment in Upgrades and Additions driven by a reduction in PDCI projected spending needs as construction nears completion offset by increases in Area and Customer Services and System Replacements to address customer requests and numerous issues with aging and obsolete electric and telecom infrastructure.</p>
Area & Customer Service		+\$16,445/+93.8%
<p>Milestones:</p> <ul style="list-style-type: none"> • Begin construction of Hooper Springs Substation. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue construction of Hooper Springs Substation. 	<p>The increase reflects the addition of the Hooper Springs project.</p>

FY 2015 Estimate	FY 2016 Estimate	Explanation of Changes FY 2016 vs FY 2015 Estimate (Dollars in Thousands)
<p>Upgrades & Additions</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Begin design for site 1 for 500kV spares at wind integration substations. • Continue construction at multiple sites of the Synchrophasor project. • Begin construction for the upgrading of the Pacific DC Intertie from 3,100 MW to 3,800 MW project. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Begin construction of site 1 and design for site 2 for 500kV spares at wind integration substations. • Continue construction at multiple sites of the Synchrophasor project. • Continue construction for the upgrading of the Pacific DC Intertie from 3,100 MW to 3,800 MW project. 	<p>-\$142,331/-45.8%</p> <p>The decrease reflects reductions in the Pacific Direct Current Line (PDCI) project as construction nears completion.</p>
<p>Systems Replacements</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue design and construction of capital improvements for identified existing facilities. • Continue non-electric replacements as necessary. • Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue design and construction of capital improvements for identified existing facilities. • Continue non-electric replacements as necessary. • Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. 	<p>+\$39,756/+16.1%</p> <p>The increase is due to an increase in the number of replacement projects.</p>
<p>PPIA</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. 	<p>\$0/0%</p> <p>No change in funding identified.</p>

**Capital Information Technology & Equipment/Capitalized Bond Premium
Funding Schedule by Activity
Funding (\$K)**

	FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate	FY 2016 vs FY 2015	
				\$	%
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	30,204	34,669	37,356	2,687	8%
Capitalized Bond Premium	0	0	2,000	2,000	2,000%
Total, Capital IT & Equipment/Capitalized Bond Premium	30,204	34,669	39,356	4,687	14%

Outyears (\$K)

	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	37,356	28,794	10,896	6,477	4,141
Capitalized Bond Premium	2,000	2,000	2,000	2,000	2,000
Total, Capital IT & Equipment/Capitalized Bond Premium	39,356	30,794	12,896	8,477	6,141

Capital Information Technology & Equipment/Capitalized Bond Premium

Overview

Capital Information Technology (IT) provides for the acquisition of general and some dedicated special purpose capital information technologies, and acquisition of special-use capital and IT equipment in support of Bonneville's strategic objectives. This category also includes Bonneville's on-going efforts to facilitate delivery of a highly resilient organization, able to anticipate, withstand and effectively respond to disruptive events affecting it and its partners in the Northwest region. The four main areas of resiliency focus continue to include asset management, emergency management, crisis management and continuity of operations.

Bonneville continues to move its IT infrastructure to a more efficient architecture. This FY 2016 Budget supports this effort. IT continues to eliminate redundancies in tools and applications, establish an agency-wide IT architecture with standardized IT purchasing criteria, standardize software licensing processes and minimize agency liabilities through stronger contracts, apply continuous improvement practices to IT project management, and implement an agency IT portfolio cost management strategy. The IT estimates in this FY 2016 Budget, under Capital IT and Equipment include all IT functions within the agency except TS grid operations. See the Capital Program—TS section of this budget for additional discussion of grid operations-related IT requirements acquisitions.

Capital equipment provides for the acquisition of general and some dedicated special purchases of capital office furniture and equipment.

Bonneville can incur a bond premium when it repays a U.S. Treasury bond before the due date. When bonds are refinanced and premiums are incurred, the bond premiums can be capitalized. Historically, Bonneville generally has chosen to finance capitalized bond premiums with bonds issued to the U.S. Treasury, as envisioned by the Transmission Act.

**Capital IT & Equipment
(\$K)**

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
30,204	34,669	37,356

Overview

This category includes enhancements to Bonneville’s information technology processes to provide cost effective efficiencies for secure, timely and accurate information. Investments will enable continued enhancements to Bonneville’s Enterprise systems that are designed to link key information systems throughout Bonneville and improve business processes. Current efforts include continued functional process improvements in areas not included in the initial development phase. Other investments include acquisition of capital office furniture and equipment, capital automated data processing (ADP) based administrative telecommunications equipment, ADP equipment (hardware), and support of capital software development for certain Bonneville programs.

Continued investments in Capital IT & Equipment assets include:

Continuous Activity (all years)

Capital system developments in support of:

- Corporate IT Projects
- IT Infrastructure Projects
- Power IT Project
- Transmission Services IT Projects

**Capitalized Bond Premium
(\$K)**

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
0	0	2,000

Overview

Continue to assess financial market and when cost-effective, refinance available bonds as prudent.

Activities, Milestones, and Explanation of Changes

FY 2015 Estimate	FY 2016 Estimate	Explanation of Changes FY 2016 vs FY 2015 Estimate (Dollars in Thousands)
<p>Capital Information Technology & Equipment/Capitalized Bond Premium \$34,669,000</p>	<p>\$39,356,000</p>	<p>+\$4,687,000</p>
<p>Milestones: Capital system developments in support of:</p> <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	<p>Milestones: Capital system developments in support of:</p> <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	<p>The increase reflects ongoing emphasis on business resiliency efforts.</p>
<p>Capital Bond Premiums Milestones:</p> <ul style="list-style-type: none"> • Bonneville does not expect to refinance any federal bonds with premium in FY 2015. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Possible refinancings of outstanding federal bonds. 	<p>+\$2,000/+2,000% The increase reflects possible refinancings of federal bonds with premium in FY 2016.</p>

**Power Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate	FY 2016 vs FY 2015	
				\$	%
Power Services - Operating Expenses					
Production	1,532,435	1,062,935	1,152,349	89,414	+8%
Associated Projects Costs	411,331	428,078	454,869	26,791	+6%
Fish & Wildlife	231,781	260,000	267,000	7,000	+3%
Residential Exchange Program	201,345	203,900	217,100	13,200	7%
NW Power & Conservation Council	9,727	10,784	11,236	452	+4%
Energy Efficiency & Renewable Resources	73,375	90,453	92,800	2,347	+3%
Total, Power Services - Operating Expenses	2,459,994	2,056,150	2,195,355	139,204	+7%

Outyears (\$K)

	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate
Power Services - Operating Expenses					
Production	1,152,349	1,225,142	1,198,137	1,050,671	1,045,814
Associated Projects Costs	454,869	464,286	471,846	479,399	498,032
Fish & Wildlife	267,000	274,000	281,000	288,000	295,000
Residential Exchange Program	217,100	217,100	238,600	238,600	251,600
NW Power & Conservation Council	11,236	11,446	11,629	11,812	12,004
Energy Efficiency & Renewable Resources	92,800	85,791	86,503	87,213	87,962
Total, Power Services - Operating Expenses	2,195,355	2,277,766	2,287,716	2,155,695	2,190,412

Power Services – Operating Expense

Overview

Production includes all Bonneville non-federal debt service (including Energy Northwest debt service), O&M costs for power system generation resources (including a large nuclear plant, business operations, short- and long-term power purchases⁴), electric utility marketing of power, and oversight of hydro and nuclear projects. Bonneville develops products and services to meet the needs of Bonneville customers and stakeholders, and acquires power as needed.

In FY 2010, Bonneville completed a long-term Resource Program to guide potential future resource acquisitions needed to meet Bonneville's supply obligations. In the event that Bonneville does acquire output from a resource on a long term basis, Bonneville will modify its budget to reflect the acquisition. Bonneville is proposing to acquire conservation from a third party beginning in FY 2016.

Associated Projects represents funding for operation and maintenance costs for the FCRPS, minor additions, improvements and replacements, and liabilities of the Corps and Reclamation hydroelectric projects in the Pacific Northwest, which serve many purposes. All agencies emphasize efficient power production from existing facilities and improvement of the performance and availability of power generating units. Bonneville pays additional financing costs of the FCRPS facilities through its Interest Expense and Capital Transfer budget programs. Bonneville provides funding for the operations and maintenance costs that are part of the Lower Snake River Compensation Plan (LSRCP) hatcheries. Bonneville is responsible for annual payments to the Confederated Tribes of the Colville Reservation for their claims concerning their contribution to the production of hydropower by the Grand Coulee Dam in accordance with the Settlement Agreement between the United States and the Tribes (April 1994).

Bonneville's Fish and Wildlife program provides for extensive protection, enhancement, and mitigation of Columbia River Basin fish and wildlife adversely affected by the development and operation of federal hydroelectric projects on the Columbia River and its tributaries from which Bonneville markets power. Bonneville satisfies most of its fish and wildlife responsibilities by funding projects and activities designed to be consistent with the Council's Program developed pursuant to Section 4(h) of the Northwest Power Act. Through the Council's Program Bonneville also implements measures to aid in the protection of fish in the Columbia River and its tributaries, listed as threatened or endangered under the ESA. Bonneville pursues a comprehensive approach to integrate the ESA requirements of the FCRPS biological opinions with the broad resource protection, mitigation and enhancement objectives of the Council's Program (see ESA discussion in the Power Capital Overview section).

Bonneville's mitigation and recovery expenditures will focus on activities that benefit Columbia River Basin fish and wildlife resources, following priorities established through ESA consultations and the Council's Program, including:

- increase survival of ESA-listed and non-listed fish at FCRPS dams and reservoirs;
- increase survival of ESA-listed and non-listed fish throughout their life cycle by protecting and enhancing important habitat areas;
- reform hatchery practices that affect ESA-listed populations and use hatcheries to contribute to conservation and recovery of ESA-listed and non-listed fish;
- provide for offsite mitigation projects and habitat, passage, and other improvements that address limiting factors for target species;
- reduce harvest-related mortality on ESA-listed and non-listed fish and encourage sustainable fisheries; and
- support a focused and well-coordinated research, monitoring, and evaluation program.

To the extent possible, Bonneville is integrating the actions implemented in response to the FCRPS BiOps with projects implemented under the Council's Program. Sub-basin plans and Accords that include prioritized strategies for mitigation actions will help guide project selection that meets Bonneville's ESA, Clean Water Act, Northwest Power Act, and other responsibilities. In order to address the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, Bonneville continues its ongoing work with

⁴ Including expenses associated with the use of power financial instruments to hedge Bonneville's exposure to market price risk and certain index sales contract provisions as permitted by Bonneville's Power Transacting Risk Management Policy.

the Council and the regional fish and wildlife managers, customers, and Tribes to review projects to ensure ratepayers fund appropriate mitigation. For example, Bonneville established a cost sharing Memorandum of Understanding (MOU) with the U.S. Forest Service in 2005, and renewed it in 2010, that requires a programmatic 30 percent cost share for fish mitigation projects funded by Bonneville on U.S. Forest Service lands. Bonneville continues to operate in a cooperative manner with the U.S. Forest Service.

The Energy and Water Development Appropriations Act of 1996 added section 4(h)(10)(D) to the Northwest Power Act, directing the Council to appoint an ISRP “to review a sufficient number of projects” proposed to be funded through Bonneville’s fish and wildlife budget “to adequately ensure that the list of prioritized projects recommended is consistent with the Council’s Program.” The Northwest Power Act further states that “in making its recommendations to Bonneville, the Council shall consider the impact of ocean conditions on fish and wildlife populations and shall determine whether the projects employ cost effective measures to achieve program objectives.” Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council has shifted to a multi-year project review cycle during which the ISRP reviews categories of projects grouped together; e.g., all fish and wildlife projects were recently reviewed.

The Council’s major activities include the periodic preparation of a Northwest Conservation and Electric Power Plan (a 20-year electric energy demand and resources forecast and conservation program— known as the Power Plan) and a Columbia River Basin Fish and Wildlife Program. The Northwest Power Act directs that expenses of the Council, subject to certain limits based on forecasted Bonneville power sales, shall be included in Bonneville’s annual budget to Congress. Funding for the Council is provided by Bonneville and is recovered through Bonneville power rates.

Bonneville will acquire conservation resources consistent with the Council’s Power Plan and act as a catalyst for energy efficiency. Such actions will: 1) meet energy efficiency targets; 2) achieve a least cost resource mix; 3) lessen the cost impacts of power purchases; 4) avoid the costs of ramping programs and infrastructure up and down; 5) extend the value of the FCRPS to customers; and 6) build the region’s resource portfolio with energy efficiency. Bonneville is also exploring how best to integrate demand-side management, distributed generation, and other leading edge technologies (i.e., Energy Web and Smart Grid applications) into its generation and transmission planning processes.

The Residential Exchange Program (REP) was created by the Northwest Power Act to extend the benefits of low-cost federal power to the residential and small farm customers of Pacific Northwest electric utilities that have high average system costs. Currently, the region’s six investor-owned utilities (IOUs) and two of the region’s consumer-owned utilities are actively participating in the REP. Payments under the REP are made to individual IOUs based on the difference between Bonneville’s utility-specific PF Exchange rates and each utility’s average system cost (ASC), times a utility’s residential and farm loads. The process and calculation of ASCs are governed by the 2008 Average System Cost Methodology (ASCM). Participating utility ASCs are established in a public process that occurs prior to and during Bonneville’s power rate case. Bonneville’s utility-specific Priority Firm (PF) Exchange rates are determined each rate period. As described below, Bonneville and regional parties reached a settlement of the REP in 2011 in which the total amount of REP benefits available to the IOUs has been settled through 2028. Payments to the IOUs are made monthly based on historical invoiced exchange loads.

Over the past decade, regional parties have filed multiple lawsuits challenging BPA’s implementation of the REP. These lawsuits have been consolidated into four cases currently pending before the U.S. Court of Appeals for the Ninth Circuit. On July 26, 2011, Bonneville adopted a regionally supported settlement, referred to as the 2012 REP Settlement, which should resolve or render moot many legal challenges to Bonneville’s implementation of the REP. The settlement reduces a significant element of litigation uncertainty and risk from Bonneville’s power rates for the vast majority of utilities in the region. Under the Settlement, the Region’s six IOUs will receive about \$4.1 billion in REP payments over the 17-year term of the settlement, beginning at \$182.1 million in FY 2012 and increasing to \$286.1 million in FY 2028. Distribution of the REP payments among the IOUs will be determined each rate period based on the difference between the utilities’ respective ASCs and Bonneville’s utility-specific PF Exchange rates. In addition to this settlement, Bonneville has reached related REP settlements with two consumer-owned utilities, only one of which is currently receiving REP benefits. A single challenge to the 2012 REP Settlement was rejected by the U.S. Court of Appeals for the Ninth Circuit in October of 2013. Following this decision, Bonneville and other settling parties requested the U.S. Court of Appeals for the Ninth Circuit to dismiss the REP matters from the pending litigation. To date, the Court has not ruled on this matter.

Explanation of Changes

Bonneville's budget includes \$2,195 million in FY 2016 for Power Services operating expenses, which is a 6.8 percent increase over the FY 2015 forecasted level. The increase reflects continuing emphasis on operation and maintenance of hydro generation projects on the FCRPS.

The FY 2016 budget increases the level for Production (+\$89.4 million), and increases the levels for Associated Projects (+\$26.8 million), Fish & Wildlife (+\$7.0 million), Planning Council (+\$0.5 million), Energy Efficiency & Renewable Resources (+\$2.3 million) and Residential Exchange (+\$13.2 million).

Production (\$K)		
FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
1,532,435	1,062,935	1,152,349

Overview

Power Purchases: Includes purchased power to cover power supply obligations as well as balancing loads with generation from the hydro system. These purchases can be made in the form of long-term purchases to meet supply obligations based on long-term planning requirements or they can be made within the year due to the monthly shape of the loads and the monthly shape of the hydro electric generation. Also, purchases can be made within the month and within the day to fill shortages due to fluctuations in the hydro system and load changes.

Power Scheduling/Marketing: Schedule and market (buy/sell) electric energy with Bonneville customers and the Pacific Northwest's interconnected utilities. Scheduling includes Power Services' implementation of physical and memo power schedules and associated transmission schedules, implementation of Electronic Tagging (ETag) in accordance with NERC and in accordance with FERC, implementation of electronic scheduling and the Columbia Grid as it evolves.

Columbia Generating Station (formerly WNP-2): Continue to acquire full capability of CGS. CGS is on a 24-month fuel and outage cycle. A maintenance and refueling outage is planned for the Spring of calendar year 2015.

Continued investments in Production include:

-Continuous Activity (all years)

- Provide oversight of all signed contracts including oversight of large thermal generating plants from which Bonneville purchases capability to ensure that all Bonneville approval rights are protected; coordinate, communicate, and administer agreements, issues, and programs between Bonneville and the project owners.
- Continue to provide wind resource integration services for customer wind generation.
- Power Purchases. Power expenditures could increase somewhat due to the implementation of the Oversupply Management Protocol.
- Power Scheduling/Marketing.
- Continue to provide oversight of all contracts signed to date. Pursue cost-effective means to mitigate capacity demands associated with interconnecting large amounts of wind into the Bonneville system. Pursue acquisition of additional cost-effective renewable generation to meet load growth. Continue to provide oversight on the wind resource integration services currently purchased by public power customers and offer additional renewable resource shaping services to such customers using wind generation to serve their load.

**Associated Projects
(\$K)**

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
411,331	428,078	454,869

Overview

Support FCRPS project costs and work to strengthen interagency and regional relationships to improve project performance, supporting functions, and to better understand project resource requirements and costs. This helps to maintain FCRPS reliability and system performance, as well as to attain Bonneville's strategic business objectives.

Continued investments in Associated Projects include:

-Continuous Activity (all years)

Bureau of Reclamation:

- Continue direct funding Reclamation O&M power activities.

Corps of Engineers:

- Continue direct funding Corps O&M power activities.

Fish & Wildlife (\$K)		
FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
231,781	260,000	267,000

Overview

Bonneville now implements a stable, mature fish and wildlife mitigation program based on recommendations of the region’s fish and wildlife management agencies and tribes to the Council. Several recent Council reviews have made additional fish and wildlife project recommendations to Bonneville. Bonneville, in coordination with the Council, reviews new and on-going projects for consistency with the Program. Bonneville reviews and resets project-specific funding commitments annually, including projects under the FCRPS BiOps, Fish Accords, and other agreements. Bonneville informs its funding decisions with the management objectives and priorities in the Council’s Program (including Sub-basin Plans and ISRP reviews), and the Accords as it integrates their implementation with actions necessary to fulfill ESA responsibilities as described in the NOAA Fisheries’ and USFWS’s BiOps. Regular coordination continues among Bonneville, Council, federal resource management agencies, states, tribes and others on implementation priorities.

Continued investments in Fish & Wildlife include:

-Continuous Activity (all years)

- Anadromous Fish: Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, and the Willamette Agreement. Prioritize projects that address the factors that limit mitigation success and that fulfill Bonneville’s responsibility for mitigating the impacts from the FCRPS power facilities. Implement and develop activities that protect and enhance tributary and estuary habitat; improve mainstream habitat; reduce potentially harmful hatchery practices on ESA-listed populations; and contribute to sustainable fisheries.
- Resident Fish: Implement activities to determine the impacts of the FCRPS on lamprey, sturgeon and bull trout and mitigate for those impacts, and promote the reproduction and recruitment of Kootenai River white sturgeon. These activities have been selected in response to the USFWS’s 2000 bull trout and 2006 Libby BiOp, the Council’s Program, and the Fish Accords.
- Continue mitigation using resident fish to offset anadromous fish losses (substitution); mitigate for reservoir power operation impacts to resident fish and wildlife by seeking projects that provide dual benefits, i.e., benefits to both. Those resident fish habitat acquisition projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget.
- Wildlife: Use existing Bonneville policies to continue the current effort to mitigate wildlife in a manner consistent with the Council’s Program and fulfill commitments in wildlife agreements such as the Kalispel Agreement, Willamette Wildlife Agreement, and Southern Idaho Wildlife Agreement. Those wildlife projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited according to Bonneville’s crediting policy and applicable mitigation contracts.

Residential Exchange, Northwest Power and Conservation Council, and Energy Efficiency & Renewable Resources
(\$K)

FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
284,447	305,137	321,136

Overview

Residential Exchange Program

- Includes forecasted REP benefits based on the 2012 REP Settlement.

Northwest Power and Conservation Council

- Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities.

Energy Efficiency & Renewable Resources

- Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville's contractual obligation to serve customer loads.
- Provide credible, unbiased information, and technical and financial support to energy efficiency purposes. Bonneville has a statutory responsibility to encourage and support the development of conservation in the Pacific Northwest. Bonneville is participating with other regional entities to support market transformation and development activities that meet the needs of Bonneville customers and create business opportunities for the private sector in the Pacific Northwest. Toward that end, Bonneville has been helping create a delivery infrastructure to ensure conservation savings are installed efficiently and effectively throughout the region.
- Continue to purchase the output from renewable resources such as wind and solar.

Activities, Milestones, and Explanation of Changes

FY 2015 Estimate	FY 2016 Estimate	Explanation of Changes FY 2016 vs FY 2015 Estimate (Dollars in Thousands)
<p>Power Services - Operating Expense \$2,056,150,000</p>	<p>\$2,195,355,000</p>	<p>+\$139,204,000</p>
<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	<p>The increase reflects higher capital related and power purchase costs.</p>
<p>Associated Project Costs</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	<p>+\$26,791/+6.3%</p> <p>The increase reflects changes to security, biological opinion requirements, non-routine extraordinary maintenance, WECC/NERC compliance activities, and improvements, replacements, and minor additions at the projects.</p>
<p>Fish & Wildlife Costs</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 and 2010 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Southern Idaho Agreement and the Willamette Agreement. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 and 2010 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Willamette Agreement and the Southern Idaho Agreement. 	<p>+\$7,000/+2.7%</p> <p>The increase reflects funding associated with Biological Opinions, Fish Accord commitments and Northwest Power Act activities.</p>
<p>Residential Exchange Program</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue to provide REP benefits. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to provide REP benefits. 	<p>+\$13,200/+6.5%</p> <p>The increase reflects the scheduled rise in the amount of REP payments payable to the IOUs prescribed by the Residential Exchange Settlement.</p>

FY 2015 Estimate	FY 2016 Estimate	Explanation of Changes FY 2016 vs FY 2015 Estimate (Dollars in Thousands)
<p>NW Power & Conservation Council</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	<p>+\$452/4.2%</p> <p>The increase reflects continuing emphasis on NW Power and Conservation Council.</p>
<p>Energy Efficiency & Renewable Resources</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville's contractual obligation to serve customer loads. Continue to purchase the output from renewable resources such as wind and solar. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville's contractual obligation to serve customer loads. Continue to purchase the output from renewable resources such as wind and solar. 	<p>+\$2,347/+2.6%</p> <p>The increase reflects continuing emphasis on energy efficiency program consistent with the Power Plan and increased Renewable Resource acquisition costs.</p>

**Transmission Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate	FY 2016 vs FY 2015	
				\$	%
Transmission Services - Operating Expense					
Engineering	93,453	81,935	82,253	318	.4%
Operations	156,039	170,282	176,033	5,751	3%
Maintenance	182,870	189,873	189,585	-288	-.2%
Total, Transmission Services - Operating Expense	432,362	442,090	447,871	5,781	1%

Outyears (\$K)

	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate
Transmission Services - Operating Expense					
Engineering	82,253	82,833	84,035	85,245	86,509
Operations	176,033	182,443	186,166	189,939	193,848
Maintenance	189,585	191,556	195,271	199,025	202,929
Total, Transmission Services - Operating Expense	447,871	456,831	465,472	474,209	483,286

Transmission Services – Operating Expense

Overview

This activity provides for the transmission system services of engineering, operations, and maintenance for Bonneville's electric transmission system, and the associated power system control and communication facilities. Primary strategies of this program are: 1) maintain the safety and reliability of the transmission system; 2) increase the focus on meeting customers' needs; 3) optimize the transmission system; 4) provide open and non-discriminatory transmission access; and 5) improve Bonneville's cost effectiveness.

Explanation of Changes

Bonneville's budget includes \$448 million in FY2016 for TS expense which is a 1 percent increase over the FY 2015 forecasted level. The increase reflects continuing operation and maintenance of Bonneville's transmission assets.

The FY 2016 budget increases the levels for Engineering (+\$0.3 million) and Operations (+\$5.7 million), and decreases the level for Maintenance (-\$0.3 million)

Engineering (\$K)		
FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
93,453	81,935	82,253

Overview

Continue efforts to identify best methods for improving system reliability and maintenance practices, and continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system.

Continued investments in Engineering include:

Continuous Activity (all years)

- **Asset Management:** Continue deploying the Asset Management approach to sustain the existing assets and expanding the system to meet Agency objectives using ISO 5000 as guidance for improving Asset Management.
- **R&D:** Conduct research focused on technologies related to business challenges Bonneville faces including reliability, energy efficiency, and integration of renewable energy resources. Technologies of interest are identified in Bonneville's Technology Roadmaps. A portfolio of research is selected every year through Bonneville's Portfolio Decision Framework.
- **Technical Support:** Provide technical support activities, such as transmission system planning and studies to optimize portions of the system. Provide support for non-wires solutions studies and pilot projects.
- **Capital-to-Expense Adjustments:** Conduct annual analysis of Bonneville's outstanding capital work orders to assess whether they should be expensed. As obsolete inventory is identified and disposed of, it is expensed.
- **Regulatory Fees:** WECC dues and loop flow payments, DOC/NTIA licensing costs for radio frequencies, DOE Radio Spectrum staff and contractor support and NERC Critical Infrastructure Protection (CIP) compliance program costs. Includes membership in ColumbiaGrid.
- **Reimbursable Transactions:** Enter into written agreements with federal and non-federal entities that have work or services to be performed by Bonneville staff at the expense of the benefiting entities. The projects must be beneficial, under agreed upon criteria, to Bonneville operations and to the federal or non-federal entity involved or otherwise be aligned with or supportive of Bonneville's strategic objectives. Additionally, these activities generally contribute to more efficient or reliable construction of the federal transmission system or otherwise enhance electric service to the region.
- **Leased and Other Costs:** Includes leases and other costs of financing transmission, delivery and voltage support facilities when such arrangements are operationally feasible and cost effective to deliver power. Capitalized leases enable Bonneville to continue to invest in infrastructure to support a safe and reliable system for the transmission of power. Other costs included are the accrued interest costs associated with Large Generator Interconnection Agreements (LGIA).

Operations (\$K)		
FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
156,039	170,282	176,033

Overview

Substation Operations: Perform operations functions necessary to provide electric service to customers and to protect the federal investment in electric equipment and other facilities. Includes equipment adjustments, switching lines and equipment during emergencies or maintenance, isolating damaged equipment, restoring service to customers, inspecting equipment, reading meters, etc.

Power System Dispatching and Supporting Functions: Perform central dispatching, control, and monitoring of the electric operation of the federal transmission system. Also includes load, frequency and voltage control of federal generating plants, and coordinating long- and short-term outages of system equipment. In addition, provides technical engineering support of dispatching function and provides all technical and systems support for Dittmer Control Center (DCC) and Munro Control Center (MCC).

Marketing and Sales: Provide management and direction of transmission rates, and provide business strategy in marketing of transmission and ancillary products and services of Transmission Services. Involve customers and constituents in the process of product and rate development. Maintain accurate and complete historical records of current and past legacy transmission agreements. Provide guidance for current and future transmission contract negotiations. Provide financial analysis of market strategies. Monitor and report on the financial health of Transmission Services. Support cost management by effective reporting and analysis of current expenditures. Ensure official budget submittals reflect current management financial strategies and adequately fund transmission programs.

Transmission Scheduling: Provide non-discriminatory, open access to the Bonneville transmission system consistent with Bonneville’s Open Access Transmission Tariff (OATT). Schedule transmission capacity to eligible Bonneville customers, which include customers acquiring services under Use of Facilities (UFT), Formula Power Transmission (FPT), Integration of Resources (IR), and Part II or Part III, of the OATT. Manage the reservations and scheduling of all transmission services associated with the OATT. Update practices, policies and commercial systems to accommodate a large diversity of resources, including wind.

Continuous Activity (all years):

- Continue to operate within parameters of NERC and WECC.
- Continue support of increased compliance activities related to the reliability of the transmission system, including cyber security.
- Continue developing facilities, policies, procedures and implementing systems to support integrating the diversity of resources, including wind, into the transmission grid.
- Continue preparation for increased complexity of transmission scheduling, power system operations and dispatching, including congestion management and outage scheduling.
- Continue developing facilities to support the network operations center and one transmission scheduling operations facility.
- Continue developing a long-term approach to optimize transmission availability through streamlined, cost-effective, and sustainable processes.
- Continue to address succession planning issues across key functions.
- Continue development and implementation of business systems and tools.

Maintenance (\$K)		
FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate
182,870	189,873	189,585

Overview

In all aspects of maintenance, Bonneville is continuing the use of Reliability Centered Maintenance (RCM) practices. The use of RCM practices is focused on improving system reliability, increasing availability and meeting new and existing compliance regulations at lowest lifecycle costs. In addition Bonneville is deploying Asset Management to optimize maintain/replace decision making. Maintenance costs are expected to increase as Bonneville addresses the aging transmission system, meeting Reliability Standards, including Vegetation Management, and environmental constraints associated with construction, enhancement, and maintenance of the system. The Bonneville transmission system encompasses 15,169 circuit miles on over 11,860 right-of-way miles (many of these miles are through rugged, inaccessible terrain).

Continued investments in Maintenance include:

-Continuous Activity (all years)

- Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets.
- Continue refining processes and procedures for monitoring and tracking compliance activities related to the reliability of the transmission system.
- Continue to improve system availability performance through new maintenance procedures and work practices.
- Continue to develop and implement work practices and procedures for implementation of a new specialty crew using bare-handing live line practices for maintenance of high-voltage transmission lines.
- Continue increased emphasis on replacement of line hardware (life extension programs for insulators, connectors, dampers & fiber optic cable hardware).
- Continue to prepare for the impact of an expected high attrition rate among Bonneville’s aging workforce by recruiting apprentices and replacements for critical minimum crew size workload positions.
- Increase outage-scheduling planning and coordination to increase customer satisfaction and system availability.
- Maintain vegetation management levels to ensure system reliability.
- Continue access road work to provide reliable access to facilities and ensure environmental compliance.
- Continue improving environmental stewardship.

Transmission Line Maintenance: Maintain and repair 15,169 circuit miles of high voltage transmission lines, of which over 7,617 km (4,734 circuit miles) are 500 kV transmission extra-high voltage (EHV). Maintenance of EHV lines is two and one-half times more labor-intensive than maintenance of lower transmission voltages, although more efficient in transmission of power. This responsibility includes maintaining transmission rights-of-way to ensure system reliability, safety, and environmental compliance. Adopt work practices that improve system availability, reliability, and compliance.

Right-of-Way Maintenance: Maintain over 11,860 of Bonneville’s right-of-way miles. This responsibility includes vegetation management, danger tree management, and access road maintenance to ensure system reliability, safety, and environmental compliance. Adopt procedures and processes that improve system availability, reliability, environmental compliance, and reliability compliance. Continue to deploy new technologies such as LiDAR (Light Detection and Ranging) to reliably and cost-effectively manage vegetation.

Substation Maintenance: Maintain and repair the transmission system power equipment located in Bonneville’s 260 substations. Work includes inspections, diagnostic testing, and predictive and condition-based maintenance.

System Protection Maintenance: Maintain relaying metering and remedial action scheme equipment used to control and protect the electrical transmission system and to meter energy transfers for the purpose of revenue billing. Additionally,

field-engineering services provide technical advice and assure the correct operation of power system relaying and special control systems used to support interregional energy transmission capabilities.

Power System Control Maintenance: Test, repair, and provide field engineering support of Bonneville's highly complex equipment, communications, and control systems, including seven major microwave systems, fiber optic systems, and other critical communications and control equipment that support the power system.

Non-Electric Plant Maintenance: Maintain and manage Bonneville's non-electric facilities. Includes site, building, and building utility maintenance; custodial services; station utility; and other maintenance service activities, as well as, facilities asset management on Bonneville-owned or Bonneville-leased non-electric facilities.

Maintenance Standards and Engineering: Establish, monitor, and update system maintenance standards, policies, and procedures, and review and update long-range plans for maintenance of the electric power transmission system.

Activities, Milestones, and Explanation of Changes

FY 2015 Estimate	FY 2016 Estimate	Explanation of Changes FY 2016 vs FY 2015 Estimate (Dollars in Thousands)
Transmission Services - Operating Expense \$442,090,000	\$447,871,000	+\$5,781,000
<p>Milestones:</p> <ul style="list-style-type: none"> Continue efforts to identify best methods for improving system reliability and maintenance practices. Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue efforts to identify best methods for improving system reliability and maintenance practices. Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	<p>The increase reflects emphasis on system reliability standards compliance and research and development.</p>
<p>Operations</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue to operate within parameters of NERC and WECC. Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue to operate within parameters of NERC and WECC. Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	<p>+\$5,751/+3.4%</p> <p>The increase reflects continued emphasis on reliability compliance activities, wind integration activities, security, and control center systems support.</p>
<p>Maintenance</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	<p>-\$288/-0.2%</p> <p>The decrease reflects a small reduction in the implementation of facilities asset management plans, continued implementation of live-line crew, NERC/WECC compliance activities related to land rights and vegetation management, continuing maintenance program activities, including system protection, right-of-way, line maintenance, and performance improvements.</p>

Interest, Pension and Post-retirement Benefits
Operating Expense
Funding Schedule by Activity
Funding (\$K)

	FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate	FY 2016 vs FY 2015	
				\$	%
Interest, Pension and Post-retirement Benefits					
BPA Bond Interest (Net)	137,733	140,796	115,304	-25,492	-18%
BPA Appropriation Interest	14,514	14,257	14,091	-166	-1%
Corps of Engineers Appropriation Interest	160,959	160,606	169,668	9,062	6%
Lower Snake River Comp Plan Interest	16,525	16,525	16,525	-	0%
Bureau of Reclamation Appropriation Interest	43,615	43,526	43,616	90	.2%
Bond Premiums Paid/Discounts (not capitalized)	-40,000	0	0	0	-
Subtotal, Interest – Operating Expense	333,370	375,710	359,204	-16,506	-4%
Additional Pension and Post-retirement Benefits	37,002	37,638	38,286	648	2%
Total, Interest, Pension and Post-retirement Benefits	370,372	413,348	397,490	-15,858	-4%

Outyears (\$K)

	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate
Interest, Pension and Post-retirement Benefits					
BPA Bond Interest (Net)	115,304	149,556	199,734	223,091	251,131
BPA Appropriation Interest	14,091	10,078	7,466	1,083	250
Corps of Engineers Appropriation Interest	169,668	166,850	162,736	156,157	157,782
Lower Snake River Comp Plan Interest	16,525	16,525	16,525	16,525	16,525
Bureau of Reclamation Appropriation Interest	43,616	43,616	43,616	40,457	40,457
Bond Premiums Paid/Discounts (not capitalized)	0	0	0	0	0
Subtotal, Interest – Operating Expense	359,204	386,626	430,078	437,313	466,145
Additional Pension and Post-retirement Benefits	38,286	39,226	39,814	40,412	41,018
Total, Interest, Pension and Post-retirement Benefits	397,490	425,852	469,892	477,725	507,162

Interest, Pension and Post-retirement Benefits Operating Expense

Overview

Interest expense provides for the payment of interest due on bonds issued to the U.S. Treasury and appropriations repayment responsibilities. The appropriation repayments relate to capital investment in FCRPS hydroelectric generating and transmission facilities of Bonneville, the Corps and Reclamation. Investments were financed by Congressional appropriations and Bonneville borrowings from the U.S. Treasury. Bonneville repays these amounts through revenue raised in its power sales and transmission services revenues.

Since receiving U.S. Treasury borrowing authority in 1974 under the Transmission Act, all Bonneville U.S. Treasury borrowing has been at market rates. As of October 1, 1996, all of Bonneville's repayment obligations on FCRPS appropriated investment (Corps and Reclamation FCRPS investment and Bonneville investment financed with appropriations prior to the Transmission Act that were unpaid as of September 30, 1996) were restructured and assigned new current-market interest rates. The Bonneville Appropriations Refinancing Act of 1996 (Refinancing Act) called for resetting (reducing) the unpaid principal of FCRPS appropriations and reassigning (increasing) interest rates. New principal amounts were established as of the beginning of FY 1997 at the present value of the principal and annual interest payments Bonneville would make to the U.S. Treasury for these obligations in the absence of the legislation, plus \$100 million. The new principal amounts were assigned prevailing market interest rates as of October 1, 1996. Bonneville's outstanding appropriations repayment obligations at the end of FY 1996 were \$6.6 billion with a weighted average interest rate of 3.4 percent. The refinancing reduced the principal amount to \$4.1 billion with a weighted average interest rate of 7.1 percent. Implementation of the refinancing took place in 1997 after audited actual financial data were available. Pursuant to the legislation, Bonneville submitted its calculations and interest rate assignments implementing the Refinancing Act to the U.S. Treasury for its review and approval. The U.S. Treasury approved the implementation calculations in July 1997. The Refinancing Act also calls for all future FCRPS appropriations to be assigned prevailing U.S. Treasury yield curve interest rates. Bonneville's outstanding appropriations are subject to early prepayment prior to their stated maturities.

Interest estimates are a direct function of costs of U.S. Treasury borrowing to Bonneville, repayment status of outstanding FCRPS investments, and projected additions to FCRPS plant in service. These estimates may change over time depending on forecasted market conditions. The interest cost estimates include the impact of Bonneville's appropriation refinancing legislation.

Federal employees associated with the operation of the FCRPS participate in either the Civil Service Retirement System or the Federal Employees Retirement System. Employees may also participate in the Federal Employees Health and Benefit Program and the Federal Employee Group Life Insurance Program. All such postretirement systems and programs are sponsored by the Office of Personnel Management; therefore, Bonneville does not record any accumulated plan assets or liabilities related to the administration of such programs. Bonneville makes additional annual contributions to the General Fund of the U.S. Treasury (receipt account 892889) related to the Federal post-retirement benefit programs provided to employees associated with the operation of the FCRPS. These payments were begun with the FY 2001 Administration's budget which assumed Bonneville would prospectively cover the unfunded liability that accrues in fiscal years after FY 1997 of the Civil Service Retirement and Disability Fund (Disability Fund), the Employees Health Benefits Fund (Health Fund), and the Employees Life Insurance Fund (Insurance Fund) that it had not covered prior to FY 1998. Bonneville's additional annual contributions include amounts relating to pension and post-retirement benefits for Bonneville and the power-related portion of the Corps and Reclamation projects.

**Capital Transfers
Funding Schedule by Activity
Funding (\$K)**

	FY 2014 Actual	FY 2015 Estimate	FY 2016 Estimate	FY 2016 vs FY 2015	
				\$	%
Capital Transfers					
BPA Bond Amortization ¹	246,000	111,151	52,871	-58,280	-52%
Reclamation Appropriation Amortization	0	0	0	0	0%
BPA Appropriation Amortization	0	98,119	55,347	-42,772	-44%
Corps Appropriation Amortization	321,000	0	98,682	98,682	98,682%
Total, Capital Transfers	567,000	209,270	206,900	-2,370	-1%

Outyears (\$K)

	FY 2016 Estimate	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate
Capital Transfers					
BPA Bond Amortization ¹	52,871	87,032	13,840	536,297	499,339
Reclamation Appropriation Amortization	0	0	44,125	0	0
BPA Appropriation Amortization	55,347	36,051	88,369	11,565	3,462
Corps Appropriation Amortization	98,682	98,196	117,817	11,054	137
Total, Capital Transfers	206,900	221,279	264,151	558,916	502,938

Overview

This activity conveys funds to the U.S. Treasury for repayment of certain FCRPS costs not included in the Associated Project Costs budget. Since capital transfers are cash transactions, they are not considered budget obligations.

¹ Bonneville "Bond(s)" in this FY 2016 Budget refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act (P.L. 93-454), which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

**Bonneville Power Administration
Performance Measures**

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2014	FY 2015	FY 2016
Performance Goal (Measure)	BPA Hydropower Generation Efficiency Performance - Achieve 97% Heavy-Load-Hour Availability (HLHA) through efficient performance of Federal hydro-system processes and assets, including joint efforts of BPA, Army Corps of Engineers, and Bureau of Reclamation. HLHA is actual machine capacity available during heavy-load hours (0700-2200 Monday-Saturday), divided by planned available capacity during heavy-load hours.		
Target	≥ 97.5%	≥ 97.5%	≥ 97.5%
Result	Target Met: 100.7%	Not yet available	Not yet available
Endpoint Target	Maintain at least 97.5% Heavy-Load-Hour Availability.		
Performance Goal (Measure)	BPA Repayment of Federal Power Investment Performance - Meet planned annual repayment of principal on Federal power investments.		
Target	≥ 100%	≥ 100%	≥ 100%
Result	Target Met: 100%	Not yet available	Not yet available
Endpoint Target	Continue to meet planned annual repayment of principal.		
Performance Goal (Measure)	BPA System Reliability Performance - NERC Rating - Attain average North American Reliability Council (NERC) compliance ratings for NERC Control Performance Standard 1 (CPS1) which measures generation/load balance on one-minute intervals (rating > or = 100%).		
Target	CPS1 ≥ 100%	CPS1 ≥ 100%	CPS1 ≥ 100%
Result	Target Met: 130.39%	Not yet available	Not yet available
Endpoint Target	Maintain CPS1 score of >= 100%.		

Additional Tables

**BONNEVILLE POWER ADMINISTRATION
TOTAL OBLIGATIONS/OUTLAYS**

Current Services
(in millions of dollars)

BP-1 SUMMARY^{1/3/}

	2014		2015		2016		2017	2018	2019	2020
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	201	201	204	204	217	217	217	239	239	252
2 Power Services ^{2/}	1,944	1,944	1,491	1,491	1,607	1,607	1,689	1,670	1,530	1,544
3 Transmission Services	773	773	1,146	1,146	1,070	1,070	1,001	911	919	900
4 Conservation & Energy Efficiency	151	151	182	182	188	188	183	187	191	195
5 Fish & Wildlife	269	269	312	312	322	322	305	300	323	330
6 Interest/ Pension ^{4/}	370	370	413	413	397	397	426	470	478	507
7 Associated Project Cost - Capital	58	58	212	212	241	241	270	281	314	334
8 Capital Equipment	30	30	35	35	37	37	29	11	6	4
9 Planning Council	10	10	11	11	11	11	11	12	12	12
10 Misc. Accounting Adjs.	0	0	0	0	0	0	0	0	0	0
11 Projects Funded in Advance	385	385	30	30	30	30	30	30	50	50
12 Capitalized Bond Premiums	0	0	0	0	2	2	2	2	2	2
13 TOTAL OBLIGATIONS/ OUTLAYS^{3/}	4,192	4,192	4,036	4,036	4,122	4,122	4,164	4,112	4,063	4,129

REVENUES AND REIMBURSEMENTS

Current Services

(in millions of dollars)

FISCAL YEAR

	2014		2015		2016		2017	2018	2019	2020
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
14 Revenues ^{5/}	3,169	3,169	3,849	3,849	4,036	4,036	4,084	4,085	4,065	4,105
15 Project Funded in Advance	385	385	30	30	30	30	30	30	50	50
16 TOTAL	3,554	3,554	3,879	3,879	4,066	4,066	4,114	4,115	4,115	4,155
BUDGET AUTHORITY (NET) ^{6/}	623		888		845		753	596	347	396
17 OUTLAYS (NET) ^{6/7/8}		262		157		56	50	(2)	(51)	(26)

These notes are an integral part of this table.

- ^{1/} This FY 2016 budget includes capital and expense estimates based on IPR and CIR initial proposed spending for FYs 2015-2017 and forecasted data for FYs 2018-2020.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.
- ^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency, and Associated Project Costs which have been shown separately for display purposes.
- ^{3/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.
- ^{4/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.
- ^{5/} Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies, and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.
- ^{6/} BPA received \$48.7 million of additional budget authority in FY 2007 to accommodate the work necessary to relocate the radio spectrum consistent with the Commercial Spectrum Enhancement Act (P.L. 108-494). BPA anticipates returning the forecasted unused balance of approximately \$8.2 million to the U.S. Treasury in FY 2015.
- ^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.
- ^{8/} FY 2015 Net Outlays are calculated using Bonneville's revenue forecast from the BP-14 rate case. FYs 2016 & 2017 Net Outlays are calculated using Bonneville's revenue forecast from the BP-16 rate case. FYs 2018 & 2019 assume no growth in Offsetting Collections compared to FYs 2016 & 2017. FY 2020 assumes a 1% growth in Offsetting Collections.

EXPENSED OBLIGATIONS/OUTLAYS ^{1,4/}
Current Services
(in millions of dollars)
FISCAL YEAR

BP-2

	2014		2015		2016		2017	2018	2019	2020
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	201	201	204	204	217	217	217	239	239	252
2 Power Services ^{2/}	1,944	1,944	1,491	1,491	1,607	1,607	1,689	1,670	1,530	1,544
3 Transmission Services	432	432	442	442	448	448	457	465	474	483
4 Conservation & Energy Efficiency	73	73	90	90	93	93	86	87	87	88
5 Fish & Wildlife	232	232	260	260	267	267	274	281	288	295
6 Interest/ Pension ^{3/}	370	370	413	413	397	397	426	470	478	507
7 Planning Council	10	10	11	11	11	11	11	12	12	12
8 TOTAL EXPENSE	3,263	3,263	2,912	2,912	3,041	3,041	3,160	3,223	3,108	3,181
9 Projects Funded in Advance	385	385	30	30	30	30	30	30	50	50

CAPITAL OBLIGATIONS/OUTLAYS ^{1/}

Current Services
(in millions of dollars)

FISCAL YEAR

BP-2 continued	2014		2015		2016		2017	2018	2019	2020
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
10 Conservation & Energy Efficiency	78	78	92	92	95	95	98	101	104	107
11 Transmission Services	341	341	704	704	622	622	544	446	445	416
12 Associated Project Cost	58	58	212	212	241	241	270	281	314	334
13 Fish & Wildlife	37	37	52	52	55	55	31	19	35	35
14 Capital Equipment	30	30	35	35	37	37	29	11	6	4
15 Capitalized Bond Premiums	0	0	0	0	2	2	2	2	2	2
16 TOTAL CAPITAL INVESTMENTS	544	544	1,095	1,095	1,052	1,052	974	859	906	898
17 TREASURY BORROWING AUTHORITY TO										
18 FINANCE CAPITAL OBLIGATIONS ^{4/}	544		1,095		1,052		974	859	906	898

These notes are an integral part of this table.

^{1/} This FY 2016 budget includes capital and expense estimates based on IPR and CIR initial proposed spending for FYs 2015-2017 and forecasted data for FYs 2018-2020.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{4/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

CURRENT SERVICES
(in millions of dollars)

CAPITAL TRANSFERS

	2014
	Pymts
Amortization:	
19 BPA Bonds	246
20 Reclamation Appropriations	
21 BPA Appropriations	
22 Corps Appropriations	321
23 TOTAL CAPITAL TRANSFERS	567

FISCAL YEAR

2015	2016	2017	2018	2019	2020
Pymts	Pymts	Pymts	Pymts	Pymts	Pymts
111	53	87	14	536	499
			44		
98	55	36	88	12	3
0	99	98	118	11	0
209	207	221	264	559	503

24 FULL-TIME EQUIVALENT (FTE)	2,893
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STAFFING

3,100	3,100	3,100	3,100	3,100
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PROGRAM & FINANCING SUMMARY

Current Services
(in millions of dollars)

Identification Code 89-4045-0-3-271

	est.						
	2014	2015	2016	2017	2018	2019	2020
Program by activities							
Operating expenses							
0.01 Power Services	1,543	1,063	1,152	1,225	1,198	1,051	1,046
0.02 Residential Exchange Program	201	204	217	217	239	239	252
Associated Project Costs							
0.05 Bureau of Reclamation	141	143	157	158	161	163	165
0.06 Corps of Engineers	226	232	244	251	255	259	274
0.07 Colville Settlement	20	21	22	22	23	23	23
0.19 U.S. Fish & Wildlife Service	31	32	32	33	34	34	35
0.20 Planning Council	8	11	11	11	12	12	12
0.21 Fish & Wildlife	231	260	267	274	281	288	295
0.23 Transmission Services	415	442	448	457	465	474	483
0.24 Conservation & Energy Efficiency	73	90	93	86	87	87	88
0.25 Interest	337	376	359	387	430	437	466
0.26 Pension and Health Benefits ^{1/}	37	38	38	39	40	40	41
0.91 Total operating expenses ^{2/}	3,264	2,912	3,040	3,160	3,224	3,107	3,181
Capital investment							
1.01 Power Services	58	212	241	270	281	314	334
1.02 Transmission Services	341	704	622	544	446	445	416
1.03 Conservation & Energy Efficiency	78	92	95	98	101	104	107
1.04 Fish & Wildlife	37	52	55	31	19	35	35
1.05 Capital Equipment	30	35	37	29	11	6	4
1.06 Capitalized Bond Premiums	0	0	2	2	2	2	2
1.07 Total Capital Investment ^{3/}	544	1,095	1,052	974	860	906	898
2.01 Projects Funded in Advanced	385	30	30	30	30	50	50
10.00 Total obligations ^{4/}	4,192	4,036	4,122	4,164	4,112	4,063	4,129

These notes are an integral part of this table.

^{1/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{2/} Assumes expense obligations, not accrued expenses.

Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency, and Associated Project Costs which have been shown separately for display purposes.

^{3/} Assumes capital obligations, not capital expenditures.

^{4/} This FY 2016 budget includes capital and expense estimates based on IPR and CIR initial proposed spending for FYs 2015-2017 and forecasted data for FYs 2018-2020.

For purposes of this table, this FY 2016 budget reflects, for FY 2014, actual third party financing expense only for PFIA.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988 regarding Bonneville's ability to obligate funds.

Program and Financing (continued)

Current Services
(in millions of dollars)

	est.						
	2014	2015	2016	2017	2018	2019	2020
Financing:							
1000 Unobligated balance available, start of year. ^{5/}	8	8	0	0	0	0	0
1050 Unobligated balance available, end of year. ^{5/}	8	8	0	0	0	0	0
1900 Budget authority (gross)	4,191	4,774	4,920	4,867	4,711	4,462	4,551
Budget Authority:							
1400 Permanent Authority: Authority to borrow from Treasury (indefinite) ^{6/}	603	1,095	1,052	974	860	906	898
1800 Spending authority from off-setting collections	3,554	3,879	4,066	4,114	4,115	4,115	4,155
1825 Portion applied to debt reduction	(246)	(209)	(207)	(221)	(264)	(559)	(502)
1850 Spending authority from offsetting collections (adjusted)	1,761	3,679	3,868	3,893	3,851	3,556	3,653
900 Total obligations	4,192	4,036	4,122	4,164	4,112	4,063	4,129
4100 Outlays (gross)	4,192	4,036	4,122	4,164	4,112	4,063	4,129
Adjustments to budget authority and outlays:							
Deductions for offsetting collections:							
4120 Federal funds	(42)	(90)	(90)	(90)	(90)	(90)	(90)
4121 Interest on Federal Securities	2						
4123 Non-Federal sources	(3,514)	(3,789)	(3,976)	(4,024)	(4,025)	(4,025)	(4,065)
4130 Total, offsetting collections	(3,554)	(3,879)	(4,066)	(4,114)	(4,115)	(4,115)	(4,155)
4160 Budget authority (net)	623	895	854	753	596	347	396
4170 Outlays (net) ^{7/8/}	262	157	56	50	(2)	(51)	(26)

These notes are an integral part of this table.

^{5/} Reflects estimated cost for radio spectrum fund.

^{6/} The Permanent Authority: Authority to borrow (indefinite) from the U.S. Treasury amounts reflect both Bonneville's capital program financing needs and either the use of, or creation of, deferred borrowing. Deferred borrowing is created when, as a cash and debt management decision, Bonneville uses cash from revenues to liquidate capital obligations in lieu of borrowing from Treasury. This temporary use of cash on hand instead of borrowed funds creates the ability in future years to borrow money, when fiscally prudent. The FY 1989 Energy and Water Development Appropriations Act (P.L. 100-371 Of 7/19/88) confirmed that Bonneville has authority to incur obligations in excess of U.S. Treasury borrowing authority and cash in the BPA fund.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies, and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

^{8/} FY 2015 Net Outlays are calculated using Bonneville's revenue forecast from the BP-14 rate case. FYs 2016 & 2017 Net Outlays are calculated using Bonneville's revenue forecast from the BP-16 rate case. FYs 2018 & 2019 assume no growth in Offsetting Collections compared to FYs 2016 & 2017. FY 2020 assumes a 1% growth in Offsetting Collections.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4A

	Fiscal Year							
	2014				2015			
	Net Capital Obs	Net Capital Subject to BA	Net Capital Expend.	Bonds Out- Standing	Net Capital Obs	Net Capital Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	3,090	2,548	3,989	3,944	3,388	2,846	4,287	4,242
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	544	544	544		1,095	1,095	1,095	
Treasury Borrowing (Cash)				544				1,095
Less:								
BPA Bond Amortization	246	246	246	246	111	111	111	111
Net Increase/(Decrease):	298	298	298	298	984	984	984	984
Cum.-End-of-Year: Total	3,388	2,846	4,287	4,242	4,372	3,830	5,271	5,226
Total Remaining Treasury Borrowing Amount				3,458				2,474
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2016 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2014-2020.

Cumulative advance amortization payments as of the end of FY 2014 are \$3,060 million.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4B

	2016				2017			
	Net Capital		Net Capital		Net Capital		Net Capital	
	Net Capital	Obs Subject to BA	Net Capital	Bonds Out-Standing	Net Capital	Obs Subject to BA	Net Capital	Bonds Out-Standing
Start-of-Year: Total	4,372	3,830	5,271	5,226	5,371	4,829	6,270	6,225
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	1,052	1,052	1,052		974	974	974	
Treasury Borrowing (Cash)				1,052				974
Less:								
Total BPA Bond Amortization	53	53	53	53	87	87	87	87
Net Increase/(Decrease):								
Total	999	999	999	999	887	887	887	887
Cum.-End-of-Year: Total	5,371	4,829	6,270	6,225	6,258	5,716	7,157	7,112
Total Remaining Treasury Borrowing Amount				1,475				588
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2016 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2014-2020.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4C

Fiscal Year

	2018				2019			
	Net Capital		Net Bonds		Net Capital		Net Bonds	
	Net Capital	Obs Subject	Net Capital	Bonds Out-	Net Capital	Obs Subject	Net Capital	Bonds Out-
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
Start-of-Year: Total	6,258	5,716	7,157	7,112	7,103	6,561	8,002	7,957
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	859	859	859		906	906	906	
Treasury Borrowing (Cash)				859				906
Less:								
Total BPA Bond Amortization	14	14	14	14	536	536	536	536
Net Increase/(Decrease):								
Total	845	845	845	845	370	370	370	370
Cum.-End-of-Year: Total	7,103	6,561	8,002	7,957	7,473	6,931	8,372	8,327
Total Remaining Treasury Borrowing Amount				(257)				(627)
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2016 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2014-2020.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4D

	Fiscal Year			
	2020			
	Net Capital		Net Capital	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	7,473	6,931	8,372	8,327
Plus: Annual Increase				
Cum.-Annual Treasury Borrowing	898	898	898	
Treasury Borrowing (Cash)				898
Less:				
Total BPA Bond Amortization	499	499	499	499
Net Increase/(Decrease):				
Total	399	399	399	399
Cum.-End-of-Year: Total	7,872	7,330	8,771	8,726
Total Remaining Treasury Borrowing Amount				(1,026)
Total Legislated Treasury Borrowing Amount				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2016 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2014-2020.

**BONNEVILLE POWER ADMINISTRATION
POTENTIAL THIRD PARTY FINANCING TRANSPARENCY**

(in millions of dollars)

BP-5

		Fiscal Year						
		2014	2015	2016	2017	2018	2019	2020
Transmission Services - Capital	Requirements							
	Main Grid	47	129	133	184	152	154	125
	Area & Customer Services	10	18	34	14	1	0	0
	Upgrades & Additions	141	310	168	113	63	58	54
	System Replacements	143	247	287	233	230	232	237
	Projects Funded in Advance	270	30	30	30	30	50	50
	Total, Transmission Services - Capital	611	734	652	574	476	495	466

Associated Project Costs - Capital

Requirements	Associated Project Costs	58	212	241	270	281	314	334
	Projects Funded in Advance ^{1/}	115	NA	NA	NA	NA	NA	NA
	Total, Associated Project Costs - Capital	173	212	241	270	281	314	334

Federal and Non-Federal Funding

Sources	Projects Funded in Advance	385	30	30	30	30	50	50
	Treasury Borrowing Authority	399	916	863	814	727	759	750

Scenario

Scenario	Projects Funded in Advance ^{1/}	115	170	35	0	0	0	0
	Third Party Financing	245	250	250	250	250	250	250
	Alternate Treasury Borrowing Authority	NA	496	578	564	477	509	500

These notes are an integral part of this table.

^{1/}In this instance, Projects Funded in Advance represents prepayment of Power customers' bills reimbursed by future credits and third party non-federal financing for Conservation initiatives. Power Prepays will be included in this category in the future, depending on customer interest in participation.

The table above shows both the potential use of Treasury borrowing authority for transmission capital projects based on this FY 2016 budget and the use adjusted for potential third-party financing to fund appropriate capital expenditures when feasible in lieu of Treasury borrowing. Estimates included in this FY 2016 budget are uncertain and may change due to revised capital investment plans, changing economic conditions, and an evolving financial market environment. The estimates of third-party financing included in the table show a reduction in the use of Treasury borrowing and do not reflect the actual notional third party financing commitment BPA may enter into in that particular year. The difference of reduction in use of Treasury borrowing and Bonneville's Third Party Financing for Transmission Services consists primarily of lease-purchase agreements, which are capitalized obligations that enable BPA to acquire the use of transmission facilities over time. BPA also undertakes the construction and installation of facilities from funds that customers advance to BPA for construction of BPA-owned facilities that assist the customers in obtaining necessary transmission service from BPA. These customers receive monetary payment credits in bills for transmission services from BPA up to the amount of funds advanced to BPA, plus interest.

BPA's historical Third Party Financing amounts may vary over time due to re-assignment of certain lease-purchase agreements to Treasury Financing.

BPA Status of Treasury Borrowing with Potential Third Party Financing & PFIA Scenario

With the potential use of third party financing assumed in the scenario above, BPA's total remaining Treasury Borrowing Amount would be extended to the following amounts. See BP-4 BPA Status of Treasury Borrowing- Current Services.

		Fiscal Year						
		2014	2015	2016	2017	2018	2019	2020
Start-of-Year: Total Bonds Outstanding		3,944	4,242	4,806	5,520	6,157	6,752	6,872
Plus:								
Treasury Borrowing (Cash)		544	1,095	1,052	974	859	906	898
Less:								
Potential Third Party Financing & PFIA		NA	420	285	250	250	250	250
BPA Bond Amortization		246	111	53	87	14	536	499
Net Increase/(Decrease) Bonds Outstanding:		298	564	714	637	595	120	149
Cum.-End-of-Year: Total		4,242	4,806	5,520	6,157	6,752	6,872	7,021
Total Remaining Treasury Borrowing Amount		3,458	2,894	2,180	1,543	948	828	679
Total Legislated Treasury Borrowing Amount		7,700	7,700	7,700	7,700	7,700	7,700	7,700

U.S. TREASURY PAYMENTS

(in millions of dollars)

	FISCAL YEAR						
	2014	2015	2016	2017	2018	2019	2020
A. INTEREST ON BONDS & APPROPRIATIONS							
Bonneville Bond Interest							
1 Bonneville Bond Interest (net)	88	141	115	150	200	223	251
2 AFUDC ^{1/}	50	39	44	42	42	50	52
Appropriations Interest							
3 Bonneville	15	14	14	10	7	1	0
4 Corps of Engineers ^{2/}	161	161	170	167	163	156	158
5 Lower Snake River Comp. Plan	17	17	17	17	17	17	17
6 Bureau of Reclamation ^{3/}	44	44	44	44	44	40	40
7 Bond Premiums paid/Discounts (not capitalized)	-40	0	0	0	0	0	0
8 Total Bond and Approp. Interest	333	414	403	429	472	488	518
B. ASSOCIATED PROJECT COST							
9 Bureau of Reclamation Irrigation Assistance	53	52	61	51	28	57	25
10 Bureau of Rec. O & M ^{4/}	0	0	0	0	0	0	0
11 Corps of Eng. O & M ^{4/}	1	0	0	0	0	0	0
12 L. Snake River Comp. Plan O & M ^{4/}	0	0	0	0	0	0	0
13 Total Assoc. Project Costs	54	52	61	51	28	57	25
C. CAPITAL TRANSFERS							
Amortization							
14 Bonneville Bonds ^{6/}	246	111	53	87	14	536	499
15 Bureau of Reclamation Appropriations					44		
16 Corps of Engineers Appropriations	321		99	98	118	11	0
17 Lower Snake River Comp. Plan	0	0	0	0	0	0	0
18 Bonneville Appropriations	0	98	55	36	88	12	3
19 Total Capital Transfers	567	209	207	221	264	559	503
D. OTHER PAYMENTS							
20 Unfunded CSRS Liability ^{5/}	37	38	38	39	40	40	41
21 TOTAL TREASURY PAYMENTS	991	713	710	741	803	1,144	1,087

These notes are an integral part of this table.

- ^{1/} This interest cost is capitalized and included in BPA's Transmission System Development, System Replacements, and Associated Projects Capital programs. AFUDC is
- ^{2/} Includes interest on construction funding for Corp of Engineers (Corps) fish bypass facilities at Corps dams in the Columbia River Basin, including Lower
- ^{3/} Includes payments paid by Reclamation to the U.S. Treasury on behalf of Bonneville.
- ^{4/} Costs for power O&M is funded directly by Bonneville as follows (in millions):

	FISCAL YEAR	2014	2015	2016	2017	2018	2019	2020
Bureau of Reclamation		138	143	157	158	161	163	165
Corps of Engineers		223	232	244	251	255	259	274
Subtotal Bureau and Corps		361	375	401	409	416	422	440
Lower Snake River Comp. Plan		31	32	32	33	34	34	35
Total		392	407	433	442	449	456	475

^{5/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{6/} In this FY 2016 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold to the U.S. Treasury.

Does not include Treasury bond premiums on refinanced Treasury bonds.

Status of U.S. Treasury Principal Repayment

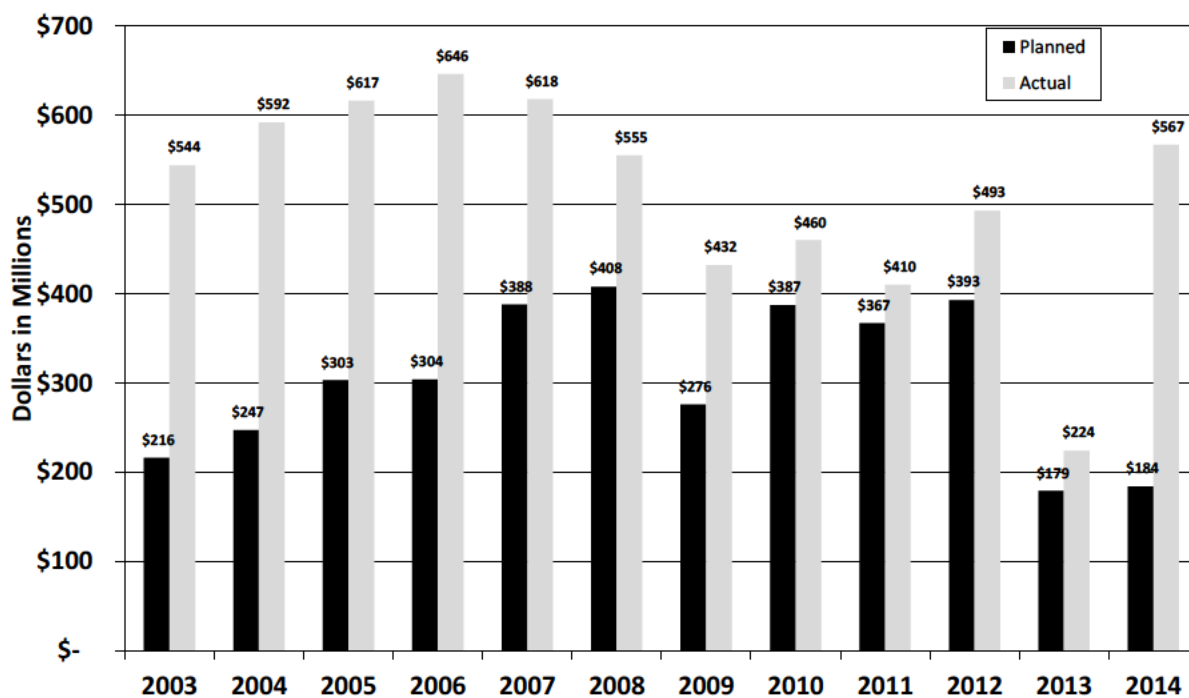


Chart Notes

^{1/} This chart displays principal repayment only.

^{2/} U.S. Treasury payment outyear estimates for planned amortization of principal are based on rate case estimates when available and planned amortization for future rate case periods. These estimates may change due to revised capital investment plans, actual U.S. Treasury borrowing, and advanced amortization payments. Bonneville made its full scheduled FY 2014 payment responsibility to the U.S. Treasury. Bonneville's aggregate U.S. Treasury payment was \$991 million, comprised of \$567 million in amortization, including advanced repayment of \$321 million, \$333 million in interest, and \$91 million for other costs.

^{3/} FYs 2002-2012 payments include portions of future planned amortization amounts consistent with Bonneville's capital strategy plan and the Bonneville/Energy Northwest debt optimization program.

^{4/} Advance amortization due to sale of transmission facilities includes \$12.7 million in FY 2003, \$5.3 million in FY 2006, \$2 million in FY 2011, \$0.4 million in FY 2013 and \$0.4 million in FY 2014.

^{5/} The cumulative amount of actual advance amortization payments as of the end of FY 2014 are \$3,060 million.

OBJECT CLASSIFICATION STATEMENT
(in millions of dollars)

ESTIMATES

	2014 act.	2015	2016
11.1 Full-time permanent	347	368	376
11.3 Other than full-time permanent	-	-	-
11.5 Other personnel compensation	30	32	33
11.9 Total personnel compensation	378	401	409
12.1 Civilian personnel benefits	113	120	123
13.0 Benefits for former personnel	-	-	-
21.0 Travel and transportation of persons	18	19	19
22.0 Transportation of things	2	3	3
23.1 Rental payments to GSA	10	10	11
23.2 Rents, other	31	33	34
23.3 Communication, utilities & misc. charges	9	10	10
25.1 Consulting Services	197	209	214
25.2 Other Services	2,635	2,385	2,437
25.5 R & D Contracts	17	16	16
26.0 Supplies and materials	56	60	61
31.0 Equipment	150	160	163
32.0 Lands and structures	297	315	322
41.0 Grants, subsidies, contributions	43	45	46
43.0 Interest and dividends	235	249	255
99.0 Total obligations	4,192	4,036	4,122

Estimate of Receipts
(in millions of dollars)

	Fiscal Year						
	2014	2015	2016	2017	2018	2019	2020
Reclamation Interest	44	44	44	44	44	40	40
Reclamation Amortization	0	0	0	0	44	0	0
Reclamation O&M		0	0	0	0	0	0
Reclamation Irrig. Assist.	53	52	61	51	28	57	25
Revenues Collected by Reclamation Distributed in Treasury Account (credit)	-12	-7	-7	-7	-7	-7	-7
Colville Settlement (credit)	-5	-5	-5	-5	-5	-5	-5
Total 1/ Reclamation Fund	79	84	93	83	103	86	53
Corps O&M							
CSRS	37	38	38	39	40	40	41
Total 2/ Repayments on misc.costs	37	38	38	39	40	40	41

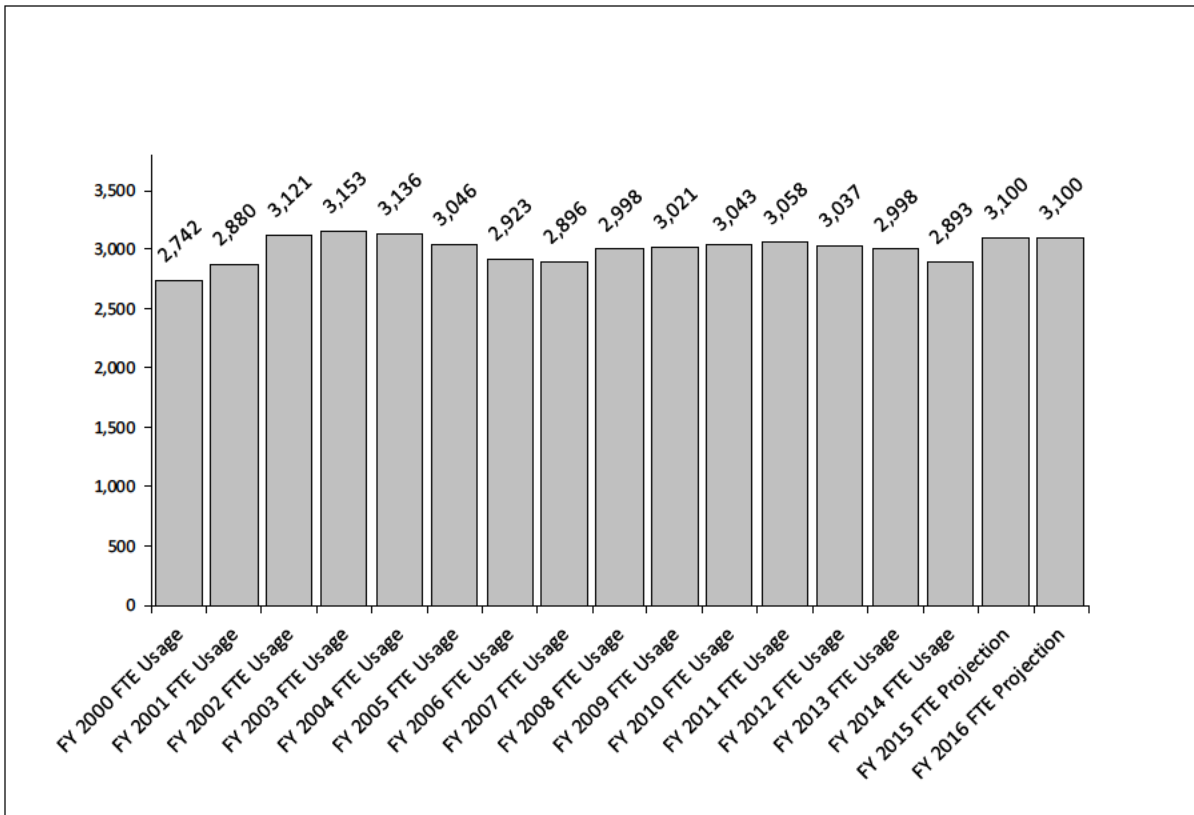
1/ Includes amortization of appropriations and irrigation assistance, and interest costs for Reclamation. The cost of power O&M for Reclamation is no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfer to Account #895000.26

2/ The costs of power O&M for the Corps and Lower Snake Comp. Plan are no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfers to Account #892889, Repayments on misc. recoverable costs, not otherwise classified. Costs for power O&M is funded directly by Bonneville as follows (in millions)

	2014	2015	2016	2017	2018	2019	2020
Bureau of Reclamation	138	143	157	158	161	163	165
Corps of Engineers	223	232	244	251	255	259	274
Lower Snake River Comp. Plan	31	32	32	33	34	34	35
Total	392	407	433	442	449	456	475

See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

BONNEVILLE FTE



Actual FTE data is consistent with DOE personnel reports.

FTE outyear data are estimates and may change.

Total Cost of BPA Fish & Wildlife Actions

COST ELEMENT	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CAPITAL INVESTMENTS ^{1/}										
BPA FISH AND WILDLIFE	12.2	35.4	35.2	25.5	27.4	40.0	90.2	57.5	52.1	37.4
BPA SOFTWARE DEVELOPMENT COSTS	-	0.9	1.0	1.3	0.6	1.2	0.8	0.4	0.0	0.1
ASSOCIATED PROJECTS (FEDERAL HYDRO)	53.8	360.0	60.4	37.3	135.7	56.4	103.0	114.5	103.6	101.7
TOTAL CAPITAL INVESTMENTS	66.0	396.3	96.6	64.2	163.7	97.6	193.9	172.3	155.7	139.2
PROGRAM EXPENSES										
BPA DIRECT FISH AND WILDLIFE PROGRAM	135.8	137.9	139.5	148.9	177.9	199.6	221.1	248.9	239.0	231.8
FISH & WILDLIFE SOFTWARE EXPENSE COSTS									0.2	0.3
SUPPLEMENTAL MITIGATION PROGRAM EXPENSES ^{2/}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
REIMBURSABLE/DIRECT-FUNDED PROJECTS ^{3/}										
O & M LOWER SNAKE RIVER HATCHERIES	17.2	20.1	19.3	19.4	20.8	23.3	24.5	22.0	28.7	31.0
O & M CORPS OF ENGINEERS	32.5	31.8	32.9	34.4	34.3	36.5	40.3	41.1	39.2	47.8
O & M BUREAU OF RECLAMATION	3.9	4.5	3.9	4.3	4.5	5.2	5.0	5.3	5.6	6.6
NW POWER AND CONSERVATION COUNCIL ALLOCATED @ 50%	4.3	4.3	4.2	4.1	4.7	4.7	4.5	4.6	5.0	4.9
SUBTOTAL (REIMB/DIRECT-FUNDED)	57.9	60.7	60.3	62.2	64.3	69.7	74.3	73.0	78.5	90.3
TOTAL OPERATING EXPENSES	193.7	198.6	199.7	211.1	242.1	269.3	295.3	321.9	317.7	322.40
PROGRAM RELATED FIXED EXPENSES ^{4/}										
INTEREST EXPENSE	56.4	53.4	76.0	76.9	78.7	80.5	79.2	80.6	89.1	83.4
AMORTIZATION EXPENSE	17.4	17.4	22.9	24.4	24.6	25.0	28.3	30.2	35.7	38.7
DEPRECIATION EXPENSE	15.9	16.7	14.0	14.9	16.7	18.0	19.6	20.7	18.6	19.2
TOTAL FIXED EXPENSES	89.7	87.5	112.9	116.2	120.0	123.5	127.2	131.5	143.4	141.3
GRAND TOTAL PROGRAM EXPENSES	283.4	286.1	312.7	327.3	362.1	392.8	422.5	453.4	461.1	463.7
FORGONE REVENUES AND POWER PURCHASES										
FOREGONE REVENUES	182.1	397.4	282.6	273.5	142.8	99.4	156.7	152.2	135.5	122.7
BPA POWER PURCH. FOR FISH ENHANCEMENT	110.8	168.2	120.7	274.9	240.3	310.1	70.7	38.5	85.8	196.2
TOTAL FOREGONE REVENUES AND POWER PURCHASES	292.9	565.6	403.3	548.5	383.1	409.5	227.4	190.7	221.3	318.9
TOTAL PROGRAM EXPENSES, FOREGONE REVENUES, & POWER PURCHASES	576.3	851.7	716.0	875.8	745.3	802.3	649.9	644.1	682.4	782.6
CREDITS										
4(h)(10)(C)	(57.7)	(76.4)	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)
TOTAL CREDITS	(57.7)	(76.4)	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)

1/ Capital Investments include both BPA's direct Fish and Wildlife Program capital investments, funded by BPA's Treasury borrowing, and "Associated Projects", which include capital investments at Corps of Engineers' and Bureau of Reclamation projects, funded by appropriations and repaid by BPA. The negative amount in FY 1997 reflects a decision to reverse "plant-in-service" investment that was never actually placed into service. The annual expenses associated with these investments are included in "Program-Related Fixed Expenses", below.

2/ Includes High Priority and Action Plan Expenses and other supplemental programs.

3/ "Reimbursable/Direct-Funded Projects" includes the portion of costs BPA pays to or on behalf of other entities that is determined to be for fish and wildlife purposes.

4/ "Fixed Expenses" include depreciation, amortization and interest on investments on the Corps of Engineers' projects, and amortization and interest on the investments associated with BPA's direct Fish and Wildlife Program.

Bonneville Power Administration (Bonneville, BPA)
Proposed Appropriations Language

Expenditures from the Bonneville Power Administration Fund, established pursuant to Public Law 93-454, are approved for [the Shoshone Paiute Trout Hatchery, the Spokane Tribal Hatchery, the Snake River Sockeye Weirs and, in addition, for] official reception and representation expenses in an amount not to exceed \$5,000: Provided, that during fiscal year [2016] 2017, no new direct loan obligations may be made.

Explanation of Changes

The proposed appropriations language restricts new direct loans in FY 2017 as in FY 2016. This bill language is drafted consistent with the Credit Reform Act of 1990.

Please Note - The FY 2017 Bonneville Power Administration Congressional Budget submission includes FY 2016 budget estimates.

Bonneville operates under a business-type budget under the Government Corporation Control Act, 31 U.S.C 9101-10 and on the basis of the self-financing authority provided by the Federal Columbia River Transmission System Act of 1974 (Transmission Act) (Public Law 93-454). Bonneville has authority to borrow from the U.S. Treasury under the Transmission Act, the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Pacific Northwest Power Act) (Public Law 96-501) for acquisition of energy conservation and renewable energy resources, investment in fish facilities, and other purposes, the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), and other legislation. Authority to borrow from the U.S. Treasury is available to Bonneville on a permanent, revolving basis. The amount of U.S. Treasury borrowing outstanding at any time cannot exceed \$7.70 billion.¹ Bonneville finances its approximate \$4.3 billion annual cost of operations and investments primarily using power and transmission revenues, and borrowing from the U.S. Treasury.

This budget has been prepared in accordance with the Statutory Pay-As-You-Go Act (PAYGO) of 2010. Under PAYGO, all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

¹ Amount of total bonds outstanding can be found in tables BP-4A – 4D in the Additional Tables section.

Bonneville Power Administration

Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2015 Actuals	2016 Original ^{2/}	2016 Revised ^{2/}	2017 Proposed
Capital Investment Obligations				
Associated Project Costs ^{3/}	43,201	N/A	240,790	269,908
Fish & Wildlife	21,373	N/A	40,000	45,602
Conservation & Energy Efficiency ^{3/}	87,225	N/A	0	0
Subtotal, Power Services	151,799	N/A	280,790	315,510
Transmission Services	461,279		700,040	644,478
Capital Equipment & Bond Premium	34,344	N/A	37,356	28,794
Total, Capital Obligations ^{3/}	647,423	1,051,569	1,018,186	988,782
Expensed and Other Obligations				
Expensed	2,747,786	3,040,716	3,016,942	3,049,010
Projects Funded in Advance	389,677	30,000	30,000	30,000
Total, Obligations	3,784,886	4,122,285	4,065,128	4,067,792
Capital Transfers (cash)	448,761	206,900	189,107	205,868
BPA Total	4,233,647	4,329,185	4,254,235	4,273,660
Bonneville Net Outlays	(383,275)		(635)	(45,734)
Full-time Equivalents (FTEs)	2,836	3,100	3,100	3,100

Public Law Authorizations include:

Bonneville Project Act of 1937, Public Law No. 75-329

Federal Columbia River Transmission System Act of 1974, Public Law No. 93-454

Regional Preference Act of 1964, Public Law No. 88-552

Flood Control Act of 1944, Public Law No. 78-543

Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act), Public Law No. 96-501

Outyear Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2018	2019	2020	2021
Capital Investment Obligations				
Associated Project Costs ^{3/}	281,511	313,754	333,297	347,926
Fish & Wildlife	18,646	34,806	35,033	33,599
Conservation & Energy Efficiency ^{3/}	0	0	0	0
Subtotal, Power Services	300,157	348,560	368,330	381,525
Transmission Services	445,475	445,032	417,097	306,225
Capital Equipment & Bond Premium	12,854	8,417	6,069	13,136
Total, Capital Obligations ^{3/}	758,486	802,009	791,497	700,886
Expensed and Other Obligations				
Expensed	3,248,601	3,387,808	3,415,055	3,306,906
Projects Funded in Advance	30,000	50,000	50,000	50,000
Total, Obligations	4,037,087	4,239,817	4,256,552	4,057,791
Capital Transfers (cash)	228,791	564,341	533,603	517,744
BPA Total	4,265,878	4,804,158	4,790,155	4,575,535
Bonneville Net Outlays	(76,734)	126,266	102,129	(138,420)
Full-time Equivalents (FTEs)	3,100	3,100	3,100	3,100

These notes are an integral part of this table.

- 1/ This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.
- 2/ Original estimates reflect Bonneville's FY 2016 Congressional Budget Submission. Revised estimates, consistent with Bonneville's annual near-term funding review process, provide notification to the Administration and Congress of updated capital and expense funding levels for FY 2016.
- 3/ Includes infrastructure investments designed to address the long-term electric power related needs of the Northwest and to reflect significant changes affecting Bonneville's power and transmission markets.

Additional Notes

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Cumulative advance amortization payments as of the end of FY 2015 are \$3,291 million.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

FY 2015 Net Outlays are based on Bonneville's FY 2015 audited actuals. FYs 2016 & 2017 Net Outlays are calculated using Bonneville's revenue forecast from the BP-16 rate case. FYs 2018 & 2019 assume no growth in Offsetting Collections compared to FYs 2016 & 2017. FYs 2020 and 2021 assume a 1% growth in Offsetting Collections.

FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing transmission marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.

Major Outyear Considerations

Bonneville's outyear estimates reflect ongoing efforts to achieve its long-term mission and strategic direction. The outyear estimates are developed with consideration and support of Bonneville's multi-year performance targets that lay out the course for achieving Bonneville's long-term objectives. Outyear capital investment levels support Bonneville's infrastructure program, hydro efficiency program, and its fish and wildlife mitigation projects.

Bonneville continues to incorporate the various aspects of the Energy Policy Act of 2005 related to its business, in particular the energy supply, conservation, and new energy technologies for the future that are highlighted in the legislation.

Overview and Accomplishments

Bonneville provides electric power, transmission, and energy efficiency throughout the Pacific Northwest. Bonneville serves a 300,000 square mile area including Oregon, Washington, Idaho, western Montana, and parts of northern California, Nevada, Utah, and Wyoming with a population of about 12.9 million people. Bonneville markets the electric power produced from 31 federal hydro projects in the Pacific Northwest owned by the U.S. Army Corps of Engineers (Corps) and the U.S. Department of Interior, Bureau of Reclamation (Reclamation) – the hydro projects are known as Associated Projects. Bonneville also acquires non-federal power, including the power from the nuclear power plant, Columbia Generating Station (CGS), to meet the needs of its customer utilities. Bonneville maintains and operates 15,156 circuit miles of transmission lines, 259 substations, and associated power system control and communications facilities over which this electric power is delivered. Bonneville has capital and similar leases for certain transmission facilities. Bonneville also supports the protection and enhancement of fish and wildlife, and promotes conservation and energy efficiency, as part of its efforts to preserve and balance the economic and environmental benefits of the Federal Columbia River Power System (FCRPS).

The organization of Bonneville's FY 2017 Budget reflects Bonneville's business services basis for utility enterprise activities. Bonneville's two major areas of activity on a consolidated budget and accounting basis are Power Services (PS) and Transmission Services (TS) with administrative costs included. The PS includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program (REP), Associated Projects Operations & Maintenance (O&M) Costs, and Northwest Power and Conservation Council (Planning Council or Council).

The mission of Bonneville is to create and deliver the best value for its customers and constituents as it acts in concert with others to assure the Pacific Northwest: (1) an adequate, efficient, economical and reliable power supply; (2) an open access transmission system that is adequate for integrating and transmitting power from federal and non-federal generating units, providing service to Bonneville's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and (3) mitigation of the FCRPS impacts on fish and wildlife. Bonneville is legally obligated to provide cost-based rates and public and regional preference in its marketing of power. Bonneville establishes rates as low as possible consistent with sound business principles and sufficient to ensure the full recovery of all of its costs, including timely repayment of the federal investment in the system. Bonneville's vision is to provide: (1) high reliability; (2) low rates consistent with sound business principles; (3) responsible environmental stewardship; and (4) accountability to the region. Bonneville pursues this vision consistent with its four core values of safety, trustworthy stewardship of the FCRPS, collaborative relationships, and operational excellence.

Alignment to Strategic Plan and President's Climate Action Plan

Bonneville contributes to the Administration's clean energy goals and aligns to Goal 1 of the Department of Energy's (DOE) Strategic Plan to *Advance foundational science, innovate energy technologies, and inform data driven policies that enhance U.S. economic growth and job creation, energy security, and environmental quality, with emphasis on implementation of the President's Climate Action Plan to mitigate the risks of and enhance resilience against climate change.*

The FCRPS is one of the nation's largest nearly carbon-free energy sources and preserving and enhancing the value of the FCRPS for the future continues to be a major Bonneville focus. Bonneville's ongoing prioritization and execution of capital investment in transmission and FCRPS generation assets is the foundation for delivering clean, low cost power to support the communities and economies of the region well into the future.

Bonneville plays a key role in advancing energy efficiency across the region consistent with its statutes, including developing and promoting related technologies, and exploring demand-side management opportunities. Bonneville is making disciplined technology innovation investments and looking to apply new operational and market mechanisms that enhance the reliability, efficiency and flexibility of system operations.

In addition to these efforts, Bonneville is committed to the quality of the Northwest's natural resources. Bonneville funds one of the largest fish and wildlife programs in the nation and continues to be a national leader on environmental protection and compliance.

Together, all of these efforts contribute to sustaining and advancing the region's resilience against climate change.

To validate and verify program performance, Bonneville conducts various internal and external reviews and audits. Bonneville conducts extensive reviews with regional stakeholders of both capital and expense programs. In addition, Bonneville's programmatic activities are subject to review by Congress, the U.S. Government Accountability Office (GAO), the DOE's Inspector General, and other governmental entities. Bonneville's financial statements are audited annually by an independent external auditor. Bonneville has received unqualified audit opinions since the mid-1980s and no material weaknesses have been identified in controls over financial reporting.

Legislative History

The Bonneville Project Act of 1937 provides the statutory foundation for Bonneville's utility responsibilities and authorities. In 1974, passage of the Federal Columbia River Transmission System Act (Transmission Act) applied provisions of the Government Corporation Control Act (31 U.S.C. §§ 9101-9110) to Bonneville. The Transmission Act provides Bonneville with "self-financing" authority, establishes the Bonneville Fund (a permanent, indefinite appropriation) allowing Bonneville to use its revenues from electric power and transmission ratepayers to fund all programs without further appropriation, and authorizes Bonneville to sell bonds to the U.S. Treasury to finance the region's high-voltage electric transmission system requirements.

In 1980, enactment of the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) expanded Bonneville's authorities, obligations and responsibilities to encourage: electric energy conservation to meet regional electric power loads placed on Bonneville; develop renewable energy resources within the Pacific Northwest; assure the Northwest an adequate, efficient, economical, and reliable power supply; promote regional participation and planning; and protect, mitigate and enhance the fish and wildlife of the Columbia River and its tributaries. The Northwest Power Act also established the statutory framework for Bonneville's administrative rate-setting process and established judicial review of Bonneville's final decisions in the U.S. Court of Appeals for the Ninth Circuit.

As of 2015, Congress has provided Bonneville with revolving U.S. Treasury borrowing authority of \$7.7 billion.

The Columbia River Treaty

On December 13, 2013, the U.S. Entity, which includes Bonneville and the Corps, delivered the final regional recommendation concerning the post-2024 future of the Columbia River Treaty to the U.S. Department of State. The U.S. Government reached consensus on a high level position for negotiations of the Treaty in June 2015. The State Department selected a lead negotiator in August 2015. U.S. Government discussions of a path forward for formal negotiations are underway.

Judicial and Regulatory Activity

The Energy Policy Act of 2005 authorized the Federal Energy Regulatory Commission (FERC) to approve and enforce mandatory electric reliability standards with which users, owners, and operators of the bulk power system, including Bonneville, are required to comply. These standards became enforceable on June 18, 2007, and compliance is monitored by the North American Electric Regulatory Corporation (NERC) and the regional reliability organizations.

Fish and Wildlife Program Overview

Bonneville is committed to continue funding its share of the region's efforts to protect and mitigate Columbia River Basin fish and wildlife. To the extent possible, Bonneville is integrating actions to protect listed species in response to the FCRPS Biological Opinions (BiOps), including the National Oceanic and Atmospheric Administration (NOAA) Willamette River BiOp and the United States Fish and Wildlife Service's (USFWS) 2006 Libby Dam BiOp, with projects implemented under the Council's Fish and Wildlife Program (Program). The Program, BiOps, and long-term agreements include prioritized strategies for mitigation actions that help guide project selection to meet both Bonneville's Endangered Species Act (ESA) and Northwest Power Act responsibilities.

Included with the budget schedules section of this document is the current tabulation of Bonneville's fish and wildlife costs from FY 2006 through FY 2015.

Infrastructure Investments

Bonneville is moving forward with infrastructure investments in the Pacific Northwest to meet transmission and reliability needs and continues to support a competitive wholesale market in the Western Interconnection, which encompasses 14 western states, two Canadian provinces, and one Mexican state. The McNary-John Day line – completed in FY 2012, under budget and ahead of schedule – added 79 miles, and three additional transmission projects would add more than 140 miles of lines to the Northwest transmission grid, increasing service and improving reliability. In combination with other transmission projects, these projects would allow Bonneville to provide service to about 3,881 megawatts (MWs) of requests for Bonneville transmission, including 3,138 MWs of additional renewable resource generation. One transmission project is the proposed Bonneville's I-5 Corridor Reinforcement Project, which is currently undergoing environmental review. The Big Eddy-Knight 500kV transmission line and substation project resumed construction in 2014 and was energized in November 2015. In addition, Central Ferry-Lower Monumental 500kV Reinforcement began construction in May 2014 and was also energized in November 2015. If the I-5 Corridor Reinforcement Project is constructed, these three projects plus the McNary-John Day will provide almost 6,000 MW of transmission service. In addition, Bonneville is continuing to target additional transmission investments in those areas with reliability needs.

In FY 2012, Bonneville signed two agreements to participate with two investor-owned utilities in the environmental work and permitting for the proposed Boardman-to-Hemingway 500kV line. Participation in this preliminary review keeps Bonneville's options open for serving its six southeast Idaho preference customers after the current transmission service agreements terminate. Bonneville has not made a decision to co-develop or purchase capacity in these projects. On January 17, 2014, Public Law 113-76 was enacted into law, which provided Bonneville with expenditure authority approval to construct or participate in the construction of a transmission line to southeast Idaho, should Bonneville decide to continue pursuing that service arrangement.

Bonneville has experienced significant growth within its balancing area in installed variable renewable generation, primarily in the form of wind generation. Since 2001, installed wind generation has grown from 115 MWs to 5,081 MWs through December 2015. This substantial increase in variable renewable generation has resulted in additional uncertainties in the balance between load and generation required for maintaining a reliable grid. Wind is a non-dispatchable source of energy, meaning it cannot be relied upon for capacity. As a result, Bonneville has implemented and continues to study operational tools for integrating this variable generation more cost effectively and reliably.

Bonneville is considering approaches, in addition to the use of its U.S. Treasury borrowing authority, to sustain funding for its infrastructure investment requirements. These approaches include reserve financing of some amount of transmission investments, and seeking, when feasible, third party financing sources. See the BP-5 Potential Third Party Financing Transparency table (page 80) in the budget schedules section of this document. This FY 2017 Budget assumes \$15 million of annual reserve financing in FYs 2016-2021 for transmission infrastructure capital, which is included in this budget under Projects Funded In Advance.

Radio Spectrum Communications

Bonneville's wireless communication system is used to operate and control critical national transmission grid infrastructure in a reliable, secure, and safe manner. Bonneville's communication systems are designed to meet strict reliability/availability objectives required by NERC and Western Electricity Coordinating Council (WECC) standards. Concerning proper spectrum stewardship, Bonneville designs highly efficient radio systems that use minimal radio frequency (RF) channel bandwidths to meet critical mission needs. However, in certain circumstances, efficiently designed spectrum radio systems will require broad RF channels and/or lower state RF modulation schemes to meet existing and future requirements in order to meet operational and reliability/availability objectives.

In order to meet Bonneville's mission/operational requirements, RF communication equipment approved for system use goes through a rigorous evaluation and testing process. RF spectrum efficiency factors are considered during the

evaluation/testing period. RF terminal equipment approved for use is normally purchased directly from vendors and is not typically supplied through a Request for Proposal process.

Bonneville's operational telecommunications and other capital equipment and systems are acquired using Bonneville's self-financing and procurement authorities. The Bonneville budget includes a system-wide electric reliability performance indicator, consistent with NERC rules, to track and evaluate performance.

Bonneville may share temporarily-available spare capacity on its RF communication system with other government agencies (both Federal and State), and with other electric utilities in the region whose power systems interconnect with Bonneville. Non-critical administrative traffic is typically supported by commercial carrier enterprises. However, to meet NERC/WECC electrical bulk transmission requirements, Bonneville exclusively operates highly critical transmission control traffic over its private telecommunication system as Bonneville has no control over the reliability/availability of the commercial enterprise or on how quickly critical operational control circuits are restored to active service during an interruption.

For high capacity communication system applications, Bonneville considers and operates non-spectrum dependent alternatives such as fiber optic cable infrastructure systems.

During FY 2014, Bonneville began upgrading the Very High Frequency (VHF) land mobile system and installing a number of digital Synchronous Optical Network (SONET) rings typically consisting of fiber segments in combination with point-to-point microwave hops operating in the 4 GHz and 7/8 GHz bands. These various telecommunication systems operate within Bonneville's approximate 300,000 square mile utility responsibility service territory (Oregon, Washington, Idaho, western Montana) with the majority of the RF infrastructure located in low population-rural areas.

The FCRPS hydroelectric projects, owned by the Corps and Reclamation, also utilize federal radio spectrum to preserve very high operational telecommunications and power system reliability.

In FY 2014, Bonneville completed work costing approximately \$40,000, funded through the Spectrum Relocation Fund, to relocate its operational telecommunication systems from the 1710-55 MHz radio spectrum bands to alternative federal radio spectrum bands. In accordance with Federal law, Bonneville plans to return the approximately \$8.2 million of excess funds to the U.S. Treasury, via the Spectrum Relocation Fund, as soon as the National Telecommunications and Information Administration (NTIA) officially notifies the Federal Communications Commission (FCC) that the DOE relocation effort is complete.

Bonneville is participating in a new spectrum relocation effort. The NTIA has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The FCC held an auction of this spectrum on November 13, 2014. Bonneville received an additional \$5.2 million from the Spectrum Relocation Fund on July 29, 2015 to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment. Bonneville received obligational authority to proceed with this relocation effort by apportionment on July 24, 2015.

Financial Mechanisms

Bonneville's program is treated as mandatory and nondiscretionary. Bonneville is "self-financed" with its own revenues and does not rely on annual appropriations from Congress. Under the Transmission Act, Bonneville funds the expense portion of its budget and repays the federal investment with revenues from electric power and transmission sales. Bonneville's revenues fluctuate for a variety of reasons, including in response to variations in market prices for fuels and stream flow in the Columbia River System due to variations in weather conditions and fish mitigation needs. Through FY 2015, Bonneville has returned approximately \$30.7 billion to the U.S. Treasury, of which about \$3.5 billion was for payment of FCRPS operation and maintenance (O&M) and other costs, \$15.1 billion for interest, and \$12.1 billion for amortization of appropriations and bonds.

In the FY 2017 Budget, the term Bonneville "bonds" refers to the debt instruments under which Bonneville receives advances of funds from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act, which

defines Bonneville bonds as all bonds, notes, and other evidences of indebtednesses issued and sold by Bonneville to the U.S. Treasury.

As of September 30, 2015, debt instruments issued by non-federal entities but secured by payment and other financial commitments provided by Bonneville maintained their credit ratings as follows: Moody's at Aa1 with a stable outlook, Fitch at AA with a stable outlook and Standard & Poor's at AA- with a stable outlook.

Bonneville and the U.S. Treasury have a comprehensive banking arrangement that covers Bonneville's short- and long-term federal borrowings and establishes a phased-in approach to a market-based investing program. This provides Bonneville with the ability to borrow to finance assets and, on a short-term basis, to cover Northwest Power Act-related operating expenses. This latter ability provides Bonneville with much needed liquidity to help manage within-year cash flow needs and mitigate risk. Access to this use of U.S. Treasury borrowing authority has been incorporated into and relied upon in Bonneville's rate-setting process.

Bonneville undertook a Power Prepayment Program in FY 2013 under which all Bonneville preference customers had an opportunity to submit formal offers to provide lump-sum payments to Bonneville as prepayments of a portion of their power purchases through September 30, 2028, the termination date of the Long-Term Regional Dialogue Power Sales Contracts. Bonneville accepted power prepayments from four preference customers, as described below.

Upon Bonneville's receipt of the agreed-to, lump-sum prepayments, the selected preference customers became entitled to future portions of their electricity from Bonneville without further payment. The power prepayments are and will be recognized in the customers' future power bills from Bonneville as fixed, equal monthly prepayment credits. In effect, the amount of electricity that is prepaid may vary by month, depending on Bonneville's power rates and rate schedules that apply to electricity purchases by the prepaying customers in the related month. Because this is structured as a variable amount prepayment and not as a fixed-price/fixed-amount type of prepayment, Bonneville maintains flexibility to establish rates for the electric power that is prepaid.

As a result of the FY 2013 Prepayment solicitation, Bonneville received \$340 million in prepayments, which Bonneville is using to fund needed FCRPS hydroelectric investments. The aggregate prepayment credits are set at \$2.55 million per month through FY 2028.

Depending on a variety of factors it is possible that Bonneville may seek to implement later phases of the Power Prepayment Program in connection with future FCRPS hydroelectric investment needs.

Treasury Payments and Budget Overview

Bonneville made its full scheduled FY 2015 payment responsibility to the U.S. Treasury. Bonneville's aggregate U.S. Treasury payment was \$891 million, comprised of \$449 million in principal, which included \$229 million in early retirement of higher interest rate U.S. Treasury debt, \$350 million in interest, and \$92 million for other costs. Total credits associated with fish mitigation and recovery and applied toward Bonneville's U.S. Treasury payment, were about \$80 million for FY 2015. These credits are established and applied under section 4(h)(10)(C) of the Northwest Power Act. For FY 2016, Bonneville plans to pay the U.S. Treasury \$640 million: \$189 million to repay investment principal, \$351 million for interest, and \$100 million for Associated Project costs and pension and post-retirement benefits. The FYs 2017 and 2018 U.S. Treasury payments are currently estimated at \$662 million and \$707 million, respectively. The FY 2016-2017 4(h)(10)(C) credits are estimated at \$91 million and \$88 million, respectively.

Estimates of interest and amortization levels for outyear U.S. Treasury payments are included in the FY 2016-2017 final transmission and power rates. Bond and Appropriations Interest will continue to be revised based on upcoming capital investments and debt management actions. These estimates may change due to revised capital investment plans and actual U.S. Treasury borrowing. In recent years, Bonneville has made amortization payments in excess of those scheduled in its FERC-approved rate filings resulting in a balance of advance repayment. The cumulative amount of advance amortization payments as of the end of FY 2015 is about \$3,291 million.

Bonneville has direct funding arrangements to fund the power-related portion of O&M and capital investments at the Corps and Reclamation facilities as well as the O&M costs of the U.S. Fish and Wildlife Service Lower Snake River Compensation Plan facilities. Direct funded capital costs, which were previously funded through appropriations to the Corps and Reclamation prior to the initiation of direct funding, are now paid primarily from the proceeds of bonds issued by Bonneville to the U.S. Treasury. Certain power prepayments have also been a source of proceeds for direct funding. Bonneville's aggregate direct funding provided for capital and O&M was \$559 million in FY 2015.

Starting in FY 2014, Bonneville and Energy Northwest, the not-for-profit Washington state joint operating agency that owns and operates the Columbia Generating Station nuclear plant, worked closely to establish a new phase of integrated debt management for their combined total debt portfolios, the debt service of which is borne by Bonneville and recovered from Bonneville ratepayers through Bonneville's rates. Energy Northwest-related debt refinanced under this effort for both fiscal years 2014 and 2015 is called Regional Cooperation Debt.

An important component of Regional Cooperation Debt is the issuance of new bonds by Energy Northwest to refund outstanding bonds shortly before their maturities when substantial principal repayments are due. Funds made available from these refinancings enable Bonneville to prepay higher interest rate federal obligations. The net effect of Regional Cooperation Debt and prepayment of higher interest rate federal obligations is that both the weighted-average interest rate and the maturity of Bonneville's overall debt portfolio will be reduced over the life of the proposal. The refinancings also preserve and restore U.S. Treasury borrowing capacity, enabling Bonneville to make much-needed investments in critical infrastructure.

Energy Northwest accelerated site restoration of the Energy Northwest Nuclear Projects 1 and 4 beginning in the summer of 2015.

This FY 2017 Budget proposes estimated accrued expenditures of \$3,049 million for operating expenses, \$30 million for Projects Funded in Advance (PFIA), \$989 million for capital investments, and \$206 million for capital transfers in FY 2017.

The estimated spending levels in this budget are still subject to change to accommodate competitive dynamics in the region's energy markets, debt management strategies, and the continued restructuring of the electric industry.

Current Financial Status

Bonneville is striving to enhance its competitive, cost-effective delivery of utility products and services and continued delivery of the public benefits of its operations, while ensuring its ability to make its scheduled payments to the U.S. Treasury on time and in full. Bonneville employs a strategic planning process using the balanced scorecard model to align all business units around specific goals and align resources to achieve these goals. Results from these efforts include continued efficiency gains, performance integration improvements, and a high assurance for repayment of bonds issued to the U.S. Treasury and the appropriated investment in the FCRPS.

Through cost-based rates and attentive cost management efforts once rates are set, Bonneville has maintained adequate financial reserve levels to assure full recovery of its costs and long-term financial stability while meeting its overall responsibilities to the Pacific Northwest and U.S. taxpayers.

The Final Record of Decision for the FYs 2016-2017 rate case was issued on July 23, 2015 and FERC granted interim approval on September 17, 2015. The new rates went into effect on a provisional basis on October 1, 2015 pending final FERC review.

Budget Estimates and Planning

This FY 2017 Budget includes capital and expense estimates based on Bonneville's Capital Investment Review (CIR), Integrated Program Review (IPR), and Integrated Program Review 2 (IPR2) processes and updated estimates for FYs 2016 and 2017 Transmission capital. FY 2015 actual costs are based on Bonneville's FY 2015 audited financial statements.

Capital funding levels reflect Bonneville's capital asset management process and external factors such as the significant changes affecting the West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region and national energy security goals.

Capital investment levels in this FY 2017 Budget reflect executive management decisions from Bonneville's Finance Committee and the associated capital review process. Bonneville utilizes a structured capital project selection process requiring submission of a standardized business case for review. Each business case consists of a description of the project, a clear statement of objectives, description and mitigation of risks, and a rigorous analysis of project costs and benefits including a status quo assumption and preferred alternatives. In addition, both annual and end-of-project targets are set for each project covering cost, scope, and schedule. Progress reports on these targets are provided to Bonneville's senior executives at least quarterly.

The FYs 2016-2021 revenue estimates in this budget, included in the Net Outlay formulation, are calculated consistent with cash management goals. The revenue estimates reflect assumed adjustments, which include the use of a combination of tools, including: upcoming rate adjustment mechanisms; reduced cost estimates; a net revenue risk adjustment; debt management strategies; and/or short-term financial tools to manage net revenues and cash. The revenue estimates also include depreciation and U.S. Treasury repayment credit assumptions. These U.S. Treasury repayment credits offset, among other things, Bonneville's fish and wildlife program costs allocable to the non-power project purposes of the FCRPS under section 4h(10)(C) of the Northwest Power Act.

Overview of Detailed Justifications

In Bonneville's Detailed Justification Summaries, accrued expenditure is the basis of presenting Bonneville's program funding levels in the power and transmission rate making processes and the basis upon which Bonneville managers control their resources to provide products and services. Accrued expenditures relate period costs to period performance. Traditional budget obligation requirements for Bonneville's budget are assumed on the Program and Financing Summary Schedule prepared in accordance with Office of Management & Budget (OMB) Circular A-11.

The organization of Bonneville's FY 2017 Budget and these performance summaries reflect Bonneville's business services basis for utility enterprise activities. Bonneville's major areas of activity on a consolidated budget and accounting basis include power and transmission, with administrative costs included. Power Services includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program, Associated Projects O&M Costs, and the Council. Environmental activities are shown in the relevant Power Services and Transmission Services sections, as are reimbursable costs. Bonneville's interest expense, pension and post-retirement benefits, and capital transfers to the Treasury are shown by program.

The first section of performance summaries, Capital Investments, includes accrued expenditures for investments in electric utility and general plant associated with the FCRPS generation and transmission services, energy efficiency, fish and wildlife, and capital equipment. These capital investments are estimated to require budget obligations and expected use of \$988.8 million in bonds to be issued and sold to the U.S. Treasury in FY 2017.

The near-term forecast of capital funding levels has undergone an extensive internal review as a result of Bonneville's capital asset management strategy. These capital reviews encompass project cost management initiatives, capital investment assessments, and categorization of capital projects to be funded based on risk and other factors. Consistent with Bonneville's near-term capital funding review process and Bonneville's standard operating budget process, this FY 2017 Budget includes updated capital funding levels for FY 2016. Utilizing this review process helps Bonneville in its efforts to compete in the deregulated wholesale energy market. Bonneville will continue to work with the Corps and Reclamation to optimize the mix of projects.

In addition to its internal management assessment of capital investments, Bonneville has developed and implemented an associated external capital investment review process that provides significant benefits to Bonneville. The combined internal and external processes add value by both improving direction on what the FCRPS invests in (tying investments more closely to agency strategy) and by improving how those investments are made (more detailed analysis and review of capital investments and their alternatives).

Bonneville's second section of the performance summaries, entitled Annual Operating Expenses, includes accrued expenditures for services and program activities financed by power sales revenues, transmission sales revenues, and projects funded in advance. For FY 2017, budget expense obligations are estimated at \$3,049 million. The total program requirements of all Bonneville programs include estimated budget obligations of \$4,068 million in FY 2017.

Evidence and Analysis in the Budget

Consistent with the President's emphasis on evidence and evaluation in the budget, Bonneville has undertaken several initiatives and processes to determine appropriate budget expenditures.

Bonneville's Integrated Program Review (IPR) process allows interested parties to see all relevant FCRPS expense and capital spending level estimates in the same forum. The IPR occurs every two years, or just prior to each rate case, and provides participants with an opportunity to review and comment on Bonneville's program level estimates prior to spending levels being set for inclusion in rate cases. In addition, Bonneville's Capital Investment Review (CIR) process allows interested parties to review and comment on Bonneville's draft Asset Strategies and 10-year capital forecasts. The CIR occurs every two years prior to the IPR. The 2014 IPR and CIR processes concluded in 2014. Bonneville's IPR2 process, a follow-up to the 2014 IPR process, concluded in May 2015. The 2016 IPR and CIR processes will be combined and is expected to begin in June 2016.

Bonneville also is focused on institutionalizing operational excellence – continuous improvement that produces more efficient and effective ways to deliver on Bonneville's mission and vision. Bonneville's Strategy Execution organization provides programs and process support to improve business operations, and the quality of outputs, while applying the tools and principles of operational excellence in alignment with the vision of Bonneville's strategic direction. In FY 2012, Bonneville embarked on an extensive assessment of utility benchmarking and elected to adopt a benchmarking program to support meaningful evidence of efficiency and cost-effectiveness. In FY 2013, the Bonneville Benchmarking & Operational Excellence Program comprehensively benchmarked four specific strategic focus areas around Safety, Supply Chain, Reliability Compliance, and Energy Accounting and Determination of Loads. As a result of those efforts, in FY 2014 Bonneville took the data collected and implemented process improvement actions to move its business units towards becoming top quartile performers. In FY 2015, Bonneville refocused its continuous improvement efforts to concentrate on seven Key Strategic Initiatives. One of these initiatives resulted in a major program overhaul to our Safety and Health program. This effort encompassed changes to safety governance, improved safety culture, organization design modifications, process improvement projects to close gaps, and improvements in policy, human performance and job specific training.

Educational Activities

The Bonneville Power Administration is a supporter of science, technology, engineering and math (collectively known as "STEM") education programs. These programs provide support and encouragement to middle and high school students to study the sciences in school and to pursue careers in these fields. Working with Bonneville employees as volunteer ambassadors, the Bonneville education program provides value-added presentations, curricula and activities to K-12 schools that enhance the learning experience for students and teachers, and extend awareness of the value of the region's hydroelectric system to future generations. As a regional leader in STEM education, Bonneville also proudly supports and organizes an award-winning Science Bowl. Bonneville also sponsors Science Fair competitions for students in Washington state, as well as a Lego Robotics tournament championship.

**Power Services - Capital
Funding Schedule by Activity**

Funding (\$K)

Power Services – Capital

Associated Project Costs
Fish & Wildlife
Energy Efficiency
Projects Funded in Advance¹
Total, Power Services – Capital

	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate	FY 2017 vs FY 2016	
				\$	%
Associated Project Costs	43,201	240,790	269,908	29,118	12%
Fish & Wildlife	21,373	40,000	45,602	5,602	14%
Energy Efficiency	87,225	0	0	0	0
Projects Funded in Advance ¹	123,694	0	0	0	0
Total, Power Services – Capital	275,493	280,790	315,510	34,720	12%

Outyears (\$K)

Power Services – Capital

Associated Project Costs
Fish & Wildlife
Energy Efficiency
Projects Funded in Advance
Total, Power Services - Capital

	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate
Associated Project Costs	269,908	281,511	313,754	333,297	347,926
Fish & Wildlife	45,602	18,646	34,806	35,033	33,599
Energy Efficiency	0	0	0	0	0
Projects Funded in Advance	0	0	0	0	0
Total, Power Services - Capital	315,510	300,157	348,560	368,330	381,525

¹ Amount is attributable to Bonneville’s Power Prepayment Program.

Program Overview

Associated Project Costs provide for direct funding of additions, improvements, and replacements of existing Reclamation and Corps hydroelectric projects in the Pacific Northwest. The FCRPS hydro projects produce electric power that is marketed by Bonneville.

Maintaining the availability and increasing the efficiency of the FCRPS is critical to ensuring that the region has an adequate, efficient, economic, and reliable power system. The FCRPS represents about 80 percent of Bonneville's firm power supply and includes 31 operating federal hydroelectric projects with over 200 generating units. These projects have an average age of about 50 years, with some that exceed 60 years of age. Through direct funding and the cooperation of the Corps and Reclamation, Bonneville uses its U.S. Treasury borrowing authority and customer prepayment program to make investments needed to restore generation availability and improve efficiency, reducing demand on Corps and Reclamation appropriations for power-related investments.

Since the beginning of direct funding in FY 1997, Bonneville, along with its joint operating partners, the Corps and Reclamation, has improved system performance. In 1999, at the direction of Congress, Bonneville issued a report that it soon began to implement called the "Asset Management Strategy for the FCRPS." In this report, Bonneville concluded that it needed to invest nearly \$1 billion, in aggregate, in the hydroelectric projects over the ensuing 12 to 15 years. Supplementary analyses and experience with the system have revealed additional and ongoing investment needs above and beyond the levels originally planned under the 1999 Asset Management Strategy. In 2008, 2010, 2012, and 2014, Bonneville updated its asset strategy and refined its understanding of the long-term capital investments needed to preserve system performance.

These planned investments, included in the FY 2017 Budget estimates, will maintain the generation performance of the FCRPS. Moving forward with the cost-effective opportunities to expand the generation and to preserve and enhance the capability of the FCRPS is a smart, economic, and environmentally beneficial decision when compared to purchasing power from the market to serve growing Pacific Northwest electricity needs.

Fish and wildlife capital costs incurred by Bonneville are directed at activities that improve Columbia River Basin fish and wildlife resources. It includes projects designed to increase juvenile and adult fish passage through the Columbia River system, to increase fish production and survival through construction of hatchery, acclimation and fish monitoring facilities, and to increase wildlife and resident fish populations through land acquisitions. These capital projects support both Northwest Power Act and ESA priorities and are integrated with the Program in order to efficiently meet Bonneville's legal responsibilities to mitigate hydrosystem impacts to Columbia River Basin fish and wildlife.

Bonneville implements projects consistent with the Program and the purposes of the Northwest Power Act. Most projects recommended by the Council undergo independent scientific review as directed by the 1996 Energy and Water Appropriations Act, which added section 4(h)(10)(D) to the Northwest Power Act. As a result, the Council appoints an Independent Scientific Review Panel (ISRP) "to review a sufficient number of projects" proposed to be funded through Bonneville's annual fish and wildlife budget "to adequately ensure that the list of prioritized projects recommended is consistent with the Program." The Northwest Power Act further states that "in making its recommendations to Bonneville, the Planning Council shall consider the impact of ocean conditions on fish and wildlife populations; and shall determine whether the projects employ cost effective measures to achieve program objectives." Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council uses a multi-year project review cycle during which the ISRP will review categories of projects grouped together.

Under the Northwest Power Act, the Council must develop a Fish and Wildlife Program that protects, mitigates, and enhances Columbia River Basin fish and wildlife affected by the federal and non-federal hydroelectric projects in the basin. The Program, FCRPS BiOps, and Bonneville's long-term agreements include prioritized strategies for mitigation actions and projects to meet Bonneville's responsibilities under the Northwest Power Act, the ESA, the Federal Clean Water Act, and other laws. When issues arise that potentially trigger the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, Bonneville works with the

Council and the regional fish and wildlife managers, customers, and tribes, as appropriate, to ensure ratepayers fund only appropriate mitigation.

As required under the ESA, Bonneville implements additional measures to avoid jeopardizing listed species. ESA measures are part of the most recent BiOp issued by NOAA in 2008, as supplemented in 2010 and 2014, and USFWS BiOp in 2006/2010.

- In February 2006, USFWS issued a BiOp for Libby Dam for the Kootenai River white sturgeon and bull trout. A subsequent Settlement Agreement between USFWS and the Center for Biological Diversity was memorialized by modifying the BiOp in 2008. Additional consultation is occurring as part of the larger USFWS bull trout consultation.
- In 2010 USFWS designated critical habitat for bull trout (following USFWS's issuance in 2000 of a BiOp for FCRPS impacts on bull trout). The Action Agencies (Corps, Reclamation, and Bonneville) are preparing a biological assessment covering FCRPS operational effects on bull trout and designated bull trout critical habitat.
- In May 2008, NOAA issued a FCRPS BiOp for 13 listed species of salmon and steelhead, supplemented in a 2010 Supplemental BiOp that incorporated the Action Agency's Adaptive Management Implementation Plan, and further supplemented in a 2014 Supplemental BiOp. On January 17, 2014, NOAA released its 2014 Supplemental BiOp. The 2008/2010/2014 BiOp is now under legal review.
- In July 2008, USFWS and NOAA issued Willamette River BiOps to address impacts from 13 federal dams on salmon, steelhead, Oregon chub, and bull trout. Implementation of a BiOp measure related to hatchery fish in the McKenzie River was the subject of litigation in Federal District Court. The Action Agencies are currently engaged in discussion with NOAA related to BiOp implementation for downstream passage and for hatchery consultations.

Under these collective BiOps, the Action Agencies have committed to implement hydro, habitat, hatchery, and other actions throughout the Columbia River Basin to address impacts stemming from the operation of the federal hydro-electric dams on ESA-listed fish, and to ensure that operations of the federal dams do not jeopardize the continued existence of the listed species or adversely modify their designated critical habitat.

The Action Agencies also signed the 2008 Columbia Basin Fish Accords (Fish Accords or Accords) with five Northwest Tribes, and the states of Idaho and Montana. In 2009, an agreement was signed with the state of Washington and federal agencies (the state of Washington Estuary agreement). And in 2012, the Action Agencies signed an agreement with the Kalispel Tribe of Indians covering Albeni Falls Dam and FCRPS operations. Wildlife settlement agreements have been signed with the states of Oregon and Idaho to help extinguish the required mitigation for the flooding and inundation caused by FCRPS dams operating in those states. These Fish Accords and settlements complement the BiOps and provide firm commitments to prioritize mitigation actions and secure funding over the life of the agreements.

As noted above, BiOps, Fish Accord and wildlife settlement commitments are integrated along with other projects and implemented through the Program under the Northwest Power Act. They provide the basis for the Bonneville Fish and Wildlife Program's planned capital investment.

Energy Efficiency is an important part of Bonneville's diverse portfolio of resources that provides a reliable approach to meeting Bonneville's load obligations. When acquiring resources to meet planned future loads, the Northwest Power Act requires the Administrator to first consider and acquire all cost-effective conservation that the Administrator determines is consistent with the Council's Power Plan. The Council's 6th Power Plan, finalized in February 2010, established a regional target of 1,200 annual average megawatts (aMW) of energy efficiency in 2010 through 2014. Bonneville, in collaboration with its public power customers, took responsibility for public power's share of the regional target, approximately 42 percent (504 aMW). Bonneville exceeded the target of 504 aMW by approximately 109 aMW, at the end of FY 2014. Since the 7th Power Plan is not expected to be issued until early in 2016, in the interim, Bonneville's planning is focused on consistency with the 6th Power Plan's later years. Bonneville has adopted an interim goal of 400 aMW of energy efficiency in FY 2015 through FY 2017. In FY 2015, Bonneville anticipates that between 45 and 50 aMW of this amount will be acquired under its capital energy efficiency program. Beginning in FY 2012, at least 70 percent of this energy efficiency budget was allocated to utilities to fund energy efficiency incentives with the remainder going to support regional programs. Program performance measurements (\$/aMW) indicate that Bonneville is realizing value for these investments relative to other

resources. As of FY 2016, new expenditures in this program are being expensed and are included in the Power Services – Operating Expense category discussed further below.

In general, long-term investments in energy efficiency help buffer the FCRPS against future resource uncertainties. During periods of price volatility, energy efficiency reduces financial risk associated with relying on the market for energy purchases.

Accomplishments

- Issued final Record of Decision for the FYs 2016-2017 rate case on July 23, 2015.
- Facilitated integration of 5,081 MW of wind generation through December 2015.
- Completed 500 kV switchyard relay replacements at Grand Coulee.
- Completed fire detection and alarm system at Palisades.
- Completed governor replacements and vibration and air gap monitoring installation at Bonneville Dam.
- Completed powerhouse roof replacement at Libby.
- Completed spillway crane modernization, spillway gate modification, and intake crane modernization at Albeni Falls.
- The returns of adult salmon and steelhead to the Columbia River system from 2009 to 2014 vary by species, but many stocks (especially Snake River fall Chinook and Snake River sockeye) have returned at the highest numbers in decades. Research shows that survival of juvenile salmon and steelhead migrating down the Snake and Columbia rivers has improved in recent years and is on track to meet performance standards of 96 percent survival per dam for spring-migrating fish and 93 percent survival for summer migrants.

Explanation of Changes

Bonneville's budget includes \$315.5 million in FY 2017 for Power Services capital, which is a 12.4 percent increase over the FY 2016 forecasted level. The FY 2017 level reflects a continuing need for investment in the hydro electric system assets, and funding necessary to implement the BiOps, Fish Accords, and Columbia Basin Fish and Wildlife activities.

The FY 2017 budget increases the levels for Associated Projects (+\$29.1 million) and Fish & Wildlife (+\$5.6 million), relative to FY 2016. Energy Efficiency will be funded out of expense beginning in FY 2016.

Strategic Management

Bonneville provides electric power while supporting the achievement of its vital responsibilities for fish and wildlife, energy efficiency, renewable resources, and low-cost power in the Pacific Northwest region. Bonneville will continue to implement the following strategies to serve the region:

1. Bonneville coordinates its power operational activities with the Corps, Reclamation, NERC, regional electric reliability councils, its customers, and other stakeholders to provide the most efficient use of federal assets.
2. Ongoing work with the Corps and Reclamation is focused on improving the reliability of the FCRPS, increasing its generation efficiency, and optimizing hydro facility operation.
3. Bonneville is committed to continue funding efforts to protect listed fish and wildlife species in the Columbia Basin under the ESA and to work closely with the Council, regional fisheries managers, and other federal agencies to prioritize and manage projects to address Fish and Wildlife Program priorities.
4. Bonneville's utility customers have been, and continue to be, a critical part of Bonneville's collaborative efforts to promote and foster the efficient use of energy.
5. Bonneville has partnered and assisted with a DOE Wind Power crosscutting initiative to strengthen energy security by adding alternative sources of renewable energy.

The following external factors present the most significant risk and impact to overall achievement of the program's strategic goals:

1. Continually changing regional economic and institutional conditions;
2. Competitive dynamics; and
3. Ongoing changes in the electric industry.

Associated Projects

Overview

Bonneville will work with both the Corps and Reclamation to reach mutual agreement on budgeting and scheduling those capital improvement projects that are cost-effective and provide system or site-specific enhancements, increase system reliability, or provide generation efficiencies.

The work is focused on improving the reliability of the FCRPS and on increasing its generation efficiency or capacity through turbine runner replacements, optimizing hydro facility operation, and new unit construction. Also, limited investments may be made in joint-use facilities that are beneficial to both the FCRPS operations and to other Corps and Reclamation project purposes.

Corps of Engineers Projects

(\$K)		
FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
33,712	154,324	160,429

Bonneville Dam:

- **FY 2015.** Completed governor replacements and vibration and air gap monitoring installation. Continued main unit breaker and station service reconfiguration, governor oil filtration system installation, generator step-up (GSU) transformer instrumentation, Powerhouse 2 transformer refurbishment, and control room fire protection upgrades.
- **FY 2016.** Complete governor oil filtration system installation. Continue control room fire protection upgrades, Powerhouse 2 transformer refurbishment, GSU transformer instrumentation, and main unit breaker and station service reconfiguration. Begin Powerhouse 1 DC and preferred AC upgrades.
- **FY 2017.** Continue main unit breaker and station service reconfiguration, Powerhouse 2 transformer refurbishment, GSU transformer instrumentation, and Powerhouse 1 DC and preferred AC upgrades. Begin Powerhouse 2 tailrace gantry crane rehabilitation and fire protection projects for the control room and both oil storage rooms, and purchase draft tube stop logs for the Powerhouse 2.

John Day Dam:

- **FY 2015.** Continued governor replacements, DC system upgrades, Baldwin-Lima Hamilton (BLH) turbine hub upgrades, draft tube bulkhead refurbishment, station service transformer replacements, and control room fire protection upgrades. Began transformer and powerhouse oil/water separator and rotor pedestal installation.
- **FY 2016.** Complete governor replacements and DC system upgrades. Continue BLH turbine hub upgrades, control room fire protection upgrades, transformer and powerhouse oil/water separator, rotor pedestal installation, and station service transformer replacements. Begin 500kV disconnect replacement.
- **FY 2017.** Complete draft tube bulkhead refurbishment and rotor pedestal installation. Continue BLH turbine hub upgrades, control room fire protection upgrades, 500kV disconnect replacement, and station service transformer replacement. Begin SQ board (switchgear) replacement and powerhouse oil detection system installation.

The Dalles Dam:

- **FY 2015.** Completed control room fire protection upgrades, Station Control Console (SCC) replacement, and elevator refurbishments. Continued tailrace gantry crane refurbishment and transformer replacements.
- **FY 2016.** Complete tailrace gantry crane refurbishment. Continue transformer replacements and elevator refurbishments. Begin emergency crane rehabilitation, arc flash hazard reduction project, and SR panel (switchgear) replacement.
- **FY 2017.** Complete elevator refurbishments. Continue transformer replacements, SR panel replacement, arc flash hazard reduction project, and emergency crane rehabilitation. Begin fish unit breaker replacement and thrust bearing oil coolers installation.

Willamette Plants:

- **FY 2015.** Completed spillway tainter gate repair at Dexter and butterfly valve replacement at Lost Creek. Completed turbine runner replacements at Hills Creek and governor replacement at Green Peter and Foster. Continued governor replacements at Big Cliff, Cougar, Dexter, Detroit, and Lookout Point. Continued electrical reliability upgrades at Dexter and Foster. Continued spillway tainter gate rehabilitation at Green Peter. Continued Generic Data Acquisition and Control System (GDACS) installation and communication system upgrade at all Willamette Valley plants. Began main unit breaker replacement at Green Peter and bridge crane rehabilitation at Foster and Green Peter. Began Hills Creek and Detroit spillway tainter gate rehabilitation.
- **FY 2016.** Complete governor replacements at Big Cliff, Cougar, Dexter, Detroit, and Lookout Point. Complete spillway tainter gate rehabilitation at Lookout Point, Green Peter, and Hills Creek. Complete electrical reliability upgrades at Dexter. Continue Detroit spillway tainter gate rehabilitation and electrical reliability upgrades at Foster, as well as bridge crane rehabilitation at Foster and Green Peter. Continue GDACS installation and communication system upgrade at all Willamette Valley plants. Begin electrical reliability upgrades at Lookout Point and spillway gate rehabilitation at Hills Creek and Cougar.
- **FY 2017.** Complete Foster bridge crane rehabilitation. Continue Detroit spillway gate rehabilitation and electric reliability upgrades at Foster and Lookout Point. Continue GDACS installation and communication system upgrade at all Willamette Valley plants. Continue main unit breaker and electrical reliability upgrades and powerhouse bridge crane refurbishment at Green Peter. Begin powerhouse roof replacement at Cougar and turbine platform installations at all Willamette Valley plants.

Albeni Falls Dam:

- **FY 2015.** Completed spillway crane modernization, spillway gate modification, and intake crane modernization. Began transformer replacement and station service switchgear replacement.
- **FY 2016.** Continue transformer replacement and station service switchgear replacement. Begin generator fire suppression system upgrade.
- **FY 2017.** Complete station service switchgear replacement. Continue transformer replacement.

Libby Dam:

- **FY 2015.** Completed powerhouse roof replacement. Continued governor installation and powerhouse and dam electrical distribution equipment replacement. Began powerhouse DC emergency lighting system installation and control console replacement.
- **FY 2016.** Complete powerhouse and dam electrical distribution equipment replacement. Complete powerhouse DC emergency lighting system installation and control console replacement. Continue governor installation.
- **FY 2017.** Complete governor installation.

Chief Joseph Dam:

- **FY 2015.** Completed exciter replacement. Continued governor installation, generator cooling system upgrades, DC and preferred AC upgrades, Station Control Console (SCC) board replacement, and turbine replacements. Began upgrades for station service units.
- **FY 2016.** Complete SCC board replacement. Continue governor installation, generator cooling system upgrades, DC and preferred AC upgrades, upgrades for station service units SS01 and SS02, and turbine replacements. Begin Units 17-27 generator rewinds.
- **FY 2017.** Complete turbine replacements. Continue DC and preferred AC upgrade, generator cooling system upgrades, Units 17-27 generator rewinds.

Dworshak Dam

- **FY 2015.** Continued governor replacement and Unit 3 rehabilitation. Began Regulating Outlet (RO) valve upgrade.
- **FY 2016.** Complete powerhouse Heating, Ventilating, Air Conditioning (HVAC) upgrade. Continue governor replacement and Unit 3 rehabilitation. Continue upgrade RO valve. Begin exciter replacement and tailrace crane rehabilitation.
- **FY 2017.** Complete unit 3 stator and cooler replacement. Continue exciter replacement, RO valve upgrade and

tailrace crane rehabilitation.

McNary Dam

- **FY 2015.** Continued generator winding replacements. Continued turbine design and replacement, 4160-480V station service rehabilitation, exciter replacement, potable water system upgrade, and levee drainage pump station upgrades. Began governor installation, powerhouse bridge crane skew control, spillway gate rehabilitation, main unit (MU) cooling water strainers replacement, and 230kV transformer design.
- **FY 2016.** Complete generator winding replacements and potable water system upgrade. Continue turbine design and replacement, 4160-480V station service rehabilitation, exciter replacement, MU cooling water strainers replacement, levee drainage pump station upgrades, and governor installation. Begin isophase bus upgrade.
- **FY 2017.** Complete transformer purchase, bridge crane skew control, digital governor replacements and exciter replacements. Continue turbine design, isophase bus upgrade, levee drainage pump station upgrades, MU cooling water strainers replacement, and 4160-480V station service rehabilitation. Begin spare main unit bearing design and purchase.

Ice Harbor Dam

- **FY 2015.** Completed governor replacement, drainage and dewatering pump upgrade, and oil storage and handling upgrade. Continued Units 1-3 runner replacements and stator winding replacement. Began HVAC controls upgrade.
- **FY 2016.** Continue Units 1-3 runner replacements, stator winding replacement, and HVAC controls upgrade.
- **FY 2017.** Continue Units 1-3 runner replacements.

Little Goose Dam

- **FY 2015.** Completed powerhouse bridge crane rehabilitation. Continued governor installations. Began station service transformers replacement.
- **FY 2016.** Complete governor installation. Purchase spare tailrace stoplogs. Continue station service transformers replacement.
- **FY 2017.** Purchase spare main unit bearing.

Lower Granite Dam

- **FY 2015.** Completed sewage treatment plant upgrade and powerhouse bridge crane refurbishment. Continued governor replacement, powerhouse HVAC system upgrade, and Unit 1 BLH linkage upgrade.
- **FY 2016.** Complete powerhouse HVAC system upgrade. Continue Unit 1 BLH linkage upgrade and governor replacement.
- **FY 2017.** Complete Unit 1 BLH linkage upgrade and governor replacement. Purchase spare main unit bearing.

Lower Monumental Dam

- **FY 2015.** Continued Unit 1 BLH linkage upgrade and generator rewind. Continued governor replacement.
- **FY 2016.** Continue Unit 1 BLH linkage upgrade and generator rewind. Continue governor replacement. Begin isophase bus rehabilitation.
- **FY 2017.** Complete Unit 1 BLH linkage upgrade and generator rewind. Continue governor replacement. Begin station service breaker replacement.

Bureau of Reclamation Projects

(\$K)

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
9,489	86,466	109,479

Grand Coulee Dam

- **FY 2015.** Completed 500 kV switchyard relay replacements. Continued Supervisory Control and Data Acquisition System (SCADA) replacement, purchase of another left and right powerhouse spare winding, G22-24 wear ring replacements, and right powerplant transformer replacements. Continued powerplant battery replacement, drumgate floating bulkhead, Units 1-18 stator windings, cores, and spare replacement program, Units 1-18 exciter and governor replacement, station service compressed air system upgrades, and Units 21-24 transformer replacement. Began design for Units 19-21 upgrades including winding replacements.
- **FY 2016.** Complete powerplant battery replacement. Continue SCADA replacement, G22-24 wear ring replacements, drumgate floating bulkhead, Units 1-18 stator windings, cores, and spare replacement program, Units 1-18 exciter and governor replacement. Continue purchase of another left and right powerhouse spare winding, Units 19-21 upgrades including winding replacements, station service compressed air system upgrades, and Units 21-24 transformer replacement. Begin Units 22 and 23 wicket gate replacements.
- **FY 2017.** Complete G22-24 wear ring replacements and floating drumgate bulkhead. Continue SCADA replacement, Units 19-21 upgrades including winding replacements, Units 1-18 windings, core, exciter and governor replacements. Continue Units 22 and 23 wicket gate replacements, Units 21-24 transformer replacements and compressed air system upgrades. Begin Units 11-18 transformer replacements.

Keys Pump Generating Plant

- **FY 2015.** Continued P1-P6 exciters, relays and unit controls, PG7-PG12 governors, exciters, relays and unit controls. Continued PG7-PG12 circuit breaker replacement, and P5 and P6 impeller and core replacement and rewinds.
- **FY 2016.** Continue P1-P6 exciters, relays and unit controls, PG7-PG12 governors, exciters, relays and unit controls. Continue PG7-PG12 circuit breaker replacement, and P5 and P6 impeller and core replacement and rewinds. Begin phase reversal switch replacement.
- **FY 2017.** Complete PG7-PG12 circuit breaker replacement. Continue P5 and P6 impeller and core replacement and rewinds. Continue P1-P6 exciters, relays and unit controls and PG7-12 governors, exciters, relays and unit controls. Continue phase reversal switch replacement.

Hungry Horse Dam

- **FY 2015.** Continued SCADA replacement and station service and Motor Control Center (MCC) upgrades, main unit transformer fire protection system replacement, powerhouse crane controls, and exciter and governor replacement.
- **FY 2016.** Complete station service and MCC upgrades. Continue SCADA replacement, main unit transformer fire protection system replacement, powerhouse crane controls, and exciter and governor replacement.
- **FY 2017.** Continue SCADA replacement, G1-G4 exciter and governor replacement, main unit transformer fire protection system replacement, and powerplant crane controls.

Chandler Dam

- **FY 2015.** No capital projects underway.
- **FY 2016.** Begin Units 1 and 2 generator rewinds.
- **FY 2017.** Continue Units 1 and 2 generator rewinds.

Palisades Dam

- **FY 2015.** Completed fire detection and alarm system. Continued turbine runner replacement. Begin microwave system backbone east side.
- **FY 2016.** Complete turbine runner replacement and arc flash mitigation.
- **FY 2017.** Continue microwave system backbone eastside.

Green Springs Dam

- **FY 2015.** Continued exciter and transformer replacement.
- **FY 2016.** Complete transformer replacement.
- **FY 2017.** Complete exciter replacement.

Black Canyon Dam

- **FY 2015.** Continued Units 1 and 2 upgrades, and trash rake system.
- **FY 2016.** Continue Units 1 and 2 upgrades, and trash rake system.
- **FY 2017.** Complete installation of trash rake system. Continue Units 1 and 2 upgrades.

Anderson Ranch Dam

- **FY 2015.** Continued station service upgrade.
- **FY 2016.** Complete station service upgrade.
- **FY 2017.** No planned capital projects.

Roza Dam

- **FY 2015.** Continued switch rehabilitation and breaker upgrade.
- **FY 2016.** Complete switch rehabilitation and breaker upgrade.
- **FY 2017.** No planned capital projects.

Minidoka Dam

- **FY 2015.** Began Units 8 and 9 governor replacement and microwave system backbone east side. Continued arc flash mitigation.
- **FY 2016.** Complete arc flash mitigation. Continue Units 8 and 9 governor replacement and microwave system backbone east side. Begin switchyard modernization.
- **FY 2017.** Continue Units 8 and 9 governor replacement, switchyard modernization and microwave system backbone eastside.

**Fish & Wildlife
(\$K)**

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
21,373	40,000	45,602

Overview

Bonneville continues to develop budgets for the suite of fish and wildlife mitigation projects originally adopted in FY 2007 based on recommendations from the Council. Bonneville reaffirmed and expanded many project-specific commitments in subsequent agreements and processes, including BiOps and Fish Accords, and since then, virtually all these projects received independent science review through the Council and its project review processes. Bonneville’s funding decisions embrace many of the management objectives and priorities in the Program and continue to integrate ESA responsibilities as described in the NOAA Fisheries’ and USFWS’s FCRPS BiOps. Coordination continues among Bonneville, Council, federal resource management agencies, states, tribes, and others to support the projects that satisfy Bonneville’s mitigation responsibilities.

Bonneville intends to continue implementing the kinds of projects listed below. These projects are based upon the best available science and are regionally important in that they provide high priority mitigation and protection actions for fish and wildlife populations affected by the construction and operation of the FCRPS dams. Projects and facilities listed below deliver direct on-the-ground benefits to both ESA listed and non-listed fish and wildlife throughout the Columbia River Basin and have been evaluated and coordinated with the Council, state, federal and tribal fish and wildlife resource managers, local governments, watershed and environmental groups, and other interested parties. Specifically, as capital construction projects, hatchery facilities typically go through the Council’s three-step process, which includes development of a Master Plan, environmental compliance, ESA consultation, value engineering analysis, and review by the Independent Science Review Panel.

Bonneville also may capitalize investment in some fish and wildlife habitat acquisitions if it provides a creditable and quantifiable benefit against a defined obligation for Bonneville and follows Bonneville’s Capitalization Policy.

The three types of fish and wildlife projects that Bonneville capitalizes are as follows:

- 1) Fish passage structures -- Structures that enhance fish access to habitat in the Columbia River Basin. Work elements could contain the following: wells, ladders, screens, pumping, culverts, diversion (irrigation) consolidation, piping to reduce water loss, irrigation efficiencies (drip irrigation), lining of ditches (seepage reduction), removal of objects impeding fish passage or pushup dams, and construction-related habitat restoration.
- 2) Hatchery facility construction -- Projects and activities relating to the construction of fish hatcheries, including related satellite facilities (acclimation ponds and collection weirs). This may also include construction-related habitat restoration.
- 3) Land acquisition and stewardship -- Land acquisition projects protect, enhance, and maintain instream wetland and riparian habitat and provide credit to Bonneville, such as habitat units (HUs) or acres for wildlife or instream miles for resident fish, to fulfill the legal obligation of Bonneville to mitigate the impacts from construction and operation of the FCRPS.

Fish supplementation, production, and related facilities that may require capital funds in FY 2017 include the following:

The Consolidated Appropriations Act, 2016 (Public Law 114-113) provided Expenditure Authority for the following projects:

- Shoshone Paiute Trout Hatchery: The Shoshone Paiute Tribes of the Duck Valley Reservation propose that Bonneville fund the purchase and/or construction of a trout hatchery. The Tribes would own and operate the hatchery to produce trout for stocking in reservoirs located on the Duck Valley Reservation. Bonneville would fund the capital expenditure to meet contemporary aquaculture standards and achieve fish production goals. The Tribes believe they can reduce federal reservoir stocking costs—some of which Bonneville pays now on an annual basis.

- Spokane Tribal Hatchery: The Spokane Tribal Hatchery, funded by Bonneville in 1989 as partial mitigation for the impacts of the FCRPS, is owned and operated by the Spokane Tribe of Indians. The facility spawns, incubates, and rears Kokanee salmon and rainbow trout near Wellpinit, WA. In June 2015, the Tribe and Bonneville signed a 20-year agreement renewing commitments to operate and maintain the facility. The renewed agreement also plans to upgrade aging infrastructure, including ground water pumps and rearing containers. The work could begin in FY 2017.

-Snake River Sockeye Weirs: Bonneville funds efforts implemented by the Idaho Department of Fish and Game and the Shoshone Bannock Tribes to rebuild Snake River sockeye throughout their historic range. The combination of substantially increased numbers of returning adults as well as the completion of the Springfield Sockeye Hatchery in 2013 and its associated increased production, has created the need for Bonneville to potentially fund the construction, operation, and maintenance of weirs to further sockeye management objectives.

The FY 2014 Omnibus Appropriations Act (Public Law No. 113-76) provided Expenditure Authority for the following projects:

- John Day Reprogramming and Construction: This project is being proposed by the Columbia River Inter-Tribal Fish Commission (CRITFC) under the Accords to work on the balance between upriver and down river salmon hatchery production mitigating for John Day and The Dalles Dams. Final reprogramming facilities and locations are still being analyzed by the Tribes, the Corps, and Bonneville. The project area encompasses the mainstem Columbia River from the base of McNary Dam downstream to The Dalles Dam. Capital dollars for this project will integrate with the Corps funds constructing additions to new or existing FCRPS hatchery facilities to accommodate the reprogramming of hatchery fish.

- Columbia River Basin White Sturgeon Hatchery: The Columbia River Basin White Sturgeon Hatchery, proposed by the CRITFC under the Accords, will mitigate for white sturgeon population declines due to consistent poor recruitment upstream of Bonneville Dam. Expected production at a new or existing facility will be 15,000 - 20,000 yearling white sturgeon per year. The final project may include broodstock collection and holding, rearing wild-spawned juveniles, and acclimating juveniles prior to release. A location for the facility has not yet been determined, but it will likely be located within 60 miles of the confluence of the Columbia and Snake Rivers. The Master Plan for the hatchery is currently under review by the Council.

- Kelt Reconditioning and Reproductive Success Evaluation Research: CRITFC, under the Accords, is proposing a relatively small holding tank facility to recondition female steelhead (kelts) after they have spawned. The fish will be held and fed until they have rematured and then be released into the Snake River where they will contribute to the spawning run. The capital portion of the project is expected to be constructed in the Snake River Basin, potentially at Lower Granite Dam. As specified in the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, Bonneville will implement the kelt reconditioning plan to improve the productivity of Snake River basin B-run steelhead populations that are listed for protection under the ESA. NOAA's analysis of Prospective Actions indicates that a combination of transportation, kelt reconditioning, and in-stream passage improvements (e.g., spill-flow modifications) could increase kelt returns enough to increase the number of returning Snake River B-run steelhead spawners to Lower Granite Dam by a target of 6 percent as specified under the BiOp. The Master Plan for the facility is currently being reviewed by Bonneville.

Ongoing Projects (Expenditure Authority previously received):

- Crystal Springs Hatchery Facilities: This project is for facilities for rearing and out-planting resident and anadromous fish in central and southern Idaho. The facility would be located near the American Falls Reservoir in Idaho. It may produce Yellowstone Cutthroat, a resident fish, and anadromous fish including Snake River spring Chinook salmon Snake River steelhead, and Snake River sockeye. The facility is expected to produce up to one million Chinook smolts annually. The facility is sponsored by the Shoshone-Bannock Tribes under their Accord, who are expected to operate and manage the facility once it is complete. A final Environmental Impact Statement is expected to be complete in 2016 and a Record of Decision is expected in February 2017.

- Redfish Lake Sockeye Salmon program: The Snake River sockeye salmon, an Evolutionarily Significant Unit (ESU), was listed under the Endangered Species Act in 1991 (56 FR 58619). The Snake River Sockeye Salmon Captive Broodstock Program has

prevented the extinction of endangered Snake River sockeye salmon. The program has been able to help successfully conserve the genetic resources of the founding population and begun producing fish for rebuilding the naturally spawning population in Redfish Lake. The program uses state of the art hatchery facilities and fish husbandry protocols, genetic support, and monitoring and evaluation to continue rebuilding numbers of fish. Currently, the program retains replicate, captive broodstock within multiple facilities (Eagle Fish Hatchery (FH) located in Idaho state and Burley Creek FH and Manchester Research Station, both located in Washington state). Eggs produced from these locations are transferred to other facilities (Oxbow FH, located in Oregon state and/or Sawtooth FH located in Idaho state) for release programs. The project continues to expand by increasing the capacity of existing facilities and also by acquiring a new facility under the Idaho Columbia Basin Fish Accord. The newly constructed Springfield FH located in Idaho produces additional smolts as called for in the NOAA Fisheries FCRPS BiOp. The expanded smolt releases have already resulted in an increase in the abundance and productivity of the naturally-spawning population. This strategy will greatly increase the likelihood of higher adult returns. Additional expansions include improvements at the Redfish Lake Creek trap and Sawtooth FH weir to hold/trap an increased number of adults to support increased smolt production from Springfield Hatchery. The biological goals are to increase the number of adults spawning naturally in the Sawtooth Valley and transition the captive broodstock to a conventional hatchery production program that uses anadromous adults as broodstock.

- Klickitat Production Expansion: The Klickitat River Master Plan was submitted by the Yakama Nation, reviewed by the ISRP, recommended with comments by the Council, and approved by Bonneville in 2008. The plan's goal is to protect and increase naturally producing populations of spring Chinook and steelhead while protecting the biological integrity and the genetic diversity of indigenous fish stocks in the sub-basin. The Klickitat Master Plan includes three main elements: Lyle Falls Fishway upgrades; construction of the Castile Falls enumeration facility; upgrades to the Klickitat hatchery with the potential for constructing a new facility in the lower Klickitat River to accommodate the ongoing production of coho and fall Chinook; and an acclimation site in the upper watershed at McCreedy Creek. In early 2009 Bonneville completed the Lyle Falls Environmental Impact Statement (EIS) and Record of Decision (ROD). Upgrades to enumeration and collection facilities at Lyle and Castile have been completed. Certain upgrades at the Klickitat Hatchery have also been made to maintain existing fish and wildlife program activities and to address hatchery safety concerns. Lyle and Castile Falls fishways have passive integrated transponder (PIT) tag interrogation capability, and the Lyle Falls facility includes a lamprey passage structure. A new Klickitat Hatchery Complex EIS initiated in July 2009 will examine options for the development and operation of new production and supplementation facilities and acclimation alternatives, and additional upgrades to the existing hatchery facility. The Yakama Nation issued a revised Master Plan, July 2012, providing updates to their fish management plans. When the EIS is complete and Master Plan accepted, the Council will review the Step 3 recommendation in the Council 3-Step Review process. The final EIS has been held up while the Yakama Nation refines its proposal. The National Environmental Policy Act (NEPA) process will resume shortly after the tribe settles on its proposal. Construction would occur only after Bonneville issues a ROD and the National Marine Fisheries Service (NMFS) completes the Biological Opinion for the Klickitat Production/Fish Management plans. Bonneville is working with the Yakama Nation to identify and focus on the highest priority construction actions in the Klickitat Watershed.

- Hood River Production Facility: This project is underway and includes expansion of existing Parkdale fish hatchery to accommodate spring Chinook rearing, construction of new Hood River adult salmonid trapping facilities, and development of alternative adult trapping sites. The Powerdale Dam Fish Trap formerly provided the foundation for many of the activities associated with implementation of the Hood River Production Program. These include: monitoring escapement, collecting life history characteristics, and broodstock acquisition. PacificCorps' demolition of its Powerdale Dam and the associated fish trapping facility in 2010 necessitated the development of alternative adult broodstock trapping sites. One permanent fish trap on the West Fork of the Hood River was completed in 2013, and a temporary trapping site is operational on the East Fork Hood River. A permanent trap site on the East Fork is currently being evaluated. The Hood River Production Program has four primary goals: 1) re-establish naturally sustaining runs of spring Chinook in the Hood River; 2) re-build naturally sustaining runs of summer and winter steelhead in the Hood River; 3) maintain genetic characteristics of Hood River fish populations; and 4) provide fish for sustainable harvest by both sport and tribal fishers.

- Mid-Columbia Coho Restoration: This Yakama Accord project's vision is to re-establish naturally reproducing coho salmon populations in the Wenatchee River and Methow River sub-basins at biologically sustainable levels which provide significant harvest in most years. This program will construct a facility on the Wenatchee River for holding and spawning broodstock,

incubating eggs, and rearing juveniles. Additional semi-natural ponds will also be constructed in the Wenatchee and Methow sub-basins for acclimating smolts prior to their release. The phased approach, including associated facilities, incorporates development of a mid-Columbia hatchery broodstock, local adaptation to tributaries in the Wenatchee and Methow Basins, and habitat restoration that will benefit coho as well as ESA-listed spring Chinook, steelhead, and bull trout. Major facility construction is expected to occur over the FYs 2016-2017 timeframe.

- Walla Walla Hatchery: The Walla Walla Hatchery is proposed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) under their Accord. The Tribes would own and operate the hatchery, which will produce up to 500,000 spring Chinook smolts annually for release into the Walla Walla River. Final-design started in the summer of 2013, upon finalization of the Council/BPA/CTUIR agreement to proceed. An environmental impact statement, which was started in January 2013, is now expected to be completed in 2016. Construction may commence as early as 2016. The facility will hold, spawn, incubate and rear spring Chinook on the South Fork Walla Walla River near Milton-Freewater, Oregon.

- Yakima Coho Facility: This hatchery is proposed by the Confederated Tribes and Bands of the Yakama Nation under the Yakama Nation Accord, and is presented in the Yakima River Subbasin Summer and Fall Run Chinook and Coho Salmon Hatchery Master Plan. The Yakama Nation would own and operate the hatchery which will produce 500,000 parr and 200,000 smolts using broodstock collected at Roza and Sunnyside dams. Pre-design is completed. Bonneville will hold the design and construction contract on behalf of the Yakama Nation. A Request for Offers went out in June 2015 and proposals are expected later in the summer of 2015. Shortly afterward, Bonneville expects to begin scoping an environmental impact statement. Construction is not expected to begin until 2017.

Potential non-construction capital Wildlife and Resident Fish Habitat Acquisitions (including Conservation Easements) eligible for capitalization are:

- Albeni Falls Wildlife Mitigation
- Willamette Wildlife Habitat Acquisitions
- Libby and Hungry Horse Reservoirs Resident Fish Acquisitions
- Southern Idaho Habitat Acquisitions

Energy Efficiency (\$K)		
FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
87,225	0	0

Overview

Bonneville’s energy efficiency program offers several ways for customer utilities to participate in regional energy efficiency. Program components include: (1) standard offer efficiency measures and custom projects, which result in customer proposals to conserve energy through such programs as residential weatherization, commercial lighting, Heating, Ventilation, and Air Conditioning (HVAC), industrial processes and lighting, irrigated agriculture, etc.; (2) third party delivery programs, such as Simple Steps Smart Savings, Energy Smart Industrial, and Green Motors programs; and, (3) programs to help regional federal installations reduce energy use, including federal hatcheries and irrigation districts, and to support the Corps and Reclamation in their efforts to reduce energy use. Support is also available through the large project program which offers funding for larger energy efficiency opportunities. Beginning in FY 2016, all but the large project program will transfer funding from capital to operating expense. Bonneville does not currently have any projected spending for the large project program. This funding conversion from capital to expense eliminates the growth of long-term energy efficiency debt and associated debt service costs without reducing the ability to help the region meet its energy efficiency goals.

Bonneville’s energy efficiency budget reflects a need to meet aggressive targets from the Council’s 6th Power Plan and anticipated targets in the 7th Power Plan. Specifically, Bonneville’s energy efficiency targets increased from about 280 aMW under the Council’s 5th Power Plan (2005-09) to 504 aMW under its 6th Power Plan (2010-14). The 504 aMW reflects conservation that was expected to be achievable in the service territories of Bonneville’s public power customers. In FY 2014, Bonneville exceeded the five-year target and FY 2015 performance continued on that trajectory, exceeding the 117 aMW which was the target for FY 2014 and FY 2015 combined. Because the 7th Power Plan draft is expected to be released in early 2016, Bonneville has determined its level of energy efficiency performance and associated budget based on the 6th Power Plan’s annual savings targets, which call for an incremental 400 aMW of energy efficiency between 2015 and 2017. In meeting its energy efficiency goals, Bonneville may employ resource acquisition agreements, as authorized by Northwest Power Act section 6, and customer self-funded conservation.

Activities and Explanation of Changes

FY 2016 Estimate	FY 2017 Estimate	Explanation of Changes FY 2017 vs FY 2016 Estimate
Power Services – Capital \$280,790,000	\$315,510,000	+\$34,720,000
Associated Projects \$240,790,000 Milestones ¹ : <ul style="list-style-type: none"> • Complete powerplant battery replacement at Grand Coulee. • Complete governor oil filtration system installation at Bonneville dam. • Complete powerhouse and dam electrical distribution equipment replacement at Libby. • Complete turbine runner replacement and arc flash mitigation at Palisades. 	\$269,908,000 Milestones: <ul style="list-style-type: none"> • Complete G22-24 wear ring replacements and floating drumgate bulkhead at Grand Coulee. • Complete turbine replacements at Chief Joseph. • Complete station service switchgear replacement at Albeni Falls. • Complete draft tube bulkhead refurbishment and rotor pedestal installation at John Day. • Complete governor installation at Libby. 	+\$29,118,000/+12.1% The increase reflects a reshaping of funding needs for investment in the hydro electric system assets.
Fish & Wildlife \$40,000,000 Milestones: <ul style="list-style-type: none"> • Continue implementation of the Program, BiOps and Fish Accords. 	\$45,602,000 Milestones: <ul style="list-style-type: none"> • Continue implementation of the Program, BiOps and Fish Accords. 	+\$5,602,000/+14.0% The increase reflects a long-term, planned effort to reshape funding necessary to implement the BiOps, Fish Accords, Columbia River Basin Fish and Wildlife activities.
Energy Efficiency \$0 Milestones: Not applicable	\$0 Milestones: Not applicable	\$0 Not applicable

¹ FY 2016 milestones have been updated from the FY 2016 Congressional submission due to updated forecasts.

**Transmission Services – Capital
Funding Schedule by Activity
Funding (\$K)**

	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate	FY 2017 vs FY 2016	
				\$	%
Transmission Services – Capital					
Main Grid	63,518	104,380	133,777	29,397	28%
Area & Customer Services	4,101	12,946	30,754	17,809	138%
Upgrades & Additions	267,057	253,097	213,994	-39,103	-15%
System Replacements	126,603	329,618	265,952	-63,665	-19%
Projects Funded in Advance	265,983	30,000	30,000	0	0
Total, Transmission Services - Capital	727,262	730,040	674,478	-55,562	-8%

Outyears (\$K)

	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate
Transmission Services - Capital					
Main Grid	133,777	147,782	149,848	121,797	618
Area & Customer Services	30,754	939	299	232	76
Upgrades & Additions	213,994	63,785	59,268	55,017	52,684
System Replacements	265,952	232,969	235,617	240,052	252,846
Projects Funded in Advance	30,000	30,000	50,000	50,000	50,000
Total, Transmission Services - Capital	674,478	475,475	495,032	467,097	356,225

Transmission Services – Capital

Overview

Transmission Services (TS) is responsible for about 75 percent of the Pacific Northwest's high-voltage transmission. TS provides funding for all additions, upgrades and replacements to the Bonneville transmission system, resulting in reliable service to northwest generators and transmission customers. The Bonneville transmission system also facilitates the sale and exchange of power to and from the region.

TS continues to make significant infrastructure improvements and additions to the system to assure reliable transmission in the Northwest. These improvements and additions will help the Bonneville transmission system continue to comply with national reliability standards, replace aging and obsolete equipment, allow for interconnection of needed new generation, and remove constraints that limit economic trade or the ability to maintain the system. Many of the proposed TS projects will be funded through Bonneville lease-purchase agreements. The lease-purchases obligate Bonneville to make expenditures to acquire the use of the related facilities and are identified on an as needed basis. Bonneville may also make related expenditures to facilitate lease-purchase opportunities.

Bonneville's completed infrastructure investments in the last decade that further strengthen the network consist of the following projects: Puget Sound Area Additions, North of Hanford/North of John Day, Celilo Modernization, Eastern Washington Reinforcement, Grand Coulee-Bell, Kangley-Echo Lake, Schultz-Wautoma, McNary-John Day, and Portland Area Additions.

Congressionally-approved Production Tax Credits (PTC) for renewable energy enacted in 2005 were extended in 2009 to 2012, and most recently again in 2013, 2014 and 2015. The incentives created by these credits, along with Renewable Portfolio Standards (RPS) implemented by the states of Oregon, Washington, and California, have spurred a large number of renewable interconnection requests to the Bonneville transmission grid. As of December 31, 2015, Bonneville has interconnected a total of 5,243 MW of new renewable qualified generation. Bonneville has more than 7,000 MW in additional renewable (wind, solar, biomass, geothermal, etc.) interconnection requests still remaining in the study queue. The current projections are possibly 8,500 interconnected MW by 2025. Much of the remaining generation demand is the result of the Renewable Portfolio Standards enacted by Oregon and Washington that require utilities to acquire more than 8,000 MW of renewable energy in the Northwest by 2025. Exports to California are limited now by California laws and are expected to remain at 2,000 to 2,500 MW during the same period. Also in the interconnection queue is approximately 800 MW of natural gas fired generation. Efficiency improvements to the FCRPS hydro units that qualify as renewable are also proposed between 2015 and 2021.

In June 2008, Bonneville's first Network Open Season (NOS) received 153 requests from 28 customers for 6,410 MW of new service, about three-fourths for wind energy integration. Bonneville subsequently offered 1,782 MW of new transmission service on its existing system. Bonneville identified four new Main Grid capital projects from the 2008 NOS: (1) McNary-John Day 500 kV transmission line (part of West of McNary Reinforcements Group 1); (2) Big Eddy-Knight 500 kV transmission line and substation (part of West of McNary Reinforcements Group 2); (3) Central Ferry- Lower Monumental 500 kV Reinforcement (formerly Little Goose Area Reinforcement); and (4) I-5 Corridor 500 kV Reinforcement. Construction of the McNary-John Day 500 kV transmission line is complete and Bonneville has completed construction of the Big Eddy-Knight project and the Central Ferry-Lower Monumental 500 kV Reinforcement project. The I-5 Corridor project is currently undergoing environmental review. If all four projects are constructed they will provide almost 6,000 MW of new transmission service.

Bonneville's second NOS window for new transmission service requests in 2009 resulted in 82 service requests resulting in 34 contracts totaling 1,553 MW. Of that amount, approximately 923 MW represent wind project interconnection requests.

Bonneville's third NOS window in 2010 resulted in new requests totaling 3,759 MW, of which 2,993 MW represent wind integration requests. The 2010 process identified one additional Main Grid capital project, the Montana to Washington project, for which environmental review was begun, however, the requests to support this project have been subsequently withdrawn and so all work on the project was terminated.

After a three-year pause, Bonneville re-started the NOS process in the spring of 2013. Bonneville's 2013 NOS included 50 transmission service requests from 18 customers for 3,673 MW demand of which only 95 MW represent new wind integration requests in the Pacific Northwest. The 2013 NOS identified one new area of expansion at the Monroe-Novely Hill facilities but otherwise found no additional Main Grid capital projects beyond those previously recommended under the prior NOS processes.

As noted, Bonneville's capital program for TS includes a wide variety of specific investments that are determined after internal review and, in some cases, external review. In 2009, TS began implementing best practice frameworks that provide a standardized structure and approach to Asset Management. As a result, TS's Asset Management Strategies, derived from Agency Strategies, drive Bonneville's Asset Plans, which determine its capital and expense needs. On occasion, capital investments must be made on short notice because of unexpected needs; because of the identification of obsolete, worn out, failed, failing, or at-risk systems and facilities; because of system reliability requirements; and because near-term opportunities to install or construct facilities arise as outages occur or as schedules for outages change. For these and other reasons, TS's capital program is fluid and subject to change. Thus, Bonneville is unable to predict with specificity some of the new capital investments in the transmission system. The types of investments may include but are not limited to: arrestor, bus and bus pedestal, circuit breaker, circuit switcher, communication tower, concrete pole, control center mapboard and video wall displays, control house, converter grading capacitors, converter harmonic filters, converter smoothing reactors, converter transformers, current limiting reactor, current limiting resistor, current transformer, digital fault locator, digital cross-connect system (DCS), disconnect switch, engine generator, engineered steel pole, fiber optic cable, fiber terminal, fuel dispensing facility, grounding system, grounding transformer, microwave multiplex transmitter, network management system (NMS), overhead conductor, overhead ground wire, phase measuring unit (PMU), power control assembly (PCA), power transformer, relay, revenue meter, series capacitor, shunt capacitor, shunt reactor, station service transformer, station service inverter, substation dead end tower, substation perimeter fence, switchyard lighting, thyristor, transfer switch, transmission steel tower, voltage regulator, voltage transformer, water/sewer system, wood pole and cross-arm, and other similar items consistent with Bonneville's capitalization policy determinations (such as spacer damper replacements).

Notwithstanding that the capital program for TS is subject to change, Bonneville has identified several general areas where capital program investment will occur.

Bonneville will continue to fund fiber optic communications facilities needed to meet Bonneville's projected operational needs. To the extent that these investments create temporary periods of excess fiber optic capacity, such dark fiber capacity can be made available to telecommunications providers and to non-profits to meet public benefit internet access needs for rural areas and other needs in Bonneville's service area. Bonneville's investments in fiber optics, including the role of the private sector in building fiber optic networks, is consistent with the "Fiber Optic Cable Plan" submitted to Congress on May 24, 2000, accompanying the FY 2000 Energy and Water Development Appropriations Act. In accordance with this plan, when possible, Bonneville will establish partnerships with fiber optic facility and service providers to meet its needs.

In December 2004, the Congress passed and the President signed the Commercial Spectrum Enhancement Act (CSEA, Title II of P.L. 108-494), creating the Spectrum Relocation Fund (SRF) to streamline the relocation of federal systems from certain spectrum bands to accommodate commercial use by facilitating reimbursement to affected agencies of relocation costs. The Federal Communications Commission has auctioned licenses for reallocated federal spectrum, which will facilitate the provision of Advanced Wireless Services to consumers. Funds were made available to agencies in FY 2007 for relocation of communications systems operating on the affected spectrum. These funds are mandatory and will remain available until expended, and agencies will return to the SRF any amounts received in excess of actual relocation costs. The estimated Bonneville cost of this relocation was \$48.7 million. The project was completed in November 2013 and the operational system performance was being observed during FY 2014 and early FY 2015 to determine that it has achieved comparable capability as defined under the CSEA. Bonneville determined in December 2014 that comparable capability had been achieved.

As part of the Homeland Security Presidential Directives, Bonneville has completed a physical security assessment of all critical facilities and is implementing security enhancements at these facilities. These security enhancements increase controlled access to Bonneville's facilities and provide video surveillance and monitoring capabilities.

Accomplishments

- Issued final Record of Decision for the FYs 2016-2017 rate case on July 23, 2015.
- Integrated 5,081 MW of wind by December 2015 on Bonneville's transmission system.
- Completed construction of the Big Eddy-Knight Transmission Project.
- Completed construction of the Central Ferry-Lower Monumental Transmission Project.
- Completed route analysis for the I-5 Corridor Reinforcement project and completed the draft EIS.
- Completed design of the Paul Substation 500kV Shunt Reactor Addition.
- Completed construction of the Raver Substation Reactor Upgrade.
- Completed construction of the Capacitor Bank at Kalispel.

Explanation of Changes

Bonneville's budget includes \$674.5 million in FY 2017 for TS which is an eight percent decrease from the FY 2016 forecasted level. The decrease reflects reduced investment in Systems and Replacements and Upgrades and Additions driven by a reduction in the Pacific Direct Current Line (PDCI) projected spending needs as construction nears completion offset by increases in Main Grid and Area and Customer Services driven by an increase in the I-5 Corridor Reinforcement project and other projects.

The FY 2017 budget increases the levels for Main Grid (+\$29.4 million) and Area & Customer Services (+\$17.8 million). The budget decreases levels for Upgrades & Additions (-\$39.1 million) and System Replacements (-\$63.6 million). There is no change in funding for PFIA.

Strategic Management

Bonneville provides transmission and energy services while supporting integration of renewable resources in the Pacific Northwest. Bonneville will continue to implement the following strategies to serve the region:

1. To improve system adequacy, reliability and availability, Bonneville has embarked on major transmission infrastructure projects. The projects shore up the region's transmission system and help deliver the region's future power needs. These projects address multiple challenges, such as integration of renewable energy, the need to relieve a number of congested transmission paths, the challenge to keep up with growing energy demands, and the need to meet Bonneville's open access policy in support of competitive markets. Specific strategies for these efforts are outlined in the TS Load Service and Generation Integration strategies.
2. Bonneville will continue to replace aging assets that are vital to the reliability of the existing transmission system. To that end, TS has developed specific long-term strategies for the following asset categories:
 - a. Substations AC
 - b. Power System Control/System Telecommunications
 - c. Wood Lines
 - d. Steel Lines
 - e. Rights of Way (ROW), (Land Rights, Access Roads, and Vegetation Management)
 - f. System Protection and Control
 - g. Control Center

The following external factors present the strongest impact to overall achievement of the program's strategic goal:

- Continually changing economic and institutional conditions
- Competitive dynamics
- Ongoing changes in the electric industry
- Siting issues

Main Grid (\$K)		
FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
63,518	104,380	133,777

Overview

Bonneville's strategic objectives for Main Grid projects are to assure compliance with the NERC and Western Electricity Coordinating Council (WECC) reliability criteria, provide voltage support, provide a reliable transmission system for open access, and provide for relief of transmission system congestion. During this budgeting period, projects are planned that will provide transmission reinforcement and voltage support to major load areas that are primarily west of the Cascade Mountains. In addition, transmission reinforcements are planned for load centers in central Oregon, central Washington, the Puget Sound area, the Willamette Valley, and along the I-5 Corridor, as well as projects to provide transmission access for new generation projects.

Continued investments in Main Grid assets include:

I-5 Corridor Reinforcement

- **FY 2015.** Concluded route analysis and completing National Environmental Policy Act (NEPA) work.
- **FY 2016.** Complete NEPA work and begin design.
- **FY 2017.** Complete design and possibly begin construction.

Big Eddy-Knight (West of McNary Reinforcements Group 2)

- **FY 2015.** Continued construction.
- **FY 2016.** Completed construction and energized in November 2015.

Central Ferry-Lower Monumental 500 kV Reinforcement (formerly Little Goose Area Reinforcement)

- **FY 2015.** Continued construction.
- **FY 2016.** Completed construction and energized in November 2015.

Midway-Grandview 115 kV Line upgrade

- **FY 2016.** Begin construction.
- **FY 2017.** Continue construction.

Puget Sound Area Northern Intertie (PSANI)

- **FY 2015.** Continued construction.
- **FY 2016.** Continue construction.
- **FY 2017.** Complete construction.

Tucannon, LaPine, Franklin, White Bluffs, Monroe and McNary (6 separate Capacitor projects)

- **FY 2015.** Completed construction.

Alvey Substation Reactors

- **FY 2015.** Began construction.
- **FY 2016.** Complete construction.

Raver Substation Reactor

- **FY 2015.** Completed construction of the 500 kV Reactor upgrade.

Schultz Series Capacitors

- **FY 2017.** Begin design.

Monroe-Echo Lake 500 kV Line Re-termination #2

- **FY 2016.** Begin design.

- **FY 2017.** Begin construction.

McNary Substation 500/230 kV Bank Addition

- **FY 2015.** Completed design and begin construction.
- **FY 2016.** Continue construction.
- **FY 2017.** Continue construction.

Paul Substation 500 kV Shunt Reactor Addition

- **FY 2015.** Completed design and begin construction.
- **FY 2016.** Complete construction.

Continue Planning Studies to: (all years)

- Identify infrastructure additions.
- Identify projects driven by NERC and WECC reliability criteria.
- Identify system reactive needs to mitigate unacceptable low or high voltage problems and other system additions.
- Relieve transmission system congestion and integrate new generation facilities.

Area & Customer Service
(\$K)

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
4,101	12,946	30,754

Overview

Bonneville’s strategic objective for Area and Customer Service projects is to assure that Bonneville meets reliability standards and contractual obligations.

Continued investments in Area & Customer Service assets include:

Hooper Springs Substation

- **FY 2015.** Began design.
- **FY 2016.** Begin construction.
- **FY 2017.** Continue construction.

Capacitor Bank at Kalispel

- **FY 2015.** Completed construction.

Continuous Activities (all years)

- Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for Bonneville’s service area.

**Upgrades & Additions
(\$K)**

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
267,057	253,097	213,994

Overview

Bonneville’s strategic objectives for Upgrades and Additions are to replace older 60 Hz (Hertz) communications and controls with newer technology including fiber optics in order to maintain or enhance the capabilities of the transmission system; to implement special remedial action control schemes to accommodate new generation and mitigate immediate operational and market constrained paths; and to support communications and remedial action schemes, among other proposals.

During this budget period, Bonneville will complete design, material acquisition, construction and activation of several fiber optics facilities to provide bandwidth capacity and high-speed data transfers to eventually replace microwave analog radios, which are technologically obsolete and nearing the end of their useful life. Temporarily, in some areas, excess dark fiber capacity is being offered for a term to telecommunications providers or to public entities such as public utilities, schools, libraries, and hospitals, providing them access to high-speed telecommunication services as a public benefit.

Continued investments in Upgrades & Additions assets include:

VHF Radio System Upgrade

- **FY 2015.** Continued construction.
- **FY 2016.** Continue construction.
- **FY 2017.** Complete construction.

Synchrophasor Project

- **FY 2015.** Continued construction at multiple sites.
- **FY 2016.** Continue construction at multiple sites.
- **FY 2017.** Continue construction at multiple sites.

Pacific DC Intertie from 3,100 MW to 3,800 MW Project

- **FY 2015.** Began construction for upgrade.
- **FY 2016.** Continue construction.
- **FY 2017.** Continue construction.

Ross-Schultz Fiber Circuit Upgrade

- **FY 2015.** Continued construction.
- **FY 2016.** Continue construction.
- **FY 2017.** Continue construction.

Bell-Boundary #DC SONET Ring Upgrade

- **FY 2015.** Continued construction.
- **FY 2016.** Continue construction.
- **FY 2017.** Complete construction.

Operational Megabit Ethernet (OMET) System

- **FY 2015.** Continued construction.
- **FY 2016.** Continue construction.
- **FY 2017.** Continue construction.

Longhorn Annex for Umatilla Electric Cooperative (UEC)

- **FY 2015.** Continued construction.
- **FY 2016.** Complete construction.

500 kV Spares at Wind Integration Substations

- **FY 2016.** Begin design for site 1.
- **FY 2017.** Begin construction for site 1 and design for site 2.

Continuous Activities (all years)

- Upgrading two miles of fiber between Bonneville Power House and Bonneville Control House.
- Planning, design, material acquisition, and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths.
- Planning, design, material acquisition, and construction of various system additions and upgrades necessary to maintain a reliable system for Bonneville's service area.
- Construction of secondary fiber related projects and digital radio system upgrades to improve the operational telecommunication system.
- Material procurement and construction to upgrade the main fiber optic backbone system (#KC and #NC systems).
- Continue to upgrade control houses and standby engine generators at various locations.

**System Replacements
(\$K)**

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
126,603	329,618	265,952

Overview

Bonneville’s strategic objectives for the Sustain Program are to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: (1) replacing high voltage transformers and power circuit breakers which are at or near the end of their useful life; (2) replacing risky, outdated and obsolete control and communications equipment and systems, and includes mandated replacements due to legislation; and (3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system. Transmission Services uses a total economic cost model to determine priorities for replacement.

Continued investments in System Replacements assets include:

Continuous Activity (all years)

Non-Electric Replacements

- Continue non-electric replacements as necessary.
- Continue the design, material acquisition, and construction for the Access Road program capital component and the Land Rights program capital component in support of the Lines and ROW Programs.
- Continue design and construction of capital improvements for identified existing facilities.

Electric Replacements

- Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. Such replacements include relays, annunciators, oscillographs, metering and various types of communication related equipment replacing and migrating analog to digital technology and SCADA equipment.
- Continue replacement of under-rated and high maintenance substation equipment.
- Continue replacing spacer dampers on various 500 kV lines.
- Continue replacing critical, operational tools and marketing business systems at the Dittmer and Munro Control Centers.
- Continue replacing deteriorating wood pole transmission line structures, spacer dampers, and insulators.

**Projects Funded in Advance
(\$K)**

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
265,983	30,000	30,000

Overview

This category includes those facilities and/or equipment where Bonneville retains control or ownership but which are funded or financed by a third party or with reserves, either in total or in part. This program also includes investments associated with the Commercial Spectrum Enhancement Act (CSEA).

Continued investments in PFIA assets include:

Continuous Activity (all years)

- Continue to integrate various new generation and line/load projects into Bonneville transmission grid based on requests placed and processed in accordance with transmission tariff.
- Continue planning studies to identify system impacts and needs regarding proposed new generation projects.
- Engineer and begin construction of several large wind generation interconnection substations.
- Complete environmental cleanup and other work necessary for the sale of Bonneville facilities.
- Continue the design and construction for various radio replacements at accessible sites associated with the CSEA.

Activities, Milestones, and Explanation of Changes

FY 2016 Estimate	FY 2017 Estimate	Explanation of Changes FY 2017 vs FY 2016 Estimate
Transmission Services – Capital \$730,040,000	\$674,478,000	-\$55,562,000
Main Grid \$104,380,000 Milestones: <ul style="list-style-type: none"> • Complete NEPA and begin design of the I-5 Corridor Reinforcement project. • Begin construction of Midway-Grandview 115kV Line upgrade. • Complete construction of the Big Eddy-Knight project. • Continue construction of the PSANI project. • Complete construction of Central Ferry Lower Monumental. 	\$133,777,000 Milestones: <ul style="list-style-type: none"> • Complete design and possibly begin construction of the I-5 Corridor Reinforcement project. • Continue construction of Midway-Grandview 115kV Line upgrade. • Complete construction of the PSANI project • Continue construction of McNary Substation. 	+\$29,397,000/+28.2% The increase reflects the start of construction on the I-5 Corridor Reinforcement project.
Area & Customer Service \$12,946,000 Milestones: <ul style="list-style-type: none"> • Begin construction of Hooper Springs Substation. 	\$30,754,000 Milestones: <ul style="list-style-type: none"> • Continue construction of Hooper Springs Substation. 	+\$17,809,000/+137.6% The increase reflects the construction work scheduled for the Hooper Springs project.

FY 2016 Estimate	FY 2017 Estimate	Explanation of Changes FY 2017 vs FY 2016 Estimate
<p>Upgrades & Additions \$253,097,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Begin design for site 1 for 500kV spares at wind integration substations. • Continue construction at multiple sites of the Synchrophasor project. • Continue construction for the upgrading of the Pacific DC Intertie from 3,100 MW to 3,800 MW project. 	<p>\$213,994,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Begin construction of site 1 and design for site 2 for 500kV spares at wind integration substations. • Continue construction at multiple sites of the Synchrophasor project. • Continue construction for the upgrading of the Pacific DC Intertie from 3,100 MW to 3,800 MW project. 	<p>-\$39,103,000/-15.4%</p> <p>The decrease reflects the ramping down of construction in the Pacific Direct Current Line (PDCI) project as construction nears completion.</p>
<p>Systems Replacements \$329,618,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue design and construction of capital improvements for identified existing facilities. • Continue non-electric replacements as necessary. • Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. 	<p>\$265,952,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue design and construction of capital improvements for identified existing facilities. • Continue non-electric replacements as necessary. • Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. 	<p>-\$63,665,000/-19.3%</p> <p>The decrease reflects a decrease in the number of replacement projects.</p>
<p>Projects Funded in Advanced \$30,000,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. 	<p>\$30,000,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. 	<p>\$0/0%</p> <p>No change in funding identified.</p>

**Capital Information Technology & Equipment/Capitalized Bond Premium
Funding Schedule by Activity
Funding (\$K)**

	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate	FY 2017 vs FY 2016	
				\$	%
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	34,344	37,356	28,794	-8,562	-23%
Capitalized Bond Premium	0	0	0	0	-
Total, Capital IT & Equipment/Capitalized Bond Premium	34,344	37,356	28,794	-8,562	-23%

Outyears (\$K)

	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	28,794	10,854	6,417	4,069	11,136
Capitalized Bond Premium	0	2,000	2,000	2,000	2,000
Total, Capital IT & Equipment/Capitalized Bond Premium	28,794	12,854	8,417	6,069	13,136

Capital Information Technology & Equipment/Capitalized Bond Premium

Overview

Capital Information Technology (IT) provides for the acquisition of general and some dedicated special purpose capital information technologies, and acquisition of special-use capital and IT equipment in support of Bonneville's strategic objectives. This category also includes Bonneville's on-going efforts to facilitate delivery of a highly resilient organization, able to anticipate, withstand and effectively respond to disruptive events affecting it and its partners in the Northwest region. The four main areas of resiliency focus continue to include asset management, emergency management, crisis management, and continuity of operations.

Bonneville continues to move its IT infrastructure to a more efficient architecture. This FY 2017 Budget supports this effort. IT continues to eliminate redundancies in tools and applications, establish an agency-wide IT architecture with standardized IT purchasing criteria, standardize software licensing processes and minimize agency liabilities through stronger contracts, apply continuous improvement practices to IT project management, and implement an agency IT portfolio cost management strategy. The IT estimates in this FY 2017 Budget, under Capital IT and Equipment include all IT functions within the agency except TS grid operations. See the Capital Program – TS section of this budget for additional discussion of grid operations-related IT requirements acquisitions.

Capital equipment provides for the acquisition of general and some dedicated special purchases of capital office furniture and equipment.

Bonneville can incur a bond premium when it repays a U.S. Treasury bond before the due date. When bonds are refinanced and premiums are incurred, the bond premiums can be capitalized. Historically, Bonneville generally has chosen to finance capitalized bond premiums with bonds issued to the U.S. Treasury, as envisioned by the Transmission Act.

**Capital IT & Equipment
(\$K)**

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
34,344	37,356	28,794

Overview

This category includes enhancements to Bonneville’s information technology processes to provide cost effective efficiencies for secure, timely, and accurate information. Investments will enable continued enhancements to Bonneville’s enterprise systems that are designed to link key information systems throughout Bonneville and improve business processes. Current efforts include continued functional process improvements in areas not included in the initial development phase. Other investments include acquisition of capital office furniture and equipment, capital automated data processing (ADP) based administrative telecommunications equipment, ADP equipment (hardware), and support of capital software development for certain Bonneville programs.

Continued investments in Capital IT & Equipment assets include:

Continuous Activity (all years)

Capital system developments in support of:

- Corporate IT Projects
- IT Infrastructure Projects
- Power IT Projects
- Transmission Services IT Projects (excluding grid operations)

**Capitalized Bond Premium
(\$K)**

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
0	0	0

Overview

Continue to assess financial market and when cost-effective, refinance available bonds as prudent.

Activities, Milestones, and Explanation of Changes

FY 2016 Estimate	FY 2017 Estimate	Explanation of Changes FY 2017 vs FY 2016 Estimate
Capital Information Technology & Equipment/Capitalized Bond Premium \$37,356,000	\$28,794,000	-\$8,562,000/22.9%
Capital Information Technology & Equipment \$37,356,000 Milestones: Capital system developments in support of: <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	\$28,794,000 Milestones: Capital system developments in support of: <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	-\$8,562,000/22.9% The decrease reflects an anticipated shift toward using less capital for infrastructure projects and system upgrades. Possible shifting to Software as a Service (SaaS) solutions may also require less capital funding.
Capitalized Bond Premium \$0 Milestones: <ul style="list-style-type: none"> • Bonneville does not expect to refinance any federal bonds with premium in FY 2016. 	\$0 Milestones: <ul style="list-style-type: none"> • Bonneville does not expect to refinance any federal bonds with premium in FY 2017. 	\$0/0% No change in funding.

**Power Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate	FY 2017 vs FY 2016	
				\$	%
Power Services - Operating Expenses					
Production	948,520	1,103,239	1,097,286	-5,952	-1%
Associated Projects Costs	414,511	454,869	464,286	9,417	2%
Fish & Wildlife	258,177	267,000	274,000	7,000	3%
Residential Exchange Program	200,265	217,100	217,100	0	0
NW Power & Conservation Council	9,870	11,236	11,446	210	2%
Energy Efficiency & Renewable Resources	74,897	177,636	173,306	-4,329	-2%
Total, Power Services - Operating Expenses	1,906,240	2,231,080	2,237,425	6,345	.3%

Outyears (\$K)

	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate
Power Services - Operating Expenses					
Production	1,097,286	1,202,507	1,295,414	1,249,570	1,077,360
Associated Projects Costs	464,286	471,846	479,399	498,032	513,942
Fish & Wildlife	274,000	281,000	288,000	295,000	302,000
Residential Exchange Program	217,100	238,600	238,600	251,600	251,600
NW Power & Conservation Council	11,446	11,629	11,812	12,004	12,207
Energy Efficiency & Renewable Resources	173,306	179,120	182,719	186,987	191,380
Total, Power Services - Operating Expenses	2,237,425	2,384,702	2,495,944	2,493,193	2,348,489

Power Services – Operating Expense

Overview

Production includes all Bonneville non-federal debt service (including Energy Northwest debt service), O&M costs for power system generation resources (including a large nuclear plant, business operations, short- and long-term power purchases⁴), electric utility marketing of power, and oversight of the FCRPS hydroelectric projects and CGS. Bonneville develops products and services to meet the needs of Bonneville's customers and stakeholders, and acquires power as needed.

In FY 2010, Bonneville completed a long-term Resource Program to guide potential future resource acquisitions needed to meet Bonneville's supply obligations. In the event that Bonneville does acquire output from a resource on a long-term basis, Bonneville will modify its budget to reflect the acquisition.

Associated Projects represents funding for operation and maintenance costs for the FCRPS hydroelectric projects, minor additions, improvements and replacements, and liabilities of the Corps and Reclamation hydroelectric projects in the Pacific Northwest, which serve many purposes. All agencies emphasize efficient power production from existing facilities and improvement of the performance and availability of power generating units. Bonneville pays additional financing costs of the FCRPS facilities through its Interest Expense and Capital Transfer budget programs. Bonneville provides funding for the operations and maintenance costs that are part of the USFWS's Lower Snake River Compensation Plan (LSRCP) hatcheries. Bonneville is responsible for annual payments to the Confederated Tribes of the Colville Reservation for their claims concerning their contribution to the production of hydropower by the Grand Coulee Dam in accordance with the Settlement Agreement between the United States and the Colville Tribes (April 1994).

Bonneville's Fish and Wildlife Program provides for extensive protection, mitigation and enhancement of Columbia River Basin fish and wildlife adversely affected by the development and operation of the FCRPS. Bonneville satisfies its fish and wildlife responsibilities by funding projects and activities designed to be consistent with the Program under the Northwest Power Act. Through the Program, Bonneville also implements measures to aid in the protection of fish in the Columbia River and its tributaries, both listed as threatened or endangered as well as unlisted, under the ESA (see ESA discussion in the Power Capital Overview section).

Bonneville's mitigation expenditures will focus on activities that benefit Columbia River Basin fish and wildlife resources, following priorities established through ESA consultations, agreements with resource managers, and the Program, including actions that:

- increase survival of ESA-listed and non-listed fish at FCRPS dams and reservoirs;
- increase survival of ESA-listed and non-listed fish throughout their life cycle by protecting and enhancing important habitat areas;
- protect and enhance important wildlife habitat;
- use of hatcheries to contribute to conservation and recovery of ESA-listed and non-listed fish;
- provide offsite mitigation projects and habitat, passage, and other improvements that address factors limiting improvements of target species; and
- support a focused and well-coordinated research, monitoring, and evaluation program.

In order to address the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, Bonneville continues its ongoing work with the Council and the regional fish and wildlife managers, customers, and Tribes to review projects to ensure ratepayers fund appropriate mitigation. For example, Bonneville established a cost sharing Memorandum of Understanding (MOU) with the U.S. Forest Service in 2005, and renewed it in 2010, that requires a programmatic 30 percent cost share for fish mitigation projects

⁴ Including expenses associated with the use of power financial instruments to hedge Bonneville's exposure to market price risk and certain index sales contract provisions as permitted by Bonneville's internal power transacting risk management guidance.

funded by Bonneville on U.S. Forest Service lands. Bonneville continues to operate in a cooperative manner with the U.S. Forest Service.

The Energy and Water Development Appropriations Act of 1996 added section 4(h)(10)(D) to the Northwest Power Act, directing the Council to appoint an ISRP “to review a sufficient number of projects” proposed to be funded through Bonneville’s annual fish and wildlife budget “to adequately ensure that the list of prioritized projects recommended is consistent with the Program.” The Northwest Power Act further states that “in making its recommendations to Bonneville, the Council shall consider the impact of ocean conditions on fish and wildlife populations and shall determine whether the projects employ cost effective measures to achieve program objectives.” Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council has shifted to a multi-year project review cycle during which the ISRP reviews categories of projects grouped together; e.g., all wildlife projects were recently reviewed simultaneously.

The Council’s major activities include the periodic preparation of a Northwest Conservation and Electric Power Plan (a 20-year electric energy demand and resources forecast and conservation program – known as the Power Plan) and the Fish and Wildlife Program. The Northwest Power Act directs that expenses of the Council, subject to certain limits based on forecasted Bonneville power sales, shall be included in Bonneville’s annual budget to Congress. The cost of funding the Council is recovered through Bonneville’s power rates.

Bonneville’s Energy Efficiency program acquires conservation resources consistent with the Council’s Power Plan and acts as a catalyst for energy efficiency actions in the region. Such actions will: 1) meet energy efficiency targets; 2) achieve a least cost resource mix; 3) lessen the cost impacts of power purchases; 4) avoid the costs of ramping programs and infrastructure up and down; 5) extend the value of the FCRPS to customers; and 6) build the region’s resource portfolio with energy efficiency. Bonneville is also exploring how best to integrate demand-side management, distributed generation, and other leading edge technologies (e.g., Energy Web and Smart Grid applications) into its generation and transmission planning processes.

Starting in FY 2016, Bonneville’s Energy Efficiency program will be expensed. This program offers several ways for customer utilities to participate in energy efficiency. Program components include: (1) standard offer efficiency measures and custom projects, which result in customer proposals to conserve energy through such programs as residential weatherization, commercial lighting, Heating, Ventilation, and Air Conditioning (HVAC), industrial processes and lighting, irrigated agriculture, etc.; (2) third party delivery programs, such as Simple Steps Smart Savings, Energy Smart Industrial, and Green Motors programs; and, (3) programs to help regional federal installations reduce energy use, including federal hatcheries and irrigation districts, and to support the Corps and Reclamation in their efforts to reduce energy use.

Bonneville’s Energy Efficiency budgets reflect a need to meet aggressive targets from the Council’s 6th Power Plan and anticipated targets in the 7th Power Plan. Specifically, Bonneville’s energy efficiency targets increased from about 280 aMW under the Council’s 5th Power Plan (FYs 2005-2009) to 504 aMW under its 6th Power Plan (FYs 2010-2014). The 504 aMW reflects conservation that was expected to be achievable in the service territories of Bonneville’s preference customers. In FY 2014, Bonneville exceeded the five-year target and FY 2015 performance continued on that trajectory, exceeding the 117 aMW that was the target for FY 2014 and FY 2015 combined. Because the 7th Power Plan draft is not expected to be released until early 2016, Bonneville has determined its level of energy efficiency performance and associated budget based on the 6th Power Plan annual savings targets, which call for an incremental 400 aMW of energy efficiency between 2015 and 2017. In meeting its energy efficiency goals Bonneville may employ resource acquisition agreements, as authorized by Northwest Power Act section 6, and customer self-funded conservation.

The Residential Exchange Program (REP) was created by the Northwest Power Act to extend the benefits of low-cost federal power to the residential and farm customers of Pacific Northwest electric utilities that have high average system costs. Currently, the region’s six investor-owned utilities (IOUs) and two of the region’s consumer-owned utilities are actively participating in the REP. Payments under the REP are made to individual IOUs based on the difference between Bonneville’s utility-specific Priority Firm (PF) Exchange rates and each utility’s average system cost (ASC), times a utility’s residential and farm loads. ASCs are determined in accordance with the 2008 Average System Cost Methodology (ASCM).

Participating utility ASCs are established in a public process that occurs prior to and during Bonneville's power rate case. Bonneville's utility-specific PF Exchange rates are determined each rate period. As described below, Bonneville and regional parties reached a settlement of the REP in 2011 in which the total amount of REP benefits available to the IOUs was established through 2028. Payments to the IOUs are made monthly based on historical invoiced exchange loads.

Over the past decade, regional parties have filed multiple lawsuits challenging Bonneville's implementation of the REP. These lawsuits were consolidated into four cases that were stayed before the U.S. Court of Appeals for the Ninth Circuit. On July 26, 2011, Bonneville adopted a regionally supported settlement, referred to as the 2012 REP Settlement. Under the settlement, the region's six IOUs will receive about \$4.1 billion in REP payments over the 17-year term of the settlement, beginning at \$182.1 million in FY 2012, and increasing to \$286.1 million in FY 2028. In addition to this settlement, Bonneville has reached related REP settlements with two consumer-owned utilities. A single challenge to the 2012 REP Settlement was dismissed by the U.S. Court of Appeals for the Ninth Circuit in October of 2013.

Explanation of Changes

Bonneville's budget includes \$2,237 million in FY 2017 for Power Services operating expenses, which is a 0.3 percent increase over the FY 2016 forecasted level. The increase reflects continuing emphasis on operation and maintenance of hydro generation projects on the FCRPS.

The FY 2017 budget decreases the level for Production (-\$5.9 million), increases the level for Associated Projects (+\$9.4 million), Fish & Wildlife (+\$7.0 million), Planning Council (+\$210,000), and decreases the level for Energy Efficiency & Renewable Resources (-\$4.3 million). There is no change in funding for Residential Exchange.

Production (\$K)		
FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
948,520	1,103,239	1,097,286

Overview

Power Purchases: Includes purchased power to cover power supply obligations as well as balancing loads with generation from the hydro system. These purchases can be made in the form of long-term purchases to meet supply obligations based on long-term planning requirements or they can be made within the year due to the monthly shape of the loads and the monthly shape of the hydro electric generation. Also, purchases can be made within the month and within the day to fill shortages due to fluctuations in the hydro system and load changes.

Power Scheduling/Marketing: Schedule and market (buy/sell) electric energy with Bonneville customers and the Pacific Northwest’s interconnected utilities. Scheduling includes Power Services’ implementation of physical and memo power schedules and associated transmission schedules, implementation of Electronic Tagging (ETag) in accordance with NERC and in accordance with FERC, and implementation of electronic scheduling.

Columbia Generating Station (CGS): Bonneville has acquired full lifetime project capability of CGS. CGS is on a 24-month fuel and outage cycle. A maintenance and refueling outage occurred in the spring of 2015.

Continued investments in Production include:

Continuous Activity (all years)

- Provide oversight of all power supply contracts and related projects from which Bonneville purchases generation capability to ensure that all Bonneville approval rights are protected; coordinate, communicate, and administer agreements, issues, and programs between Bonneville and the project owners.
- Continue to provide wind resource integration services for customer wind generation.
- Power Purchases. Power expenditures could increase somewhat due to the implementation of the Oversupply Management Protocol.
- Power Scheduling/Marketing.
- Continue to provide oversight of all contracts signed to date. Pursue cost-effective means to mitigate capacity demands associated with interconnecting large amounts of wind into the Bonneville system. Pursue acquisition of additional cost-effective renewable generation to meet load growth. Continue to provide oversight on the wind resource integration services currently purchased by public power customers and offer additional renewable resource shaping services to such customers using wind generation to serve their load.

**Associated Projects
(\$K)**

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
414,511	454,869	464,286

Overview

Support FCRPS project costs and work to strengthen interagency and regional relationships to improve project performance, supporting functions, and to better understand project resource requirements and costs. This helps to maintain FCRPS reliability and system performance, as well as to attain Bonneville’s strategic business objectives.

Continued investments in Associated Projects include:

Continuous Activity (all years)

Bureau of Reclamation:

- Continue direct funding Reclamation O&M power activities.

Corps of Engineers:

- Continue direct funding Corps O&M power activities.

Fish & Wildlife		
(\$K)		
FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
258,177	267,000	274,000

Overview

Bonneville implements a mature fish and wildlife mitigation program based on recommendations made by the region’s fish and wildlife management agencies and tribes to the Council. Several recent Council reviews have made additional fish and wildlife project recommendations to Bonneville. Bonneville, in coordination with the Council, reviews new and on-going projects for consistency with the Program. Bonneville reviews and resets project-specific funding commitments annually, including projects under the FCRPS BiOps and other agreements. Bonneville informs its funding decisions with the management objectives and priorities in the Program (including ISRP reviews), and the Accords as it integrates their implementation with actions necessary to fulfill ESA responsibilities consistent with the applicable BiOps. Regular coordination on implementation priorities continues among Bonneville, the Council, federal resource management agencies, states, Tribes, and others.

Continued investments in Fish & Wildlife include:

Continuous Activity (all years)

- **Anadromous Fish:** Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, and the Willamette and Southern Idaho agreements. Prioritize projects that address the factors that contribute most to mitigation success and that fulfill Bonneville’s responsibility for mitigating the impacts from the FCRPS. Implement and develop activities that protect and enhance tributary and estuary habitat; improve mainstream habitat; reduce potentially harmful hatchery practices on ESA-listed populations; and contribute to sustainable fisheries.
- **Resident Fish:** Implement activities to mitigate the impacts of the FCRPS on lamprey, sturgeon and bull trout and, and promote the reproduction and recruitment of Kootenai River white sturgeon. These activities have been selected in response to the USFWS’s 2000 bull trout and 2006 Libby BiOp, the Program, and the Fish Accords.
- **Continue mitigation using resident fish to offset anadromous fish losses (substitution);** mitigate for reservoir power operation impacts to resident fish and wildlife by seeking projects that provide dual benefits, i.e., benefits to both. Those resident fish habitat acquisition projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget.
- **Wildlife:** Use existing Bonneville policies to continue the current effort to mitigate wildlife in a manner consistent with the Program and fulfill commitments in wildlife agreements such as the Kalispel Agreement, Willamette Wildlife Agreement, and Southern Idaho Wildlife Agreement. Those wildlife projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited according to Bonneville’s crediting policy and applicable mitigation contracts.

Residential Exchange, Northwest Power and Conservation Council, and Energy Efficiency & Renewable Resources
((\$K)

FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
285,032	405,972	401,852

Overview

Residential Exchange Program (REP)

- Includes forecasted REP benefits based on the 2012 REP Settlement.

Northwest Power and Conservation Council

- Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities.

Energy Efficiency & Renewable Resources

- Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads.
- Provide incentives to help utilities acquire Public Power’s share of regional energy efficiency targets.
- Deliver regional energy efficiency programs, such as Simple Steps Smart Savings, Energy Smart Industrial, and Green Motors, to acquire energy efficiency throughout the region.
- Provide credible, unbiased information, and technical and financial support to energy efficiency purposes. Bonneville has a statutory responsibility to encourage and support the development of conservation in the Pacific Northwest. Bonneville is participating with other regional entities to support market transformation, low income energy efficiency, and program development activities that meet the needs of Bonneville customers and create business opportunities for the private sector in the Pacific Northwest. Towards that end, Bonneville has been helping create a delivery infrastructure to ensure conservation savings are installed efficiently and effectively throughout the region and that energy efficiency savings can be counted on to be reliable.
- Continue to purchase the output from renewable resources such as wind and solar.

Activities, Milestones, and Explanation of Changes

FY 2016 Estimate	FY 2017 Estimate	Explanation of Changes FY 2017 vs FY 2016 Estimate
Power Services - Operating Expense \$2,231,080,000	\$2,237,425,000	+\$6,345,000/.03%
Production \$1,103,239,000 Milestones: <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	\$1,097,286,000 Milestones: <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	-\$5,952,000/-0.5% The decrease reflects lower power purchase costs.
Associated Project Costs \$454,869,000 Milestones: <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	\$464,286,000 Milestones: <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	+\$9,417,000/+2.1% The increase reflects changes to security, biological opinion requirements, non-routine extraordinary maintenance, WECC/NERC compliance activities, and improvements, replacements, and minor additions at the projects.
Fish & Wildlife Costs \$267,000,000 Milestones: <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Southern Idaho Agreement, and the Willamette Agreement. 	\$274,000,000 Milestones: <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Willamette Agreement, and the Southern Idaho Agreement. 	+\$7,000,000/+2.6% The increase reflects funding associated with the Biological Opinions, Fish Accord commitments, and Northwest Power Act activities.

FY 2016 Estimate	FY 2017 Estimate	Explanation of Changes FY 2017 vs FY 2016 Estimate
Residential Exchange Program \$217,100,000 Milestones: <ul style="list-style-type: none"> • Continue to provide REP benefits. 	\$217,100,000 Milestones: <ul style="list-style-type: none"> • Continue to provide REP benefits. 	+\$0/0% No change in funding.
NW Power & Conservation Council \$11,236,000 Milestones: <ul style="list-style-type: none"> • Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	\$11,446,000 Milestones: <ul style="list-style-type: none"> • Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	+\$210,000/1.9% The increase reflects continuing emphasis on the NW Power and Conservation Council.
Energy Efficiency & Renewable Resources \$177,636,000 Milestones: <ul style="list-style-type: none"> • Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads. • Continue to purchase the output from renewable resources such as wind and solar. • Continue to support utility incentive programs. • Continue to support regional energy efficiency programs. • Continue supporting energy efficiency at direct serve federal agencies. 	\$173,306,000 Milestones: <ul style="list-style-type: none"> • Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads. • Continue to purchase the output from renewable resources such as wind and solar. • Continue to support utility incentive programs. • Continue to support regional energy efficiency programs. • Continue supporting energy efficiency at direct serve federal agencies. 	-\$4,329,000/-2.4% Even though there is a small decrease, there is a continuing emphasis on the energy efficiency program consistent with the Power Plan and increased Renewable Resource acquisition costs.

**Transmission Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate	FY 2017 vs FY 2016	
				\$	%
Transmission Services - Operating Expense					
Engineering	103,892	81,574	82,284	710	1%
Operations	155,928	179,207	185,868	6,661	4%
Maintenance	193,645	188,021	190,287	2,266	1%
Total, Transmission Services - Operating Expense	453,465	448,803	458,439	9,637	2%

Outyears (\$K)

	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate
Transmission Services - Operating Expense					
Engineering	82,284	84,036	85,247	86,512	87,834
Operations	185,868	186,168	189,943	193,854	197,906
Maintenance	190,287	195,238	198,956	202,824	206,848
Total, Transmission Services - Operating Expense	458,439	465,441	474,146	483,191	492,588

Transmission Services – Operating Expense

Overview

This activity provides for the transmission system services of engineering, operations, and maintenance for Bonneville's electric transmission system, and the associated power system control and communication facilities. Primary strategies of this program are: 1) maintain the safety and reliability of the transmission system; 2) increase the focus on meeting customers' needs; 3) optimize the transmission system; 4) provide open and non-discriminatory transmission access; and 5) improve Bonneville's cost effectiveness.

Explanation of Changes

Bonneville's budget includes \$458.4 million in FY 2017 for TS expense which is a two percent increase over the FY 2016 forecasted level. The increase reflects continuing operation and maintenance of Bonneville's transmission assets.

The FY 2017 budget increases the levels for Engineering (+\$710,000), Operations (+\$6.7 million), and Maintenance (+\$2.3 million)

Engineering (\$K)		
FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
103,892	81,574	82,284

Overview

Continue efforts to identify best methods for improving system reliability and maintenance practices, and continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system.

Continued investments in Engineering include:

Continuous Activity (all years)

- **Asset Management:** Continue deploying the Asset Management approach to sustain the existing assets and expanding the system to meet Agency objectives using leading practices as guidance for improving Asset Management.
- **Research and Development (R&D):** Conduct research focused on technologies related to business challenges Bonneville faces including reliability, energy efficiency, and integration of renewable energy resources. Technologies of interest are identified in Bonneville's Technology Roadmaps. A portfolio of research is selected every year through Bonneville's Portfolio Decision Framework.
- **Technical Support:** Provide technical support activities, such as transmission system planning and studies to optimize portions of the system. Provide support for non-wires solutions studies and pilot projects.
- **Capital-to-Expense Adjustments:** Conduct annual analysis of Bonneville's outstanding capital work orders to assess whether they should be expensed. As obsolete inventory is identified and disposed of, it is expensed.
- **Regulatory Fees:** WECC dues and loop flow payments, Department of Commerce/National Telecommunications and Information Administration licensing costs for radio frequencies, DOE Radio Spectrum staff and contractor support, and NERC Critical Infrastructure Protection (CIP) compliance program costs. Includes membership in ColumbiaGrid, a transmission planning organization in the region.
- **Reimbursable Transactions:** Enter into written agreements with federal and non-federal entities that have work or services to be performed by Bonneville staff at the expense of the benefiting entities. The projects must be beneficial, under agreed upon criteria, to Bonneville operations and to the federal or non-federal entity involved or otherwise be aligned with or supportive of Bonneville's strategic objectives. Additionally, these activities generally contribute to more efficient or reliable construction of the federal transmission system or otherwise enhance electric service to the region.
- **Leased and Other Costs:** Includes leases, lease purchases, and other costs of financing transmission, delivery, and voltage support facilities when such arrangements are operationally feasible and cost effective to deliver power. Leases and lease purchases enable Bonneville to continue to invest in infrastructure to support a safe and reliable system for the transmission of power. Other costs included are the accrued interest costs associated with Large Generator Interconnection Agreements (LGIA).

Operations (\$K)		
FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
155,928	179,207	185,868

Overview

Substation Operations: Perform operations functions necessary to provide electric service to customers and to protect the federal investment in electric equipment and other facilities. Includes equipment adjustments, switching lines and equipment during emergencies or maintenance, isolating damaged equipment, restoring service to customers, inspecting equipment, reading meters, etc.

Power System Dispatching and Supporting Functions: Perform central dispatching, control, and monitoring of the electric operation of the federal transmission system. Also includes load, frequency, and voltage control of federal generating plants, and coordinating long- and short-term outages of system equipment. In addition, provides technical engineering support of dispatching function and provides all technical and systems support for Dittmer Control Center (DCC) and Munro Control Center (MCC).

Marketing and Sales: Provide management and direction of transmission rates, and provide business strategy in marketing of transmission and ancillary products and services of Transmission Services. Involve customers and constituents in the process of product and rate development. Maintain accurate and complete historical records of current and past legacy transmission agreements. Provide guidance for current and future transmission contract negotiations. Provide financial analysis of market strategies. Monitor and report on the financial health of Transmission Services. Support cost management by effective reporting and analysis of current expenditures. Ensure official budget submittals reflect current management financial strategies and adequately fund transmission programs.

Transmission Scheduling: Provide non-discriminatory, open access to the Bonneville transmission system consistent with Bonneville's Open Access Transmission Tariff (OATT). Schedule transmission capacity to eligible Bonneville customers, which include customers acquiring services under Use of Facilities (UFT), Formula Power Transmission (FPT), Integration of Resources (IR), and Part II or Part III of the OATT. Manage the reservations and scheduling of all transmission services associated with the OATT. Update practices, policies, and commercial systems to accommodate a large diversity of resources, including wind.

Continuous Activity (all years):

- Continue to operate within parameters of NERC and WECC.
- Continue support of increased compliance activities related to the reliability of the transmission system, including cyber security.
- Continue developing facilities, policies, procedures, and implementing systems to support integrating the diversity of resources, including wind, into the transmission grid
- Continue preparation for increased complexity of transmission scheduling, power system operations, and dispatching, including congestion management and outage scheduling.
- Continue developing the Dittmer Scheduling Center and Munro Scheduling Center facilities to support continuous real time scheduling operations from both facilities.
- Continue developing a long-term approach to optimize transmission availability through streamlined, cost-effective, and sustainable processes.
- Continue to address succession planning issues across key functions.
- Continue development and implementation of business systems and tools.

Maintenance (\$K)		
FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
193,645	188,021	190,287

Overview

In all aspects of maintenance, Bonneville is continuing the use of Reliability Centered Maintenance (RCM) practices. The use of RCM practices is focused on improving system reliability, increasing availability, and meeting new and existing compliance regulations at lowest lifecycle costs. In addition Bonneville is deploying Asset Management to optimize maintain/replace decision making. Maintenance costs are expected to increase as Bonneville addresses the aging transmission system, meeting Reliability Standards, including Vegetation Management, and environmental constraints associated with construction, enhancement, and maintenance of the system. The Bonneville transmission system encompasses 15,156 circuit miles on over 11,860 right-of-way miles (many of these miles are through rugged, inaccessible terrain).

Continued investments in Maintenance include:

Continuous Activity (all years)

- Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets.
- Continue refining processes and procedures for monitoring and tracking compliance activities related to the reliability of the transmission system.
- Continue to improve system availability performance through new maintenance procedures and work practices.
- Continue to develop and implement work practices and procedures for implementation of a new specialty crew using bare-handing live line practices for maintenance of high-voltage transmission lines.
- Continue increased emphasis on replacement of line hardware (life extension programs for insulators, connectors, dampers & fiber optic cable hardware).
- Continue to prepare for the impact of an expected high attrition rate among Bonneville’s aging workforce by recruiting apprentices and replacements for critical minimum crew size workload positions.
- Increase outage-scheduling planning and coordination to increase customer satisfaction and system availability.
- Maintain vegetation management levels to ensure system reliability.
- Continue access road work to provide reliable access to facilities and ensure environmental compliance.
- Continue improving environmental stewardship.

Transmission Line Maintenance: Maintain and repair 15,156 circuit miles of high voltage transmission lines, of which over 7,617 km (4,734 circuit miles) are 500 kV transmission extra-high voltage (EHV). Maintenance of EHV lines is two and one-half times more labor-intensive than maintenance of lower transmission voltages, although more efficient in transmission of power. This responsibility includes maintaining transmission rights-of-way to ensure system reliability, safety, and environmental compliance. Adopt work practices that improve system availability, reliability, and compliance.

Right-of-Way Maintenance: Maintain over 11,860 of Bonneville’s right-of-way miles. This responsibility includes vegetation management, danger tree management, and access road maintenance to ensure system reliability, safety, and environmental compliance. Adopt procedures and processes that improve system availability, reliability, environmental compliance, and reliability compliance. Continue to deploy new technologies such as LiDAR (Light Detection and Ranging) to reliably and cost-effectively manage vegetation.

Substation Maintenance: Maintain and repair the transmission system power equipment located in Bonneville’s 259 substations. Work includes inspections, diagnostic testing, and predictive and condition-based maintenance.

System Protection Maintenance: Maintain relaying metering and remedial action scheme equipment used to control and protect the electrical transmission system and to meter energy transfers for the purpose of revenue billing. Additionally,

field-engineering services provide technical advice and assure the correct operation of power system relaying and special control systems used to support interregional energy transmission capabilities.

Power System Control Maintenance: Test, repair, and provide field engineering support of Bonneville's highly complex equipment, communications, and control systems, including seven major microwave systems, fiber optic systems, and other critical communications and control equipment that support the power system.

Non-Electric Plant Maintenance: Maintain and manage Bonneville's non-electric facilities. Includes site, building, and building utility maintenance; custodial services; station utility; and other maintenance service activities, as well as, facilities asset management on Bonneville-owned or Bonneville-leased non-electric facilities.

Maintenance Standards and Engineering: Establish, monitor, and update system maintenance standards, policies, and procedures, and review and update long-range plans for maintenance of the electric power transmission system.

Activities, Milestones, and Explanation of Changes

FY 2016 Estimate	FY 2017 Estimate	Explanation of Changes FY 2017 vs FY 2016 Estimate
Transmission Services - Operating Expense \$448,803,000	\$458,439,000	+\$9,637,000/2.0%
Engineering \$81,574,000 Milestones: <ul style="list-style-type: none"> • Continue efforts to identify best methods for improving system reliability and maintenance practices. • Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	\$82,284,000 Milestones: <ul style="list-style-type: none"> • Continue efforts to identify best methods for improving system reliability and maintenance practices. • Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	+\$710,000/+0.9% The increase reflects emphasis on system reliability standards compliance and research and development.
Operations \$179,207,000 Milestones: <ul style="list-style-type: none"> • Continue to operate within parameters of NERC and WECC. • Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	\$185,868,000 Milestones: <ul style="list-style-type: none"> • Continue to operate within parameters of NERC and WECC. • Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	+\$6,661,000/+3.7% The increase reflects continued emphasis on reliability compliance activities, wind integration activities, security, and control center systems support.
Maintenance \$188,021,000 Milestones: <ul style="list-style-type: none"> • Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	\$190,287,000 Milestones: <ul style="list-style-type: none"> • Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	+\$2,266,000/+1.2% The increase reflects a small reduction in the implementation of facilities asset management plans, continued implementation of live-line crew, NERC/WECC compliance activities related to land rights and vegetation management, continuing maintenance program activities, including system protection, right-of-way, line maintenance, and performance improvements.

**Interest, Pension, and Post-retirement Benefits
Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate	FY 2017 vs FY 2016	
				\$	%
Interest, Pension, and Post-retirement Benefits					
BPA Bond Interest (Net)	132,324	94,631	118,915	24,285	25.7%
BPA Appropriation Interest	14,482	14,386	8,954	-5,432	-37.8%
Corps of Engineers Appropriation Interest	145,645	136,302	136,223	-79	-.1%
Lower Snake River Comp Plan Interest	16,534	16,534	16,534	0	0%
Bureau of Reclamation Appropriation Interest	40,456	36,921	33,294	-3,627	-9.8%
Bond Premiums Paid/Discounts (not capitalized)	0	0	0	0	0%
Subtotal, Interest – Operating Expense	349,441	298,773	313,920	15,147	5.1%
Additional Pension, and Post-retirement Benefits	37,638	38,286	39,226	940	2.5%
Total, Interest, Pension, and Post-retirement Benefits	387,079	337,059	353,146	16,087	4.8%

Outyears (\$K)

	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate
Interest, Pension, and Post-retirement Benefits					
BPA Bond Interest (Net)	118,915	167,034	195,144	213,998	240,293
BPA Appropriation Interest	8,954	4,940	0	0	0
Corps of Engineers Appropriation Interest	136,223	136,841	135,931	137,425	137,672
Lower Snake River Comp Plan Interest	16,534	16,534	16,534	16,534	16,534
Bureau of Reclamation Appropriation Interest	33,294	33,294	29,697	29,697	29,697
Bond Premiums Paid/Discounts (not capitalized)	0	0	0	0	0
Subtotal, Interest – Operating Expense	313,920	358,643	377,306	397,654	424,196
Additional Pension, and Post-retirement Benefits	39,226	39,814	40,412	41,018	41,633
Total, Interest, Pension, and Post-retirement Benefits	353,146	398,457	417,718	438,672	465,829

Bonneville Power Administration/
Interest, Pension and Post-retirement Benefits –
Operating Expense

Interest, Pension and Post-retirement Benefits Operating Expense

Overview

Interest expense provides for interest due on bonds issued to the U.S. Treasury and appropriations repayment responsibilities. The appropriation repayments relate to capital investment in FCRPS hydroelectric generating and transmission facilities of Bonneville, and the Corps and Reclamation. Investments were financed by Congressional appropriations and Bonneville borrowings from the U.S. Treasury. Bonneville repays these amounts through revenue raised in its power sales and transmission services revenues.

Since receiving U.S. Treasury borrowing authority in 1974 under the Transmission Act, all Bonneville U.S. Treasury borrowing has been at market rates. As of October 1, 1996, all of Bonneville's repayment obligations on FCRPS appropriated investment (Corps and Reclamation FCRPS investment and Bonneville investment financed with appropriations prior to the Transmission Act that were unpaid as of September 30, 1996) were restructured and assigned new current-market interest rates. The Bonneville Appropriations Refinancing Act of 1996 (Refinancing Act) called for re-setting (reducing) the unpaid principal of FCRPS appropriations and reassigning (increasing) interest rates. New principal amounts were established as of the beginning of FY 1997 at the present value of the principal and annual interest payments Bonneville would make to the U.S. Treasury for these obligations in the absence of the legislation, plus \$100.0 million. The new principal amounts were assigned prevailing market interest rates as of October 1, 1996. Bonneville's outstanding appropriations repayment obligations at the end of FY 1996 were \$6.6 billion with a weighted average interest rate of 3.4 percent. The refinancing reduced the principal amount to \$4.1 billion with a weighted average interest rate of 7.1 percent. Implementation of the refinancing took place in 1997 after audited actual financial data were available. Pursuant to the legislation, Bonneville submitted its calculations and interest rate assignments implementing the Refinancing Act to the U.S. Treasury for its review and approval. The U.S. Treasury approved the implementation calculations in July 1997. The Refinancing Act also calls for all future FCRPS appropriations to be assigned prevailing U.S. Treasury yield curve interest rates. Bonneville's outstanding appropriations may be prepaid prior to their stated maturities.

Interest estimates are a function of costs of U.S. Treasury borrowing to Bonneville, repayment status of outstanding FCRPS investments, and projected additions to FCRPS plant in service. These estimates may change over time depending on forecasted market conditions. The interest cost estimates include the impact of Bonneville's appropriation refinancing legislation.

Federal employees associated with the operation of the FCRPS participate in either the Civil Service Retirement System or the Federal Employees Retirement System. Employees may also participate in the Federal Employees Health and Benefit Program and the Federal Employee Group Life Insurance Program. All such postretirement systems and programs are sponsored by the Office of Personnel Management; therefore, Bonneville does not record any accumulated plan assets or liabilities related to the administration of such programs. Bonneville makes additional annual contributions to the General Fund of the U.S. Treasury (receipt account 892889) related to the Federal post-retirement benefit programs provided to employees associated with the operation of the FCRPS. These payments were begun with the FY 1998 Administration's budget which assumed Bonneville would prospectively cover the unfunded liability that accrues in fiscal years after FY 1997 of the Civil Service Retirement and Disability Fund (Disability Fund), the Employees Health Benefits Fund (Health Fund), and the Employees Life Insurance Fund (Insurance Fund) that it had not covered prior to FY 1998. Bonneville's additional annual contributions include amounts relating to pension and post-retirement benefits for Bonneville and the power-related portion of the Corps and Reclamation projects.

**Capital Transfers
Funding Schedule by Activity
Funding (\$K)**

	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate	FY 2017 vs FY 2016	
				\$	%
Capital Transfers					
BPA Bond Amortization ¹	212,300	30,000	76,100	46,100	153.7%
Reclamation Appropriation Amortization	49,439	50,728	0	-50,728	-100%
BPA Appropriation Amortization	6,000	74,910	55,489	-29,321	-25.9%
Corps Appropriation Amortization	181,022	33,469	74,279	40,810	121.9%
Total, Capital Transfers	448,761	189,107	205,868	16,761	8.9%

Outyears (\$K)

	FY 2017 Estimate	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate
Capital Transfers					
BPA Bond Amortization ¹	76,100	47,862	559,419	533,548	473,598
Reclamation Appropriation Amortization	0	50,295	0	0	0
BPA Appropriation Amortization	55,489	68,458	0	0	0
Corps Appropriation Amortization	74,279	62,176	4,922	56	44,146
Total, Capital Transfers	205,868	228,791	564,341	533,603	517,744

Overview

This activity conveys funds to the U.S. Treasury for repayment of certain FCRPS costs not included in the Associated Project Costs budget. Since capital transfers are cash transactions, they are not considered budget obligations.

¹ Bonneville "Bond(s)" in this FY 2017 Budget refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act (P.L. 93-454), which defines Bonneville bonds as all bonds, notes, and other evidences of indebtednesses issued and sold by Bonneville to the U.S. Treasury.

**Bonneville Power Administration
Performance Measures**

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2015	FY 2016	FY 2017
Performance Goal (Measure)	BPA Hydropower Generation Efficiency Performance - Achieve 97.5% Heavy-Load-Hour Availability (HLHA) through efficient performance of Federal hydro-system processes and assets, including joint efforts of BPA, Army Corps of Engineers, and Bureau of Reclamation. HLHA is actual machine capacity available during heavy-load hours (0700-2200 Monday-Saturday), divided by planned available capacity during heavy-load hours.		
Target	≥ 97.5%	≥ 97.5%	≥ 97.5%
Result	Target Met: 100.6%	Not yet available	Not yet available
Endpoint Target	Maintain at least 97.5% Heavy-Load-Hour Availability.		

	FY 2015	FY 2016	FY 2017
Performance Goal (Measure)	BPA Repayment of Federal Power Investment Performance - Meet planned annual repayment of principal on Federal power investments.		
Target	≥ 100%	≥ 100%	≥ 100%
Result	Target Met: 100%	Not yet available	Not yet available
Endpoint Target	Continue to meet planned annual repayment of principal.		

	FY 2015	FY 2016	FY2016
Performance Goal (Measure)	BPA System Reliability Performance - NERC Rating - Attain average North American Reliability Council (NERC) compliance ratings for NERC Control Performance Standard 1 (CPS1) which measures generation/load balance on one-minute intervals (rating > or = 100%).		
Target	CPS1 ≥ 100%	CPS1 ≥ 100%	CPS1 ≥ 100%
Result	Target Met:139.91%	Not yet available	Not yet available
Endpoint Target	Maintain CPS1 score of >= 100%.		

Additional Tables

**BONNEVILLE POWER ADMINISTRATION
TOTAL OBLIGATIONS/OUTLAYS**

Current Services
(in millions of dollars)

FISCAL YEAR

BP-1 SUMMARY^{1/3/}

	2015		2016		2017		2018	2019	2020	2021
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	200	200	217	217	217	217	239	239	252	252
2 Power Services ^{2/}	1,364	1,364	1,558	1,558	1,562	1,562	1,674	1,775	1,748	1,591
3 Transmission Services	915	915	1,149	1,149	1,103	1,103	911	919	900	799
4 Conservation & Energy Efficiency	162	162	178	178	173	173	179	183	187	191
5 Fish & Wildlife	280	280	307	307	320	320	300	323	330	336
6 Interest/ Pension ^{4/}	387	387	337	337	353	353	398	418	439	466
7 Associated Project Cost - Capital	43	43	241	241	270	270	282	314	333	348
8 Capital Equipment	34	34	37	37	29	29	11	6	4	11
9 Planning Council	10	10	11	11	11	11	12	12	12	12
10 Misc. Accounting Adjs.	0	0	0	0	0	0	0	0	0	0
11 Projects Funded in Advance	390	390	30	30	30	30	30	50	50	50
12 Capitalized Bond Premiums	0	0	0	0	0	0	2	2	2	2
13 TOTAL OBLIGATIONS/ OUTLAYS ^{3/}	3,785	3,785	4,065	4,065	4,068	4,068	4,037	4,240	4,257	4,058

REVENUES AND REIMBURSEMENTS

Current Services

(in millions of dollars)

FISCAL YEAR

BP-1 SUMMARY	2015		2016		2017		2018	2019	2020	2021
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
14 Revenues ^{5/}	3,164	3,164	4,035	4,035	4,084	4,084	4,084	4,064	4,105	4,146
15 Project Funded in Advance	390	390	30	30	30	30	30	50	50	50
16 TOTAL	3,554	3,554	4,065	4,065	4,114	4,114	4,114	4,114	4,155	4,196
BUDGET AUTHORITY (NET) ^{6/}	420		624		556		145	210	(52)	(194)
17 OUTLAYS (NET) ^{6/7/8}		383		(1)		(46)	(77)	126	102	(138)

These notes are an integral part of this table.

^{1/} This FY 2017 budget includes capital and expense estimates based on Bonneville's IPR and CIR processes and updated estimates for the FY 2016 and 2017 Transmission capital.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

^{4/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{5/} Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

^{6/} BPA received \$48.7 million of additional budget authority in FY 2007 to accommodate the work necessary to relocate the radio spectrum consistent with the Commercial Spectrum Enhancement Act (P.L. 108-494). In accordance with Federal law, Bonneville plans to return the forecasted unused balance of approximately \$8.2 million to the U.S. Treasury as soon as the National Telecommunications Information Administration notifies the Federal Communications Commission that the DOE relocation effort is complete.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

^{8/} FY 2015 Net Outlays are based on Bonneville's FY 2015 audited actuals. FYs 2016 & 2017 Net Outlays are calculated using Bonneville's revenue forecast from the BP-16 rate case. FYs 2018 & 2019 assume no growth in Offsetting Collections compared to FYs 2016 & 2017. FYs 2020 and 2021 assume a 1% growth in Offsetting Collections.

EXPENSED OBLIGATIONS/OUTLAYS ^{1,4/}

Current Services

(in millions of dollars)

FISCAL YEAR

BP-2

	2015		2016		2017		2018	2019	2020	2021
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	200	200	217	217	217	217	239	239	252	252
2 Power Services ^{2/}	1,364	1,364	1,558	1,558	1,562	1,562	1,674	1,775	1,748	1,591
3 Transmission Services	453	453	449	449	458	458	465	474	483	493
4 Conservation & Energy Efficiency	75	75	178	178	173	173	179	183	187	191
5 Fish & Wildlife	258	258	267	267	274	274	281	288	295	302
6 Interest/ Pension ^{3/}	387	387	337	337	353	353	398	418	439	466
7 Planning Council	10	10	11	11	11	11	12	12	12	12
8 TOTAL EXPENSE	2,748	2,748	3,017	3,017	3,049	3,049	3,249	3,388	3,415	3,307
9 Projects Funded in Advance	390	390	30	30	30	30	30	50	50	50

CAPITAL OBLIGATIONS/OUTLAYS^{2/}

Current Services
(in millions of dollars)

FISCAL YEAR

BP-2 continued	2015		2016		2017		2018	2019	2020	2021
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
10 Conservation & Energy Efficiency	87	87	0	0	0	0	0	0	0	0
11 Transmission Services	461	461	700	700	644	644	445	445	417	306
12 Associated Project Cost	43	43	241	241	270	270	282	314	333	348
13 Fish & Wildlife	21	21	40	40	46	46	19	35	35	34
14 Capital Equipment	34	34	37	37	29	29	11	6	4	11
15 Capitalized Bond Premiums	0	0	0	0	0	0	2	2	2	2
16 TOTAL CAPITAL INVESTMENTS	647	647	1,018	1,018	989	989	758	802	791	701
17 TREASURY BORROWING AUTHORITY TO										
18 FINANCE CAPITAL OBLIGATIONS ^{4/}	647		1,018		989		758	802	791	701

These notes are an integral part of this table.

^{1/} This FY 2017 budget includes capital and expense estimates based on Bonneville's IPR and CIR processes and updated estimates for the FY 2016 and 2017 Transmission capital.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{4/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

CURRENT SERVICES
(in millions of dollars)

	FISCAL YEAR						
	2015 Pymts	2016 Pymts	2017 Pymts	2018 Pymts	2019 Pymts	2020 Pymts	2021 Pymts
CAPITAL TRANSFERS							
Amortization:							
19 BPA Bonds	212	30	76	48	559	534	474
20 Reclamation Appropriations	49	51	0	50	0	0	0
21 BPA Appropriations	6	75	55	68	0	0	0
22 Corps Appropriations	181	33	74	62	5	0	44
23 TOTAL CAPITAL TRANSFERS	449	189	206	229	564	534	518
24 FULL-TIME EQUIVALENT (FTE)	2,836	3,100	3,100	3,100	3,100	3,100	3,100

PROGRAM & FINANCING SUMMARY

Current Services

(in millions of dollars)

Identification Code: 89-4045-0-3-271

est.

	2015	2016	2017	2018	2019	2020	2021
Program by activities:							
Operating expenses:							
0.01 Power Services	950	1,103	1,097	1,203	1,295	1,250	1,077
0.02 Residential Exchange Program	200	217	217	239	239	252	252
Associated Project Costs:							
0.05 Bureau of Reclamation	134	157	158	161	163	165	172
0.06 Corps of Engineers	230	244	251	255	259	274	282
0.07 Colville Settlement	19	22	22	23	23	23	24
0.19 U.S. Fish & Wildlife Service	31	32	33	34	34	35	36
0.20 Planning Council	10	11	11	12	12	12	12
0.21 Fish & Wildlife	258	267	274	281	288	295	302
0.23 Transmission Services	453	449	458	465	474	483	493
0.24 Conservation & Energy Efficiency	75	178	173	179	183	187	191
0.25 Interest	350	299	314	359	377	398	424
0.26 Pension and Health Benefits ^{1/}	38	38	39	40	40	41	42
0.91 Total operating expenses ^{2/}	2,748	3,017	3,049	3,249	3,388	3,415	3,307
Capital investment:							
1.01 Power Services	43	241	270	282	314	333	348
1.02 Transmission Services	461	700	644	445	445	417	306
1.03 Conservation & Energy Efficiency	87	0	0	0	0	0	0
1.04 Fish & Wildlife	21	40	46	19	35	35	34
1.05 Capital Equipment	34	37	29	11	6	4	11
1.06 Capitalized Bond Premiums	0	0	0	2	2	2	2
1.07 Total Capital Investment ^{3/}	647	1,018	989	758	802	791	701
2.01 Projects Funded in Advanced	390	30	30	30	50	50	50
10.00 Total obligations ^{4/}	3,785	4,065	4,068	4,037	4,240	4,257	4,058

These notes are an integral part of this table.

^{1/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{2/} Assumes expense obligations, not accrued expenses.

Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} Assumes capital obligations, not capital expenditures.

^{4/} This FY 2017 budget includes capital and expense estimates based on Bonneville's IPR and CIR processes and updated estimates for the FY 2016 and 2017 Transmission capital.

For purposes of this table, this FY 2017 budget reflects, for FY 2015, actual third party financing expense only for PFIA.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988 regarding Bonneville's ability to obligate funds.

Program and Financing (continued)

Current Services
(in millions of dollars)

	est.						
	2015	2016	2017	2018	2019	2020	2021
Financing:							
1000 Unobligated balance available, start of year. ^{5/}	8	13	0	0	0	0	0
1050 Unobligated balance available, end of year. ^{5/}	8	10	0	0	0	0	0
1900 Budget authority (gross)	3,788	4,894	4,906	4,645	4,352	4,412	4,379
Budget Authority:							
1400 Permanent Authority: Authority to borrow from Treasury (indefinite) ^{6/}	619	1,018	989	758	802	791	701
1800 Spending authority from off-setting collections	3,345	4,065	4,114	4,114	4,114	4,155	4,196
1825 Portion applied to debt reduction	(212)	(189)	(206)	(229)	(564)	(534)	(518)
1850 Spending authority from offsetting collections (adjusted)	1,218	3,876	3,917	3,886	3,550	3,621	3,678
900 Total obligations	3,785	4,065	4,068	4,037	4,240	4,257	4,058
4110 Outlays (gross)	3,728	4,065	4,068	4,037	4,240	4,257	4,058
Adjustments to budget authority and outlays:							
Deductions for offsetting collections:							
4120 Federal funds	(47)	(90)	(90)	(90)	(90)	(90)	(90)
4121 Interest on Federal Securities	3						
4123 Non-Federal sources	(3,301)	(3,975)	(4,024)	(4,024)	(4,024)	(4,065)	(4,106)
4130 Total, offsetting collections	(3,345)	(4,065)	(4,114)	(4,114)	(4,114)	(4,155)	(4,196)
4160 Budget authority (net)	420	829	792	531	238	257	183
4170 Outlays (net)^{7/8/}	383	(1)	(46)	(77)	126	102	(138)

These notes are an integral part of this table.

^{5/} Reflects estimated cost for radio spectrum fund.

^{6/} The Permanent Authority: Authority to borrow (indefinite) from the U.S. Treasury amounts reflect both Bonneville's capital program financing needs and either the use of, or creation of, deferred borrowing. Deferred borrowing is created when, as a cash and debt management decision, Bonneville uses cash from revenues to liquidate capital obligations in lieu of borrowing from Treasury. This temporary use of cash on hand instead of borrowed funds creates the ability in future years to borrow money, when fiscally prudent. The FY 1989 Energy and Water Development Appropriations Act (P.L. 100-371 Of 7/19/88) confirmed that Bonneville has authority to incur obligations in excess of U.S. Treasury borrowing authority and cash in the BPA fund.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies, and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because Bonneville operates within existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

^{8/} FY 2015 Net Outlays are based on Bonneville's FY 2015 audited actuals. FYs 2016 & 2017 Net Outlays are calculated using Bonneville's revenue forecast from the BP-16 rate case. FYs 2018 & 2019 assume no growth in Offsetting Collections compared to FYs 2016 & 2017. FYs 2020 and 2021 assume a 1% growth in Offsetting Collections.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4A

	Fiscal Year							
	2015				2016			
	Net Capital		Net Capital		Net Capital		Net Capital	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	3,388	2,846	4,287	4,214	3,823	3,281	4,722	4,649
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	647	647	647		1,018	1,018	1,018	
Treasury Borrowing (Cash)				647				1,018
Less:								
BPA Bond Amortization	212	212	212	212	30	30	30	30
Net Increase/(Decrease):	435	435	435	435	988	988	988	988
Cum.-End-of-Year: Total	3,823	3,281	4,722	4,649	4,811	4,269	5,710	5,637
Total Remaining Treasury Borrowing Amount				3,051				2,063
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2017 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2015-2021.

Cumulative advance amortization payments as of the end of FY 2015 are \$3,291 million.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4B

	2017				2018			
	Net Capital		Net Bonds		Net Capital		Net Bonds	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	4,811	4,269	5,710	5,637	5,724	5,182	6,623	6,550
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	989	989	989		758	758	758	
Treasury Borrowing (Cash)				989				758
Less:								
Total BPA Bond Amortization	76	76	76	76	48	48	48	48
Net Increase/(Decrease):								
Total	913	913	913	913	710	710	710	710
Cum.-End-of-Year: Total	5,724	5,182	6,623	6,550	6,434	5,892	7,333	7,260
Total Remaining Treasury Borrowing Amount				1,150				440
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2017 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2015-2021.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4C

Fiscal Year

	2019				2020			
	Net Capital		Net Bonds		Net Capital		Net Bonds	
	Net Capital	Obs Subject	Net Capital	Bonds Out-	Net Capital	Obs Subject	Net Capital	Bonds Out-
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
Start-of-Year: Total	6,434	5,892	7,333	7,260	6,677	6,135	7,576	7,503
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	802	802	802		791	791	791	
Treasury Borrowing (Cash)				802				791
Less:								
Total BPA Bond Amortization	559	559	559	559	534	534	534	534
Net Increase/(Decrease):								
Total	243	243	243	243	257	257	257	257
Cum.-End-of-Year: Total	6,677	6,135	7,576	7,503	6,934	6,392	7,833	7,760
Total Remaining Treasury Borrowing Amount				197				(60)
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2017 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2015-2021.

**BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES**
(in millions of dollars)

BP-4D

	Fiscal Year			
	2021			
	Net Capital		Net Bonds	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Out- Standing
Start-of-Year: Total	6,934	6,392	7,833	7,760
Plus: Annual Increase				
Cum.-Annual Treasury Borrowing	701	701	701	
Treasury Borrowing (Cash)				701
Less:				
Total BPA Bond Amortization	474	474	474	474
Net Increase/(Decrease):				
Total	227	227	227	227
Cum.-End-of-Year: Total	7,161	6,619	8,060	7,987
Total Remaining Treasury Borrowing Amount				(287)
Total Legislated Treasury Borrowing Amount				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2017 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2015-2021.

BONNEVILLE POWER ADMINISTRATION
POTENTIAL THIRD PARTY FINANCING TRANSPARENCY
(in millions of dollars)

BP-5

		Fiscal Year						
		2015	2016	2017	2018	2019	2020	2021
Transmission Services - Capital	Main Grid	63	104	134	148	150	122	1
	Area & Customer Services	4	13	31	1	0	0	0
	Upgrades & Additions	267	205	160	24	17	14	15
	System Replacements	127	377	320	272	278	281	291
	Projects Funded in Advance	266	30	30	30	50	50	50
	Total, Transmission Services - Capital	727	730	674	475	495	467	356

Associated Project Costs - Capital

		2015	2016	2017	2018	2019	2020	2021
Requirements	Associated Project Costs	43	241	270	282	314	333	348
	Projects Funded in Advance ^{1/}	124	NA	NA	NA	NA	NA	NA
	Total, Associated Project Costs - Capital	167	241	270	282	314	333	348

Federal and Non-Federal Funding

		2015	2016	2017	2018	2019	2020	2021
Sources	Projects Funded in Advance	390	30	30	30	50	50	50
	Treasury Borrowing Authority	504	941	914	727	759	750	654

Scenario

		2015	2016	2017	2018	2019	2020	2021
Scenario	Projects Funded in Advance ^{1/}	124	82	0	0	0	0	0
	Third Party Financing	249	350	322	223	223	209	153
	Alternate Treasury Borrowing Authority	NA	509	592	504	536	542	501

These notes are an integral part of this table.

^{1/}In this instance, Projects Funded in Advance represents prepayment of Power customers' bills reimbursed by future credits and third party non-federal financing for Conservation initiatives.

The table above shows both the potential use of Treasury borrowing authority for transmission capital projects based on this FY 2017 budget and the use adjusted for potential third-party financing to fund appropriate capital expenditures when feasible in lieu of Treasury borrowing. Estimates included in this FY 2017 budget are uncertain and may change due to revised capital investment plans, changing economic conditions, and an evolving financial market environment. The estimates of third-party financing included in the table show a reduction in the use of Treasury borrowing and do not reflect the actual notional third party financing commitment BPA may enter into in that particular year. The difference of reduction in use of Treasury borrowing and the Bonneville's Third Party Financing for Transmission Services consists primarily of lease-purchase agreements, which are capitalized obligations that enable BPA to acquire the use of transmission facilities over time. BPA also undertakes the construction and installation of facilities from funds that customers advance to BPA for construction of BPA-owned facilities that assist the customers in obtaining necessary transmission service from BPA. These customers receive monetary payment credits in bills for transmission services from BPA up to the amount of funds advanced to BPA, plus interest.

BPA's historical Third Party Financing amounts may vary over time due to re-assignment of certain lease-purchase agreements to Treasury Financing.

BPA Status of Treasury Borrowing with Potential Third Party Financing & PFIA Scenario

With the potential use of third party financing assumed in the scenario above, BPA's total remaining Treasury Borrowing Amount would be extended to the following amounts. See BP-4 BPA Status of Treasury Borrowing- Current Services.

		Fiscal Year						
		2015	2016	2017	2018	2019	2020	2021
Start-of-Year: Total Bonds Outstanding		4,214	4,649	5,205	5,796	6,283	6,303	6,352
Plus:								
Treasury Borrowing (Cash)		647	1,018	989	758	802	791	701
Less:								
Potential Third Party Financing & PFIA		NA	432	322	223	223	209	153
BPA Bond Amortization		212	30	76	48	559	534	474
Net Increase/(Decrease) Bonds Outstanding:		435	556	591	487	20	48	74
Cum.-End-of-Year: Total		4,649	5,205	5,796	6,283	6,303	6,352	6,426
Total Remaining Treasury Borrowing Amount		3,051	2,495	1,904	1,417	1,397	1,348	1,274
Total Legislated Treasury Borrowing Amount		7,700	7,700	7,700	7,700	7,700	7,700	7,700

U.S. TREASURY PAYMENTS

(in millions of dollars)

	FISCAL YEAR						
	2015	2016	2017	2018	2019	2020	2021
A. INTEREST ON BONDS & APPROPRIATIONS							
Bonneville Bond Interest							
1 Bonneville Bond Interest (net)	132	95	119	167	195	214	240
2 AFUDC ^{1/}		53	51	52	58	54	48
Appropriations Interest							
3 Bonneville	14	14	9	5	0	0	0
4 Corps of Engineers ^{2/}	146	136	136	137	136	137	138
5 Lower Snake River Comp. Plan	17	17	17	17	17	17	17
6 Bureau of Reclamation ^{3/}	40	37	33	33	30	30	30
7 Bond Premiums paid/Discounts (not capitalized)		0	0	0	0	0	0
8 Total Bond and Approp. Interest	350	351	365	411	435	452	472
B. ASSOCIATED PROJECT COST							
9 Bureau of Reclamation Irrigation Assistance	52	61	51	28	57	25	12
10 Bureau of Rec. O & M ^{4/}	2	0	0	0	0	0	0
11 Corps of Eng. O & M ^{4/}	1	0	0	0	0	0	0
12 L. Snake River Comp. Plan O & M ^{4/}	0	0	0	0	0	0	0
13 Total Assoc. Project Costs	55	61	51	28	57	25	12
C. CAPITAL TRANSFERS							
Amortization							
14 Bonneville Bonds ^{6/}	212	30	76	48	559	534	474
15 Bureau of Reclamation Appropriations	49	51		50	0	0	0
16 Corps of Engineers Appropriations	181	33	74	62	5	0	44
17 Lower Snake River Comp. Plan	0	0	0	0	0	0	0
18 Bonneville Appropriations	6	75	55	68	0	0	0
19 Total Capital Transfers	449	189	206	229	564	534	518
D. OTHER PAYMENTS							
20 Unfunded CSRS Liability ^{5/}	38	38	39	40	40	41	42
21 TOTAL TREASURY PAYMENTS	891	640	662	707	1,098	1,051	1,044

These notes are an integral part of this table.

^{1/} This interest cost is capitalized and included in BPA's Transmission System Development, System Replacements, and Associated Projects Capital programs. AFUDC is financed through the sale of bonds.

^{2/} Includes interest on construction funding for Corp of Engineers (Corps) fish bypass facilities at Corps dams in the Columbia River Basin, including Lower Monumental, Ice Harbor, and The Dalles.

^{3/} Includes payments paid by Reclamation to the U.S. Treasury on behalf of Bonneville.

^{4/} Costs for power O&M is funded directly by Bonneville as follows (in millions):

	FISCAL YEAR	2015	2016	2017	2018	2019	2020	2021
Bureau of Reclamation		134	157	158	161	163	165	172
Corps of Engineers		230	244	251	255	259	274	282
Subtotal Bureau and Corps		364	401	409	416	422	440	455
Lower Snake River Comp. Plan		31	32	33	34	34	35	36
Total		395	433	442	449	456	475	490

^{5/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{6/} In this FY 2017 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

Does not include Treasury bond premiums on refinanced Treasury bonds.

Status of U.S. Treasury Principal Repayment

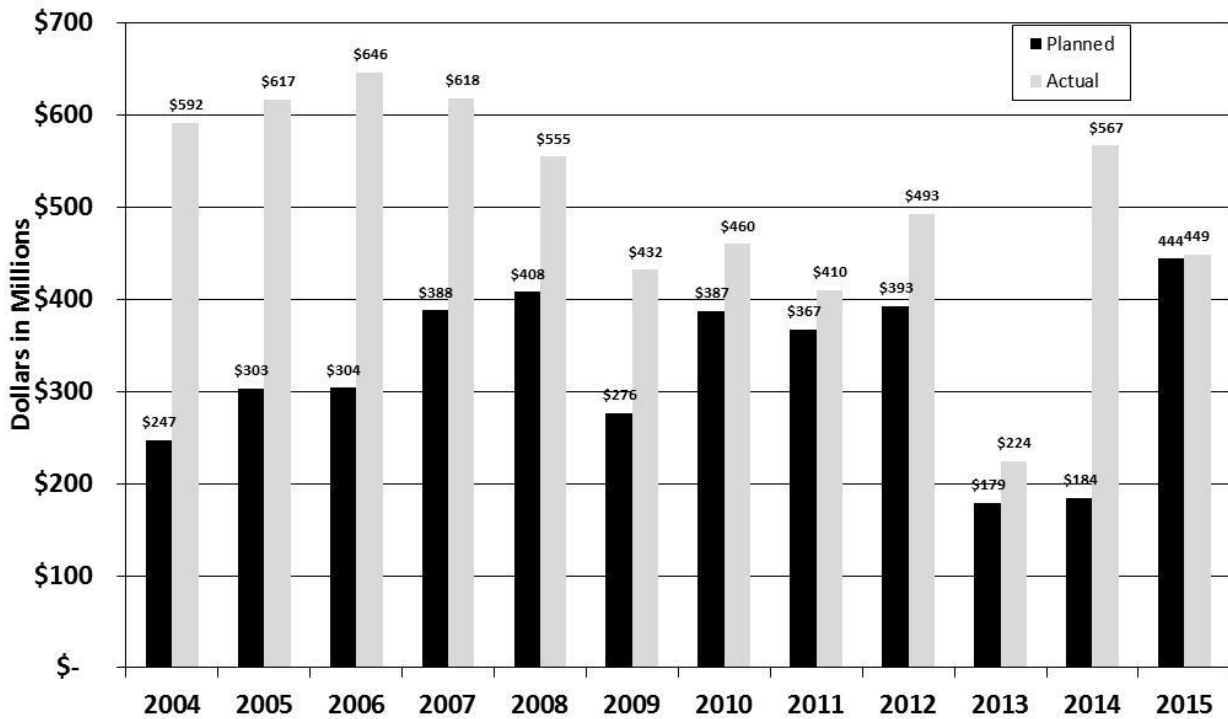


Chart Notes

^{1/} This chart displays principal repayment only.

^{2/} U.S. Treasury payment outyear estimates for planned amortization of principal are based on rate case estimates when available and planned amortization for future rate case periods. These estimates may change due to revised capital investment plans, actual U.S. Treasury borrowing, and advanced amortization payments. Bonneville made its full scheduled FY 2015 payment responsibility to the U.S. Treasury. Bonneville's aggregate U.S. Treasury payment was \$891.0 million, comprised of \$449.0 million in principal, which included \$229.0 million in early retirement of higher interest rate U.S. Treasury debt, \$350.0 million in interest, and \$92.0 million for other costs.

^{3/} FYs 2002-2012 payments include portions of future planned amortization amounts consistent with Bonneville's capital strategy plan and the Bonneville /Energy Northwest debt optimization program.

^{4/} Advance amortization due to sale of transmission facilities includes \$12.7 million in FY 2003, \$5.3 million in FY 2006, \$2.0 million in FY 2011, \$0.4 million in FY 2013 and \$0.4 million in FY 2014.

^{5/} The cumulative amount of actual advance amortization payments as of the end of FY 2015 is \$3,291 million.

OBJECT CLASSIFICATION STATEMENT
(in millions of dollars)

ESTIMATES

	2015 act.	2016	2017
11.1 Full-time permanent	348	372	373
11.3 Other than full-time permanent			
11.5 Other personnel compensation	65	69	69
11.9 Total personnel compensation	413	442	442
12.1 Civilian personnel benefits	130	139	139
13.3 Benefits for former personnel	0	0	0
21.0 Travel and transportation of persons	21	22	22
22.0 Transportation of things	2	2	2
23.1 Rental payments to GSA	17	19	19
23.2 Rents, other	30	32	32
23.3 Communication, utilities & misc. charges	10	11	11
25.1 Consulting Services	221	237	237
25.2 Other Services	1,933	2,088	2,090
25.5 R & D Contracts	13	11	11
26.0 Supplies and materials	59	63	63
31.0 Equipment	232	248	249
32.0 Lands and structures	397	425	425
41.0 Grants, subsidies, contributions	46	49	49
43.0 Interest and dividends	260	277	278
99.0 Total obligations	3,785	4,065	4,068

Estimate of Receipts
(in millions of dollars)

	Fiscal Year						
	2015	2016	2017	2018	2019	2020	2021
Reclamation Interest	40	37	33	33	30	30	30
Reclamation Amortization	49	51	0	50	0	0	0
Reclamation O&M	2	0	0	0	0	0	0
Reclamation Irrig. Assist.	52	61	51	28	57	25	12
Revenues Collected by Reclamation	-16	-7	-7	-7	-7	-7	-7
Distributed in Treasury Account (credit)							
Colville Settlement (credit)	-5	-5	-5	-5	-5	-5	-5
Total 1/ Reclamation Fund	123	137	73	99	75	42	30
Corps O&M							
CSRS	38	38	39	40	40	41	42
Total 2/ Repayments on misc.costs	38	38	39	40	40	41	42

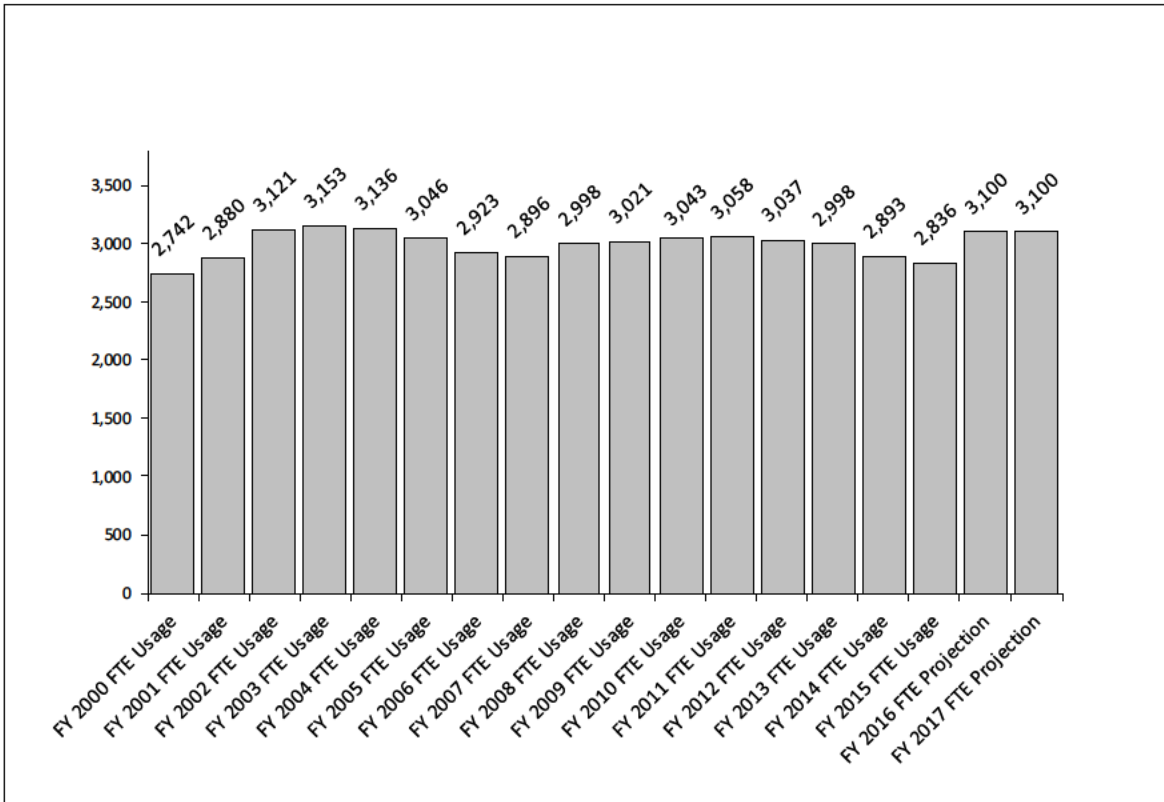
1/ Includes amortization of appropriations and irrigation assistance, and interest costs for Reclamation. The cost of power O&M for Reclamation is no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfer to Account #895000.26

2/ The costs of power O&M for the Corps and Lower Snake Comp. Plan are no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfers to Account #892889, Repayments on misc. recoverable costs, not otherwise classified. Costs for power O&M is funded directly by Bonneville as follows (in millions)

	2015	2016	2017	2018	2019	2020	2021
Bureau of Reclamation	134	157	158	161	163	165	172
Corps of Engineers	230	244	251	255	259	274	282
Lower Snake River Comp. Plan	31	32	33	34	34	35	36
Total	395	433	442	449	456	475	490

See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

BONNEVILLE FTE



Actual FTE data is consistent with DOE personnel reports.

FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing transmission marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.

Total Cost of BPA Fish & Wildlife Actions

COST ELEMENT	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CAPITAL INVESTMENTS ^{1/}										
BPA FISH AND WILDLIFE	35.4	35.2	25.5	27.4	40.0	90.2	57.5	52.1	37.4	21.4
BPA SOFTWARE DEVELOPMENT COSTS	0.9	1.0	1.3	0.6	1.2	0.8	0.4	0.0	0.1	1.4
ASSOCIATED PROJECTS (FEDERAL HYDRO)	360.0	60.4	37.3	135.7	56.4	103.0	114.5	103.6	101.7	81.4
TOTAL CAPITAL INVESTMENTS	396.3	96.6	64.2	163.7	97.6	193.9	172.3	155.7	139.2	104.1
PROGRAM EXPENSES										
BPA DIRECT FISH AND WILDLIFE PROGRAM	137.9	139.5	148.9	177.9	199.6	221.1	248.9	239.0	231.8	258.2
FISH & WILDLIFE SOFTWARE EXPENSE COSTS								0.2	0.3	0.1
SUPPLEMENTAL MITIGATION PROGRAM EXPENSES ^{2/}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
REIMBURSABLE/DIRECT-FUNDED PROJECTS ^{3/}										
O & M LOWER SNAKE RIVER HATCHERIES	20.1	19.3	19.4	20.8	23.3	24.5	22.0	28.7	31.0	30.9
O & M CORPS OF ENGINEERS	31.8	32.9	34.4	34.3	36.5	40.3	41.1	39.2	47.8	46.4
O & M BUREAU OF RECLAMATION	4.5	3.9	4.3	4.5	5.2	5.0	5.3	5.6	6.6	2.6
NW POWER AND CONSERVATION COUNCIL ALLOCATED @ 50%	4.3	4.2	4.1	4.7	4.7	4.5	4.6	5.0	4.9	4.9
SUBTOTAL (REIMB/DIRECT-FUNDED)	60.7	60.3	62.2	64.3	69.7	74.3	73.0	78.5	90.3	84.9
TOTAL OPERATING EXPENSES	198.6	199.7	211.1	242.1	269.3	295.3	321.9	317.0	322.40	343.17
PROGRAM RELATED FIXED EXPENSES ^{4/}										
INTEREST EXPENSE	53.4	76.0	76.9	78.7	80.5	79.2	80.6	89.1	83.4	89.2
AMORTIZATION EXPENSE	17.4	22.9	24.4	24.6	25.0	28.3	30.2	35.7	38.7	41.3
DEPRECIATION EXPENSE	16.7	14.0	14.9	16.7	18.0	19.6	20.7	18.6	19.2	20.1
TOTAL FIXED EXPENSES	87.5	112.9	116.2	120.0	123.5	127.2	131.5	143.4	141.3	150.6
GRAND TOTAL PROGRAM EXPENSES	286.1	312.7	327.3	362.1	392.8	422.5	453.4	461.1	463.7	493.7
FORGONE REVENUES AND POWER PURCHASES										
FOREGONE REVENUES	397.4	282.6	273.5	142.8	99.4	156.7	152.2	135.5	122.7	195.8
BPA POWER PURCH. FOR FISH ENHANCEMENT	168.2	120.7	274.9	240.3	310.1	70.7	38.5	85.8	196.2	67.5
TOTAL FOREGONE REVENUES AND POWER PURCHASES	565.6	403.3	548.5	383.1	409.5	227.4	190.7	221.3	318.9	263.3
TOTAL PROGRAM EXPENSES, FOREGONE REVENUES, & POWER PURCHASES	851.7	716.0	875.8	745.3	802.3	649.9	644.1	682.4	782.6	757.0
CREDITS										
4(h)(10)(C)	(76.4)	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)	(77.7)
TOTAL CREDITS	(76.4)	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)	(77.7)

1/ Capital Investments include both BPA's direct Fish and Wildlife Program capital investments, funded by BPA's Treasury borrowing, and "Associated Projects", which include capital investments at Corps of Engineers' and Bureau of Reclamation projects, funded by appropriations and repaid by BPA. The negative amount in FY 1997 reflects a decision to reverse "plant-in-service" investment that was never actually placed into service. The annual expenses associated with these investments are included in "Program-Related Fixed Expenses", below.

2/ Includes High Priority and Action Plan Expenses and other supplemental programs.

3/ "Reimbursable/Direct-Funded Projects" includes the portion of costs BPA pays to or on behalf of other entities that is determined to be for fish and wildlife purposes.

4/ "Fixed Expenses" include depreciation, amortization and interest on investments on the Corps of Engineers' projects, and amortization and interest on the investments associated with BPA's direct Fish and Wildlife Program.

**Bonneville Power Administration (Bonneville, BPA)
Proposed Appropriations Language**

Expenditures from the Bonneville Power Administration Fund, established pursuant to Public Law 93-454, are approved for official reception and representation expenses in an amount not to exceed \$5,000: Provided, that during fiscal year 2018, no new direct loan obligations may be made.

Explanation of Changes

The proposed appropriations language restricts new direct loans in FY 2018 as in FY 2017. This bill language is drafted consistent with the Credit Reform Act of 1990.

Please Note - The FY 2018 Bonneville Power Administration Congressional Budget submission includes FY 2017 budget estimates.

Bonneville operates under a business-type budget under the Government Corporation Control Act, 31 U.S.C 9101-10 and on the basis of the self-financing authority provided by the Federal Columbia River Transmission System Act of 1974 (Transmission Act) (Public Law 93-454). Bonneville has authority to borrow from the U.S. Treasury under the Transmission Act, the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Pacific Northwest Power Act) (Public Law 96-501) for acquisition of energy conservation and renewable energy resources, investment in fish facilities, and other purposes, the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), and other legislation. Authority to borrow from the U.S. Treasury is available to Bonneville on a permanent, revolving basis. The amount of U.S. Treasury borrowing outstanding at any time may not exceed \$7.70 billion.¹ Bonneville finances its approximate \$4.4 billion annual cost of operations and investments primarily using power and transmission revenues, and proceeds of borrowing from the U.S. Treasury.

This budget has been prepared in accordance with the Statutory Pay-As-You-Go Act (PAYGO) of 2010. Under PAYGO, all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories, which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

¹ Amount of total treasury bonds outstanding can be found in tables BP-4A – 4D in the Additional Tables section.

Bonneville Power Administration

Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2016 Actuals	2017 Original ^{2/}	2017 Revised ^{2/}	2018 Proposed
Capital Investment Obligations				
Associated Project Costs ^{3/}	186,982	N/A	246,257	264,764
Fish & Wildlife	16,030	N/A	44,602	50,532
Subtotal, Power Services	203,012	N/A	290,859	315,296
Transmission Services	277,468		530,697	439,434
Capital Equipment & Bond Premium	23,924	N/A	27,000	28,860
Total, Capital Obligations ^{3/}	504,404	988,782	848,556	783,590
Expensed and Other Obligations				
Expensed	3,330,435	3,049,010	3,267,646	3,360,901
Projects Funded in Advance	272,432	30,000	42,010	40,107
Total, Obligations	4,107,271	4,067,792	4,158,212	4,184,598
Capital Transfers (cash)	1,437,000	205,868	280,147	333,134
BPA Total	5,544,271	4,273,660	4,438,360	4,517,732
Bonneville Net Outlays	509,317		41,266	71,266
Full-time Equivalent (FTEs)	2,880	3,100	3,100	3,100

Public Law Authorizations include:

Bonneville Project Act of 1937, Public Law No. 75-329

Federal Columbia River Transmission System Act of 1974, Public Law No. 93-454

Regional Preference Act of 1964, Public Law No. 88-552

Flood Control Act of 1944, Public Law No. 78-543

Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act), Public Law No. 96-501

Outyear Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2019	2020	2021	2022
Capital Investment Obligations				
Associated Project Costs ^{3/}	287,872	313,375	338,652	345,501
Fish & Wildlife	44,000	38,033	33,599	29,047
Subtotal, Power Services	331,872	351,408	372,251	374,548
Transmission Services	458,369	591,142	587,534	597,550
Capital Equipment & Bond Premium	28,860	4,880	16,257	9,267
Total, Capital Obligations ^{3/}	819,101	947,430	976,042	981,365
Expensed and Other Obligations				
Expensed	3,466,914	3,352,417	3,485,412	3,547,025
Projects Funded in Advance	38,937	36,025	34,837	34,774
Total, Obligations	4,324,953	4,335,873	4,496,291	4,563,164
Capital Transfers (cash)	501,741	410,398	461,500	497,173
BPA Total	4,826,694	4,746,270	4,957,791	5,060,337
Bonneville Net Outlays	211,266	141,225	215,652	192,337
Full-time Equivalents (FTEs)	3,100	3,100	3,100	3,100

These notes are an integral part of this table.

- 1/ This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.
- 2/ Original estimates reflect Bonneville's FY 2017 Congressional Budget Submission. Revised estimates, consistent with Bonneville's annual near-term funding review process, provide notification to the Administration and Congress of updated capital and expense funding levels for FY 2017.
- 3/ Includes infrastructure investments designed to address the long-term electric power related needs of the Northwest and to reflect significant changes affecting Bonneville's power and transmission markets.

Additional Notes

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Cumulative advance amortization payments as of the end of FY 2016 are \$4,333 million.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

FY 2016 Net Outlays are based on Bonneville's FY 2016 audited actuals. FY 2017 Net Outlays are calculated using Bonneville's revenue forecast from the BP-16 rate case. FYs 2018 & 2019 assume no growth in Offsetting Collections compared to FYs 2016 & 2017. FYs 2020 through 2022 assume a growth in Offsetting Collections based on standard inflation factors.

FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing transmission marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.

Major Outyear Considerations

Bonneville's outyear estimates reflect ongoing efforts to achieve its long-term mission and strategic direction. The outyear estimates are developed with consideration and support of Bonneville's multi-year performance targets that lay out the course for achieving Bonneville's long-term objectives. Outyear capital investment levels support Bonneville's infrastructure program, hydro efficiency program, and its fish and wildlife mitigation projects.

Bonneville continues to incorporate the various aspects of the Energy Policy Act of 2005 related to its business, in particular the energy supply, conservation, and new energy technologies for the future that are highlighted in the legislation.

Overview and Accomplishments

Bonneville provides electric power, transmission, and energy efficiency throughout the Pacific Northwest. Bonneville serves a 300,000 square mile area including Oregon, Washington, Idaho, western Montana, and small parts of eastern Montana, California, Nevada, Utah, and Wyoming with a population of about 13.3 million people. Bonneville markets the electric power produced from 31 federal hydro projects in the Pacific Northwest owned by the U.S. Army Corps of Engineers (Corps) and the U.S. Department of Interior, Bureau of Reclamation (Reclamation)—the hydro projects are known as Associated Projects. Bonneville also markets power acquired from non-federal generating resources, including the power from a nuclear power plant, Columbia Generating Station (CGS). Bonneville uses the power from non-federal and federal projects primarily to meet the needs of its customer utilities. Bonneville currently maintains and operates 15,212 circuit miles of transmission lines, 261 substations, and associated power system control and communications facilities over which this electric power is delivered. Bonneville has capital and similar leases for certain transmission facilities. Bonneville also supports the protection and enhancement of fish and wildlife, and promotes conservation and energy efficiency, as part of its efforts to preserve and balance the economic and environmental benefits of the Federal Columbia River Power System (FCRPS).

The organization of Bonneville's FY 2018 Budget reflects Bonneville's business services basis for utility enterprise activities. Bonneville's two major areas of activity on a consolidated budget and accounting basis are Power Services (PS) and Transmission Services (TS) and include their related administrative costs. PS activities include line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program (REP), Associated Projects Operations & Maintenance (O&M) Costs, and Northwest Power and Conservation Council (Planning Council or Council). The FY 2018 Budget Request proposes that the Federal government be authorized to sell the transmission assets of Bonneville.

The current mission of Bonneville is to create and deliver the best value for its customers and constituents as it acts in concert with others to assure the Pacific Northwest has the following: (1) an adequate, efficient, economical, and reliable power supply; (2) an open access transmission system that is adequate for integrating and transmitting power from federal and non-federal generating units, providing service to Bonneville's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and (3) mitigation of the FCRPS impacts on fish and wildlife. Bonneville is legally obligated to provide cost-based rates and public and regional preference in its marketing of power. Bonneville establishes rates as low as possible consistent with sound business principles and sufficient to ensure the full recovery of all of its costs, including timely repayment of the federal investment in the system. Bonneville's vision is to provide: (1) high reliability; (2) low rates consistent with sound business principles; (3) responsible environmental stewardship; and (4) accountability to the region. Bonneville pursues this vision consistent with its four core values of safety, trustworthy stewardship of the FCRPS, collaborative relationships, and operational excellence.

Preserving and Enhancing the FCRPS

The FCRPS is one of the nation's largest nearly carbon-free energy sources and preserving and enhancing the value of the FCRPS for the future continues to be a major Bonneville focus. Bonneville's ongoing prioritization and execution of capital investment in transmission and FCRPS generation assets is the foundation for delivering clean, low cost power to support the communities and economies of the region well into the future.

Bonneville plays a key role in advancing energy efficiency across the region consistent with its statutes, including developing and promoting related technologies, and exploring demand-side management opportunities. Bonneville is making disciplined technology innovation investments and looking to apply new operational and market mechanisms that enhance the reliability, efficiency, and flexibility of system operations.

In addition to these efforts, Bonneville is committed to the quality of the Northwest's natural resources. Bonneville funds one of the largest fish and wildlife programs in the nation and continues to be a national leader on environmental protection and compliance.

Together, all of these efforts contribute to sustaining and advancing the region's resilience.

Program Performance

To validate and verify program performance, Bonneville conducts various internal and external reviews and audits. Bonneville conducts extensive reviews with regional stakeholders of both capital and expense programs. In addition, Bonneville's programmatic activities are subject to review by Congress, the U.S. Government Accountability Office (GAO), the DOE's Inspector General, and other governmental entities. Bonneville's financial statements are audited annually by an independent external auditor. Bonneville has received unqualified audit opinions since the mid-1980s and no material weaknesses have been identified in controls over financial reporting.

Legislative History

The Bonneville Project Act of 1937 provides the original statutory foundation for Bonneville's power marketing responsibilities and authorities. In 1974, passage of the Federal Columbia River Transmission System Act (Transmission Act) applied provisions of the Government Corporation Control Act (31 U.S.C. §§ 9101-9110) to Bonneville. The Transmission Act provides Bonneville with "self-financing" authority, establishes the Bonneville Fund (a permanent, indefinite appropriation) allowing Bonneville to use its revenues from electric power and transmission ratepayers to fund all programs without further appropriation, and authorizes Bonneville to sell bonds to the U.S. Treasury to finance Bonneville's high-voltage electric transmission system.

In 1980, enactment of the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) expanded Bonneville's authorities, obligations, and responsibilities. The purpose of the act includes the following: to encourage electric energy conservation to meet regional electric power loads placed on Bonneville; to develop renewable energy resources within the Pacific Northwest; to assure the Northwest an adequate, efficient, economical, and reliable power supply; to promote regional participation and planning; and to protect, mitigate, and enhance the fish and wildlife of the Columbia River and its tributaries. The Northwest Power Act also established the statutory framework for Bonneville's administrative rate-setting process and established judicial review of Bonneville's final decisions in the U.S. Court of Appeals for the Ninth Circuit.

As of the end of FY 2016, Bonneville has revolving U.S. Treasury borrowing authority of \$7.7 billion with approximately \$3 billion remaining on it.

The Columbia River Treaty

The U.S. Government reached consensus on a high level position for negotiations of the post-2024 future of the Columbia River Treaty in June 2015. The final regional recommendation delivered to the Department of State by Bonneville and the Corps (together the "U.S. Entity") in December 2013 was considered in this effort. A lead negotiator from the Department of State was named in August 2015. Since that time, the Department of State, the U.S. Entity, and other federal agencies have worked toward completing the official authorization that allows the U.S. Government to negotiate with Canada. The authorization to negotiate was concluded in October 2016.

Judicial and Regulatory Activity

The Energy Policy Act of 2005 authorized the Federal Energy Regulatory Commission (FERC) to approve and enforce mandatory electric reliability standards with which users, owners, and operators of the bulk power system, including Bonneville, are required to comply. These standards became enforceable on June 18, 2007, and compliance is monitored by the North American Electric Regulatory Corporation (NERC) and the regional reliability organizations.

Fish and Wildlife Program Overview

Bonneville is committed to continue funding its share of the region's efforts to protect and mitigate Columbia River Basin fish and wildlife. To the extent possible, Bonneville is integrating actions to protect species listed for protection under the Endangered Species Act (ESA) in response to the FCRPS Biological Opinions (BiOps), including the National Oceanic and Atmospheric Administration (NOAA) Willamette River BiOp and the United States Fish and Wildlife Service's (USFWS) 2006 Libby Dam BiOp, with projects implemented consistent with the Council's Fish and Wildlife Program (Program). The

Program, BiOps, and long-term agreements include prioritized strategies for mitigation actions to meet Bonneville's environmental compliance responsibilities under the ESA, Northwest Power Act, and other laws.

Included with the budget schedules section of this document is the current tabulation of Bonneville's fish and wildlife costs from FY 2007 through FY 2016.

Infrastructure Investments

Bonneville is reviewing infrastructure investments in the Pacific Northwest to meet transmission capacity and reliability needs and continues to support a competitive wholesale market in the Western Interconnection, which encompasses 14 western states, two Canadian provinces, and one Mexican state.

Bonneville has completed three major transmission lines since 2011 (i) the McNary-John Day line—completed in FY 2012, under budget and ahead of schedule—added 79 miles, (ii) the Big Eddy-Knight 500kV transmission line and substation project resumed construction in 2014 and was energized in November 2015, and (iii) the Central Ferry-Lower Monumental 500kV Reinforcement which began construction in May 2014 and was also energized in November 2015. Bonneville also completed the modernization of the Celilo Converter station at the northern end of the 846-mile Pacific Direct Current Intertie. The new station was energized in January 2016, well ahead of schedule and within budget.

The proposed I-5 Corridor Reinforcement Project environmental review is complete and is being discussed with stakeholders prior to any decision to move forward. In FY 2012, Bonneville signed two agreements to participate with two investor-owned utilities in the environmental work and permitting for another transmission project, the proposed Boardman-to-Hemingway 500kV line. Participation in this preliminary review keeps Bonneville's options open for serving its six southeast Idaho Preference Customers after the current transmission service agreements terminate. Bonneville has not made a decision to co-develop or purchase capacity in these projects. On January 17, 2014, Public Law 113-76 was enacted into law, which provided Bonneville with expenditure authority approval to construct or participate in the construction of a transmission line to southeast Idaho, should Bonneville decide to continue pursuing that service arrangement.

Bonneville is also continuing to evaluate additional transmission investments across the Pacific Northwest to improve reliability and support both load and renewable generation needs.

Bonneville has experienced significant growth within its balancing area in installed variable renewable generation, primarily in the form of wind generation. Since 2001, installed wind generation connected to Bonneville's transmission system has grown from 115 MWs to 5,081 MWs through September 2016. Of the 5,081 MW of connected wind, 4,782 MW is currently in Bonneville's Balancing Authority Area (BAA). This substantial increase in variable renewable generation has resulted in additional uncertainties in the balance between load and generation required for maintaining a reliable grid. Wind is a non-dispatchable source of energy, meaning it cannot be relied upon for capacity. As a result, Bonneville has implemented and continues to study operational tools for integrating this variable generation more cost effectively and reliably. Further complicating matters, 2,408 MW of the wind energy currently in Bonneville's BAA is requesting to join different BAA's. Although this removes variable generation from Bonneville's BAA, these projects are still physically connected to Bonneville's system and continue to impact the daily operations of BPA. Off-setting the wind leaving Bonneville's BAA is the possibility that a large amount of utility scale solar photo-voltaic (PV) projects are being added to Bonneville's queue. Bonneville is currently studying approximately 2,000 MW of solar interconnection requests and new requests are coming in at an average rate of one per week. Solar, like wind, is a variable generation source, but its characteristics are different than wind. Bonneville will need to learn and adapt to this new generation type.

Bonneville is considering approaches, in addition to or in lieu of the use of its U.S. Treasury borrowing authority, to sustain funding for its infrastructure investment requirements. These approaches include a divestiture of Bonneville's transmission assets, reserve financing of some amount of transmission investments, or seeking, when feasible, third party financing sources. See the BP-5 Potential Third Party Financing Transparency table in the budget schedules section of this document. This FY 2018 Budget assumes \$15 million of annual reserve financing in FYs 2017-2022 for transmission infrastructure

capital, which is included in this budget under Projects Funded In Advance. In addition, the FY 2018 Budget Request proposes that the Federal government be authorized to sell the transmission assets of Bonneville.

Radio Spectrum Communications

Bonneville's wireless communication system is used to operate and control critical national transmission grid infrastructure in a reliable, secure, and safe manner. Bonneville's communication systems are designed to meet strict reliability/availability objectives required by NERC and Western Electricity Coordinating Council (WECC) standards. Concerning proper spectrum stewardship, Bonneville designs highly efficient radio systems that use minimal radio frequency (RF) channel bandwidths to meet critical mission needs. However, in certain circumstances, efficiently designed spectrum radio systems will require broad RF channels and/or lower state RF modulation schemes to meet existing and future requirements in order to meet operational and reliability/availability objectives.

In order to meet Bonneville's mission/operational requirements, RF communication equipment approved for system use goes through a rigorous evaluation and testing process. RF spectrum efficiency factors are considered during the evaluation/testing period. RF terminal equipment approved for use is normally purchased directly from vendors and is not typically supplied through a Request for Proposal process.

Bonneville's operational telecommunications and other capital equipment and systems are acquired using Bonneville's self-financing and procurement authorities. The Bonneville budget includes a system-wide electric reliability performance indicator, consistent with NERC rules, to track and evaluate performance.

Bonneville may share temporarily-available spare capacity on its RF communication system with other government agencies (both Federal and State), and with other electric utilities in the region whose power systems interconnect with Bonneville. Non-critical administrative traffic is typically supported by commercial carrier enterprises. However, to meet NERC/WECC electrical bulk transmission requirements, Bonneville exclusively operates highly critical transmission control traffic over its private telecommunication system as Bonneville has no control over the reliability/availability of the commercial enterprise or on how quickly critical operational control circuits are restored to active service during an interruption.

For high capacity communication system applications, Bonneville considers and operates non-spectrum dependent alternatives such as fiber optic cable infrastructure systems.

During FY 2014, Bonneville began upgrading the Very High Frequency (VHF) land mobile system and installing a number of digital Synchronous Optical Network (SONET) rings typically consisting of fiber segments in combination with point-to-point microwave hops operating in the 4 GHz and 7/8 GHz bands. These various telecommunication systems operate within Bonneville's approximate 300,000 square mile utility responsibility service territory (Oregon, Washington, Idaho, western Montana) with the majority of the RF infrastructure located in low population-rural areas.

The FCRPS hydroelectric projects, owned by the Corps and Reclamation, also utilize federal radio spectrum to preserve very high operational telecommunications and power system reliability.

In FY 2014, Bonneville completed work costing approximately \$40 million, funded through the Spectrum Relocation Fund, to relocate its operational telecommunication systems from the 1710-55 MHz radio spectrum bands to alternative federal radio spectrum bands. In accordance with Federal law, Bonneville plans to return the approximately \$8.2 million of excess funds to the U.S. Treasury, via the Spectrum Relocation Fund, as soon as the National Telecommunications and Information Administration (NTIA) officially notifies the Federal Communications Commission (FCC) that the DOE relocation effort is complete.

Bonneville began participating in a new spectrum relocation effort in FY 2015. The NTIA has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The FCC held an auction of this spectrum on November 13, 2014. Bonneville received an additional \$5.2 million from the Spectrum Relocation Fund on

July 29, 2015 to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment. Bonneville received obligational authority to proceed with this relocation effort by apportionment on July 24, 2015.

Financial Mechanisms

Bonneville's program is treated as mandatory and nondiscretionary. Bonneville is "self-financed" with its own revenues and does not rely on annual appropriations from Congress. Under the Transmission Act, Bonneville funds the expense portion of its budget and repays the federal investment with revenues from electric power and transmission sales. Bonneville's revenues fluctuate for a variety of reasons, including in response to variations in market prices for fuels and stream flow in the Columbia River System due to variations in weather conditions and fish mitigation needs. Through FY 2016, Bonneville has returned approximately \$32.6 billion to the U.S. Treasury, of which about \$3.6 billion was for payment of FCRPS operation and maintenance (O&M) and other costs, \$15.5 billion for interest, and \$13.5 billion for amortization of appropriations and bonds.

In the FY 2018 Budget, the term Bonneville "bonds" refers to the debt instruments under which Bonneville receives advances of funds from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As of September 30, 2016, debt instruments issued by non-federal entities but secured by payment and other financial commitments provided by Bonneville maintained their credit ratings as follows: Moody's at Aa1 with a stable outlook, Fitch at AA with a stable outlook, and Standard & Poor's at AA- with a stable outlook.

Bonneville and the U.S. Treasury have a comprehensive banking arrangement that covers Bonneville's short- and long-term federal borrowings. This provides Bonneville with the ability to borrow to finance assets and, on a short-term basis, to cover Northwest Power Act-related operating expenses. This latter ability provides Bonneville with much needed liquidity to help manage within-year cash flow needs and mitigate risk. Access to this use of U.S. Treasury borrowing authority has been incorporated into and relied upon in Bonneville's rate-setting process.

Bonneville undertook a Power Prepayment Program in FY 2013 under which all Bonneville preference customers had an opportunity to submit formal offers to provide lump-sum payments to Bonneville as prepayments of a portion of their power purchases through September 30, 2028, the termination date of the Long-Term Regional Dialogue Power Sales Contracts. Bonneville accepted power prepayments from four preference customers, as described below.

Upon Bonneville's receipt of the agreed-to, lump-sum prepayments, the selected preference customers became entitled to future portions of their electricity from Bonneville without further payment. The power prepayments are and will be recognized in the customers' future power bills from Bonneville as fixed, equal monthly prepayment credits. In effect, the amount of electricity that is prepaid may vary by month, depending on Bonneville's power rates and rate schedules that apply to electricity purchases by the prepaying customers in the related month. Because this is structured as a variable amount prepayment and not as a fixed-price/fixed-amount type of prepayment, Bonneville maintains flexibility to establish rates for the electric power that is prepaid.

As a result of the FY 2013 Prepayment solicitation, Bonneville received \$340 million in prepayments, which Bonneville is using to fund needed FCRPS investments. The aggregate prepayment credits are set at \$2.55 million per month through FY 2028.

Depending on a variety of factors it is possible that Bonneville may seek to implement later phases of the Power Prepayment Program in connection with future FCRPS hydroelectric investment needs.

Treasury Payments and Budget Overview

Bonneville's FY 2016 payment to the U.S. Treasury of \$1,875 million was made on time and in full for the 33rd consecutive year. The payment included \$1,437 million in principal, which included \$959 million in early retirement of higher interest rate U.S. Treasury debt, \$343 million for interest, \$60 million in irrigation assistance payments, and \$35 million in other payments. Total credits associated with fish mitigation and recovery and applied toward Bonneville's U.S. Treasury payment were about \$70 million for FY 2016. These credits are established and applied under section 4(h)(10)(C) of the Northwest Power Act. For FY 2017, Bonneville plans to pay the U.S. Treasury \$668 million: \$280 million to repay investment principal, \$301 million for interest, and \$87 million for Associated Project costs and pension and post-retirement benefits. The FYs 2018 and 2019 U.S. Treasury payments are currently estimated at \$701 million and \$924 million, respectively. The FY 2017, 2018, 2019 4(h)(10)(C) credits are estimated to be \$88 million, \$97 million, and \$97 million, respectively.

Estimates of interest and amortization levels for outyear U.S. Treasury payments are included in the FY 2016-2017 final transmission and power rates. Bond and Appropriations Interest will continue to be revised based on upcoming capital investments and debt management actions. These estimates may change due to revised capital investment plans and actual U.S. Treasury borrowing. In recent years, Bonneville has made amortization payments in excess of those scheduled in its FERC-approved rate filings resulting in a balance of advance repayment. The cumulative amount of advance amortization payments as of the end of FY 2016 is about \$4,333 million.

Bonneville has direct funding arrangements to fund the power-related portion of O&M and capital investments at the Corps and Reclamation facilities as well as the O&M costs of the U.S. Fish and Wildlife Service Lower Snake River Compensation Plan facilities. Direct funded Associated Projects capital costs, which had been funded exclusively through appropriations to the Corps and Reclamation prior to the initiation of direct funding, are now paid primarily from the proceeds of bonds issued by Bonneville to the U.S. Treasury. Certain power prepayments have also been a source of proceeds for direct funding. Bonneville's aggregate direct funding provided for capital and O&M was \$605 million in FY 2016.

Starting in FY 2014, Bonneville and Energy Northwest, the Washington state joint operating agency that owns and operates the Columbia Generating Station nuclear plant, have been working together to implement a new phase of integrated debt management for their combined total debt portfolios. The debt service of these portfolios is borne by Bonneville and recovered from Bonneville ratepayers through Bonneville's rates. Energy Northwest-related debt, as refinanced under this effort, is called Regional Cooperation Debt. Bonneville expects to work with Energy Northwest to continue undertaking these types of transactions through FY 2020.

An important component of Regional Cooperation Debt is the issuance of new bonds by Energy Northwest to refund outstanding bonds shortly before their maturities when substantial principal repayments are due. The maturity extensions result in increased balances in the Bonneville Fund that are used to prepay higher interest rate federal obligations. The increased balances arise because Bonneville's rates are set assuming it would need funds to repay the maturing Energy Northwest bonds; however, when the maturing bonds are repaid with the proceeds of the new refunding bonds (and not from cash in the Bonneville Fund), the resulting 'freed up' balances in the Bonneville Fund become available to fund the early appropriations repayments. The net effect of refunding Regional Cooperation Debt and prepaying higher interest rate federal obligations is that the weighted-average interest rate of Bonneville's overall debt portfolio has been and will be reduced. In addition, Bonneville's aggregate principal balance of debt outstanding (federal and non-federal) does not and will not increase by virtue of the Regional Cooperation Debt program.

Energy Northwest accelerated site restoration of the Energy Northwest Nuclear Projects 1 and 4 in the summer of 2015.

This FY 2018 Budget proposes estimated accrued expenditures of \$3,361 million for operating expenses, \$40 million for Projects Funded in Advance (PFIA), \$784 million for capital investments, and \$333 million for capital transfers in FY 2018.

The estimated spending levels in this budget are still subject to change to accommodate competitive dynamics in the region's energy markets, debt management strategies, continuing changes in the electric industry, and other factors.

Current Financial Status

Bonneville is striving to enhance its competitive, cost-effective delivery of utility products and services and the continued delivery of the public benefits of its operations, while ensuring it continues to make its scheduled payments to the U.S. Treasury on time and in full. Bonneville employs a strategic planning process using the balanced scorecard model to align all business units around specific goals and align resources to achieve these goals. Results from these efforts include continued efficiency gains, performance integration improvements, and a high assurance for repayment of both the bonds Bonneville issues to the U.S. Treasury and the appropriated investment in the FCRPS.

Through cost-based rates and attentive cost management efforts, Bonneville has maintained adequate financial reserve levels to assure full recovery of its costs and financial stability while meeting its overall responsibilities to the Pacific Northwest and U.S. taxpayers.

Bonneville released the initial proposal for the FYs 2018-2019 rates on November 17, 2016.

Budget Estimates and Planning

This FY 2018 Budget includes capital and expense estimates based on initial spending proposals from Bonneville's 2016 Capital Investment Review (CIR) and Integrated Program Review (IPR) process. FY 2016 actual costs are based on Bonneville's FY 2016 audited financial statements. The FY 2018 Budget Request proposes that the Federal government be authorized to sell the transmission assets of Bonneville.

Capital funding levels reflect Bonneville's capital asset management process and external factors such as changes affecting the West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region and national energy security goals.

Capital investment levels in this FY 2018 Budget reflect executive management decisions from Bonneville's Finance Committee and the associated capital review process. Bonneville utilizes a structured capital project selection process requiring submission of a standardized business case for review. Each business case consists of a description of the project, a clear statement of objectives, description and mitigation of risks, and a rigorous analysis of project costs and benefits including a status quo assumption and preferred alternatives. In addition, both annual and end-of-project targets are set for each project covering cost, scope, and schedule. Progress reports on these targets are provided to Bonneville's senior executives at least quarterly.

The FYs 2017-2022 revenue estimates in this budget, included in the Net Outlay formulation, are calculated consistent with cash management goals. The revenue estimates reflect assumed adjustments, which include the use of a combination of tools, including upcoming rate adjustment mechanisms, reduced cost estimates, a net revenue risk adjustment, debt management strategies, and/or short-term financial tools to manage net revenues and cash. The revenue estimates also include depreciation and U.S. Treasury repayment credit assumptions. These U.S. Treasury repayment credits offset, among other things, Bonneville's fish and wildlife program costs allocable to the non-power project purposes of the FCRPS, as provided under section 4h(10)(C) of the Northwest Power Act.

Overview of Detailed Justifications

In Bonneville's Detailed Justification Summaries, accrued expenditure is the basis of presenting Bonneville's program funding levels in the power and transmission rate making processes and the basis upon which Bonneville managers control their resources to provide products and services. Accrued expenditures relate period costs to period performance. Traditional budget obligation requirements for Bonneville's budget are assumed on the Program and Financing Summary Schedule prepared in accordance with Office of Management & Budget (OMB) Circular A-11.

The organization of Bonneville's FY 2018 Budget and these performance summaries reflect Bonneville's business services basis for utility enterprise activities. Bonneville's major areas of activity on a consolidated budget and accounting basis include power and transmission, with administrative costs included. Power Services includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program, Associated Projects O&M Costs, and the Council. Environmental activities

are shown in the relevant Power Services and Transmission Services sections, as are reimbursable costs. Bonneville's interest expense, pension and post-retirement benefits, and capital transfers to the Treasury are shown by program.

The first section of performance summaries, Capital Investments, includes accrued expenditures for investments in electric utility and general plant associated with the FCRPS generation and transmission services, fish and wildlife, and capital equipment. These capital investments are estimated to require budget obligations and expected use of \$784 million in bonds to be issued and sold to the U.S. Treasury in FY 2018.

The near-term forecast of capital funding levels has undergone an extensive internal review as a result of Bonneville's capital asset management strategy. These capital reviews encompass project cost management initiatives, capital investment assessments, and categorization of capital projects to be funded based on risk and other factors. Consistent with Bonneville's near-term capital funding review process and Bonneville's standard operating budget process, this FY 2018 Budget includes updated capital funding levels for FY 2017. Utilizing this review process helps Bonneville in its efforts as a participant in wholesale energy markets. Bonneville will continue to work with the Corps and Reclamation to optimize the mix of projects.

In addition to its internal management assessment of capital investments, Bonneville has developed and implemented an associated external capital investment review process that provides significant benefits to Bonneville. The combined internal and external processes add value by improving direction in making the FCRPS investments (tying investments more closely to agency strategy) and by improving how those investments are made (more detailed analysis and review of capital investments and their alternatives).

The second section of Bonneville's performance summaries, entitled Annual Operating Expenses, includes accrued expenditures for services and program activities financed by power sales revenues, transmission sales revenues, and projects funded in advance. For FY 2018, budget expense obligations are estimated at \$3,361 million. The total program requirements of all Bonneville programs include estimated budget obligations of \$4,185 million in FY 2018.

Evidence and Analysis in the Budget

Bonneville has undertaken several initiatives and processes to determine appropriate budget expenditures.

Bonneville's Integrated Program Review (IPR) process allows interested parties to see all relevant FCRPS expense and capital spending level estimates in the same forum. In addition, Bonneville's Capital Investment Review (CIR) process allows interested parties to review and comment on Bonneville's draft Asset Strategies and 10-year capital forecasts. The IPR and CIR processes were combined in 2016 and occur every two years, or just prior to each rate case, and provide participants with an opportunity to review and comment on Bonneville's program level estimates prior to spending levels being set for inclusion in rate cases. The 2016 IPR and CIR process concluded in the fall of 2016. Bonneville conducted a second, targeted IPR (IPR2) process in early 2017 and will use that information in preparing Bonneville's final rate proposal for FYs 2018-2019.

Bonneville is focused on institutionalizing operational excellence – continuous improvement that produces more efficient and effective ways to deliver on Bonneville's mission and vision. In FY 2015, Bonneville re-focused its continuous improvement efforts to concentrate on seven Key Strategic Initiatives (KSIs). One of these initiatives resulted in a major program overhaul to our Safety and Health program. This effort encompassed changes to safety governance, improved safety culture, organization design modifications, process improvement projects to close gaps, and improvements in policy, human performance, and job specific training. In FY 2016 the Strategy Execution activity was realigned to the newly established Business Transformation Office (BTO). The BTO has been implemented in order to ensure that Bonneville's transformational initiatives, including the KSIs, are executed in the most efficient manner, from a time, cost, and resource perspective. In addition, the BTO will mature foundational capabilities such as process and project management, and organizational change management. The former Strategy Execution function will now be called Enterprise Architecture with the responsibility for developing a disciplined approach to modeling an organization's business processes and capabilities. Using models, policies, and defined interactions between people, processes, information, and technology, Enterprise

Architecture will bring together business and Information Technology (IT) to deliver quality and cost effective solutions for transformational initiatives.

Educational Activities

The Bonneville Power Administration is a supporter of science, technology, engineering, and math (collectively known as “STEM”) education programs. These programs provide support and encouragement to middle and high school students to study the sciences in school and to pursue careers in these fields. Working with Bonneville employees as volunteer ambassadors, the Bonneville education program provides value-added presentations, curricula, and activities to K-12 schools that enhance the learning experience for students and teachers, and extend awareness of the value of the region’s hydroelectric system to future generations. As a regional leader in STEM education, Bonneville also proudly supports and organizes an award-winning Science Bowl. Bonneville also sponsors Science Fair competitions for students in Washington state, as well as a First Robotics tournament championship.

**Power Services - Capital
Funding Schedule by Activity**

Funding (\$K)

Power Services – Capital

Associated Project Costs

Fish & Wildlife

Total, Power Services – Capital

	FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate	FY 2018 vs FY 2017	
				\$	%
Associated Project Costs	186,982	246,257	264,764	18,507	8%
Fish & Wildlife	16,030	44,602	50,532	5,930	13%
Total, Power Services – Capital	203,012	290,859	315,296	24,437	8%

Outyears (\$K)

Power Services – Capital

Associated Project Costs

Fish & Wildlife

Total, Power Services - Capital

	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate
Associated Project Costs	264,764	287,872	313,375	338,652	345,501
Fish & Wildlife	50,532	44,000	38,033	33,599	29,047
Total, Power Services - Capital	315,296	331,872	351,408	372,251	374,548

Program Overview

Associated Project Costs provide for direct funding of additions, improvements, and replacements of existing Reclamation and Corps hydroelectric projects in the Pacific Northwest. The FCRPS hydro projects produce electric power that is marketed by Bonneville.

Maintaining the availability and increasing the efficiency of the FCRPS is critical to ensuring that the region has an adequate, efficient, economic, and reliable power system. The FCRPS represents about 80 percent of Bonneville's firm power supply and includes 31 operating federal hydroelectric projects with over 200 generating units. These projects have an average age of about 50 years, with some that exceed 60 years of age. Through direct funding and the cooperation of the Corps and Reclamation, Bonneville uses its U.S. Treasury borrowing authority and other sources to make investments needed to restore generation availability and improve efficiency, reducing demand on Corps and Reclamation appropriations for power-related investments.

Since the beginning of direct funding in FY 1997, Bonneville, along with its joint operating partners, the Corps and Reclamation, has improved system performance. In 1999, at the direction of Congress, Bonneville issued a report that it soon began to implement called the "Asset Management Strategy for the FCRPS." In this report, Bonneville concluded that it needed to invest nearly \$1 billion, in aggregate, in the hydroelectric projects over the ensuing 12 to 15 years. Supplementary analyses and experience with the system have revealed additional and ongoing investment needs.

These planned investments, included in the FY 2018 Budget estimates, will maintain the generation performance of the FCRPS. Moving forward with the cost-effective opportunities to expand the generation and to preserve and enhance the capability of the FCRPS is a smart, economic, and environmentally beneficial decision when compared to purchasing power from the market to serve growing Pacific Northwest electricity needs.

Fish and wildlife capital costs incurred by Bonneville are directed at activities that mitigate Columbia River Basin fish and wildlife resources. Bonneville uses capital to fund projects designed to increase juvenile and adult fish passage through the Columbia River system, to increase fish production and survival through construction of hatchery, acclimation and fish monitoring facilities, and to increase wildlife and resident fish populations through land acquisitions. These capital projects support both Northwest Power Act and ESA priorities and are integrated with the Program in order to efficiently meet Bonneville's responsibilities under the Northwest Power Act to mitigate federal hydrosystem impacts to Columbia River Basin fish and wildlife.

Bonneville implements projects consistent with the Program and the purposes of the Northwest Power Act. Most projects recommended by the Council undergo independent scientific review as directed by the 1996 Energy and Water Appropriations Act, which added section 4(h)(10)(D) to the Northwest Power Act. As a result, the Council appoints an Independent Scientific Review Panel (ISRP) "to review a sufficient number of projects" proposed to be funded through Bonneville's annual fish and wildlife budget "to adequately ensure that the list of prioritized projects recommended is consistent with the Program." The Northwest Power Act further states that "in making its recommendations to Bonneville, the Planning Council shall consider the impact of ocean conditions on fish and wildlife populations; and shall determine whether the projects employ cost effective measures to achieve program objectives." Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council uses a multi-year project review cycle during which the ISRP reviews categories of projects grouped together.

Under the Northwest Power Act, the Council must develop a Fish and Wildlife Program that protects, mitigates, and enhances Columbia River Basin fish and wildlife affected by the federal and non-federal hydroelectric projects in the basin. The Program, the FCRPS BiOp, other BiOps, and Bonneville's long-term agreements include prioritized strategies for mitigation actions and projects to meet Bonneville's responsibilities under the Northwest Power Act, the ESA, the Federal Clean Water Act, and other laws. When issues arise that potentially trigger the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, Bonneville

works with the Council and the regional fish and wildlife managers, customers, and tribes, as appropriate, to ensure ratepayers fund only appropriate mitigation.

As required under the ESA, Bonneville uses capital to fund actions to help avoid jeopardizing listed species. Guidance for those actions is found in the most recent BiOp issued by NOAA in 2008, as supplemented in 2010 and 2014, and the USFWS BiOp in 2006/2010.

- In February 2006, USFWS issued a BiOp for Libby Dam for the Kootenai River white sturgeon and bull trout. A subsequent Settlement Agreement between USFWS and the Center for Biological Diversity was memorialized by modifying the BiOp in 2008. Additional consultation is occurring as part of the larger USFWS bull trout consultation.
- In 2010 USFWS designated critical habitat for bull trout (following USFWS's issuance in 2000 of a BiOp for FCRPS impacts on bull trout). The Action Agencies (Corps, Reclamation, and Bonneville) are preparing a biological assessment covering FCRPS operational effects on bull trout and designated bull trout critical habitat.
- In May 2008, NOAA issued a FCRPS BiOp for 13 listed species of salmon and steelhead, supplemented in a 2010 Supplemental BiOp that incorporated the Action Agency's Adaptive Management Implementation Plan, and further supplemented in a 2014 Supplemental BiOp. On January 17, 2014, NOAA released its 2014 Supplemental BiOp. In May 2016, the Federal District Court for the District of Oregon invalidated the BiOp on numerous grounds and found that the Corps and Reclamation violated the National Environmental Policy Act (NEPA) when they issued decision documents to implement the BiOp. The Court ordered NOAA to complete a new BiOp by December 31, 2018, and ordered the Corps and Reclamation to complete a NEPA process in 2021.
- In July 2008, USFWS and NOAA issued Willamette River BiOps to address impacts from 13 federal dams on salmon, steelhead, Oregon chub, and bull trout. Implementation of a BiOp measure related to hatchery fish in the McKenzie River was the subject of litigation in Federal District Court. The Action Agencies are currently engaged in discussion with NOAA related to BiOp implementation for downstream passage and for hatchery consultations.

Under these collective BiOps, the Action Agencies have committed to implement hydro, habitat, hatchery, and other actions throughout the Columbia River Basin to address impacts stemming from the operation of the federal hydro-electric dams on ESA-listed fish, and to ensure that operations of the federal dams do not jeopardize the continued existence of the ESA listed species or adversely modify their designated critical habitat.

The Action Agencies also signed the 2008 Columbia Basin Fish Accords (Fish Accords or Accords) with five Northwest Tribes and the states of Idaho and Montana. In 2009, an agreement was signed with the state of Washington and federal agencies (the state of Washington Estuary agreement). And in 2012, the Action Agencies signed an agreement with the Kalispel Tribe of Indians covering Albeni Falls Dam and FCRPS operations. Wildlife settlement agreements have been signed with the states of Oregon and Idaho to help complete mitigation for the flooding and inundation caused by FCRPS dams operating in those states. These Fish Accords and settlements complement the BiOps and provide firm commitments to prioritize mitigation actions and secure funding over the life of the agreements.

As noted above, BiOps, Fish Accords, and wildlife settlement commitments are integrated along with other projects and implemented through the Program under the Northwest Power Act. They provide the basis for the Bonneville Fish and Wildlife Program's planned capital investment.

Accomplishments

- Released initial rate proposal for FYs 2018-2019 rates on November 17, 2016.
- Facilitated integration of 5,081 MW of wind generation through September 2016.
- Completed governor oil filtration system installation and vibration and air gap monitoring projects at Bonneville Dam.
- Completed powerhouse and dam electrical distribution equipment replacement at Libby.
- Completed turbine runner replacement at Palisades.
- Completed transformer replacement at Green Springs.
- The returns of adult salmon and steelhead to the Columbia River system from 2009 to 2014 vary by species, but many stocks (especially Snake River fall Chinook and Snake River sockeye) have returned at the highest numbers in

decades. Research shows that survival of juvenile salmon and steelhead migrating down the Snake and Columbia rivers has improved in recent years and is on track to meet performance standards of 96 percent survival per dam for spring-migrating fish and 93 percent survival for summer migrants.

Explanation of Changes

Bonneville’s budget includes \$315.3 million in FY 2018 for Power Services capital, which is an 8.4 percent increase over the FY 2017 forecasted level. The FY 2018 level reflects a continuing need for investment in the hydroelectric system assets and funding necessary to implement the BiOps, Fish Accords, and Columbia Basin Fish and Wildlife activities.

The FY 2018 budget increases the levels for Associated Projects (+\$18.5 million) and Fish & Wildlife (+\$5.9 million), relative to FY 2017. In addition, The FY 2018 Budget Request proposes that the Federal government be authorized to see the transmission assets of Bonneville.

Strategic Management

Bonneville provides electric power while supporting the achievement of its vital responsibilities for fish and wildlife, energy efficiency, renewable resources, and low-cost power in the Pacific Northwest region. Bonneville will continue to implement the following strategies to serve the region:

1. Bonneville coordinates its power operational activities with the Corps, Reclamation, NERC, regional electric reliability councils, its customers, and other stakeholders to provide the most efficient use of federal assets.
2. Ongoing work with the Corps and Reclamation is focused on improving the reliability of the FCRPS, increasing its generation efficiency, and optimizing hydro facility operation.
3. Bonneville is committed to funding efforts to protect listed fish and wildlife species in the Columbia Basin under the ESA and working closely with the Council, regional fisheries managers, and other federal agencies to prioritize and manage projects to mitigate fish and wildlife affected by the FCRPS.
4. Bonneville’s utility customers have been, and continue to be, a critical part of Bonneville’s collaborative efforts to promote and foster the efficient use of energy.
5. Bonneville has assisted with a DOE Wind Power crosscutting initiative to strengthen energy security.

The following external factors present the most significant risk and impact to overall achievement of the program’s strategic goals:

1. Continually changing regional economic and institutional conditions;
2. Competitive dynamics; and
3. Ongoing changes in the electric industry.

Associated Projects

Overview

Bonneville will work with both the Corps and Reclamation to reach mutual agreement on budgeting and scheduling those capital improvement projects that are cost-effective and provide system or site-specific enhancements, increase system reliability, or provide generation efficiencies.

The work is focused on improving the reliability of the FCRPS and on increasing its generation efficiency or capacity through turbine runner replacements, optimizing hydro facility operation, and new unit construction. Also, limited investments may be made in joint-use facilities that are beneficial to both the FCRPS operations and to other Corps and Reclamation project purposes.

Corps of Engineers Projects

(\$K)		
FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
148,804	175,850	169,109

Bonneville Dam:

- FY 2016. Completed governor oil filtration system installation and vibration and air gap monitoring projects. Continued powerhouse 2 transformers refurbishment, generator step-up (GSU) transformer instrumentation, and main unit breaker and station service reconfiguration.
- FY 2017. Complete powerhouse 2 transformer refurbishment. Continue main unit breaker and station service reconfiguration, and GSU transformer instrumentation. Begin powerhouse 2 tailrace gantry crane rehabilitation, powerhouse 2 Roof replacement, and fire protection projects for the control room and both oil storage rooms.
- FY 2018. Complete GSU transformer instrumentation and powerhouse 2 roof replacement. Continue main unit breaker and station service reconfiguration, tailrace gantry crane rehabilitation, and fire protection projects.

John Day Dam:

- FY 2016. Completed governor replacements and DC system upgrades. Continued Baldwin-Lima Hamilton (BLH) turbine hub upgrades, control room fire protection upgrades, transformer and powerhouse oil/water separator, rotor pedestal installation, and station service transformer replacements. Began 500kV disconnect replacement.
- FY 2017. Complete draft tube bulkhead refurbishment and rotor pedestal installation. Continue BLH turbine hub upgrades, control room fire protection upgrades, 500kV disconnect replacement, rotor pedestal installation, and station service transformer replacement. Begin SQ board (switchgear) replacement, emergency gantry crane replacement, and powerhouse oil detection system installation.
- FY 2018. Complete 500kV disconnect replacement, station service transformer replacements, rotor pedestal installation, and HVAC system upgrade. Continue SQ board replacement and powerhouse oil detection system installation.

The Dalles Dam:

- FY 2016. Continued tailrace gantry crane refurbishment, transformer replacements, and elevator refurbishments. Began design work for emergency crane rehabilitation, arc flash hazard reduction project, and SR panel (switchgear) replacement.
- FY 2017. Continue elevator refurbishments, transformer replacements, SR panel replacement, arc flash hazard reduction project, and emergency crane rehabilitation. Begin fish unit breaker replacement, intake and tailrace crane rail replacement, and thrust bearing oil coolers installation.
- FY 2018. Continue transformer replacements, fish unit breaker replacement, SR panel replacement, thrust bearing oil coolers, elevator refurbishments, and arc flash hazard reduction projects. Begin design work on fish units runner replacement and generator rewinds.

Willamette Plants:

- FY 2016. Completed Hills Creek Turbine Unit rehabilitation. Completed governor replacements at Big Cliff, Dexter, Detroit, and Lookout Point. Completed spillway tainter gate rehabilitation at Lookout Point, Green Peter, and Hills Creek. Completed electrical reliability upgrades at Dexter. Continued governor replacements at Cougar. Continued design for Detroit spillway tainter gate rehabilitation, electrical reliability upgrades at Foster, as well as bridge crane rehabilitation at Foster. Continued Generic Data Acquisition and Control System (GDACS) installation and communication system upgrade at all Willamette Valley plants.
- FY 2017. Continue Foster bridge crane rehabilitation. Continue Detroit spillway gate rehabilitation and design for electric reliability upgrades at Foster and Lookout Point. Continue GDACS installation and communication system upgrade at all Willamette Valley plants. Continue powerhouse bridge crane refurbishment and design for main unit breaker and electrical reliability upgrades at Green Peter. Begin powerhouse roof replacement at Cougar and turbine platform installations at all Willamette Valley plants.
- FY 2018. Complete digital governor replacements at Cougar. Continue Detroit spillway gate rehabilitation, Foster bridge crane rehabilitation, and GDACS installation at all Willamette Valley plants. Continue powerhouse roof replacement at Cougar and turbine platform installations at all Willamette Valley plants. Continue main unit breaker and electrical reliability upgrades and begin bridge crane replacement at Green Peter. Begin turbine and generator rehabilitation at Foster.

Albeni Falls Dam:

- FY 2016. Continued station service switchgear replacement and design for transformer replacement.
- FY 2017. Continue station service switchgear replacement. Continue design for transformer replacement. Begin design for gantry crane rehabilitation.
- FY 2018. Complete station service switchgear replacement. Continue gantry crane rehabilitation and transformer replacement.

Libby Dam:

- FY 2016. Completed powerhouse and dam electrical distribution equipment replacement. Continued powerhouse DC emergency lighting system installation and control console replacement. Completed governor installation.
- FY 2017. Continue powerhouse DC emergency lighting system installation and control console replacement.
- FY 2018. Complete powerhouse DC emergency lighting system installation and control console replacement. Begin intake gantry crane replacement.

Chief Joseph Dam:

- FY 2016. Continued governor installation, generator cooling system upgrades, DC and preferred AC upgrades, upgrades for station service units SS01 and SS02, and turbine replacements. Began work on upgrading the utility corridor.
- FY 2017. Complete turbine replacements, governor installation, and generator cooling system upgrades. Continue DC and preferred AC upgrade, upgrades for station service units, and generator cooling system upgrades. Complete utility corridor.
- FY 2018. Complete DC and preferred AC upgrade and generator cooling system upgrades. Begin intake and tailrace gantry crane replacement and design for generator rewinds.

Dworshak Dam

- FY 2016. Completed powerhouse Heating, Ventilating, Air Conditioning (HVAC) upgrade. Continued governor replacement. Began Unit 3 rehabilitation. Began exciter replacement and tailrace crane rehabilitation.
- FY 2017. Complete unit 3 stator and cooler replacement. Continue exciter replacement, RO valve upgrade, and tailrace crane rehabilitation.
- FY 2018. Complete exciter replacement and RO valve upgrade. Continue tailrace crane rehabilitation.

McNary Dam

- FY 2016. Continued generator winding replacements and potable water system upgrade. Continued turbine design, 4160-480V station service rehabilitation, and levee drainage pump station upgrades.
- FY 2017. Continue turbine design, main unit cooling water strainers replacement, and 4160-480V station service rehabilitation.
- FY 2018. Continue turbine design and replacement, 4160-480V station service rehabilitation, MU cooling water strainers replacement. Begin drainage system oil water separator and spillway gate rehabilitation.

Ice Harbor Dam

- FY 2016. Completed purchase of tailrace stoplogs. Continued Units 1-3 runner replacements and stator winding replacement.
- FY 2017. Continue Units 1-3 runner replacements and stator winding replacements. Begin main unit surface air cooler upgrades.
- FY 2018. Continue Units 1-3 runner replacements, stator winding replacements, and main unit surface air cooler upgrades. Begin station service transformer replacements and 115kV disconnect upgrade.

Little Goose Dam

- FY 2016. Completed governor installation. Purchased spare tailrace stoplogs. Continued station service transformers replacement and bridge crane rehabilitation.
- FY 2017. Continue station service transformers replacement and bridge crane rehabilitation. Begin drainage and unwatering pump replacement and oil water separator projects.
- FY 2018. Complete station service transformers replacement, bridge crane rehabilitation, and oil water separator project. Continue drainage and unwatering pump replacement.

Lower Granite Dam

- FY 2016. Continued powerhouse HVAC system upgrade, Unit 1 BLH linkage upgrade, governor replacement, and bridge crane rehabilitation.
- FY 2017. Complete Unit 1 BLH linkage upgrade, powerhouse HVAC system upgrade, and governor replacement, and bridge crane rehabilitation.
- FY 2018. Begin isophase bus and housing upgrade and DC system and LV switchgear upgrade. Purchase spare main unit bearing.

Lower Monumental Dam

- FY 2016. Continued Unit 1 BLH linkage upgrade and generator rewind. Continued governor replacement.
- FY 2017. Complete Unit 1 BLH linkage upgrade and generator rewind. Continue governor replacement. Begin drainage and unwatering pump replacement.
- FY 2018. Continue governor replacement and drainage and unwatering pump replacement.

Bureau of Reclamation Projects

(\$K)

FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
38,178	70,407	95,655

Grand Coulee Dam

- FY 2016. Continued Supervisory Control and Data Acquisition (SCADA) replacement, Units 1-18 stator windings, cores, and spare replacement program, Units 1-18 exciter and governor replacement, and station service compressed air system upgrades. Began Units 22 and 23 wicket gate replacements and firehouse replacement work.
- FY 2017. Complete Units 22 and 23 wicket gate replacements. Continue SCADA replacement, G22-24 wear ring replacements, Units 1-18 windings, core, exciter and governor replacements, firehouse replacement and compressed air system upgrades. Begin Units 11-18 transformer replacements.
- FY 2018. Complete firehouse replacement. Continue SCADA replacement, Units 11-18 transformer replacements and G22-24 wear ring replacements, Units 1-18 windings, core, exciter and governor replacements, and compressed air system upgrades. Begin crane control upgrades, G19-21 modernization, and Third Powerplant roof replacement.

Keys Pump Generating Plant

- FY 2016. Continued P1-P6 exciters, relays and unit controls, PG7-PG12 governors, exciters, relays and unit controls. Continued PG7-PG12 circuit breaker replacement, and P5 and P6 impeller and core replacement and rewinds. Began phase reversal switch replacement.
- FY 2017. Complete PG7-PG12 circuit breaker replacement. Continue P5 and P6 impeller and core replacement and rewinds. Continue P1-P6 exciters, relays and unit controls and PG7-12 governors, exciters, relays and unit controls. Continue phase reversal switch replacement.
- FY 2018. Continue P5 and P6 impeller and core replacement and rewinds. Continue P1-P6 exciters, relays and unit controls and PG7-12 governors, exciters, relays and unit controls. Continue phase reversal switch replacement.

Hungry Horse Dam

- FY 2016. Continued SCADA replacement and main unit transformer fire protection system replacement.
- FY 2017. Continue SCADA replacement, and main unit transformer fire protection system replacement. Begin powerplant crane controls and control room panel revisions.
- FY 2018. Continue powerplant crane controls, SCADA replacement, control room panel revisions, and main unit transformer fire protection system replacement.

Chandler Dam

- FY 2016. No capital projects underway.
- FY 2017. Begin Units 1 and 2 generator rewinds.
- FY 2018. Continue Units 1 and 2 generator rewinds.

Palisades Dam

- FY 2016. Completed turbine runner replacement. Continued microwave system backbone eastside. Began switchyard modernization.
- FY 2017. Continue microwave system backbone eastside and switchyard modernization. Begin arc flash mitigation.
- FY 2018. Continue microwave system backbone eastside, switchyard modernization, and arc flash mitigation.

Green Springs Dam

- FY 2016. Completed transformer replacement. Began exciter replacement.
- FY 2017. Continue exciter replacement.
- FY 2018. Continue exciter replacement.

Black Canyon Dam

- FY 2016. No capital projects underway.
- FY 2017. Begin installation of new unit, switchyard replacement, trash rake system, and Units 1 and 2 upgrades.
- FY 2018. Continue new unit installation, switchyard replacement, trash rake system, and units 1 and 2 upgrades.

Anderson Ranch Dam

- FY 2016. Continued station service upgrade.
- FY 2017. Complete station service upgrade.
- FY 2018. No planned capital projects.

Roza Dam

- FY 2016. Began switchyard rehabilitation and breaker upgrade.
- FY 2017. Continue switchyard rehabilitation and breaker upgrade.
- FY 2018. Continue switchyard rehabilitation and breaker upgrade.

Minidoka Dam

- FY 2016. Continued arc flash mitigation, Units 8 and 9 governor replacement, and microwave system backbone eastside. Begin switchyard modernization.
- FY 2017. Complete Units 8 and 9 governor replacement. Continue switchyard modernization, arc flash mitigation, and microwave system backbone eastside.
- FY 2018. Continue switchyard modernization, arc flash mitigation, and microwave system backbone eastside.

**Fish & Wildlife
(\$K)**

FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
16,030	44,602	50,532

Overview

Bonneville continues to develop budgets for the suite of fish and wildlife mitigation projects originally adopted in FY 2007 based on recommendations from the Council. Bonneville reaffirmed and expanded many project-specific commitments in subsequent agreements and processes, including BiOps and Fish Accords, and since then, virtually all these projects received independent science review through the Council and its project review processes. Bonneville’s funding decisions embrace many of the management objectives and priorities in the Program and continue to integrate ESA responsibilities as described in the NOAA Fisheries’ and USFWS’s FCRPS BiOps. Coordination continues among Bonneville, Council, federal resource management agencies, states, tribes, and others to support the projects that satisfy Bonneville’s mitigation responsibilities.

Bonneville intends to continue implementing the kinds of capital projects listed below. These projects are based upon the best available science and are regionally important in that they provide high priority mitigation and protection actions for fish and wildlife populations affected by the construction and operation of the FCRPS dams. Projects and facilities listed below deliver direct on-the-ground benefits to both ESA listed and non-listed fish and wildlife throughout the Columbia River Basin and have been evaluated and coordinated with the Council, state, federal and tribal fish and wildlife resource managers, local governments, watershed and environmental groups, and other interested parties. Specifically, as capital construction projects, hatchery facilities typically go through the Council’s three-step process, which includes development of a Master Plan, environmental compliance, ESA consultation, value engineering analysis, and review by the Independent Science Review Panel.

The three types of fish and wildlife projects that Bonneville capitalizes are as follows:

- 1) Fish passage structures – Structures funded with capital that enhance fish access to habitat in the Columbia River Basin include wells, ladders, screens, pumping, culverts, diversion (irrigation) consolidation, piping to reduce water loss, irrigation efficiencies (drip irrigation), lining of ditches (seepage reduction), removal of objects impeding fish passage or pushup dams, and construction-related habitat restoration.
- 2) Hatchery facility construction – Projects and activities relating to the construction, improvement, and replacement of fish hatcheries, including related satellite facilities (acclimation ponds and collection weirs). This may also include construction-related habitat restoration.
- 3) Land acquisition and stewardship – Land acquisition projects protect, enhance, and maintain instream wetland and riparian habitat and provide credit to Bonneville, such as habitat units (HUs) or acres for wildlife or instream miles for resident fish, to fulfill the legal obligation of Bonneville to mitigate the impacts from construction and operation of the FCRPS.

Fish supplementation, production, and related facilities that may require capital funds in FY 2018 include the following:

The Consolidated Appropriations Act, 2016 (Public Law 114-113) provided Expenditure Authority for the following projects:

- Shoshone Paiute Trout Hatchery: The Shoshone Paiute Tribes of the Duck Valley Reservation propose that Bonneville fund the purchase and/or construction of a trout hatchery. The Tribes would own and operate the hatchery to produce trout for stocking in reservoirs located on the Duck Valley Reservation. Bonneville would fund the capital expenditure to meet contemporary aquaculture standards and achieve fish production goals. The Tribes believe they can reduce federal reservoir stocking costs—some of which Bonneville pays now on an annual basis.

- Spokane Tribal Hatchery: The Spokane Tribal Hatchery, funded by Bonneville in 1989 as partial mitigation for the impacts of the FCRPS, is owned and operated by the Spokane Tribe of Indians. The facility spawns, incubates, and rears Kokanee salmon and rainbow trout near Wellpinit, WA. In June 2015, the Tribe and Bonneville signed a 20-year agreement renewing

commitments to operate and maintain the facility. The renewed agreement also plans to upgrade aging infrastructure, including ground water pumps and rearing containers. The work is scheduled to begin in FY 2017.

- Snake River Sockeye Weirs: Bonneville funds efforts implemented by the Idaho Department of Fish and Game and the Shoshone Bannock Tribes to rebuild Snake River sockeye throughout their historic range. The combination of substantially increased numbers of returning adults as well as the completion of the Springfield Sockeye Hatchery in 2013 and its associated increased production has created the need for Bonneville to potentially fund the construction, operation, and maintenance of weirs to further sockeye management objectives.

The FY 2014 Omnibus Appropriations Act (Public Law No. 113-76) provided Expenditure Authority for the following projects:

- John Day Reprogramming and Construction: This project is being proposed by the Columbia River Inter-Tribal Fish Commission (CRITFC) under the Accords to work on the balance between upriver and down river salmon hatchery production mitigating for John Day and The Dalles Dams. Final reprogramming facilities and locations are still being analyzed by the Tribes, the Corps, and Bonneville. The project area encompasses the mainstem Columbia River from the base of McNary Dam downstream to The Dalles Dam. Capital dollars for this project will integrate with the Corps funds constructing additions to new or existing FCRPS hatchery facilities to accommodate the reprogramming of hatchery fish.

- Columbia River Basin White Sturgeon Hatchery: This project, proposed by the CRITFC under the Accords, will mitigate for white sturgeon population declines due to consistent poor recruitment upstream of Bonneville Dam. Expected production at a new or existing facility will be 15,000 - 20,000 yearling white sturgeon per year. The final project may include broodstock collection and holding, rearing wild-spawned juveniles, and acclimating juveniles prior to release. A location for the facility has not yet been determined, but it will likely be located within 60 miles of the confluence of the Columbia and Snake Rivers. The Master Plan for the hatchery is currently under review by the Council.

- Kelt Reconditioning and Reproductive Success Evaluation Research: CRITFC, under the Accords, is proposing a relatively small holding tank facility to recondition female steelhead (kelts) after they have spawned. The fish will be held and fed until they have rematured and then be released into the Snake River where they will contribute to the spawning run. The capital portion of the project is expected to be constructed in the Snake River Basin, potentially at Lower Granite Dam. As specified in the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, Bonneville will implement the kelt reconditioning plan to improve the productivity of Snake River basin B-run steelhead populations that are listed for protection under the ESA. NOAA's analysis of Prospective Actions indicates that a combination of transportation, kelt reconditioning, and in-stream passage improvements (e.g., spill-flow modifications) could increase kelt returns enough to increase the number of returning Snake River B-run steelhead spawners to Lower Granite Dam by a target of six percent. The Master Plan for the facility is currently being reviewed by Bonneville.

Ongoing Projects (Expenditure Authority previously received):

- Crystal Springs Hatchery Facilities: This proposed project is for facilities for rearing and out-planting resident and anadromous fish in central and southern Idaho. The facility would be located near the American Falls Reservoir in Idaho. It may produce Yellowstone cutthroat, a resident fish, and anadromous fish including Snake River spring Chinook salmon, Snake River steelhead, and Snake River sockeye. The facility is expected to produce up to one million Chinook smolts annually. The facility is sponsored by the Shoshone-Bannock Tribes under their Accord, who are expected to operate and manage the facility once it is complete. A final Environmental Impact Statement is expected to be complete in FY 2017 and a Record of Decision is expected late in FY 2017.

- Redfish Lake Sockeye Salmon program: The Snake River sockeye salmon, an Evolutionarily Significant Unit (ESU), was listed under the Endangered Species Act in 1991 (56 FR 58619). The Snake River Sockeye Salmon Captive Broodstock Program has prevented the extinction of endangered Snake River sockeye salmon. The program has been able to help successfully conserve the genetic resources of the founding population and begun producing fish for rebuilding the naturally spawning

population in Redfish Lake. The program uses state of the art hatchery facilities and fish husbandry protocols, genetic support, and monitoring and evaluation to continue rebuilding numbers of fish. Currently, the program retains replicate, captive broodstock within multiple facilities (Eagle Fish Hatchery located in Idaho state and Burley Creek Fish Hatchery and Manchester Research Station, both located in Washington state). Eggs produced from these locations are transferred to other facilities (Springfield Fish Hatchery and Burley Creek Fish Hatchery) for release programs. The project continues to expand by increasing the capacity of existing facilities and also by acquiring a new facility under the Idaho Fish Accord. The newly constructed Springfield Fish Hatchery located in Idaho produces additional smolts as called for in the NOAA Fisheries FCRPS BiOp. The expanded smolt releases have already resulted in an increase in the abundance and productivity of the naturally-spawning population. This strategy will greatly increase the likelihood of higher adult returns. Additional expansions include improvements at the Redfish Lake Creek trap and Sawtooth Fish Hatchery weir to hold/trap an increased number of adults to support increased smolt production from Springfield Fish Hatchery. The biological goals are to increase the number of adults spawning naturally in the Sawtooth Valley and transition the captive broodstock to a conventional hatchery production program that uses anadromous adults as broodstock.

- Klickitat Production Expansion: The Klickitat River Master Plan was submitted by the Yakama Nation, reviewed by the ISRP, recommended with comments by the Council, and approved by Bonneville in 2008. The plan's goal is to protect and increase naturally producing populations of spring Chinook and steelhead while protecting the biological integrity and the genetic diversity of indigenous fish stocks in the sub-basin. The Klickitat Master Plan includes the following main elements: Lyle Falls Fishway upgrades; construction of the Castile Falls enumeration facility; upgrades to the Klickitat hatchery with the potential for constructing a new facility in the lower Klickitat River to accommodate the ongoing production of coho and fall Chinook; and an acclimation site in the upper watershed at McCreedy Creek. In early 2009 Bonneville completed the Lyle Falls Environmental Impact Statement (EIS) and Record of Decision (ROD). Upgrades to enumeration and collection facilities at Lyle and Castile have been completed. Certain upgrades at the Klickitat Hatchery have also been made to maintain existing fish and wildlife program activities and to address hatchery safety concerns. Lyle and Castile Falls fishways have passive integrated transponder (PIT) tag interrogation capability, and the Lyle Falls facility includes a lamprey passage structure. A new Klickitat Hatchery Complex EIS initiated in July 2009 will examine options for the development and operation of new production and supplementation facilities, acclimation alternatives, and additional upgrades to the existing hatchery facility. The Yakama Nation issued a revised Master Plan, July 2012, providing updates to their fish management plans. The final EIS has been on hold while the Yakama Nation refines its proposal. The National Environmental Policy Act (NEPA) process will resume shortly after the tribe settles on its proposal. Construction would occur only after Bonneville issues a ROD and the National Marine Fisheries Service (NMFS) completes the BiOp for the Klickitat Production and Fish Management plans. Bonneville is working with the Yakama Nation to identify and focus on the highest priority construction actions in the Klickitat Watershed.

- Hood River Production Facility: This project has been ongoing since the early 1990s. It currently produces 150,000 spring chinook salmon smolts and 50,000 winter steelhead smolts annually. The Powerdale Dam Fish Trap formerly provided the foundation for many of the activities associated with implementation of the Hood River Production Program. These include monitoring escapement, collecting life history characteristics, and broodstock acquisition. PacificCorps' demolition of its Powerdale Dam and the associated fish trapping facility in 2010 necessitated the development of alternative adult broodstock trapping sites. One permanent fish trap on the West Fork of the Hood River was completed in 2013, and a temporary trapping site is operational on the East Fork Hood River. A permanent trap site on the East Fork is currently being evaluated. The Hood River Production Program has four primary goals: 1) re-establish naturally sustaining runs of spring Chinook in the Hood River; 2) re-build naturally sustaining runs of summer and winter steelhead in the Hood River; 3) maintain genetic characteristics of Hood River fish populations; and 4) provide fish for sustainable harvest by both sport and tribal fishers.

- Mid-Columbia Coho Restoration: This Yakama Accord project's vision is to re-establish naturally reproducing coho salmon populations in the Wenatchee River and Methow River sub-basins at biologically sustainable levels which provide significant harvest in most years. This program will construct a facility on the Wenatchee River for holding and spawning broodstock, incubating eggs, and rearing juveniles. Additional semi-natural ponds will also be constructed in the Wenatchee and

Methow sub-basins for acclimating smolts prior to their release. The phased approach, including associated facilities, incorporates development of a mid-Columbia hatchery broodstock, local adaptation to tributaries in the Wenatchee and Methow Basins, and habitat restoration that will benefit coho as well as ESA-listed spring Chinook, steelhead, and bull trout. Major facility construction is expected to occur over the FYs 2017-2018 timeframe.

- Walla Walla Hatchery: The Walla Walla Hatchery is proposed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) under their Accord. The Tribes would own and operate the hatchery, which will produce up to 500,000 spring Chinook smolts annually for release into the Walla Walla River. A 30 percent design was completed in June 2015, however due to budget overruns, the project has been on hold. A draft EIS was completed in September 2016. Rebid for design completion and construction is expected to be solicited by June 2017, with construction commencing in late 2018 or early 2019. The facility will hold, spawn, incubate and rear spring Chinook on the South Fork Walla Walla River near Milton-Freewater, Oregon.

- Yakima Coho Facility: This hatchery is proposed by the Confederated Tribes and Bands of the Yakama Nation under the Yakama Nation Accord, and is presented in the Yakima River Subbasin Summer and Fall Run Chinook and Coho Salmon Hatchery Master Plan. The Yakama Nation would own and operate the hatchery which will produce up to 700,000 coho smolts using broodstock collected at Roza and Sunnyside dams. Bonneville holds the design and construction contract on behalf of the Yakama Nation. The 50 percent design is complete and the 90 percent design is undergoing internal review. Bonneville published a draft EIS on March 17, 2017, and expects to publish a final EIS by October 2017 and a Record of Decision by November or December 2017. If approved, construction would likely begin in spring 2018.

Potential non-construction capital Wildlife and Resident Fish Habitat Acquisitions (including Conservation Easements) eligible for capitalization are:

- Albeni Falls Wildlife Mitigation
- Willamette Wildlife Habitat Acquisitions
- Libby and Hungry Horse Reservoirs Resident Fish Acquisitions
- Southern Idaho Habitat Acquisitions

Activities and Explanation of Changes

FY 2017 Estimate	FY 2018 Estimate	Explanation of Changes FY 2018 vs FY 2017 Estimate
Power Services – Capital \$290,859,000	\$315,296,000	+\$24,437,000
Associated Projects \$246,257,000 Milestones ¹ : <ul style="list-style-type: none"> • Complete Units 22 and 23 wicket gate replacements at Grand Coulee. • Complete station service switchgear replacement at Albeni Falls. • Complete powerhouse DC emergency lighting system installation and control console replacement at Libby. • Complete powerhouse 2 transformer refurbishment at Bonneville dam. 	\$264,764,000 Milestones: <ul style="list-style-type: none"> • Complete firehouse replacement at Grand Coulee. • Complete DC and preferred AC upgrade and generator cooling system upgrades at Chief Joseph. • Complete exciter replacement at Dworshak. • Complete 500kV disconnect replacement, station service transformer replacements, rotor pedestal installation and HVAC system upgrade at John Day. 	+\$18,507,000/+7.5% <ul style="list-style-type: none"> • The increase reflects a reshaping of funding needs for investment in the hydroelectric system assets.
Fish & Wildlife \$44,602,000 Milestones: <ul style="list-style-type: none"> • Continue implementation of the Program, BiOps and Fish Accords. 	\$50,532,000 Milestones: <ul style="list-style-type: none"> • Continue implementation of the Program, BiOps and Fish Accords. 	+\$5,930,000/+13.3% <ul style="list-style-type: none"> • The increase reflects a long-term, planned effort to reshape funding necessary to implement the BiOps, Fish Accords, Columbia River Basin Fish and Wildlife activities.

¹ FY 2017 milestones have been updated from the FY 2017 Congressional submission due to updated forecasts.

**Transmission Services – Capital
Funding Schedule by Activity
Funding (\$K)**

	FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate	FY 2018 vs FY 2017	
				\$	%
Transmission Services – Capital					
Main Grid	16,347	48,544	4,748	-43,797	-90%
Area & Customer Services	52,951	100,757	74,865	-25,892	-26%
Upgrades & Additions	73,483	70,390	74,668	4,278	6%
System Replacements	134,687	311,006	285,153	-25,853	-8%
Projects Funded in Advance	272,432	42,010	40,107	-1,903	-5%
Total, Transmission Services - Capital	549,900	572,707	479,541	-93,166	-16%

Outyears (\$K)

	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate
Transmission Services - Capital					
Main Grid	4,748	48,225	99,203	104,484	127,097
Area & Customer Services	74,865	45,783	41,614	57,600	47,432
Upgrades & Additions	74,668	68,363	52,029	52,759	52,031
System Replacements	285,153	295,998	398,296	372,692	370,990
Projects Funded in Advance	40,107	38,937	36,025	34,837	34,774
Total, Transmission Services - Capital	479,541	497,306	627,167	622,372	632,324

Transmission Services – Capital

Overview

Transmission Services (TS) is responsible for about 75 percent of the Pacific Northwest’s high-voltage transmission. TS provides funding for all additions, upgrades, and replacements to the Bonneville transmission system, resulting in reliable service to northwest generators and transmission customers. The Bonneville transmission system also facilitates the sale and exchange of power to and from the region. The TS Capital Program is structured with a balanced focus on Expansion and Sustain investments.

TS continues to make significant infrastructure improvements and additions to the system to assure reliable transmission in the Northwest. These improvements and additions will help the Bonneville transmission system continue to comply with national reliability standards, replace aging and obsolete equipment, allow for interconnection of needed new generation, and remove constraints that limit economic trade or the ability to maintain the system. Many of the proposed TS projects will be funded through Bonneville lease-purchase agreements. The lease-purchases obligate Bonneville to make expenditures to acquire the use of the related facilities and are identified on an as needed basis. Bonneville may also make related expenditures to facilitate lease-purchase opportunities. The Budget includes a proposal to authorize the Federal government to sell the transmission assets of Bonneville.

Expansion Investments

Expansion investments continue to make significant infrastructure improvements and additions to the Bonneville transmission system to assure reliable transmission operations in the Northwest. These improvements and additions allow the system to continue to comply with national reliability standards, upgrade aging and obsolete equipment, allow for the interconnection of needed new generation, and remove constraints that limit economic trade or the ability to operate and maintain the system. Internally driven Expansion requests are derived from system engineering studies, technology innovation research, system operations and maintenance functions, and system event analysis. These investments are categorized into:

1. Main Grid – System investments effecting the major interties or internal paths and flowgates that transfer bulk power across the system.
2. Area & Customer Service – System investments related to geographical load service areas.
3. Upgrades & Additions – Investments listed below.
 - a. Upgrading existing system assets versus asset replacement.
 - b. Provide security to maintain and operate the system.
 - c. Provide IT equipment, technologies, and support to maintain and operate the system.
4. Projects Funded in Advance – System investments that are requested, and funded in advance, by customers.

Externally driven Expansion requests are derived from governmental initiatives, consumer demand, and the integration of customer load service and generation needs.

Congressionally-approved Production Tax Credits (PTC) for renewable energy enacted in 2005 were extended in 2009 to 2012, and most recently again in 2013, 2014, and 2015. The PTC begins to phase out after 2018. The incentives created by these credits, along with Renewable Portfolio Standards (RPS) implemented by the states of Oregon, Washington, and California, have spurred a large number of renewable interconnection requests to the Bonneville transmission grid. As of December 31, 2015, Bonneville has interconnected a total of 5,243 MW of new renewable qualified generation. Bonneville has more than 7,000 MW in additional renewable (wind, solar, biomass, geothermal, etc.) interconnection requests still remaining in the study queue. Solar interconnection requests are currently making up the majority of the new requests in Bonneville’s queue. The current projections are possibly 8,500 interconnected MW by 2025. Much of the remaining generation demand is the result of the Renewable Portfolio Standards enacted by Oregon and Washington that require utilities to acquire more than 8,000 MW of renewable energy in the Northwest by 2025. Exports to California are limited now by California laws and are expected to remain at 2,000 to 2,500 MW during the same period. Also in the interconnection queue is approximately 800 MW of natural gas fired generation. Efficiency improvements to the FCRPS hydro units that qualify as renewable are also proposed between 2016 and 2022.

In June 2008, Bonneville's first Network Open Season (NOS) received 153 requests from 28 customers for 6,410 MW of new service, about three-fourths for wind energy integration. Bonneville subsequently offered 1,782 MW of new transmission service on its existing system. Bonneville identified four new Main Grid capital projects from the 2008 NOS: (1) McNary-John Day 500 kV transmission line (part of West of McNary Reinforcements Group 1); (2) Big Eddy-Knight 500 kV transmission line and substation (part of West of McNary Reinforcements Group 2); (3) Central Ferry- Lower Monumental 500 kV Reinforcement (formerly Little Goose Area Reinforcement); and (4) I-5 Corridor 500 kV Reinforcement. Construction of the McNary-John Day 500 kV transmission line is complete and Bonneville has completed construction of the Big Eddy-Knight project and the Central Ferry-Lower Monumental 500 kV Reinforcement project. The I-5 Corridor project environmental review is complete and it is still undergoing further internal review. If all four projects are constructed they will provide almost 6,000 MW of new transmission service.

Bonneville's 2009, 2010, and 2013 NOS windows for new transmission service requests total 8,985 MW, including approximately 4,011 MW of wind project interconnection. The 2010 process identified the Montana to Washington project, for which environmental review was begun, however, the requests to support this project have been subsequently withdrawn and so all work on the project was terminated. The 2013 NOS identified the Monroe-Novely Hill facilities. Efforts are underway in FY 2017 to review and re-package requests from previous open seasons to determine technical and financial viability.

Sustain Investments

Sustain investments continue maintaining the existing infrastructure to assure reliable transmission in the Northwest. These replacements enable continued compliance with national reliability standards, replace aging and obsolete equipment, and remove constraints that limit economic trade or the ability to maintain the system.

In 2009, TS began implementing best practice frameworks that provide a standardized structure and approach to Asset Management. As a result, TS's Asset Management Strategies, derived from Agency Strategies, drive Bonneville's Asset Plans, which determine its capital and expense investment priorities. Sustain investments are forecasted, prioritized within asset programs, and optimized across the asset base for asset planning and approval. We now bundle both sustain and expand capital projects in an effort to improve executability and lower risks and costs. TS's capital program is still fluid and subject to changes as the complexity of the transmission system produces unexpected needs resulting from equipment failure, climate/weather incidents, changes in performance and/or operation of connected systems, outage schedules and conflicts, updated regulations, etc. For these and other reasons, specificity with Sustain investments in the transmission system is somewhat limited.

The TS Sustain Program Asset Programs include:

1. Steel Lines – Transmission lines with steel structures including footings, insulators assemblies, vibration dampers, grounding systems, conductor, ground wire.
2. Wood Lines – Transmission lines with wood structures including cross arm systems, insulator assemblies, vibration dampers, grounding systems, conductor, ground wire.
3. Rights-of-Way – Real property including land parcels, easements, use right, access roads.
4. AC Substations – Substations managing AC current including transformers, reactors, shunt capacitors, power circuit breakers, circuit switchers, series capacitors, disconnect switches.
5. Power System Controls and System Telecommunications – Control and communication equipment including SCADA, transfer trips, fiber, communications, SONET, Telephone, RAS.
6. System Protection and Control – Control equipment including relays, Control Houses, meters.
7. DC Substations – Celilo DC converter station, Static VAR Compensators, DC control systems.
8. Control Centers – Various control equipment and software.
9. Tools and Equipment Acquisition Program (TEAP) –Tools, equipment, fleet.
10. Facilities – Non-electric facilities including warehouses, operational structures, hanger, maintenance centers.
11. Aircraft – Fixed wing and rotary aircraft.

Notwithstanding that the capital program for TS is subject to change, Bonneville has identified several general areas where capital program investment will occur.

Bonneville will continue to fund fiber optic communications facilities needed to meet Bonneville's projected operational needs. To the extent that these investments create temporary periods of excess fiber optic capacity, such dark fiber capacity can be made available to telecommunications providers and to non-profits to meet public benefit internet access needs for rural areas and other needs in Bonneville's service area. Bonneville's investments in fiber optics, including the role of the private sector in building fiber optic networks, is consistent with the "Fiber Optic Cable Plan" submitted to Congress on May 24, 2000, accompanying the FY 2000 Energy and Water Development Appropriations Act. In accordance with this plan, when possible, Bonneville will establish partnerships with fiber optic facility and service providers to meet its needs.

In December 2004, Congress passed and the President signed the Commercial Spectrum Enhancement Act (CSEA, Title II of P.L. 108-494), creating the Spectrum Relocation Fund (SRF) to streamline the relocation of federal systems from certain spectrum bands to accommodate commercial use by facilitating reimbursement to affected agencies of relocation costs. The Federal Communications Commission has auctioned licenses for reallocated federal spectrum, which will facilitate the provision of Advanced Wireless Services to consumers. Funds were made available to agencies in FY 2007 for relocation of communications systems operating on the affected spectrum. These funds are mandatory and will remain available until expended, and agencies will return to the SRF any amounts received in excess of actual relocation costs. The estimated Bonneville cost of this relocation was \$48.7 million. The project was completed in November 2013 with a cost of approximately \$40 million and the operational system performance was being observed during FY 2014 and early FY 2015 to determine that it has achieved comparable capability as defined under the CSEA. Bonneville determined in December 2014 that comparable capability had been achieved.

Bonneville began participating in a new spectrum relocation effort in FY 2015. The NTIA has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The FCC held an auction of this spectrum on November 13, 2014. Bonneville received an additional \$5.2 million from the Spectrum Relocation Fund on July 29, 2015, to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment.

As part of the Homeland Security Presidential Directives, Bonneville has completed a physical security assessment of all critical facilities and is implementing security enhancements at these facilities. These security enhancements increase controlled access to Bonneville's facilities and provide video surveillance and monitoring capabilities.

Accomplishments

- Released initial rate proposal for FYs 2018-2019 rates on November 17, 2016.
- Integrated 5,081 MW of wind through September 2016 on Bonneville's transmission system.
- Completed the modernization of the Celilo Converter Station.
- Completed construction of the Big Eddy-Knight Transmission Project.
- Completed construction of the Central Ferry-Lower Monumental Transmission Project.

Explanation of Changes

Bonneville's budget includes \$479.5 million in FY 2018 for TS which is a 16.3 percent decrease from the FY 2017 forecasted level. The decrease reflects reduced investment in Main Grid, Area & Customer Services, and Systems and Replacements, driven by a reduction in projected spending needs as projects near completion, and an increase in Upgrades and Additions, driven by an increase in various other projects.

The FY 2018 budget decreases the levels for Main Grid (-\$43.8 million), Area & Customer Services (-\$25.9 million), System Replacements (-\$25.9 million) and PFIA (-\$1.9). The budget increases levels for Upgrades & Additions (+\$4.2 million). In addition, The FY 2018 Budget Request proposes that the Federal government be authorized to sell the transmission assets of Bonneville.

Strategic Management

Bonneville provides transmission and energy services while integrating renewable resources in the Pacific Northwest. Bonneville will continue to implement the following strategies to serve the region:

1. To improve system adequacy, reliability, and availability, Bonneville has embarked on major transmission infrastructure projects. The projects reinforce the region's transmission system and help deliver the region's future power needs. These projects address multiple challenges, such as integration of renewable energy, the need to relieve a number of congested transmission paths, the challenge to keep up with growing energy demands, and the need to meet changing regulatory and customer requirements.
2. Open access policy in support of competitive markets for load and generation.
3. Replacement of aging assets that are vital to the reliability of the existing transmission system. To that end, TS has developed specific long-term strategies for the following asset categories:
 - a. Substations AC
 - b. Power System Control/System Telecommunications
 - c. Wood Lines
 - d. Steel Lines
 - e. Rights of Way (ROW), (Land Rights, Access Roads, and Vegetation Management)
 - f. System Protection and Control
 - g. Control Center
 - h. Non-Electric Facilities

The following external factors present the strongest impact to overall achievement of the program's strategic goal:

- Continually changing economic and institutional conditions
- Competitive dynamics
- Ongoing changes in the electric industry
- Siting issues

Main Grid (\$K)		
FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
16,347	48,544	4,748

Overview

Bonneville’s strategic objectives for Main Grid projects are to assure compliance with the NERC and Western Electricity Coordinating Council (WECC) reliability criteria, provide voltage support, provide a reliable transmission system for open access, and provide for relief of transmission system congestion. During this budgeting period, projects are planned that will provide transmission reinforcement and voltage support to major load areas that are primarily west of the Cascade Mountains.

Continued investments in Main Grid assets include:

I-5 Corridor Reinforcement

- FY 2016. Continued NEPA work.
- FY 2017. Complete NEPA work and determine path forward.
- FY 2018. Execute on path forward.

Big Eddy-Knight (West of McNary Reinforcements Group 2)

- FY 2016. Completed construction and energized in November 2015.
- FY 2017. Complete related fiber addition.

Central Ferry-Lower Monumental 500 kV Reinforcement (formerly Little Goose Area Reinforcement)

- FY 2016. Completed construction and energized in November 2015.

Schultz Series Capacitors

- FY 2017. Begin design.
- FY 2018. Complete design and begin construction.

Monroe-Echo Lake 500 kV Line Re-termination #2

- FY 2016. Began design.
- FY 2017. Complete design and begin construction.
- FY 2018. Continue construction.

Continue Planning Studies to: (all years)

- Identify infrastructure additions.
- Identify projects driven by NERC and WECC reliability criteria.
- Identify system reactive needs to mitigate unacceptable low or high voltage problems and other system additions.
- Relieve transmission system congestion and integrate new generation facilities.

Area & Customer Service

(\$K)

FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
52,951	100,757	74,865

Overview

Bonneville’s strategic objective for Area and Customer Service projects is to assure that Bonneville meets reliability standards and contractual obligations to its load service areas.

Continued investments in Area & Customer Service assets include:

Hooper Springs Substation

- FY 2016. Began construction.
- FY 2017. Continue construction.
- FY 2018. Continue construction.

Midway-Grandview 115 kV Line upgrade

- FY 2016. Began construction.
- FY 2017. Continue construction.
- FY 2018. Complete construction.

Puget Sound Area Northern Intertie (PSANI)

- FY 2016. Continued construction.
- FY 2017. Continue construction.
- FY 2018. Complete construction

Alvey Substation Reactors

- FY 2016. Continued construction.
- FY 2017. Complete construction.

McNary Substation 500/230 kV Bank Addition

- FY 2016. Continued construction.
- FY 2017. Complete construction.

Paul Substation 500 kV Shunt Reactor Addition

- FY 2016. Continued construction.
- FY 2017. Complete construction.

Big Eddy Breaker Additions

- FY 2018. Begin design.

Drummond 115kV Breaker Additions

- FY 2016. Began design.
- FY 2017. Complete design and begin construction.
- FY 2018. Complete construction.

Midway–Ashe Double Circuit 230kV Line

- FY 2017. Begin design.
- FY 2018. Complete design and begin construction.

Carlton Substation Upgrade

- FY 2017. Begin design.
- FY 2018. Complete design and begin construction.

Conkelley Substation Retirement

- FY 2017. Begin design.
- FY 2018. Complete design and begin construction.

Continuous Activities (all years)

- Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for Bonneville's service area.

**Upgrades & Additions
(\$K)**

FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
73,483	70,390	74,668

Overview

Bonneville’s strategic objectives for Upgrades and Additions are to replace older 60 Hz (Hertz) communications and controls with newer technology including fiber optics in order to maintain or enhance the capabilities of the transmission system; to implement special remedial action control schemes to accommodate new generation and mitigate immediate operational and market constrained paths; and to support communications and remedial action schemes, among other proposals.

During this budget period, Bonneville will complete design, material acquisition, construction, and activation of several fiber optics facilities to provide bandwidth capacity and high-speed data transfers to eventually replace microwave analog radios, which are technologically obsolete and nearing the end of their useful life. Temporarily, in some areas, excess dark fiber capacity is being offered for a term to telecommunications providers or to public entities such as public utilities, schools, libraries, and hospitals, providing them access to high-speed telecommunication services as a public benefit.

Continued investments in Upgrades & Additions assets include:

VHF Radio System Upgrade

- FY 2016. Continued construction.
- FY 2017. Continue construction.
- FY 2018. Continue construction.

Synchrophasor Project

- FY 2016. Continued construction.
- FY 2017. Continue construction.
- FY 2018. Complete construction.

Pacific DC Intertie from 3,100 MW to 3,800 MW Project (Celilo Converter Station modernization)

- FY 2016. Completed construction.

Ross-Schultz Fiber Circuit Upgrade

- FY 2016. Continued construction.
- FY 2017. Continue construction.
- FY 2018. Continue construction.

Bell-Boundary #DC SONET Ring Upgrade

- FY 2016. Continued construction.
- FY 2017. Complete construction.

Operational Megabit Ethernet (OMET) System

- FY 2016. Continued construction.
- FY 2017. Continue construction.
- FY 2018. Continue construction.

Longhorn Annex for Umatilla Electric Cooperative (UEC)

- FY 2016. Completed construction.

500 kV Spares at Wind Integration Substations

- FY 2016. Began construction.
- FY 2017. Continue construction.

- FY 2018. Complete construction.

Continuous Activities (all years)

- Upgrading two miles of fiber between Bonneville Power House and Bonneville Control House.
- Planning, design, material acquisition, and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths.
- Planning, design, material acquisition, and construction of various system additions and upgrades necessary to maintain a reliable system for Bonneville's service area.
- Construction of secondary fiber related projects and digital radio system upgrades to improve the operational telecommunication system.
- Material procurement and construction to upgrade the main fiber optic backbone system (#KC and #NC systems).
- Continue to upgrade control houses and standby engine generators at various locations.

**System Replacements
(\$K)**

FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
134,687	311,006	285,153

Overview

Bonneville’s strategic objectives for the Sustain Program are to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: (1) replacing high voltage transformers and power circuit breakers which are at or near the end of their useful life; (2) replacing risky, outdated and obsolete control and communications equipment and systems, including mandated replacements due to legislation; and (3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system. Transmission Services uses a total economic cost model to determine priorities for replacement.

Continued investments in System Replacements assets include:

Continuous Activity (all years)

Non-Electric Replacements

- Continue non-electric replacements as necessary.
- Continue the design, material acquisition, and construction for the Access Road program capital component and the Land Rights program capital component in support of the Lines and ROW Programs.
- Continue design and construction of capital improvements for identified existing facilities.
- Continue replacement of tools, equipment, vehicle fleet, fixed wing aircraft, and rotary aircraft infrastructure.
 - Specific investments include the acquisition of six replacement aircraft (two fixed wing and four rotary) during FY 2017 and FY 2018 to replace, utilizing General Services Administration exchange sale authority, aging assets and to comply with new Federal Aviation Administration regulations.

Electric Replacements

- Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. Such replacements include relays, annunciators, oscillographs, metering, and various types of communication related equipment replacing and migrating analog to digital technology and SCADA equipment.
- Continue replacement of under-rated and high maintenance substation equipment.
- Continue replacing insulators and refurbishing foundations on 500 kV Lines.
- Continue replacement of older generations of digital equipment that is obsolete.
- Continue replacing critical, operational tools and business systems at the Dittmer and Munro Control Centers.
- Continue replacing deteriorating wood pole transmission line structures, spacer dampers, and insulators.

**Projects Funded in Advance
(\$K)**

FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
272,432	42,010	40,107

Overview

This category includes those facilities and/or equipment where Bonneville retains control or ownership but which are funded or financed by a third party or with reserves, either in total or in part.

Continued investments in PFIA assets include:

Continuous Activity (all years)

- Continue to integrate various new generation and line/load projects into Bonneville transmission grid based on requests placed and processed in accordance with transmission tariff.
- Continue planning studies to identify system impacts and needs regarding proposed new generation projects.
- Engineer and begin construction of several large wind generation interconnection substations.
- Complete environmental cleanup and other work necessary for the sale of Bonneville facilities.

Umatilla Electrical Cooperative - Phase 2

- FY 2017. Begin design.
- FY 2018. Complete design and begin construction.

Activities, Milestones, and Explanation of Changes

FY 2017 Estimate	FY 2018 Estimate	Explanation of Changes FY 2018 vs FY 2017 Estimate
Transmission Services – Capital \$572,707,000	\$479,541,000	-\$93,166,000
Main Grid \$48,544,000	\$4,748,000	-\$43,796,000/-90.2%
Milestones: <ul style="list-style-type: none"> • Complete NEPA and evaluate the I-5 Corridor Reinforcement project. • Complete design and begin construction of Monroe-Echo Lake 500 kV Line Re-termination #2. • Begin design of Schultz Series capacitors. 	Milestones: <ul style="list-style-type: none"> • Continue construction of Monroe-Echo Lake 500 kV Line Re-termination #2. • Complete design and begin construction of Schultz series capacitors. 	<ul style="list-style-type: none"> • The decrease is the result of large projects being completed and a shift in project focus from building new assets to projects focused on replacement of existing aging assets.
Area & Customer Service \$100,757,000	\$74,865,000	-\$25,892,000/-25.7%
Milestones: <ul style="list-style-type: none"> • Complete construction of Alvey Substation Reactor. • Complete construction of Paul Substation 500kV Reactor. • Complete construction of McNary Substation 500/230kV Bank Addition. • Continue construction of the PSANI project. • Complete design and begin construction of Drummond 115kV Breaker Additions. 	Milestones: <ul style="list-style-type: none"> • Complete construction of Midway-Grandview 115kV Line upgrade. • Complete construction of the PSANI project. • Complete construction of Drummond 115kV Breaker Additions. • Complete design and begin construction of Midway-Ashe Double Circuit 230kV line. 	<ul style="list-style-type: none"> • The decrease reflects a change in project timelines as the majority of construction is scheduled in FY 2017.

FY 2017 Estimate	FY 2018 Estimate	Explanation of Changes FY 2018 vs FY 2017 Estimate
<p>Upgrades & Additions \$70,390,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue construction of 500kV spares at wind integration substations. • Continue construction at multiple sites of the Synchrophasor project. 	<p>\$74,668,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Complete construction of 500kV spares at wind integration substations. • Complete construction at multiple sites of the Synchrophasor project. 	<p>+\$4,278,000/+6.1%</p> <ul style="list-style-type: none"> • The increase reflects the purchase of transformers for Spare Transformers for wind projects.
<p>Systems Replacements \$311,006,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue design and construction of capital improvements for identified existing facilities. • Continue non-electric replacements as necessary. • Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. 	<p>\$285,153,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue design and construction of capital improvements for identified existing facilities. • Continue non-electric replacements as necessary. • Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. 	<p>-\$25,853,000/-8.3%</p> <ul style="list-style-type: none"> • The decrease reflects a decrease in the number of replacement projects.
<p>Projects Funded in Advanced \$42,010,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. 	<p>\$40,107,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. 	<p>-\$1,903,000/-4.5%</p> <ul style="list-style-type: none"> • Small decrease, however, milestones remain the same.

**Capital Information Technology & Equipment/Capitalized Bond Premium
Funding Schedule by Activity
Funding (\$K)**

	FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate	FY 2018 vs FY 2017	
				\$	%
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	23,924	25,000	26,860	1,860	7%
Capitalized Bond Premium	0	2,000	2,000	0	-
Total, Capital IT & Equipment/Capitalized Bond Premium	23,924	27,000	28,860	1,860	7%

Outyears (\$K)

	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	26,860	26,860	2,880	14,257	7,267
Capitalized Bond Premium	2,000	2,000	2,000	2,000	2,000
Total, Capital IT & Equipment/Capitalized Bond Premium	28,860	28,860	4,880	16,257	9,267

Capital Information Technology & Equipment/Capitalized Bond Premium

Overview

Capital Information Technology (IT) provides for the acquisition of general and some dedicated special purpose capital information technologies, and acquisition of special-use capital and IT equipment in support of Bonneville's strategic objectives. This category also includes Bonneville's on-going efforts to facilitate delivery of a highly resilient organization able to anticipate, withstand, and effectively respond to disruptive events affecting it and its partners in the Northwest region. The four main areas of resiliency focus continue to include asset management, emergency management, crisis management, and continuity of operations.

Bonneville continues to move its IT infrastructure to a more efficient architecture. This FY 2018 Budget supports this effort. IT continues to eliminate redundancies in tools and applications, establish an agency-wide IT architecture with standardized IT purchasing criteria, standardize software licensing processes and minimize agency liabilities through stronger contracts, apply continuous improvement practices to IT project management, and implement an agency IT portfolio cost management strategy. The IT estimates in this FY 2018 Budget under Capital IT and Equipment include all IT functions within the agency except TS grid operations. See the Capital Program – TS section of this budget for additional discussion of grid operations-related IT requirements acquisitions.

Capital equipment provides for the acquisition of general and some dedicated special purchases of capital office furniture and equipment.

Bonneville can incur a bond premium when it repays a U.S. Treasury bond before the due date. When bonds are refinanced and premiums are incurred, the bond premiums can be capitalized. Historically, Bonneville generally has chosen to finance capitalized bond premiums with bonds issued to the U.S. Treasury, as envisioned by the Transmission Act.

**Capital IT & Equipment
(\$K)**

FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
23,924	25,000	26,860

Overview

This category includes enhancements to Bonneville’s information technology processes to provide cost effective efficiencies for secure, timely, and accurate information. Investments will enable continued enhancements to Bonneville’s enterprise systems that are designed to link key information systems throughout Bonneville and improve business processes. Current efforts include continued functional process improvements in areas not included in the initial development phase. Other investments include acquisition of capital office furniture and equipment, capital automated data processing (ADP) based administrative telecommunications equipment, ADP equipment (hardware), and support of capital software development for certain Bonneville programs.

Continued investments in Capital IT & Equipment assets include:

Continuous Activity (all years)

Capital system developments in support of:

- Corporate IT Projects
- IT Infrastructure Projects
- Power IT Projects
- Transmission Services IT Projects (excluding grid operations)

**Capitalized Bond Premium
(\$K)**

FY 2016 Current	FY 2017 Estimate	FY 2018 Estimate
0	2,000	2,000

Overview

Continue to assess financial market and when cost-effective, refinance available bonds as prudent.

Activities, Milestones, and Explanation of Changes

FY 2017 Estimate	FY 2018 Estimate	Explanation of Changes FY 2018 vs FY 2017 Estimate
Capital Information Technology & Equipment/Capitalized Bond Premium \$27,000,000	\$28,860,000	+\$1,860,000/6.9%
Capital Information Technology & Equipment \$25,000,000 Milestones: Capital system developments in support of: <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	\$26,860,000 Milestones: Capital system developments in support of: <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	+\$1,860,000/7.4% <ul style="list-style-type: none"> • The increase reflects a small increase in equipment assets.
Capitalized Bond Premium \$2,000,000 Milestones: <ul style="list-style-type: none"> • Possible refinancing of outstanding federal bonds. 	\$2,000,000 Milestones: <ul style="list-style-type: none"> • Possible refinancing of outstanding federal bonds. 	\$0/0% <ul style="list-style-type: none"> • No change in funding.

**Power Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate	FY 2018 vs FY 2017	
				\$	%
Power Services - Operating Expenses					
Production	1,435,724	1,261,275	1,274,602	13,327	1%
Associated Projects Costs	416,683	463,786	481,232	17,446	4%
Fish & Wildlife	258,142	274,000	277,000	3,000	1%
Residential Exchange Program	218,717	295,540	315,984	20,444	7%
NW Power & Conservation Council	10,720	11,590	11,624	34	0.3%
Energy Efficiency & Renewable Resources	159,768	173,273	169,514	-3,759	-2%
Total, Power Services - Operating Expenses	2,499,754	2,479,464	2,529,956	50,492	2%

Outyears (\$K)

	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate
Power Services - Operating Expenses					
Production	1,274,602	1,350,298	1,232,748	1,295,489	1,274,694
Associated Projects Costs	481,232	480,059	493,874	508,132	522,848
Fish & Wildlife	277,000	277,000	281,812	286,915	292,322
Residential Exchange Program	315,984	318,350	251,015	250,645	265,744
NW Power & Conservation Council	11,624	11,914	12,149	12,397	12,658
Energy Efficiency & Renewable Resources	169,514	170,162	173,274	172,634	175,275
Total, Power Services - Operating Expenses	2,529,956	2,607,783	2,444,872	2,526,212	2,543,541

Power Services – Operating Expense

Overview

Production includes all Bonneville non-federal debt service (including Energy Northwest debt service), O&M costs for power system generation resources (including a large nuclear plant, business operations, and short- and long-term power purchases³), electric utility marketing of power, and oversight of the FCRPS hydroelectric projects and CGS. Bonneville develops products and services to meet the needs of Bonneville’s customers and stakeholders and acquires power as needed.

In FY 2010, Bonneville completed a long-term Resource Program to guide potential future resource acquisitions needed to meet Bonneville’s supply obligations. In the event that Bonneville does acquire output from a resource on a long-term basis, Bonneville will modify its budget to reflect the acquisition.

Associated Projects Costs represents funding for operation and maintenance costs for the FCRPS hydroelectric projects, minor additions, improvements and replacements, and liabilities of the Corps and Reclamation hydroelectric projects in the Pacific Northwest, which serve many purposes. All agencies emphasize efficient power production from existing facilities and improvement of the performance and availability of power generating units. Bonneville pays additional financing costs of the FCRPS facilities through its Interest Expense and Capital Transfer budget programs. Bonneville provides funding for the operations and maintenance costs that are part of the USFWS’s Lower Snake River Compensation Plan (LSRCP) hatcheries. Bonneville is responsible for annual payments to the Confederated Tribes of the Colville Reservation for their claims concerning their contribution to the production of hydropower by the Grand Coulee Dam in accordance with the Settlement Agreement between the United States and the Colville Tribes (April 1994).

Bonneville’s Fish and Wildlife Program provides for extensive protection, mitigation, and enhancement of Columbia River Basin fish and wildlife adversely affected by the development and operation of the FCRPS. Bonneville satisfies its fish and wildlife responsibilities by funding projects and activities designed to be consistent with the Program under the Northwest Power Act. Through the Program, Bonneville also implements measures to aid in the protection of fish and wildlife in the Columbia River and its tributaries, both listed as threatened or endangered as well as unlisted, under the ESA (see ESA discussion in the Power Services – Capital Overview section).

Bonneville’s mitigation expenditures will focus on activities that benefit Columbia River Basin fish and wildlife resources, following priorities established through ESA consultations, agreements with resource managers, and the Program, including actions that:

- increase survival of ESA-listed and non-listed fish at FCRPS dams and reservoirs;
- increase survival of ESA-listed and non-listed fish throughout their life cycle by protecting and enhancing important habitat areas;
- protect and enhance important wildlife habitat;
- use of hatcheries to contribute to conservation and recovery of ESA-listed and non-listed fish;
- provide offsite mitigation projects and habitat, passage, and other improvements that address factors limiting improvements of target species; and
- support a focused and well-coordinated research, monitoring, and evaluation program.

In order to address the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, Bonneville continues its work with the Council and the regional fish and wildlife managers, customers, and Tribes to review projects to ensure ratepayers fund appropriate mitigation. For

³ Including expenses associated with the use of power financial instruments to hedge Bonneville’s exposure to market price risk and certain index sales contract provisions as permitted by Bonneville’s internal power transacting risk management guidance.

example, Bonneville established a cost sharing Memorandum of Understanding (MOU) with the U.S. Forest Service in 2005, and renewed it with two regions in 2010, that requires a programmatic 30 percent cost share for fish mitigation projects funded by Bonneville on National Forests. Bonneville continues to operate in a cooperative manner with the U.S. Forest Service.

The Energy and Water Development Appropriations Act of 1996 added section 4(h)(10)(D) to the Northwest Power Act, directing the Council to appoint an ISRP “to review a sufficient number of projects” proposed to be funded through Bonneville’s annual fish and wildlife budget “to adequately ensure that the list of prioritized projects recommended is consistent with the Program.” The Northwest Power Act further states that “in making its recommendations to Bonneville, the Council shall consider the impact of ocean conditions on fish and wildlife populations and shall determine whether the projects employ cost effective measures to achieve program objectives.” Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council has shifted to a multi-year project review cycle during which the ISRP reviews categories of projects grouped together.

The Council’s major activities include the periodic preparation of a Northwest Conservation and Electric Power Plan (a 20-year electric energy demand and resources forecast and conservation program – known as the Power Plan) and the Fish and Wildlife Program. The Northwest Power Act directs that expenses of the Council, subject to certain limits based on forecasted Bonneville power sales, shall be included in Bonneville’s annual budget to Congress. The cost of funding the Council is recovered through Bonneville’s power rates.

Bonneville’s Energy Efficiency program promotes the efficient use of energy in the Pacific Northwest and acquires conservation resources consistent with the Council’s Power Plan. Such actions will: 1) meet energy efficiency targets; 2) achieve a least cost resource mix; 3) lessen the cost impacts of power purchases; 4) avoid the costs of ramping programs and infrastructure up and down; 5) extend the value of the FCRPS to customers; and 6) build the region’s resource portfolio with energy efficiency. Bonneville is also exploring how best to integrate demand-side management, distributed generation, and other leading edge technologies into its generation and transmission planning processes.

Bonneville’s Energy Efficiency program offers several ways for customer utilities to participate in energy efficiency. Program components include: (1) standard offer efficiency measures and custom projects, which result in customer proposals to conserve energy through such programs as residential weatherization; commercial lighting; heating, ventilation, and air conditioning (HVAC); industrial processes and lighting; and irrigated agriculture; (2) third-party delivery programs, such as Simple Steps Smart Savings, Energy Smart Industrial, and the Green Motors programs; and (3) programs to help regional federal installations reduce energy use, including federal hatcheries and irrigation districts, and to support the Corps of Engineers and Bureau of Reclamation in their efforts to reduce energy use; (4) efficiency achieved independently through the market or through codes and standards, i.e. Momentum Savings; and (5) market transformation through the Northwest Energy Efficiency Alliance (NEEA).

Bonneville’s Energy Efficiency budgets reflect BPA’s commitment to acquire Public Power’s share of the Northwest Power and Conservation Planning Council’s 7th Power Plan which forecasts regional electricity demand and resource strategies for the next 20 years. The 7th Plan preferred resource strategy calls for the region to acquire 1,400 aMW of energy efficiency by 2021. Bonneville is pursuing a plan to achieve a portion of that goal (573.1 aMW).

In meeting its energy efficiency goals, Bonneville may employ resource acquisition agreements, as authorized by Northwest Power Act section 6, and customer self-funded conservation as well as research, evaluation, contract support, NEEA support, and emerging technology development.

The Residential Exchange Program (REP) was created by the Northwest Power Act to extend the benefits of low-cost federal power to the residential and farm customers of Pacific Northwest electric utilities that have high average system costs. Currently, the region’s six investor-owned utilities (IOUs) and two of the region’s consumer-owned utilities are actively participating in the REP. Payments under the REP are made to individual IOUs based on the difference between Bonneville’s utility-specific Priority Firm (PF) Exchange rates and each utility’s average system cost (ASC), times a utility’s residential and

farm loads. ASCs are determined in accordance with the 2008 Average System Cost Methodology (ASCM). Participating utility ASCs are established in a public process that occurs prior to and during Bonneville's power rate case. Bonneville's utility-specific PF Exchange rates are determined each rate period. As described below, Bonneville and regional parties reached a settlement of the REP in 2011 in which the total amount of REP benefits available to the IOUs was established through 2028. Payments to the IOUs are made monthly based on historical invoiced exchange loads.

Over the past decade, regional parties have filed multiple lawsuits challenging Bonneville's implementation of the REP. These lawsuits were consolidated into four cases that were stayed before the U.S. Court of Appeals for the Ninth Circuit. On July 26, 2011, Bonneville adopted a regionally supported settlement, referred to as the 2012 REP Settlement. Under the settlement, the region's six IOUs will receive about \$4.1 billion in REP payments over the 17-year term of the settlement, beginning at \$182.1 million in FY 2012, and increasing to \$286.1 million in FY 2028. In addition to this settlement, Bonneville has reached related REP settlements with two consumer-owned utilities. A single challenge to the 2012 REP Settlement was dismissed by the U.S. Court of Appeals for the Ninth Circuit in October of 2013.

Explanation of Changes

Bonneville's budget includes \$2,530 million in FY 2018 for Power Services operating expenses, which is a 2.0 percent increase over the FY 2017 forecasted level. The increase reflects continuing emphasis on operation and maintenance of hydro generation projects on the FCRPS.

The FY 2018 budget increases the level for Production (+\$13.3 million), Associated Projects (+\$17.4 million), Fish & Wildlife (+\$3.0 million), Residential Exchange (+20.4 million), and the Northwest Power & Conservation Council (+\$34 thousand), and decreases the level for Energy Efficiency & Renewable Resources (-\$3.8 million). In addition, the FY 2018 Budget Request proposes that the Federal government be authorized to sell the transmission assets of Bonneville.

Production (\$K)		
FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
1,435,724	1,261,275	1,274,602

Overview

Power Purchases: Includes power purchased to cover power supply obligations as well as balancing loads with generation from the hydro system. These purchases can be made in the form of long-term purchases to meet supply obligations based on long-term planning requirements or they can be made within the year due to the monthly shape of the loads and the monthly shape of the hydroelectric generation. Also, purchases can be made within the month and within the day to fill shortages due to fluctuations in the hydro system and load.

Power Scheduling/Marketing: Schedule and market (buy/sell) electric energy with Bonneville customers and the Pacific Northwest's interconnected utilities. Scheduling includes Power Services' implementation of physical and memo power schedules and associated transmission schedules, implementation of Electronic Tagging (ETag) in accordance with NERC and in accordance with FERC, and implementation of electronic scheduling.

Columbia Generating Station (CGS): Bonneville has acquired full lifetime project capability of CGS. CGS is on a 24-month fuel and outage cycle. A maintenance and refueling outage occurred in the spring of 2015 and will again in FY 2017.

Continued investments in Production include:

Continuous Activity (all years)

- Provide oversight of all power supply contracts and related projects from which Bonneville purchases generation capability to ensure that all Bonneville approval rights are protected; coordinate, communicate, and administer agreements, issues, and programs between Bonneville and the project owners.
- Provide wind resource integration services for wind generation.
- Power Purchases.
- Power Scheduling/Marketing.
- Provide oversight of all contracts signed to date. Pursue cost-effective means to mitigate capacity demands associated with interconnecting large amounts of wind into the Bonneville system.
- Pursue acquisition of additional cost-effective generation to meet load growth.
- Provide oversight on the wind resource integration services currently purchased by public power customers and offer additional renewable resource shaping services to such customers using wind generation to serve their load.

**Associated Projects
(\$K)**

FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
416,863	463,786	481,232

Overview

Support FCRPS project costs and work to strengthen interagency and regional relationships to improve project performance, supporting functions, and to better understand project resource requirements and costs. This helps to maintain FCRPS reliability and system performance, as well as to attain Bonneville’s strategic business objectives.

Continued investments in Associated Projects include:

Continuous Activity (all years)

Bureau of Reclamation:

- Continue direct funding Reclamation O&M power activities.

Corps of Engineers:

- Continue direct funding Corps O&M power activities.

Fish & Wildlife		
(\$K)		
FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
258,142	274,000	277,000

Overview

Bonneville implements a mature fish and wildlife mitigation program based on recommendations made by the region’s fish and wildlife management agencies and tribes to the Council. Several recent Council reviews have made additional fish and wildlife project recommendations to Bonneville. Bonneville, in coordination with the Council, reviews new and on-going projects for consistency with the Program and purposes of the Northwest Power Act. Bonneville reviews and resets project-specific funding commitments annually, including projects under the FCRPS BiOps and other agreements. Bonneville informs its funding decisions with the management objectives and priorities in the Program (including ISRP reviews) and the Accords as it integrates their implementation with actions necessary to fulfill ESA responsibilities. Regular coordination on implementation priorities continues among Bonneville, the Council, federal resource management agencies, states, Tribes, and others.

Continued investments in Fish & Wildlife include:

Continuous Activity (all years)

- Anadromous Fish: Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, and the Willamette and Southern Idaho agreements. Prioritize projects that address the factors that contribute most to mitigation success and that fulfill Bonneville’s responsibility for mitigating the impacts from the FCRPS. Implement and develop activities that protect and enhance tributary and estuary habitat, improve mainstream habitat, reduce potentially harmful hatchery practices on ESA-listed populations, and contribute to sustainable fisheries.
- Resident Fish: Implement activities to mitigate the impacts of the FCRPS on lamprey, sturgeon, and bull trout and promote the reproduction and recruitment of Kootenai River white sturgeon. These activities have been selected in response to the USFWS’s 2000 bull trout and 2006 Libby BiOp, the Program, and the Fish Accords.
- Mitigation using resident fish to offset anadromous fish losses (substitution): mitigate for reservoir power operation impacts to resident fish and wildlife by seeking projects that benefit both simultaneously. Those resident fish habitat acquisition projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited for both fish and wildlife where appropriate.
- Wildlife: Use existing Bonneville policies to continue the current effort to mitigate wildlife in a manner consistent with the Program and fulfill commitments in wildlife agreements such as the Kalispel Agreement, Willamette Wildlife Agreement, and Southern Idaho Wildlife Agreement. Those wildlife projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited against both wildlife and fish obligations according to Bonneville’s crediting policy and applicable mitigation contracts.

Residential Exchange, Northwest Power and Conservation Council, and Energy Efficiency & Renewable Resources
(\$K)

FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
389,205	480,403	497,122

Overview

Residential Exchange Program (REP)

- Includes forecasted REP benefits based on the 2012 REP Settlement.

Northwest Power and Conservation Council

- Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance and fish and wildlife program activities.

Energy Efficiency Resources

- Conservation Purchases: Provide programmatic savings reimbursements and energy efficiency incentives to Bonneville customers to purchase conservation savings. This includes performance payments and Energy Smart Reserved Power payments for federal installations and fish hatcheries and irrigation districts.
- Conservation Infrastructure: All support for programs and operations, including third-party program implementation, contract support, market research (Momentum Savings research), evaluation, and emerging technology research.
- Market Transformation: Support for NEEA's market transformation initiatives. NEEA identifies barriers and opportunities to increase the market adoption of efficiency by leveraging its regional partnerships.

Activities, Milestones, and Explanation of Changes

FY 2017 Estimate	FY 2018 Estimate	Explanation of Changes FY 2018 vs FY 2017 Estimate
Power Services - Operating Expense \$2,479,464,000	\$2,529,956,000	+\$50,492,000/2.0%
Production \$1,261,275,000 Milestones: <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	\$1,274,602,000 Milestones: <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	+\$13,327,000/+1.1% <ul style="list-style-type: none"> • The increase reflects higher power purchase costs.
Associated Project Costs \$463,786,000 Milestones: <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	\$481,232,000 Milestones: <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	+\$17,446,000/+3.8% <ul style="list-style-type: none"> • The increase reflects changes to security, biological opinion requirements, non-routine extraordinary maintenance, WECC/NERC compliance activities, and improvements, replacements, and minor additions at the projects.
Fish & Wildlife Costs \$274,000,000 Milestones: <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Southern Idaho Agreement, and the Willamette Agreement. 	\$277,000,000 Milestones: <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Willamette Agreement, and the Southern Idaho Agreement. 	+\$3,000,000/+1.1% <ul style="list-style-type: none"> • The increase reflects funding associated with the Biological Opinions, Fish Accord commitments, and Northwest Power Act activities.

FY 2017 Estimate	FY 2018 Estimate	Explanation of Changes FY 2018 vs FY 2017 Estimate
Residential Exchange Program \$295,540,000 Milestones: <ul style="list-style-type: none"> Continue to provide REP benefits. 	\$315,984,000 Milestones: <ul style="list-style-type: none"> Continue to provide REP benefits. 	+\$20,444,000/6.9% <ul style="list-style-type: none"> The increase reflects the scheduled rise in the amount of REP payments payable to the IOUs prescribed by the Residential Exchange Settlement.
NW Power & Conservation Council \$11,590,000 Milestones: <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	\$11,624,000 Milestones: <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	+\$34,000/0.3% <ul style="list-style-type: none"> The increase reflects continuing emphasis on the NW Power and Conservation Council.
Energy Efficiency & Renewable Resources \$173,273,000 Milestones: <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads. Continue to support utility incentive programs. Continue to support regional energy efficiency programs. Continue supporting energy efficiency at direct serve federal agencies. 	\$169,514,000 Milestones: <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads. Continue to support utility incentive programs. Continue to support regional energy efficiency programs. Continue supporting energy efficiency at direct serve federal agencies. 	-\$3,759,000/-2.2% <ul style="list-style-type: none"> Even though there is a small decrease, there is a continuing emphasis on the energy efficiency program consistent with the Power Plan.

**Transmission Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate	FY 2018 vs FY 2017	
				\$	%
Transmission Services - Operating Expense					
Engineering	95,331	110,811	116,567	5,756	5%
Operations	172,186	188,473	201,475	13,002	7%
Maintenance	186,698	199,795	203,920	4,125	2%
Total, Transmission Services - Operating Expense	454,215	499,079	521,962	22,883	5%

Outyears (\$K)

	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate
Transmission Services - Operating Expense					
Engineering	116,567	118,180	129,956	134,736	141,816
Operations	201,475	198,871	197,311	197,338	199,935
Maintenance	203,920	206,250	210,435	215,093	219,757
Total, Transmission Services - Operating Expense	521,962	523,301	537,702	547,167	561,508

Transmission Services – Operating Expense

Overview

This activity provides for the transmission system services of engineering, operations, and maintenance for Bonneville's electric transmission system, and the associated power system control and communication facilities. Primary strategies of this program are: 1) maintain the safety and reliability of the transmission system; 2) increase the focus on meeting customers' needs; 3) optimize the transmission system; 4) provide open and non-discriminatory transmission access; and 5) improve Bonneville's cost effectiveness.

Explanation of Changes

Bonneville's budget includes \$522.0 million in FY 2018 for TS operating expense which is a 4.6 percent increase over the FY 2017 forecasted level. The increase reflects continuing operation and maintenance of Bonneville's transmission assets.

The FY 2018 budget increases the levels for Engineering (+\$5.8 million), Operations (+\$13.0 million), and Maintenance (+\$4.1 million). In addition, the FY 2018 Budget Request proposes that the Federal government be authorized to sell the transmission assets of Bonneville.

Engineering (\$K)		
FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
95,331	110,811	116,567

Overview

Continue efforts to identify best methods for improving system reliability and maintenance practices, and continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system.

Continued investments in Engineering include:

Continuous Activity (all years)

- **Research and Development (R&D):** Conduct research focused on technologies related to business challenges Bonneville faces including reliability, energy efficiency, and integration of renewable energy resources. Technologies of interest are identified in Bonneville's Technology Roadmaps. A portfolio of research is selected every year through Bonneville's Portfolio Decision Framework.
- **System Development Planning and Analysis:** Continue providing technical support and asset planning to deploy the Asset Management approach to sustain existing assets and expand the system to meet Agency objectives.
- **Technical Support:** Provide technical support activities, such as transmission system planning and studies to optimize portions of the system. Provide support for non-wires solutions studies and pilot projects.
- **Capital-to-Expense Adjustments:** Conduct annual analysis of Bonneville's outstanding capital work orders to assess whether they should be expensed. As obsolete inventory is identified and disposed of, it is expensed.
- **Regulatory Fees:** WECC dues and loop flow payments, Department of Commerce/National Telecommunications and Information Administration licensing costs for radio frequencies, DOE Radio Spectrum staff and contractor support, and NERC Critical Infrastructure Protection (CIP) compliance program costs. Includes membership in ColumbiaGrid, a transmission planning organization in the region.
- **Reimbursable Transactions:** Enter into written agreements with federal and non-federal entities that have work or services to be performed by Bonneville staff at the expense of the benefiting entities. The projects must be beneficial, under agreed upon criteria, to Bonneville operations and to the federal or non-federal entity involved or otherwise be aligned with or supportive of Bonneville's strategic objectives. Additionally, these activities generally contribute to more efficient or reliable construction of the federal transmission system or otherwise enhance electric service to the region.
- **Leased and Other Costs:** Includes leases, lease purchases, and other costs of financing transmission, delivery, and voltage support facilities when such arrangements are operationally feasible and cost effective to deliver power. Leases and lease purchases enable Bonneville to continue to invest in infrastructure to support a safe and reliable system for the transmission of power. Other costs included are the accrued interest costs associated with Large Generator Interconnection Agreements (LGIA).

Operations (\$K)		
FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
172,186	188,473	201,475

Overview

Substation Operations: Perform operations functions necessary to provide electric service to customers and to protect the federal investment in electric equipment and other facilities. Includes equipment adjustments, switching lines and equipment during emergencies or maintenance, isolating damaged equipment, restoring service to customers, inspecting equipment, and reading meters.

Power System Dispatching and Supporting Functions: Perform central dispatching, control, and monitoring of the electric operation of the federal transmission system. Also includes load, frequency, and voltage control of federal generating plants, and coordinating long- and short-term outages of system equipment. In addition, provides technical engineering support of dispatching function and provides all technical and systems support for Dittmer Control Center (DCC) and Munro Control Center (MCC).

Marketing and Sales: Provide management and direction of transmission rates, and provide business strategy in marketing of transmission and ancillary products and services of Transmission Services. Involve customers and constituents in the process of product and rate development. Maintain accurate and complete historical records of current and past legacy transmission agreements. Provide guidance for current and future transmission contract negotiations. Provide financial analysis of market strategies. Monitor and report on the financial health of Transmission Services. Support cost management by effective reporting and analysis of current expenditures. Ensure official budget submittals reflect current management financial strategies and adequately fund transmission programs.

Transmission Scheduling: Provide non-discriminatory, open access to the Bonneville transmission system consistent with Bonneville's Open Access Transmission Tariff (OATT). Schedule transmission capacity to eligible Bonneville customers, which include customers acquiring services under Use of Facilities (UFT), Formula Power Transmission (FPT), Integration of Resources (IR), and Part II or Part III of the OATT. Manage the reservations and scheduling of all transmission services associated with the OATT. Update practices, policies, and commercial systems to accommodate a large diversity of resources, including wind.

Continuous Activity (all years):

- Continue to operate within parameters of NERC and WECC.
- Continue support of increased compliance activities related to the reliability of the transmission system, including cyber security.
- Continue developing facilities, policies, procedures, and implementing systems to support integrating the diversity of resources into the transmission grid.
- Continue preparation for increased complexity of transmission scheduling, power system operations, and dispatching, including congestion management and outage scheduling.
- Continue developing the Dittmer Scheduling Center and Munro Scheduling Center facilities to support continuous real time scheduling operations from both facilities.
- Continue developing a long-term approach to optimize transmission availability through streamlined, cost-effective, and sustainable processes.
- Continue to address succession planning issues across key functions.
- Continue development and implementation of business systems and tools.

Maintenance (\$K)		
FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate
186,698	199,795	203,920

Overview

In all aspects of maintenance, Bonneville is continuing the use of Reliability Centered Maintenance (RCM) practices. The use of RCM practices is focused on improving system reliability, increasing availability, and meeting new and existing compliance regulations at lowest lifecycle costs. In addition Bonneville is deploying Asset Management to optimize maintain/replace decision making. Maintenance costs are expected to increase as Bonneville addresses the aging transmission system, meeting reliability standards, including vegetation management, and environmental constraints associated with construction, enhancement, and maintenance of the system. The Bonneville transmission system encompasses 15,212 circuit miles on over 11,860 right-of-way miles (many of these miles are through rugged, inaccessible terrain).

Continued investments in Maintenance include:

Continuous Activity (all years)

- Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets.
- Continue refining processes and procedures for monitoring and tracking compliance activities related to the reliability of the transmission system.
- Continue to improve system availability performance through new maintenance procedures and work practices.
- Continue to develop and implement work practices and procedures for implementation of a new specialty crew using bare-hand live line practices for maintenance of high-voltage transmission lines.
- Continue increased emphasis on replacement of line hardware (life extension programs for insulators, connectors, dampers, and fiber optic cable hardware).
- Continue to prepare for the impact of an expected high attrition rate among Bonneville’s aging workforce by recruiting apprentices and replacements for critical minimum crew size workload positions.
- Increase outage-scheduling planning and coordination to increase customer satisfaction and system availability.
- Maintain vegetation management levels to ensure system reliability.
- Continue access road work to provide reliable access to facilities and ensure environmental compliance.
- Continue improving environmental stewardship.

Transmission Line Maintenance: Maintain and repair 15,212 circuit miles of high voltage transmission lines, of which over 7,617 km (4,734 circuit miles) are 500 kV transmission extra-high voltage (EHV). Maintenance of EHV lines is two and one-half times more labor-intensive than maintenance of lower transmission voltages, although more efficient in transmission of power. This responsibility includes maintaining transmission rights-of-way to ensure system reliability, safety, and environmental compliance. Adopt work practices that improve system availability, reliability, and compliance.

Right-of-Way Maintenance: Maintain over 11,860 of Bonneville’s right-of-way miles. This responsibility includes vegetation management, danger tree management, and access road maintenance to ensure system reliability, safety, and environmental compliance. Adopt procedures and processes that improve system availability, reliability, environmental compliance, and reliability compliance. Continue to deploy new technologies such as LiDAR (Light Detection and Ranging) to reliably and cost-effectively manage vegetation.

Substation Maintenance: Maintain and repair the transmission system power equipment located in Bonneville’s 261 substations. Work includes inspections, diagnostic testing, and predictive and condition-based maintenance.

System Protection Maintenance: Maintain relaying metering and remedial action scheme equipment used to control and protect the electrical transmission system and to meter energy transfers for the purpose of revenue billing. Additionally, field-engineering services provide technical advice and assure the correct operation of power system relaying and special control systems used to support interregional energy transmission capabilities.

Power System Control Maintenance: Test, repair, and provide field engineering support of Bonneville's highly complex equipment, communications, and control systems, including seven major microwave systems, fiber optic systems, and other critical communications and control equipment that support the power system.

Non-Electric Plant Maintenance: Maintain and manage Bonneville's non-electric facilities. Includes site, building, and building utility maintenance; custodial services; station utility; and other maintenance service activities, as well as facilities asset management on Bonneville-owned or Bonneville-leased non-electric facilities.

Maintenance Standards and Engineering: Establish, monitor, and update system maintenance standards, policies, and procedures, and review and update long-range plans for maintenance of the electric power transmission system.

Activities, Milestones, and Explanation of Changes

FY 2017 Estimate	FY 2018 Estimate	Explanation of Changes FY 2018 vs FY 2017 Estimate
Transmission Services - Operating Expense \$499,079,000	\$521,962,000	+\$22,883,000/4.6%
Engineering \$110,811,000 Milestones: <ul style="list-style-type: none"> Continue efforts to identify best methods for improving system reliability and maintenance practices. Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	\$116,567,000 Milestones: <ul style="list-style-type: none"> Continue efforts to identify best methods for improving system reliability and maintenance practices. Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	+\$5,756,000/+5.2% <ul style="list-style-type: none"> The increase reflects emphasis on system reliability standards compliance and research and development.
Operations \$188,473,000 Milestones: <ul style="list-style-type: none"> Continue to operate within parameters of NERC and WECC. Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	\$201,475,000 Milestones: <ul style="list-style-type: none"> Continue to operate within parameters of NERC and WECC. Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	+\$13,002,000/+6.9% <ul style="list-style-type: none"> The increase reflects continued emphasis on reliability compliance activities, resource integration activities, key strategic initiatives, security, and control center systems support.
Maintenance \$199,795,000 Milestones: <ul style="list-style-type: none"> Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	\$203,920,000 Milestones: <ul style="list-style-type: none"> Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	+\$4,125,000/+2.1% <ul style="list-style-type: none"> The increase reflects implementation of facilities asset management plans, continued implementation of live-line crew, NERC/WECC compliance activities related to land rights and vegetation management, continuing maintenance program activities, including system protection, right-of-way, line maintenance, and performance improvements.

Interest, Pension, and Post-retirement Benefits
Operating Expense
Funding Schedule by Activity
Funding (\$K)

	FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate	FY 2018 vs FY 2017	
				\$	%
Interest, Pension, and Post-retirement Benefits					
BPA Bond Interest (Net)	139,300	130,260	161,399	31,139	23.9%
BPA Appropriation Interest	14,059	8,954	4,615	-4,339	-48.5%
Corps of Engineers Appropriation Interest	134,663	85,131	89,735	4,604	5.4%
Lower Snake River Comp Plan Interest	16,534	15,857	3,872	-11,985	-75.6%
Bureau of Reclamation Appropriation Interest	37,547	13,230	12,426	-804	-6.1%
Bond Premiums Paid/Discounts (not capitalized)	0	0	0	0	0%
Subtotal, Interest – Operating Expense	342,103	253,432	272,047	18,615	7.3%
Additional Pension, and Post-retirement Benefits	34,183	35,671	36,936	1,265	3.5%
Total, Interest, Pension, and Post-retirement Benefits	376,286	289,103	308,983	19,880	6.9%

Outyears (\$K)

	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate
Interest, Pension, and Post-retirement Benefits					
BPA Bond Interest (Net)	161,399	196,836	231,284	273,632	305,225
BPA Appropriation Interest	4,615	0	0	0	0
Corps of Engineers Appropriation Interest	89,735	88,502	90,693	90,120	87,097
Lower Snake River Comp Plan Interest	3,872	1,301	436	187	168
Bureau of Reclamation Appropriation Interest	12,426	10,884	7,677	6,695	6,037
Bond Premiums Paid/Discounts (not capitalized)	0	0	0	0	0
Subtotal, Interest – Operating Expense	272,047	297,523	330,090	370,634	398,527
Additional Pension, and Post-retirement Benefits	36,936	38,309	39,754	41,398	43,451
Total, Interest, Pension, and Post-retirement Benefits	308,983	335,832	369,844	412,032	441,978

Interest, Pension and Post-retirement Benefits Operating Expense

Overview

Interest expense provides for interest due on bonds issued to the U.S. Treasury and appropriations repayment responsibilities. The appropriation repayments relate to capital investment in FCRPS hydroelectric generating and transmission facilities of Bonneville, and the Corps and Reclamation. Investments were financed by Congressional appropriations and Bonneville borrowings from the U.S. Treasury. Bonneville repays these amounts through revenue raised in its power sales and transmission services revenues.

Since receiving U.S. Treasury borrowing authority in 1974 under the Transmission Act, all Bonneville U.S. Treasury borrowing has been at market rates. As of October 1, 1996, all of Bonneville's repayment obligations on FCRPS appropriated investment (Corps and Reclamation FCRPS investment and Bonneville investment financed with appropriations prior to the Transmission Act that were unpaid as of September 30, 1996) were restructured and assigned new current-market interest rates. The Bonneville Appropriations Refinancing Act of 1996 (Refinancing Act) called for re-setting (reducing) the unpaid principal of FCRPS appropriations and reassigning (increasing) interest rates. New principal amounts were established as of the beginning of FY 1997 at the present value of the principal and annual interest payments Bonneville would make to the U.S. Treasury for these obligations in the absence of the legislation, plus \$100.0 million. The new principal amounts were assigned prevailing market interest rates as of October 1, 1996. Bonneville's outstanding appropriations repayment obligations at the end of FY 1996 were \$6.6 billion with a weighted average interest rate of 3.4 percent. The refinancing reduced the principal amount to \$4.1 billion with a weighted average interest rate of 7.1 percent. Implementation of the refinancing took place in 1997 after audited actual financial data were available. Pursuant to the legislation, Bonneville submitted its calculations and interest rate assignments implementing the Refinancing Act to the U.S. Treasury for its review and approval. The U.S. Treasury approved the implementation calculations in July 1997. The Refinancing Act also calls for all future FCRPS appropriations to be assigned prevailing U.S. Treasury yield curve interest rates. Bonneville's outstanding appropriations may be prepaid prior to their stated maturities.

Interest estimates are a function of costs of U.S. Treasury borrowing to Bonneville, repayment status of outstanding FCRPS investments, and projected additions to FCRPS plant in service. These estimates may change over time depending on forecasted market conditions. The interest cost estimates include the impact of Bonneville's appropriation refinancing legislation.

Federal employees associated with the operation of the FCRPS participate in either the Civil Service Retirement System or the Federal Employees Retirement System. Employees may also participate in the Federal Employees Health and Benefit Program and the Federal Employee Group Life Insurance Program. All such postretirement systems and programs are sponsored by the Office of Personnel Management; therefore, Bonneville does not record any accumulated plan assets or liabilities related to the administration of such programs. Bonneville makes additional annual contributions to the General Fund of the U.S. Treasury (receipt account 892889) related to the Federal post-retirement benefit programs provided to employees associated with the operation of the FCRPS. These payments were begun with the FY 1998 Administration's budget which assumed Bonneville would prospectively cover the unfunded liability that accrues in fiscal years after FY 1997 of the Civil Service Retirement and Disability Fund (Disability Fund), the Employees Health Benefits Fund (Health Fund), and the Employees Life Insurance Fund (Insurance Fund) that it had not covered prior to FY 1998. Bonneville's additional annual contributions include amounts relating to pension and post-retirement benefits for Bonneville and the power-related portion of the Corps and Reclamation projects.

**Capital Transfers
Funding Schedule by Activity
Funding (\$K)**

	FY 2016 Actual	FY 2017 Estimate	FY 2018 Estimate	FY 2018 vs FY 2017	
				\$	%
Capital Transfers					
BPA Bond Amortization ¹	319,000	76,100	14,076	-62,024	-81.5%
Reclamation Appropriation Amortization	352,000	0	21,561	21,561	N/A
BPA Appropriation Amortization	75,000	129,768	191,508	61,740	47.6%
Corps Appropriation Amortization	691,000	74,279	70,019	-4,260	-5.7%
Lower Snake River Comp Plan Amortization	0	0	35,970	35,970	N/A
Total, Capital Transfers	1,437,000	280,147	333,134	52,987	18.9%

Outyears (\$K)

	FY 2018 Estimate	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate
Capital Transfers					
BPA Bond Amortization ¹	14,076	358,734	292,583	326,055	297,620
Reclamation Appropriation Amortization	21,561	44,858	13,733	11,201	69,778
BPA Appropriation Amortization	191,508	71,504	58,907	67,223	99,776
Corps Appropriation Amortization	70,019	14,561	41,472	56,196	29,108
Lower Snake River Comp Plan Amortization	35,970	12,085	3,702	325	890
Total, Capital Transfers	333,134	501,742	410,397	461,000	497,172

Overview

This activity conveys funds to the U.S. Treasury for repayment of certain FCRPS costs not included in the Associated Project Costs budget. Since capital transfers are cash transactions, they are not considered budget obligations.

¹ Bonneville "Bond(s)" in this FY 2018 Budget refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act (P.L. 93-454), which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

**Bonneville Power Administration
Performance Measures**

In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2016	FY 2017	FY 2018
Performance Goal (Measure)	BPA Hydropower Generation Efficiency Performance - Achieve 97.5% Heavy-Load-Hour Availability (HLHA) through efficient performance of Federal hydro-system processes and assets, including joint efforts of BPA, Army Corps of Engineers, and Bureau of Reclamation. HLHA is actual machine capacity available during heavy-load hours (0700-2200 Monday-Saturday), divided by planned available capacity during heavy-load hours.		
Target	≥ 97.5%	≥ 97.5%	≥ 97.5%
Result	Target Met: 102.1%	Not yet available	Not yet available
Endpoint Target	Maintain at least 97.5% Heavy-Load-Hour Availability.		

	FY 2016	FY 2017	FY 2018
Performance Goal (Measure)	BPA Repayment of Federal Power Investment Performance - Meet planned annual repayment of principal on Federal power investments.		
Target	≥ 100%	≥ 100%	≥ 100%
Result	Target Met: 100%	Not yet available	Not yet available
Endpoint Target	Continue to meet planned annual repayment of principal.		

	FY 2016	FY 2017	FY2018
Performance Goal (Measure)	BPA System Reliability Performance - NERC Rating - Attain average North American Electric Reliability Council (NERC) compliance ratings for NERC Control Performance Standard 1 (CPS1) which measures generation/load balance on one-minute intervals (rating > or = 100%).		
Target	CPS1 ≥ 100%	CPS1 ≥ 100%	CPS1 ≥ 100%
Result	Target Met:143.80%	Not yet available	Not yet available
Endpoint Target	Maintain CPS1 score of >= 100%.		

Additional Tables

**BONNEVILLE POWER ADMINISTRATION
TOTAL OBLIGATIONS/OUTLAYS**

Current Services
(in millions of dollars)

	2016		2017		2018		2019	2020	2021	2022
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
BP-1 SUMMARY ^{1/3/}										
1 Residential Exchange Program	219	219	296	296	316	316	318	251	251	266
2 Power Services ^{2/}	1,853	1,853	1,725	1,725	1,756	1,756	1,830	1,727	1,804	1,798
3 Transmission Services	732	732	1,030	1,030	961	961	982	1,129	1,135	1,159
4 Conservation & Energy Efficiency	160	160	173	173	170	170	170	173	173	175
5 Fish & Wildlife	274	274	319	319	328	328	321	320	321	321
6 Interest/ Pension ^{4/}	376	376	289	289	309	309	336	370	412	442
7 Associated Project Cost - Capital	187	187	246	246	265	265	288	313	339	346
8 Capital Equipment	24	24	25	25	27	27	27	3	14	7
9 Planning Council	11	11	12	12	12	12	12	12	12	13
10 Misc. Accounting Adjs.	0	0	0	0	0	0	0	0	0	0
11 Projects Funded in Advance	272	272	42	42	40	40	39	36	35	35
12 Capitalized Bond Premiums	0	0	2	2	2	2	2	2	2	2
13 TOTAL OBLIGATIONS/ OUTLAYS^{3/}	4,107	4,107	4,158	4,158	4,185	4,185	4,325	4,336	4,496	4,563

REVENUES AND REIMBURSEMENTS

Current Services
(in millions of dollars)

BP-1 SUMMARY	FISCAL YEAR									
	2016		2017		2018		2019	2020	2021	2022
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
14 Revenues ^{5/}	3,137	3,137	4,072	4,072	4,074	4,074	4,075	4,160	4,245	4,336
15 Project Funded in Advance	272	272	42	42	40	40	39	36	35	35
16 TOTAL	3,409	3,409	4,114	4,114	4,114	4,114	4,114	4,196	4,280	4,371
BUDGET AUTHORITY (NET) ^{6/}	701		569		451		317	537	515	485
17 OUTLAYS (NET) ^{6/7/8}		510		42		71	211	141	216	192

These notes are an integral part of this table.

^{1/} This FY 2018 budget includes capital and expense estimates based on initial spending proposals from Bonneville's 2016 IPR and CIR process.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

^{4/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{5/} Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

^{6/} BPA received \$48.7 million of additional budget authority in FY 2007 to accommodate the work necessary to relocate the radio spectrum consistent with the Commercial Spectrum Enhancement Act (P.L. 108-494). In accordance with Federal law, Bonneville plans to return the forecasted unused balance of approximately \$8.2 million to the U.S. Treasury as soon as the National Telecommunications Information Administration notifies the Federal Communications Commission that the DOE relocation effort is complete.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

^{8/} FY 2016 Net Outlays are based on Bonneville's FY 2016 audited actuals. FY 2017 Net Outlays are calculated using Bonneville's revenue forecast from the BP-16 rate case. FYs 2018 & 2019 assume no growth in Offsetting Collections compared to FYs 2016 & 2017. FYs 2020 through 2022 assume a growth in Offsetting Collections based on standard inflation factors.

EXPENSED OBLIGATIONS/OUTLAYS ^{1,4/}

Current Services

(in millions of dollars)

FISCAL YEAR

BP-2

	2016		2017		2018		2019	2020	2021	2022
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	219	219	296	296	316	316	318	251	251	266
2 Power Services ^{2/}	1,853	1,853	1,725	1,725	1,756	1,756	1,830	1,727	1,804	1,798
3 Transmission Services	454	454	499	499	522	522	523	538	547	562
4 Conservation & Energy Efficiency	160	160	173	173	170	170	170	173	173	175
5 Fish & Wildlife	258	258	274	274	277	277	277	282	287	292
6 Interest/ Pension ^{3/}	376	376	289	289	309	309	336	370	412	442
7 Planning Council	11	11	12	12	12	12	12	12	12	13
8 TOTAL EXPENSE	3,330	3,330	3,268	3,268	3,361	3,361	3,467	3,352	3,485	3,547
9 Projects Funded in Advance	272	272	42	42	40	40	39	36	35	35

CAPITAL OBLIGATIONS/OUTLAYS ^{1/}

Current Services
(in millions of dollars)

FISCAL YEAR

BP-2 continued	2016		2017		2018		2019	2020	2021	2022
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
10 Transmission Services	277	277	531	531	439	439	458	591	588	598
11 Associated Project Cost	187	187	246	246	265	265	288	313	339	346
12 Fish & Wildlife	16	16	45	45	51	51	44	38	34	29
13 Capital Equipment	24	24	25	25	27	27	27	3	14	7
14 Capitalized Bond Premiums	0	0	2	2	2	2	2	2	2	2
15 TOTAL CAPITAL INVESTMENTS	504	504	849	849	784	784	819	947	976	981
16 TREASURY BORROWING AUTHORITY TO										
17 FINANCE CAPITAL OBLIGATIONS ^{4/}	504		849		784		819	947	976	981

These notes are an integral part of this table.

^{1/} This FY 2018 budget includes capital and expense estimates based on initial spending proposals from Bonneville's 2016 IPR and CIR process.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{4/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

CURRENT SERVICES
(in millions of dollars)

CAPITAL TRANSFERS

	2016 Pymts
Amortization:	
18 BPA Bonds	319
19 Reclamation Appropriations	352
20 BPA Appropriations	75
21 Corps Appropriations	691
22 Lower Snake River Comp Plan Amortization	0
23 TOTAL CAPITAL TRANSFERS	1,437

FISCAL YEAR

2017 Pymts	2018 Pymts	2019 Pymts	2020 Pymts	2021 Pymts	2022 Pymts
76	14	359	293	326	298
0	22	45	14	11	70
130	192	72	59	68	100
74	70	15	41	56	29
0	36	12	4	0	1
280	333	502	410	462	497

24 FULL-TIME EQUIVALENT (FTE)	2,880
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STAFFING

3,100	3,100	3,100	3,100	3,100
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PROGRAM & FINANCING SUMMARY

Current Services

(in millions of dollars)

Identification Code: 89-4045-0-3-271

	est.						
	2016	2017	2018	2019	2020	2021	2022
Program by activities:							
Operating expenses:							
0.01 Power Services	1,436	1,261	1,275	1,350	1,233	1,295	1,275
0.02 Residential Exchange Program	219	296	316	318	251	251	266
Associated Project Costs:							
0.05 Bureau of Reclamation	133	158	168	166	171	176	182
0.06 Corps of Engineers	238	251	257	257	265	273	281
0.07 Colville Settlement	17	22	23	23	23	24	24
0.19 U.S. Fish & Wildlife Service	29	33	33	34	35	35	36
0.20 Planning Council	11	12	12	12	12	12	13
0.21 Fish & Wildlife	258	274	277	277	282	287	292
0.23 Transmission Services	454	499	522	523	538	547	562
0.24 Conservation & Energy Efficiency	160	173	170	170	173	173	175
0.25 Interest	343	253	272	298	330	371	399
0.26 Pension and Health Benefits ^{1/}	34	36	37	38	40	41	43
0.91 Total operating expenses ^{2/}	3,331	3,268	3,361	3,467	3,352	3,485	3,547
Capital investment:							
1.01 Power Services	187	246	265	288	313	339	346
1.02 Transmission Services	277	531	439	458	591	588	598
1.04 Fish & Wildlife	16	45	51	44	38	34	29
1.05 Capital Equipment	24	25	27	27	3	14	7
1.06 Capitalized Bond Premiums	0	2	2	2	2	2	2
1.07 Total Capital Investment ^{3/}	504	849	784	819	947	976	981
2.01 Projects Funded in Advanced	272	42	40	39	36	35	35
10.00 Total obligations ^{4/}	4,107	4,158	4,185	4,325	4,336	4,496	4,563

These notes are an integral part of this table.

^{1/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{2/} Assumes expense obligations, not accrued expenses.

Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} Assumes capital obligations, not capital expenditures.

^{4/} This FY 2018 budget includes capital and expense estimates based on initial spending proposals from Bonneville's 2016 IPR and CIR process.

For purposes of this table, this FY 2018 budget reflects, for FY 2016, actual third party financing expense only for PFIA.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

Program and Financing (continued)
Current Services
(in millions of dollars)

	est.						
	2016	2017	2018	2019	2020	2021	2022
Financing:							
1000 Unobligated balance available, start of year. ^{5/}	13	13	11	0	0	0	0
1050 Unobligated balance available, end of year. ^{5/}	13	11	10	0	0	0	0
1900 Budget authority (gross)	4,107	4,684	4,574	4,431	4,733	4,785	4,850
Budget Authority:							
1400 Permanent Authority: Authority to borrow from Treasury (indefinite) ^{6/}	429	849	784	819	947	976	981
1600 Contract Authority	2,650						
1800 Spending authority from off-setting collections	3,409	4,114	4,114	4,114	4,196	4,280	4,371
1825 Portion applied to debt reduction	(319)	(280)	(333)	(502)	(410)	(462)	(497)
1850 Spending authority from offsetting collections (adjusted)	1,028	3,834	3,790	3,612	3,786	3,818	3,874
900 Total obligations	4,107	4,158	4,185	4,325	4,336	4,496	4,563
4110 Outlays (gross)	3,919	4,158	4,185	4,325	4,336	4,496	4,563
Adjustments to budget authority and outlays:							
Deductions for offsetting collections:							
4120 Federal funds	(50)	(90)	(90)	(90)	(90)	(90)	(90)
4121 Interest on Federal Securities	(7)						
4123 Non-Federal sources	(3,352)	(4,024)	(4,024)	(4,024)	(4,105)	(4,190)	(4,281)
4130 Total, offsetting collections	(3,409)	(4,114)	(4,114)	(4,114)	(4,195)	(4,280)	(4,371)
4160 Budget authority (net)	701	569	451	317	537	515	485
4170 Outlays (net)^{7/8/}	510	42	71	211	141	216	192

These notes are an integral part of this table.

^{5/} Reflects estimated cost for radio spectrum fund.

^{6/} The Permanent Authority: Authority to borrow (indefinite) from the U.S. Treasury amounts reflect both Bonneville's capital program financing needs and either the use of, or creation of, deferred borrowing. Deferred borrowing is created when, as a cash and debt management decision, Bonneville uses cash from revenues to liquidate capital obligations in lieu of borrowing from Treasury. This temporary use of cash on hand instead of borrowed funds creates the ability in future years to borrow money, when fiscally prudent. The FY 1989 Energy and Water Development Appropriations Act (P.L. 100-371 Of 7/19/88) confirmed that Bonneville has authority to incur obligations in excess of U.S. Treasury borrowing authority and cash in the BPA fund.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

^{8/} FY 2016 Net Outlays are based on Bonneville's FY 2016 audited actuals. FY 2017 Net Outlays are calculated using Bonneville's revenue forecast from the BP-16 rate case. FYs 2018 & 2019 assume no growth in Offsetting Collections compared to FYs 2016 & 2017. FYs 2020 through 2022 assume a growth in Offsetting Collections based on standard inflation factors.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4A

	Fiscal Year							
	2016				2017			
	Net Capital		Net Bonds		Net Capital		Net Bonds	
	Capital	Subject	Capital	Out-	Capital	Subject	Capital	Out-
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
Start-of-Year: Total	3,388	2,846	4,287	4,574	3,573	3,031	4,472	4,759
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	504	504	504		849	849	849	
Treasury Borrowing (Cash)				504				849
Less:								
BPA Bond Amortization	319	319	319	319	76	76	76	76
Net Increase/(Decrease):	185	185	185	185	773	773	773	773
Cum.-End-of-Year: Total	3,573	3,031	4,472	4,759	4,346	3,804	5,245	5,532
Total Remaining Treasury Borrowing Amount				2,941				2,168
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2018 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2016-2022.

Cumulative advance amortization payments as of the end of FY 2016 are \$4,333 million.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4B

	2018				2019			
	Net Capital		Net Bonds		Net Capital		Net Bonds	
	Net Capital	Obs Subject	Net Capital	Bonds Out-	Net Capital	Obs Subject	Net Capital	Bonds Out-
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
Start-of-Year: Total	4,346	3,804	5,245	5,532	5,116	4,574	6,015	6,302
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	784	784	784		819	819	819	
Treasury Borrowing (Cash)				784				819
Less:								
Total BPA Bond Amortization	14	14	14	14	359	359	359	359
Net Increase/(Decrease):								
Total	770	770	770	770	460	460	460	460
Cum.-End-of-Year: Total	5,116	4,574	6,015	6,302	5,576	5,034	6,475	6,762
Total Remaining Treasury Borrowing Amount				1,398				938
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2018 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2016-2022.

Cumulative advance amortization payments as of the end of FY 2016 are \$4,333 million.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4C

Fiscal Year

	2020				2021			
	Net Capital		Net Capital	Bonds Out-	Net Capital		Net Capital	Bonds Out-
	Net Capital	Obs Subject			Obs	Obs to BA		
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
Start-of-Year: Total	5,576	5,034	6,475	6,762	6,230	5,688	7,129	7,416
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	947	947	947		976	976	976	
Treasury Borrowing (Cash)				947				976
Less:								
Total BPA Bond Amortization	293	293	293	293	326	326	326	326
Net Increase/(Decrease):								
Total	654	654	654	654	650	650	650	650
Cum.-End-of-Year: Total	6,230	5,688	7,129	7,416	6,880	6,338	7,779	8,066
Total Remaining Treasury Borrowing Amount				284				(366)
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2018 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

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Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2016-2022.

Cumulative advance amortization payments as of the end of FY 2016 are \$4,333 million.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4D

	Fiscal Year			
	2022			
	Net Capital Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	6,880	6,338	7,779	8,066
Plus: Annual Increase				
Cum.-Annual Treasury Borrowing	981	981	981	
Treasury Borrowing (Cash)				981
Less:				
Total BPA Bond Amortization	298	298	298	298
Net Increase/(Decrease):				
Total	683	683	683	683
Cum.-End-of-Year: Total	7,563	7,021	8,462	8,749
Total Remaining Treasury Borrowing Amount				(1,049)
Total Legislated Treasury Borrowing Amount				7,700

These notes are an integral part of this table.

In any given year, BPA may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, Treasury interest rates, and other cash management factors. In such cases, BPA accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2018 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2016-2022.

Cumulative advance amortization payments as of the end of FY 2016 are \$4,333 million.

**BONNEVILLE POWER ADMINISTRATION
POTENTIAL THIRD PARTY FINANCING TRANSPARENCY**
(in millions of dollars)

BP-5

	Fiscal Year						
	2016	2017	2018	2019	2020	2021	2022
Transmission Services - Capital							
Main Grid	16	49	5	48	99	104	127
Area & Customer Services	53	101	75	46	42	58	47
Upgrades & Additions	73	70	75	68	52	53	52
System Replacements	134	311	285	296	398	373	371
Projects Funded in Advance	272	42	40	39	36	35	35
Total, Transmission Services - Capital	550	573	480	497	627	622	632

Associated Project Costs - Capital

	2016	2017	2018	2019	2020	2021	2022
Associated Project Costs	187	246	265	288	313	339	346
Projects Funded in Advance ^{1/}	0	0	0	0	0	0	0
Total, Associated Project Costs - Capital	187	246	265	288	313	339	346

Federal and Non-Federal Funding

	2016	2017	2018	2019	2020	2021	2022
Projects Funded in Advance	272	42	40	39	36	35	35
Treasury Borrowing Authority	464	777	704	746	905	926	943

Scenario

	2016	2017	2018	2019	2020	2021	2022
Projects Funded in Advance ^{1/}	0	0	0	0	0	0	0
Third Party Financing	254	265	220	229	296	294	299
Alternate Treasury Borrowing Authority	NA	512	484	517	609	632	644

These notes are an integral part of this table.

^{1/} In this instance, Projects Funded in Advance represents prepayment of Power customers' bills reimbursed by future credits and third party non-federal financing for Conservation initiatives.

The table above shows both the potential use of Treasury borrowing authority for transmission capital projects based on this FY 2018 budget and the use adjusted for potential third-party financing to fund appropriate capital expenditures when feasible in lieu of Treasury borrowing. Estimates included in this FY 2018 budget are uncertain and may change due to revised capital investment plans, changing economic conditions, and an evolving financial market environment. The estimates of third-party financing included in the table show a reduction in the use of Treasury borrowing and do not reflect the actual notional third party financing commitment BPA may enter into in that particular year. The difference of reduction in use of Treasury borrowing and the actual notional third party financing commitment is primarily due to the difference in the timing of financing transactions between Treasury and third-party financing for capital projects with multi-year construction schedules.

Bonneville's Third Party Financing for Transmission Services consists primarily of lease-purchase agreements, which are capitalized obligations that enable BPA to acquire the use of transmission facilities over time. BPA also undertakes the construction and installation of facilities from funds that customers advance to BPA for construction of BPA-owned facilities that assist the customers in obtaining necessary transmission service from BPA. These customers receive monetary payment credits in bills for transmission services from BPA up to the amount of funds advanced to BPA, plus interest.

BPA's historical Third Party Financing amounts may vary over time due to re-assignment of certain lease-purchase agreements to Treasury Financing.

BPA Status of Treasury Borrowing with Potential Third Party Financing & PFIA Scenario

With the potential use of third party financing assumed in the scenario above, BPA's total remaining Treasury Borrowing Amount would be extended to the following amounts. See BP-4 BPA Status of Treasury Borrowing- Current Services.

	Fiscal Year						
	2016	2017	2018	2019	2020	2021	2022
Start-of-Year: Total Bonds Outstanding	4,574	4,759	5,267	5,817	6,048	6,406	6,762
Plus:							
Treasury Borrowing (Cash)	504	849	784	819	947	976	981
Less:							
Potential Third Party Financing & PFIA	NA	265	220	229	296	294	299
BPA Bond Amortization	319	76	14	359	293	326	298
Net Increase/(Decrease) Bonds Outstanding:	185	508	550	231	358	356	384
Cum.-End-of-Year: Total	4,759	5,267	5,817	6,048	6,406	6,762	7,147
Total Remaining Treasury Borrowing Amount	2,941	2,433	1,883	1,652	1,294	938	553
Total Legislated Treasury Borrowing Amount	7,700	7,700	7,700	7,700	7,700	7,700	7,700

U.S. TREASURY PAYMENTS

(in millions of dollars)

	FISCAL YEAR						
	2016	2017	2018	2019	2020	2021	2022
A. INTEREST ON BONDS & APPROPRIATIONS							
Bonneville Bond Interest							
1 Bonneville Bond Interest (net)	99	130	161	197	231	274	305
2 AFUDC ^{1/}	40	47	31	30	30	31	31
Appropriations Interest							
3 Bonneville	14	9	5	0	0	0	0
4 Corps of Engineers ^{2/}	135	85	90	89	91	90	87
5 Lower Snake River Comp. Plan	17	16	4	1	0	0	0
6 Bureau of Reclamation ^{3/}	38	13	12	11	8	7	6
7 Bond Premiums paid/Discounts (not capitalized)		0	0	0	0	0	0
8 Total Bond and Approp. Interest	343	301	303	327	360	402	430
B. ASSOCIATED PROJECT COST							
9 Bureau of Reclamation Irrigation Assistance	60	51	28	57	25	12	14
10 Bureau of Rec. O & M ^{4/}	1	0	0	0	0	0	0
11 Corps of Eng. O & M ^{4/}	0	0	0	0	0	0	0
12 L. Snake River Comp. Plan O & M ^{4/}	0	0	0	0	0	0	0
13 Total Assoc. Project Costs	61	51	28	57	25	12	14
C. CAPITAL TRANSFERS							
Amortization							
14 Bonneville Bonds ^{6/}	319	76	14	359	293	326	298
15 Bureau of Reclamation Appropriations	352	0	22	45	14	11	70
16 Corps of Engineers Appropriations	691	74	70	15	41	56	29
17 Lower Snake River Comp. Plan	0	0	36	12	4	0	1
18 Bonneville Appropriations	75	130	192	72	59	68	100
19 Total Capital Transfers	1,437	280	333	502	410	462	497
D. OTHER PAYMENTS							
20 Unfunded Post-Retirement Liability ^{5/}	34	36	37	38	40	41	43
21 TOTAL TREASURY PAYMENTS	1,875	668	701	924	835	917	985

These notes are an integral part of this table.

- ^{1/} This interest cost is capitalized and included in BPA's Transmission System Development, System Replacements, and Associated Projects Capital programs. AFUDC is financed through the sale of bonds.
- ^{2/} Includes interest on construction funding for Corp of Engineers (Corps) fish bypass facilities at Corps dams in the Columbia River Basin, including Lower Monumental, Ice Harbor, and The Dalles.
- ^{3/} Includes payments paid by Reclamation to the U.S. Treasury on behalf of Bonneville.
- ^{4/} Costs for power O&M is funded directly by Bonneville as follows (in millions):

	FISCAL YEAR	2016	2017	2018	2019	2020	2021	2022
Bureau of Reclamation		133	158	168	166	171	176	182
Corps of Engineers		238	251	257	257	265	273	281
Subtotal Bureau and Corps		371	409	425	423	436	449	462
Lower Snake River Comp. Plan		29	33	33	34	35	35	36
Total		399	442	459	457	470	484	498

- ^{5/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.
- ^{6/} In this FY 2018 budget, BPA "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines BPA bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.
Does not include Treasury bond premiums on refinanced Treasury bonds.

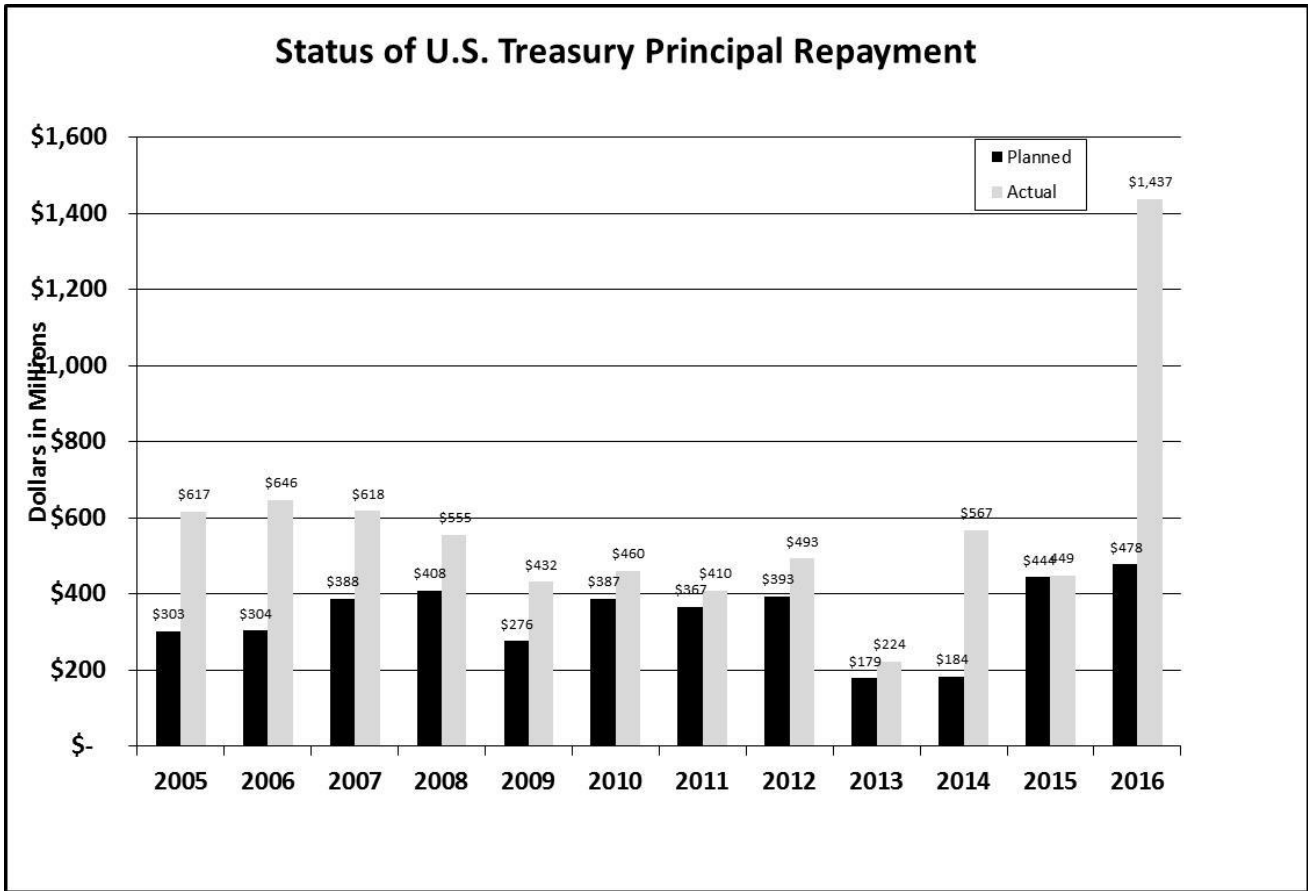


Chart Notes

^{1/} This chart displays principal repayment only.

^{2/} U.S. Treasury payment outyear estimates for planned amortization of principal are based on rate case estimates when available and planned amortization for future rate case periods. These estimates may change due to revised capital investment plans, actual U.S. Treasury borrowing, and advanced amortization payments. Bonneville’s aggregate FY 2016 U.S. Treasury payment was \$1,875 million, comprised of \$1,437 million in principal, which included \$959 million in early retirement of higher interest rate U.S. Treasury debt, \$343 million in interest, and \$96 million for other costs.

^{3/} FYs 2002-2012 payments include portions of future planned amortization amounts consistent with Bonneville's capital strategy plan and the Bonneville /Energy Northwest debt optimization program.

^{4/} Advance amortization due to sale of transmission facilities includes \$12.7 million in FY 2003, \$5.3 million in FY 2006, \$2.0 million in FY 2011, \$0.4 million in FY 2013 and \$0.4 million in FY 2014.

^{5/} The cumulative amount of actual advance amortization payments as of the end of FY 2016 is \$4,333 million.

OBJECT CLASSIFICATION STATEMENT

(in millions of dollars)

ESTIMATES

	2016 act.	2017	2018
11.1 Full-time permanent	288	290	294
11.3 Other than full-time permanent	1	1	1
11.5 Other personnel compensation	51	52	52
11.9 Total personnel compensation	341	343	347
12.1 Civilian personnel benefits	155	157	158
13.0 Benefits for former personnel	-	-	-
21.0 Travel and transportation of persons	15	15	15
22.0 Transportation of things	2	2	2
23.1 Rental payments to GSA	1	1	1
23.2 Rents, other	0	0	0
23.3 Communication, utilities & misc. charges	18	18	18
25.1 Consulting Services	125	126	127
25.2 Other Services	2,261	2,281	2,307
25.5 R & D Contracts	13	11	11
26.0 Supplies and materials	29	29	29
31.0 Equipment	548	552	558
32.0 Lands and structures	253	255	258
41.0 Grants, subsidies, contributions	45	46	46
42.0 Insurance claims and indemnities	36	36	36
43.0 Interest and dividends	265	267	270
99.0 Total obligations	4,107	4,138	4,185

Estimate of Receipts
(in millions of dollars)

	Fiscal Year						
	2016	2017	2018	2019	2020	2021	2022
Reclamation Interest	38	13	12	11	8	7	6
Reclamation Amortization	352	0	22	45	14	11	70
Reclamation O&M	1	0	0	0	0	0	0
Reclamation Irrig. Assist.	60	51	28	57	25	12	14
Revenues Collected by Reclamation Distributed in Treasury Account (credit)	-16	-7	-7	-7	-7	-7	-7
Colville Settlement (credit)	-5	-5	-5	-5	-5	-5	-5
Total 1/ Reclamation Fund	430	53	50	101	34	18	78
Corps O&M							
CSRS	34	36	37	38	40	41	43
Total 2/ Repayments on misc.costs	34	36	37	38	40	41	43

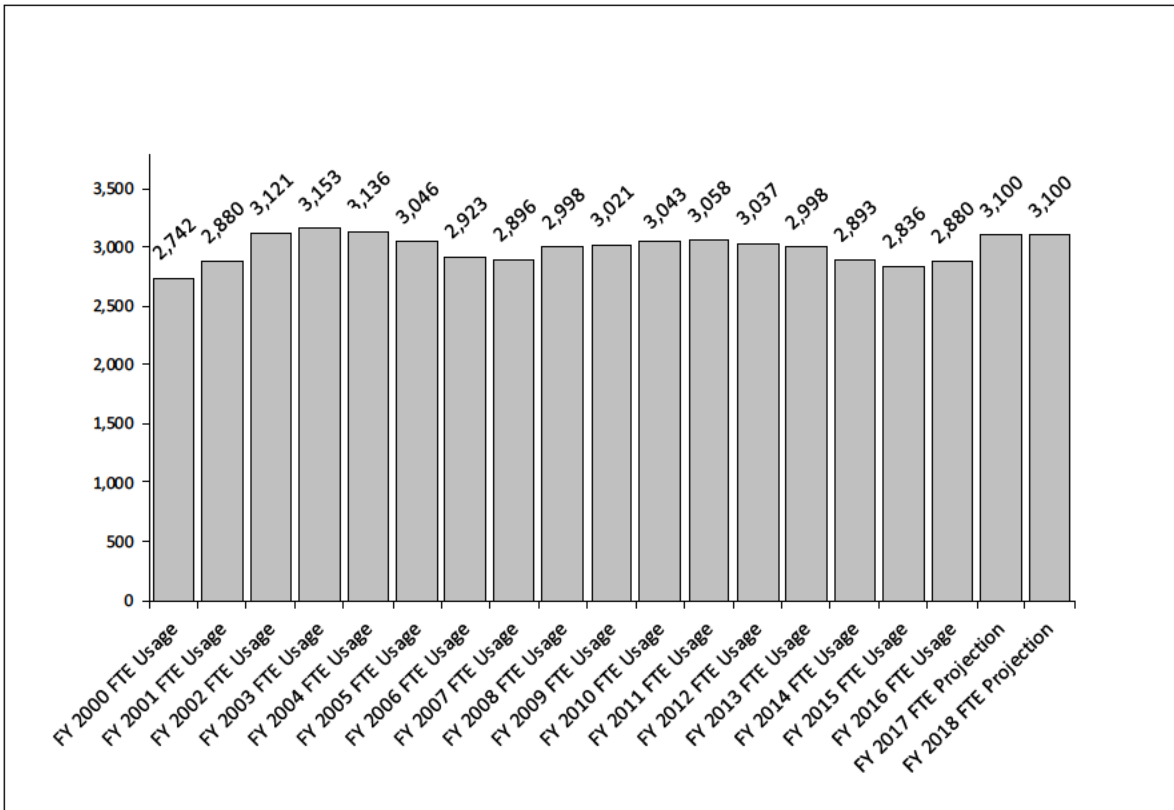
1/ Includes amortization of appropriations and irrigation assistance, and interest costs for Reclamation. The cost of power O&M for Reclamation is no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfer to Account #895000.26

2/ The costs of power O&M for the Corps and Lower Snake Comp. Plan are no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfers to Account #892889, Repayments on misc. recoverable costs, not otherwise classified. Costs for power O&M is funded directly by Bonneville as follows (in millions)

	2016	2017	2018	2019	2020	2021	2022
Bureau of Reclamation	133	158	168	166	171	176	182
Corps of Engineers	238	251	257	257	265	273	281
Lower Snake River Comp. Plan	29	33	33	34	35	35	36
Total	399	442	459	457	470	484	498

See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

BONNEVILLE FTE



Actual FTE data is consistent with DOE personnel reports.

FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing transmission marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.

Total Cost of BPA Fish & Wildlife Actions

COST ELEMENT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
CAPITAL INVESTMENTS ^{1/}										
BPA FISH AND WLDLIFE	35.2	25.5	27.4	40.0	90.2	57.5	52.1	37.4	21.4	16.0
BPA SOFTWARE DEVELOPMENT COSTS	1.0	1.3	0.6	1.2	0.8	0.4	0.0	0.1	1.4	1.2
ASSOCIATED PROJECTS (FEDERAL HYDRO)	60.4	37.3	135.7	56.4	103.0	114.5	103.6	101.7	81.4	34.1
TOTAL CAPITAL INVESTMENTS	96.6	64.2	163.7	97.6	193.9	172.3	155.7	139.2	104.1	51.4
PROGRAM EXPENSES										
BPA DIRECT FISH AND WILDLIFE PROGRAM	139.5	148.9	177.9	199.6	221.1	248.9	239.0	231.8	258.2	258.1
FISH & WILDLIFE SOFTWARE EXPENSE COSTS							0.2	0.3	0.1	0.0
SUPPLEMENTAL MITIGATION PROGRAM EXPENSES ^{2/}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
REIMBURSABLE/DIRECT-FUNDED PROJECTS ^{3/}										
O & M LOWER SNAKE RIVER HATCHERIES	19.3	19.4	20.8	23.3	24.5	22.0	28.7	31.0	30.9	28.6
O & M CORPS OF ENGINEERS	32.9	34.4	34.3	36.5	40.3	41.1	39.2	47.8	46.4	48.2
O & M BUREAU OF RECLAMATION	3.9	4.3	4.5	5.2	5.0	5.3	5.6	6.6	2.6	6.0
NW POWER AND CONSERVATION COUNCIL ALLOCATED @ 50%	4.2	4.1	4.7	4.7	4.5	4.6	5.0	4.9	4.9	5.4
SUBTOTAL (REIMB/DIRECT-FUNDED)	60.3	62.2	64.3	69.7	74.3	73.0	78.5	90.3	84.9	88.2
TOTAL OPERATING EXPENSES	199.7	211.1	242.1	269.3	295.3	321.9	317.0	322.40	343.17	346.34
PROGRAM RELATED FIXED EXPENSES ^{4/}										
INTEREST EXPENSE	76.0	76.9	78.7	80.5	79.2	80.6	89.1	83.4	89.2	85.6
AMORTIZATION EXPENSE	22.9	24.4	24.6	25.0	28.3	30.2	35.7	38.7	41.3	42.5
DEPRECIATION EXPENSE	14.0	14.9	16.7	18.0	19.6	20.7	18.6	19.2	20.1	20.1
TOTAL FIXED EXPENSES	112.9	116.2	120.0	123.5	127.2	131.5	143.4	141.3	150.6	148.2
GRAND TOTAL PROGRAM EXPENSES	312.7	327.3	362.1	392.8	422.5	453.4	461.1	463.7	493.7	494.6
FORGONE REVENUES AND POWER PURCHASES										
FOREGONE REVENUES	282.6	273.5	142.8	99.4	156.7	152.2	135.5	122.7	195.8	76.6
BPA POWER PURCH. FOR FISH ENHANCEMENT	120.7	274.9	240.3	310.1	70.7	38.5	85.8	196.2	67.5	50.3
TOTAL FOREGONE REVENUES AND POWER PURCHASES	403.3	548.5	383.1	409.5	227.4	190.7	221.3	318.9	263.3	126.9
TOTAL PROGRAM EXPENSES, FOREGONE REVENUES, & POWER PURCHASES	716.0	875.8	745.3	802.3	649.9	644.1	682.4	782.6	757.0	621.5
CREDITS										
4(h)(10)(C)	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)	(77.7)	(72.6)
TOTAL CREDITS	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)	(77.7)	(72.6)

1/ Capital investments include both BPA's direct Fish and Wildlife Program capital investments funded by BPA's Treasury borrowing and "Associated Projects" which include capital investments at Corps of Engineers' and Bureau of Reclamation projects funded by appropriations and repaid by BPA. The negative amount in FY 1997 reflects decision to reverse "plant-in-service" investment that was never actually placed into service. The annual expenses associated with these investments are included in "Program-Related Fixed Expenses" below.

2/ Includes High Priority and Action Plan Expenses and other supplemental programs.

3/ "Reimbursable/Direct-Funded Projects" includes the portion of costs BPA pays to or on behalf of other entities that is determined to be for fish and wildlife purposes.

4/ "Fixed Expenses" include depreciation, amortization and interest on investments on the Corps of Engineers' projects and amortization and interest on the investments associated with BPA's direct Fish and Wildlife Program.

Bonneville Power Administration (Bonneville, BPA)
Proposed Appropriations Language

Expenditures from the Bonneville Power Administration Fund, established pursuant to Public Law 93-454, are approved for official reception and representation expenses in an amount not to exceed \$5,000: Provided, that during fiscal year 2019, no new direct loan obligations may be made.

Note. –A full-year 2018 appropriation for this account was not enacted at the time the budget was prepared; therefore, the budget assumes this account is operating under the Continuing Appropriations Act, 2018 (Division D of P.L. 115-56, as amended). The amounts included for 2018 reflect the annualized level provided by the continuing resolution.

Explanation of Changes

The proposed appropriations language restricts new direct loans in FY 2019 as in FY 2018. This bill language is drafted consistent with the Credit Reform Act of 1990.

Please Note - The FY 2019 Bonneville Power Administration Congressional Budget submission includes FY 2018 budget estimates.

Bonneville operates under a business-type budget under the Government Corporation Control Act, 31 U.S.C 9101-10 and on the basis of the self-financing authority provided by the Federal Columbia River Transmission System Act of 1974 (Transmission Act) (Public Law 93-454). Bonneville has authority to borrow from the U.S. Treasury under the Transmission Act, the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Pacific Northwest Power Act) (Public Law 96-501) for acquisition of energy conservation and renewable energy resources, investment in fish facilities, and other purposes, the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), and other legislation. Authority to borrow from the U.S. Treasury is available to Bonneville on a permanent, revolving basis. The principal amount of U.S. Treasury borrowing outstanding at any time may not exceed \$7.70 billion.¹ Bonneville finances its approximate \$4.4 billion annual cost of operations and investments primarily using power and transmission revenues, and proceeds of borrowing from the U.S. Treasury.

This budget has been prepared in accordance with the Statutory Pay-As-You-Go Act (PAYGO) of 2010. Under PAYGO, all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories, which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

¹ The outstanding principal amount of bonds issued by Bonneville to the U.S. Treasury can be found in tables BP-4A – 4D in the Additional Tables section.

Bonneville Power Administration

Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2017 Actuals	2018 Original ^{2/}	2018 Revised ^{2/}	2019 Proposed
Capital Investment Obligations				
Associated Project Costs ^{3/}	206,870	N/A	242,795	264,735
Fish & Wildlife	5,402	N/A	50,532	44,000
Subtotal, Power Services	212,271	N/A	293,327	308,735
Transmission Services	297,019		466,241	489,066
Capital Equipment & Bond Premium	11,328	N/A	28,860	28,860
Total, Capital Obligations ^{3/}	520,618	783,590	788,429	826,661
Expensed and Other Obligations				
Expensed	3,371,458	3,360,901	3,128,229	3,140,939
Projects Funded in Advance	141,470	40,107	42,052	41,125
Total, Obligations	4,033,547	4,184,598	3,958,710	4,008,724
Capital Transfers (cash)	908,712	333,134	183,126	408,637
Bonneville Total	4,942,259	4,517,732	4,141,835	4,417,361
Bonneville Net Outlays	382,042		(27,242)	23,061
Full-time Equivalent (FTEs)	2,891	3,100	3,000	3,000

Public Law Authorizations include:

Bonneville Project Act of 1937, Public Law No. 75-329

Federal Columbia River Transmission System Act of 1974, Public Law No. 93-454

Regional Preference Act of 1964, Public Law No. 88-552

Flood Control Act of 1944, Public Law No. 78-543

Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act), Public Law No. 96-501

Outyear Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2020	2021	2022	2023
Capital Investment Obligations				
Associated Project Costs ^{3/}	313,375	338,652	345,501	352,223
Fish & Wildlife	38,033	33,599	29,047	29,291
Subtotal, Power Services	351,408	372,251	374,548	381,514
Transmission Services	591,313	587,667	597,679	558,149
Capital Equipment & Bond Premium	4,880	16,257	9,267	11,292
Total, Capital Obligations ^{3/}	947,601	976,175	981,494	950,955
Expensed and Other Obligations				
Expensed	3,135,130	3,249,861	3,348,599	3,423,253
Projects Funded in Advance	35,855	34,705	34,645	32,581
Total, Obligations	4,118,585	4,260,740	4,364,738	4,406,790
Capital Transfers (cash)	318,370	351,560	352,048	372,400
Bonneville Total	4,436,955	4,612,300	4,716,786	4,779,189
Bonneville Net Outlays	49,356	105,487	123,468	79,365
Full-time Equivalents (FTEs)	3,000	3,000	3,000	3,000

These notes are an integral part of this table.

- ^{1/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.
- ^{2/} Original estimates reflect Bonneville's FY 2018 Congressional Budget Submission. Revised estimates, consistent with Bonneville's annual near-term funding review process, provide notification to the Administration and Congress of updated capital and expense funding levels for FY 2018.
- ^{3/} Includes infrastructure investments to address the long-term electric power related needs of the Northwest and significant changes affecting Bonneville's power and transmission markets.

Additional Notes

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Cumulative advance amortization payments as of the end of FY 2017 are \$5,130 million.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, continuing restructuring of the electric industry, and other reasons.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

FY 2017 Net Outlays are based on Bonneville's FY 2017 audited actuals. FYs 2018 and 2019 Net Outlays are calculated using Bonneville's revenue forecast from the BP-18 rate case. FYs 2020 and 2021 assume no growth in Offsetting Collections compared to FYs 2018 and 2019. FYs 2022 and 2023 assume a growth in Offsetting Collections based on standard inflation factors.

FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing transmission marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.

Amounts in tables and schedules may not add to totals due to rounding.

Major Outyear Considerations

Bonneville's outyear estimates reflect ongoing efforts to achieve its long-term mission and strategic direction. The outyear estimates are developed with consideration and support of Bonneville's multi-year performance targets that lay out the course for achieving Bonneville's long-term objectives. Outyear capital investment levels support Bonneville's infrastructure program, hydro efficiency program, and its fish and wildlife mitigation projects.

Bonneville continues to incorporate the various aspects of the Energy Policy Act of 2005 related to its business, in particular the energy supply, conservation, and new energy technologies for the future that are highlighted in the legislation.

Overview and Accomplishments

Bonneville provides electric power, transmission, and energy efficiency throughout the Pacific Northwest. Bonneville serves a 300,000 square mile area including Oregon, Washington, Idaho, western Montana, and small parts of eastern Montana, California, Nevada, Utah, and Wyoming with a population of about 13.3 million people. Bonneville markets the electric power produced from 31 federal hydro projects in the Pacific Northwest owned by the U.S. Army Corps of Engineers (Corps) and the U.S. Department of Interior, Bureau of Reclamation (Reclamation)—the hydro projects are known as Associated Projects. Bonneville also markets power acquired from non-federal generating resources, including the power from a nuclear power plant, Columbia Generating Station (CGS). Bonneville uses the power from non-federal and federal projects primarily to meet the needs of its customer utilities. Bonneville currently maintains and operates 15,238 circuit miles of transmission lines, 260 substations, and associated power system control and communications facilities over which this electric power is delivered. Bonneville has capital and similar leases for certain transmission facilities. Bonneville also supports the protection and enhancement of fish and wildlife, and promotes conservation and energy efficiency, as part of its efforts to preserve and balance the economic and environmental benefits of the Federal Columbia River Power System (FCRPS).

The organization of Bonneville's FY 2019 Budget reflects Bonneville's business services basis for utility enterprise activities. Bonneville's two major areas of activity on a consolidated budget and accounting basis are Power Services (PS) and Transmission Services (TS) and include their related administrative costs. PS activities include line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program (REP), Associated Projects Operations & Maintenance (O&M) Costs, and Northwest Power and Conservation Council (Planning Council or Council).

The mission of Bonneville is to create and deliver the best value for its customers and constituents as it acts in concert with others to assure the Pacific Northwest has the following: (1) an adequate, efficient, economical, and reliable power supply; (2) an open access transmission system that is adequate for integrating and transmitting power from federal and non-federal generating units, providing service to Bonneville's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and (3) mitigation of the FCRPS impacts on fish and wildlife. Bonneville is legally obligated to provide cost-based rates and public and regional preference in its marketing of power. Bonneville establishes rates as low as possible consistent with sound business principles and sufficient to ensure the full recovery of all of its costs, including timely repayment of the federal investment in the system. Bonneville's vision is to advance a Northwest power and transmission system that provides high reliability, low rates consistent with sound business principles, responsible environmental stewardship, and accountability to the region, all through a commercially successful business. Bonneville pursues this vision consistent with its four core values of safety, trustworthy stewardship of the FCRPS, collaborative relationships, and operational excellence.

Preserving and Enhancing the FCRPS

The FCRPS is one of the nation's largest nearly carbon-free energy sources and preserving and enhancing the value of the FCRPS for the future continues to be a major Bonneville focus. Bonneville's ongoing prioritization and execution of capital investment in transmission and FCRPS generation assets is the foundation for delivering clean, low cost power to support the communities and economies of the region well into the future.

Bonneville plays a key role in advancing energy efficiency across the region consistent with its statutes, including developing and promoting related technologies, and exploring demand-side management opportunities. Bonneville is making disciplined technology innovation investments and looking to apply new operational and market mechanisms that enhance the reliability, efficiency, and flexibility of system operations.

In addition to these efforts, Bonneville is committed to the quality of the Northwest's natural resources. Bonneville funds one of the largest fish and wildlife programs in the nation and continues to be a national leader on environmental protection and compliance.

Together, all of these efforts contribute to sustaining and advancing the region's resilience.

Program Performance

To validate and verify program performance, Bonneville conducts various internal and external reviews and audits. Bonneville conducts extensive reviews with regional stakeholders of both capital and expense programs. In addition, Bonneville's programmatic activities are subject to review by Congress, the U.S. Government Accountability Office (GAO), the DOE's Inspector General, and other governmental entities. Bonneville's financial statements are audited annually by an independent external auditor. Bonneville has received unqualified audit opinions since the mid-1980s and no material weaknesses have been identified in controls over financial reporting.

Legislative History

The Bonneville Project Act of 1937 provides the original statutory foundation for Bonneville's power marketing responsibilities and authorities. In 1974, passage of the Federal Columbia River Transmission System Act (Transmission Act) applied provisions of the Government Corporation Control Act (31 U.S.C. §§ 9101-9110) to Bonneville. The Transmission Act provides Bonneville with "self-financing" authority, establishes the Bonneville Fund (a permanent, indefinite appropriation) allowing Bonneville to use its revenues from electric power and transmission ratepayers to fund all programs without further appropriation, and first authorizing Bonneville to sell bonds to the U.S. Treasury.

In 1980, enactment of the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) expanded Bonneville's authorities, obligations, and responsibilities. The purpose of the act includes the following: to encourage electric energy conservation to meet regional electric power loads placed on Bonneville; to develop renewable energy resources within the Pacific Northwest; to assure the Northwest an adequate, efficient, economical, and reliable power supply; to promote regional participation and planning; and to protect, mitigate, and enhance the fish and wildlife of the Columbia River and its tributaries. The Northwest Power Act also established the statutory framework for Bonneville's administrative rate-setting process and established judicial review of Bonneville's final decisions in the U.S. Court of Appeals for the Ninth Circuit.

As of the end of FY 2017, Bonneville has revolving U.S. Treasury borrowing authority of \$7.7 billion of which approximately \$2.7 billion remains available to be drawn.

The Columbia River Treaty

The U.S. Government reached consensus on a high level position for negotiations of the post-2024 future of the Columbia River Treaty in June 2015, and received authorization to negotiate with Canada on the Columbia River Treaty in October 2016. Government Affairs Canada notified State Department in December 2017 of Canada's mandate to negotiate the Columbia River Treaty with the United States. Negotiations are expected to begin in January 2018.

Judicial and Regulatory Activity

The Energy Policy Act of 2005 authorized the Federal Energy Regulatory Commission (FERC) to approve and enforce mandatory electric reliability standards with which users, owners, and operators of the bulk power system, including Bonneville, are required to comply. These standards became enforceable on June 18, 2007, and compliance is monitored by the North American Electric Regulatory Corporation (NERC) and the regional reliability organizations.

Fish and Wildlife Program Overview

Bonneville is committed to continue funding its share of the region's efforts to protect and mitigate Columbia River Basin fish and wildlife. To the extent possible, Bonneville is integrating actions to protect species listed for protection under the Endangered Species Act (ESA) in response to the FCRPS Biological Opinions (BiOps), including the National Oceanic and Atmospheric Administration (NOAA) Fisheries Willamette River BiOp and the United States Fish and Wildlife Service's (USFWS) 2006 Libby Dam BiOp, with projects implemented consistent with the Council's Fish and Wildlife Program (Program). The Program, BiOps, and long-term agreements include prioritized strategies for mitigation actions to meet Bonneville's environmental compliance responsibilities under the ESA, Northwest Power Act, and other laws.

Included with the budget schedules section of this document is the current tabulation of Bonneville's fish and wildlife costs from FY 2007 through FY 2017.

Infrastructure Investments

Bonneville is reviewing infrastructure investments in the Pacific Northwest to meet transmission capacity and reliability needs and continues to support a competitive wholesale market in the Western Interconnection, which encompasses 14 western states, two Canadian provinces, and one Mexican state.

Bonneville has completed three major transmission lines since 2011 (i) the McNary-John Day line—completed in FY 2012, under budget and ahead of schedule—adding 79 miles, (ii) the Big Eddy-Knight 500kV transmission line and substation project resumed construction in 2014 and was energized in November 2015, adding 28 miles, and (iii) the Central Ferry-Lower Monumental 500kV Reinforcement which began construction in May 2014 and was also energized in November 2015, adding 38 miles. Bonneville also completed the modernization of the Celilo Converter station at the northern end of the 846-mile Pacific Direct Current Intertie. The station was energized in January 2016, well ahead of schedule and within budget. Additionally, 265 miles of Direct Current line were upgraded to match the capacity of the station upgrade.

In FY 2012, Bonneville signed two agreements to participate with two investor-owned utilities in the environmental work and permitting for another transmission project, the proposed Boardman-to-Hemingway 500kV line. Participation in this preliminary review keeps Bonneville's options open for serving its six southeast Idaho Preference Customers following the expiration of legacy service agreements. Bonneville has not made a decision to co-develop or purchase capacity in these projects. On January 17, 2014, Public Law 113-76 was enacted into law, which provided Bonneville with expenditure authority approval to construct or participate in the construction of a transmission line to southeast Idaho, should Bonneville decide to continue pursuing that service arrangement.

On May 18, 2017, Bonneville announced its decision to not build the I-5 Corridor Reinforcement Project. Bonneville continues to work with constituents and stakeholders to study more cost effective options to mitigate the current limitations along this path. Public meetings began in July 2017 to address alternatives to building. Cumulative capitalized costs associated with this project of \$130.0 million were reclassified in fiscal year 2017 from Construction work in progress to a Regulatory asset on the Combined Balance Sheets, as these costs are expected to be recovered through future rates.

Bonneville is also continuing to evaluate additional transmission investments across the Pacific Northwest to improve reliability and support both load and renewable generation needs.

Bonneville has experienced significant growth within its balancing area in installed variable renewable generation, primarily in the form of wind generation. Since 2001, installed wind generation connected to Bonneville's transmission system has grown from 115 MWs to 5,081 MWs through September 2017. Of the 5,081 MW of connected wind, 4,781 MW is currently in Bonneville's Balancing Authority Area (BAA). This substantial increase in variable renewable generation has resulted in additional uncertainties in the balance between load and generation required for maintaining a reliable grid. Wind is a non-dispatchable source of energy, meaning it cannot be relied upon for capacity. As a result, Bonneville has implemented and continues to study operational tools for integrating this variable generation more cost effectively and reliably. Further complicating matters, 2,408 MW of the wind energy currently in Bonneville's BAA is requesting to join different BAA's. Although this removes variable generation from Bonneville's BAA, these projects are still physically connected to Bonneville's system and continue to impact the daily operations of Bonneville. Off-setting the wind leaving Bonneville's BAA is the possibility that a large amount of utility scale solar photo-voltaic (PV) projects are being added to Bonneville's queue. Bonneville is currently studying approximately 2,000 MW of solar interconnection requests and new requests are coming in at an average rate of one per week. Solar, like wind, is a variable generation source, but its characteristics are different than wind. Bonneville will need to learn and adapt to this new generation type.

Bonneville is considering approaches, in addition to or in lieu of the use of its U.S. Treasury borrowing authority, to sustain funding for its infrastructure investment requirements. These approaches include reserve financing of some amount of transmission investments, or seeking, when feasible, third party financing sources. See the BP-5 Potential Third Party Financing Transparency table in the budget schedules section of this document. This FY 2019 Budget assumes \$15 million of

annual reserve financing in FYs 2018-2023 for transmission infrastructure capital, which is included in this budget under Projects Funded In Advance.

Consistent with the FY 2018 Budget Request, the FY 2019 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville.

Radio Spectrum Communications

Bonneville's wireless communication system is used to operate and control critical national transmission grid infrastructure in a reliable, secure, and safe manner. Bonneville's communication systems are designed to meet strict reliability/availability objectives required by NERC and Western Electricity Coordinating Council (WECC) standards. Concerning proper spectrum stewardship, Bonneville designs highly efficient radio systems that use minimal radio frequency (RF) channel bandwidths to meet critical mission needs. However, in certain circumstances, efficiently designed spectrum radio systems will require broad RF channels and/or lower state RF modulation schemes to meet existing and future requirements in order to meet operational and reliability/availability objectives.

In order to meet Bonneville's mission/operational requirements, RF communication equipment approved for system use goes through a rigorous evaluation and testing process. RF spectrum efficiency factors are considered during the evaluation/testing period. RF terminal equipment approved for use is normally purchased directly from vendors and is not typically supplied through a Request for Proposal process.

Bonneville's operational telecommunications and other capital equipment and systems are acquired using Bonneville's self-financing and procurement authorities. The Bonneville budget includes a system-wide electric reliability performance indicator, consistent with NERC rules, to track and evaluate performance.

Bonneville may share temporarily-available spare capacity on its RF communication system with other government agencies (both Federal and State), and with other electric utilities in the region whose power systems interconnect with Bonneville. Non-critical administrative traffic is typically supported by commercial carrier enterprises. However, to meet NERC/WECC electrical bulk transmission requirements, Bonneville exclusively operates highly critical transmission control traffic over its private telecommunication system as Bonneville has no control over the reliability/availability of the commercial enterprise or on how quickly critical operational control circuits are restored to active service during an interruption.

For high capacity communication system applications, Bonneville considers and operates non-spectrum dependent alternatives such as fiber optic cable infrastructure systems.

During FY 2014, Bonneville began upgrading the Very High Frequency (VHF) land mobile system and installing a number of digital Synchronous Optical Network (SONET) rings typically consisting of fiber segments in combination with point-to-point microwave hops operating in the 4 GHz and 7/8 GHz bands. These various telecommunication systems operate within Bonneville's approximate 300,000 square mile utility responsibility service territory (Oregon, Washington, Idaho, western Montana) with the majority of the RF infrastructure located in low population-rural areas.

The FCRPS hydroelectric projects, owned by the Corps and Reclamation, also utilize federal radio spectrum to preserve very high operational telecommunications and power system reliability.

In FY 2014, Bonneville completed work costing approximately \$40 million, funded through the Spectrum Relocation Fund, to relocate its operational telecommunication systems from the 1710-55 MHz radio spectrum bands to alternative federal radio spectrum bands. In accordance with Federal law, Bonneville plans to return the approximately \$8.2 million of excess funds to the U.S. Treasury, via the Spectrum Relocation Fund, as soon as the National Telecommunications and Information Administration (NTIA) officially notifies the Federal Communications Commission (FCC) that the DOE relocation effort is complete.

Bonneville began participating in a new spectrum relocation effort in FY 2015. The NTIA has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The FCC held an auction of this spectrum on November 13, 2014. Bonneville received an additional \$5.2 million from the Spectrum Relocation Fund on July 29, 2015 to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment. Bonneville received obligational authority to proceed with this relocation effort by apportionment on July 24, 2015.

By the end of FY 2017, Bonneville had accomplished vacating three of four AWS-3 microwave segments/paths. Bonneville expects to relocate the last 1755MHz-1810MHz segment to the 7GHz - GHz band by July 31, 2018---allowing sufficient time for bad weather contingency, burning in the radio and operationally testing the radio to meet continuing high Federal Columbia River Transmission System (FCRTS) operational telecommunications requirements.

Financial Mechanisms

Bonneville's program is treated as mandatory and nondiscretionary. Bonneville is "self-financed" with its own revenues and does not rely on annual appropriations from Congress. Under the Transmission Act, Bonneville funds the expense portion of its budget and repays the federal investment with revenues from electric power and transmission sales. Bonneville's revenues fluctuate for a variety of reasons, including in response to variations in market prices for fuels and stream flow in the Columbia River System due to variations in weather conditions and fish mitigation needs. Through FY 2017, Bonneville has returned approximately \$33.8 billion to the U.S. Treasury, of which about \$3.6 billion was for payment of FCRPS operation and maintenance (O&M) and other costs, \$15.7 billion for interest, and \$14.4 billion for amortization of appropriations and bonds.

In the FY 2019 Budget, the term Bonneville "bonds" refers to the debt instruments under which Bonneville receives advances of funds from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act, which defines "bonds" as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As of September 30, 2017, debt instruments issued by non-federal entities but secured by payment and other financial commitments provided by Bonneville maintained their credit ratings as follows: Moody's at Aa1 with a stable outlook, Fitch at AA with a negative outlook, and Standard & Poor's at AA- with a stable outlook.

Bonneville and the U.S. Treasury have a comprehensive banking arrangement that covers Bonneville's short- and long-term federal borrowings. This provides Bonneville with the ability to borrow from the U.S. Treasury to finance assets and, on a short-term basis, to cover Northwest Power Act-related operating expenses. This latter ability provides Bonneville with much needed liquidity to help manage within-year cash flow needs and mitigate risk. Access to this use of U.S. Treasury borrowing authority has been incorporated into and relied upon in Bonneville's rate-setting process.

Bonneville undertook a Power Prepayment Program in FY 2013 under which all Bonneville preference customers had an opportunity to submit formal offers to provide lump-sum payments to Bonneville as prepayments of a portion of their power purchases through September 30, 2028, the termination date of the Long-Term Regional Dialogue Power Sales Contracts. Bonneville accepted power prepayments from four preference customers, as described below.

Upon Bonneville's receipt of the agreed-to, lump-sum prepayments, the selected preference customers became entitled to future portions of their electricity from Bonneville without further payment. The power prepayments are and will be recognized in the customers' future power bills from Bonneville as fixed, equal monthly prepayment credits. In effect, the amount of electricity that is prepaid may vary by month, depending on Bonneville's power rates and rate schedules that apply to electricity purchases by the prepaying customers in the related month. Because this is structured as a variable amount prepayment and not as a fixed-price/fixed-amount type of prepayment, Bonneville maintains flexibility to establish rates for the electric power that is prepaid.

As a result of the FY 2013 Prepayment solicitation, Bonneville received \$340 million in prepayments, which Bonneville is using to fund needed FCRPS investments. The aggregate prepayment credits are set at \$2.55 million per month through FY 2028.

Depending on a variety of factors it is possible that Bonneville may seek to implement later phases of the Power Prepayment Program in connection with future FCRPS hydroelectric investment needs.

U.S. Treasury Payments and Budget Overview

Bonneville's FY 2017 payment to the U.S. Treasury of \$1,258 million was made on time and in full for the 34th consecutive year. The payment included \$909 million in principal, which included \$778 million in early retirement of higher interest rate U.S. Treasury debt, \$271 million for interest, \$51 million in irrigation assistance payments, and \$28 million in pension and post-retirement benefits. Total credits associated with fish mitigation and recovery and applied toward Bonneville's U.S. Treasury payment were about \$57 million for FY 2017. These credits are established and applied under section 4(h)(10)(C) of the Northwest Power Act. The FYs 2018 and 2019 U.S. Treasury payments are currently estimated at \$514 million and \$781 million, respectively. The FY 2018 and 2019 4(h)(10)(C) credits are estimated to be \$93 million, and \$92 million, respectively.

Estimates of interest and amortization levels for outyear U.S. Treasury payments are included in the FY 2018-2019 final transmission and power rates. Bond and Appropriations Interest will continue to be revised based on upcoming capital investments and debt management actions. These estimates may change due to revised capital investment plans and actual U.S. Treasury borrowing. In recent years, Bonneville has made amortization payments in excess of those scheduled in its FERC-approved rate filings resulting in a balance of advance repayment. The cumulative amount of advance amortization payments as of the end of FY 2017 was about \$5,130 million.

Bonneville has direct funding arrangements to fund the power-related portion of O&M and capital investments at the Corps and Reclamation facilities as well as the O&M costs of the U.S. Fish and Wildlife Service Lower Snake River Compensation Plan facilities. Direct funded Associated Projects capital costs, which had been funded exclusively through appropriations to the Corps and Reclamation prior to the initiation of direct funding, are now paid primarily from the proceeds of bonds issued by Bonneville to the U.S. Treasury. Certain power prepayments have also been a source of proceeds for direct funding. Bonneville's aggregate direct funding provided for capital and O&M was \$591 million in FY 2017.

Starting in FY 2014, Bonneville and Energy Northwest, the Washington state joint operating agency that owns and operates the Columbia Generating Station nuclear plant, have been working together to implement a new phase of integrated debt management for their combined total debt portfolios. The debt service of these portfolios is borne by Bonneville and recovered from Bonneville ratepayers through Bonneville's rates. Energy Northwest-related debt, as refinanced under this effort, is called Regional Cooperation Debt Program. Bonneville currently has Energy Northwest Board approval for these types of transactions through FY 2020.

An important component of Regional Cooperation Debt is the issuance of new bonds by Energy Northwest to refund outstanding bonds shortly before their maturities when substantial principal repayments are due. The maturity extensions result in increased balances in the Bonneville Fund that are used to prepay higher interest rate federal obligations. The increased balances arise because Bonneville's rates are set assuming it would need funds to repay the maturing Energy Northwest bonds; however, when the maturing bonds are repaid with the proceeds of the new refunding bonds (and not from cash in the Bonneville Fund), the resulting 'freed up' balances in the Bonneville Fund become available to fund the early appropriations repayments. The net effect of refunding Regional Cooperation Debt and prepaying higher interest rate federal obligations is that the weighted-average interest rate of Bonneville's overall debt portfolio has been and will be reduced. In addition, Bonneville's aggregate principal balance of debt outstanding (federal and non-federal) does not and will not increase by virtue of the Regional Cooperation Debt program.

Energy Northwest accelerated site restoration efforts for the Energy Northwest Nuclear Projects 1 and 4 in the summer of 2015 and these efforts continue.

This FY 2019 Budget proposes estimated accrued expenditures of \$3,141 million for operating expenses, \$41 million for Projects Funded in Advance (PFIA), \$827 million for capital investments, and \$409 million for capital transfers in FY 2019.

The estimated spending levels in this budget are still subject to change to accommodate competitive dynamics in the region's energy markets, debt management strategies, continuing changes in the electric industry, and other factors.

Current Financial Status

Bonneville is striving to enhance its competitive, cost-effective delivery of utility products and services and the continued delivery of the public benefits of its operations, while ensuring it continues to make its scheduled payments to the U.S. Treasury on time and in full. Bonneville employs a strategic planning process using the balanced scorecard model to align all business units around specific goals and align resources to achieve these goals. Results from these efforts include continued efficiency gains, performance integration improvements, and a high assurance for repayment of both the bonds Bonneville issues to the U.S. Treasury and the appropriated investment in the FCRPS.

Through cost-based rates and attentive cost management efforts, Bonneville has maintained adequate financial reserve levels to assure full recovery of its costs and financial stability while meeting its overall responsibilities to the Pacific Northwest and U.S. taxpayers.

The Final Record of Decision for the FYs 2018-2019 rate case was issued on July 26, 2017. The rates were approved by FERC on an interim basis in late September pending final FERC review. The rates went into effect beginning October 1, 2017.

Budget Estimates and Planning

This FY 2019 Budget includes capital and expense estimates based on final spending proposals from Bonneville's 2016 Capital Investment Review (CIR), Integrated Program Review (IPR) and Integrated Program Review 2 (IPR2) processes. FY 2017 costs are based on Bonneville's FY 2017 audited financial statements. Consistent with the FY 2018 Budget Request, the FY 2019 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville. The FY 2019 budget request also includes a proposal to change BPA's statutory rate structure requirements from cost recovery to a market based structure that takes into consideration rates charged by comparable utilities and which could allow for faster recoupment of the taxpayer investment.

Capital funding levels reflect Bonneville's capital asset management process and external factors such as changes affecting the West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region and national energy security goals.

Capital investment levels in this FY 2019 Budget reflect executive management decisions from Bonneville's Finance Committee and the associated capital review process. Bonneville utilizes a structured capital project selection process requiring submission of a standardized business case for review. Each business case consists of a description of the project, a clear statement of objectives, description and mitigation of risks, and a rigorous analysis of project costs and benefits including a status quo assumption and preferred alternatives. In addition, both annual and end-of-project targets are set for each project covering cost, scope, and schedule. Progress reports on these targets are provided to Bonneville's senior executives at least quarterly.

The FYs 2018-2023 revenue estimates in this budget, included in the Net Outlay formulation, are calculated consistent with cash management goals. The revenue estimates reflect assumed adjustments, which include the use of a combination of tools, including upcoming rate adjustment mechanisms, reduced cost estimates, a net revenue risk adjustment, debt management strategies, and/or short-term financial tools to manage net revenues and cash. The revenue estimates also include depreciation and U.S. Treasury repayment credit assumptions. These U.S. Treasury repayment credits offset, among other things, Bonneville's fish and wildlife program costs allocable to the non-power project purposes of the FCRPS, as provided under section 4(h)(10)(C) of the Northwest Power Act.

Overview of Detailed Justifications

In Bonneville's Detailed Justification Summaries, accrued expenditure is the basis of presenting Bonneville's program funding levels in the power and transmission rate making processes and the basis upon which Bonneville managers control their resources to provide products and services. Accrued expenditures relate period costs to period performance.

Traditional budget obligation requirements for Bonneville's budget are assumed on the Program and Financing Summary Schedule prepared in accordance with Office of Management & Budget Circular A-11.

The organization of Bonneville's FY 2019 Budget and these performance summaries reflect Bonneville's business services basis for utility enterprise activities. Bonneville's major areas of activity on a consolidated budget and accounting basis include power and transmission, with administrative costs included. Power Services includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program, Associated Projects O&M Costs, and the Council. Environmental activities are shown in the relevant Power Services and Transmission Services sections, as are reimbursable costs. Bonneville's interest expense, pension and post-retirement benefits, and capital transfers to the U.S. Treasury are shown by program.

The first section of performance summaries, Capital Investments, includes accrued expenditures for investments in electric utility and general plant associated with the FCRPS generation and transmission services, fish and wildlife, and capital equipment. These capital investments are estimated to require budget obligations and expected use of \$827 million in bonds to be issued and sold to the U.S. Treasury in FY 2019.

The near-term forecast of capital funding levels has undergone an extensive internal review as a result of Bonneville's capital asset management strategy. These capital reviews encompass project cost management initiatives, capital investment assessments, and categorization of capital projects to be funded based on risk and other factors. Consistent with Bonneville's near-term capital funding review process and Bonneville's standard operating budget process, this FY 2019 Budget includes updated capital funding levels for FY 2018. Utilizing this review process helps Bonneville in its efforts as a participant in wholesale energy markets. Bonneville will continue to work with the Corps and Reclamation to optimize the mix of projects.

In addition to its internal management assessment of capital investments, Bonneville has developed and implemented an associated external capital investment review process that provides significant benefits to Bonneville. The combined internal and external processes add value by improving direction in making the FCRPS investments (tying investments more closely to agency strategy) and by improving how those investments are made (more detailed analysis and review of capital investments and their alternatives).

The second section of Bonneville's performance summaries, entitled Annual Operating Expenses, includes accrued expenditures for services and program activities financed by power sales revenues, transmission sales revenues, and projects funded in advance. For FY 2019, budget expense obligations are estimated at \$3,141 million. The total program requirements of all Bonneville programs include estimated budget obligations of \$4,008 million in FY 2019.

Evidence and Analysis in the Budget

Bonneville has undertaken several initiatives and processes to determine appropriate budget expenditures.

Bonneville's Integrated Program Review (IPR) process allows interested parties to see all relevant FCRPS expense and capital spending level estimates in the same forum. In addition, Bonneville's Integrated Program Review (IPR) process allows interested parties to review and comment on Bonneville's draft Asset Strategies and 10-year capital forecasts. The IPR and CIR processes were combined in 2016 and occur every two years, or just prior to each rate case, and provide participants with an opportunity to review and comment on Bonneville's program level estimates prior to spending levels being set for inclusion in rate cases. The 2016 IPR process concluded in the fall of 2016. Bonneville completed a second, targeted IPR (IPR2) process in early 2017 and used that information in preparing Bonneville's final rate proposal for FYs 2018-2019. The next IPR process is slated to begin in 2018 and will focus on FYs 2020-2021.

Bonneville is focused on institutionalizing operational excellence – continuous improvement that produces more efficient and effective ways to deliver on Bonneville's mission and vision. In FY 2015, Bonneville re-focused its continuous improvement efforts to concentrate on seven Key Strategic Initiatives (KSIs). In FY 2017 the Business Transformation Office (BTO) was implemented in order to ensure that Bonneville transformational initiatives, including the KSIs, are executed in the most efficient manner, from a time, cost and resource perspective. Additionally, the BTO will ensure KSI initiatives are

aligned to Bonneville strategy and operating environment and are focused on delivering the value as required by our customers. The BTO will mature foundational capabilities such as portfolio, project, business process management, and organizational change management. The BTO is establishing an Enterprise Architecture capability with the responsibility for developing a disciplined approach to modeling and aligning the organization's business capabilities, processes, information, technology, and resources to business models that support Bonneville's value chain and value system. Enterprise Architecture will bring together business and Information Technology to deliver quality and cost effective solutions for transformational initiatives.

Educational Activities

Bonneville is a supporter of science, technology, engineering, and math (collectively known as "STEM") education programs. These programs provide support and encouragement to middle and high school students to study the sciences in school and to pursue careers in these fields. Working with Bonneville employees as volunteer ambassadors, the Bonneville education program provides value-added presentations, curricula, and activities to K-12 schools that enhance the learning experience for students and teachers, and extend awareness of the value of the region's hydroelectric system to future generations. As a regional leader in STEM education, Bonneville also proudly supports and organizes an award-winning Science Bowl. Bonneville also sponsors Science Fair competitions for students in Washington state, as well as a First Robotics tournament championship.

**Power Services - Capital
Funding Schedule by Activity**

Funding (\$K)

Power Services – Capital

Associated Project Costs

Fish & Wildlife

Total, Power Services – Capital

	FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate	FY 2019 vs FY 2018	
				\$	%
Associated Project Costs	206,870	242,795	264,735	21,940	9.0%
Fish & Wildlife	5,402	50,532	44,000	-6,532	-12.9%
Total, Power Services – Capital	212,271	293,327	308,735	15,408	5.3%

Outyears (\$K)

Power Services – Capital

Associated Project Costs

Fish & Wildlife

Total, Power Services - Capital

	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate
Associated Project Costs	264,735	313,375	338,652	345,501	352,223
Fish & Wildlife	44,000	38,033	33,599	29,047	29,291
Total, Power Services - Capital	308,735	351,408	372,251	374,548	381,514

Program Overview

Associated Project Costs provide for direct funding of additions, improvements, and replacements of existing Reclamation and Corps hydroelectric projects in the Pacific Northwest. The FCRPS hydro projects produce electric power that is marketed by Bonneville.

Maintaining the availability and increasing the efficiency of the FCRPS is critical to ensuring that the region has an adequate, efficient, economic, and reliable power supply. The FCRPS represents about 80 percent of Bonneville's firm power supply and includes 31 operating federal hydroelectric projects with over 200 generating units. These projects have an average age of about 50 years, with some that exceed 60 years of age. Through direct funding and the cooperation of the Corps and Reclamation, Bonneville uses its U.S. Treasury borrowing authority and other sources to make investments needed to restore generation availability and improve efficiency, reducing demand on Corps and Reclamation appropriations for power-related investments.

Since the beginning of direct funding in FY 1997, Bonneville, along with its joint operating partners, the Corps and Reclamation, has improved system performance. In 1999, at the direction of Congress, Bonneville issued a report that it soon began to implement called the "Asset Management Strategy for the FCRPS." In this report, Bonneville concluded that it needed to invest nearly \$1 billion, in aggregate, in the hydroelectric projects over the ensuing 12 to 15 years. Supplementary analyses and experience with the system have revealed additional and ongoing investment needs.

These planned investments, included in the FY 2019 Budget estimates, will maintain the generation performance of the FCRPS. Moving forward with the cost-effective opportunities to expand the generation and to preserve and enhance the capability of the FCRPS is a smart, economic, and environmentally beneficial decision when compared to purchasing power from the market to serve growing Pacific Northwest electricity needs.

Fish and wildlife capital costs incurred by Bonneville are directed at activities that mitigate Columbia River Basin fish and wildlife resources. Bonneville uses capital to fund projects designed to increase juvenile and adult fish passage through the Columbia River system, to increase fish production and survival through construction of hatchery, acclimation and fish monitoring facilities, and to increase wildlife and resident fish populations through land acquisitions. These capital projects support both Northwest Power Act and ESA priorities and are integrated with the Program in order to efficiently meet Bonneville's responsibilities under the Northwest Power Act and other statutes to mitigate federal hydrosystem impacts to Columbia River Basin fish and wildlife.

Bonneville implements projects consistent with the Program and the purposes of the Northwest Power Act. Most projects recommended by the Council undergo independent scientific review as directed by the 1996 Energy and Water Appropriations Act, which added section 4(h)(10)(D) to the Northwest Power Act. As a result, the Council appoints an Independent Scientific Review Panel (ISRP) "to review a sufficient number of projects" proposed to be funded through Bonneville's annual fish and wildlife budget "to adequately ensure that the list of prioritized projects recommended is consistent with the Program." The Northwest Power Act further states that "in making its recommendations to Bonneville, the Planning Council shall consider the impact of ocean conditions on fish and wildlife populations; and shall determine whether the projects employ cost effective measures to achieve program objectives." Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council uses a multi-year project review cycle during which the ISRP reviews categories of projects grouped together.

Under the Northwest Power Act, the Council must develop a Fish and Wildlife Program that protects, mitigates, and enhances Columbia River Basin fish and wildlife affected by the federal and non-federal hydroelectric projects in the basin while assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply. The Program, the FCRPS BiOp, other BiOps, and Bonneville's long-term agreements include prioritized strategies for mitigation actions and projects to meet Bonneville's responsibilities under the Northwest Power Act, the ESA, the Federal Clean Water Act, and other laws. When issues arise that potentially trigger the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, Bonneville works with the Council and the

regional fish and wildlife managers, customers, and tribes, as appropriate, to ensure ratepayers fund only appropriate mitigation.

To comply with the ESA, Bonneville funds capital investment actions to avoid jeopardizing listed species. Guidance for those actions is found in the most recent BiOp issued by NOAA in 2008, as supplemented in 2010 and 2014, and the USFWS BiOp in 2006/2010.

- In February 2006, USFWS issued a BiOp for Libby Dam for the Kootenai River white sturgeon and bull trout. A subsequent Settlement Agreement between USFWS and the Center for Biological Diversity was memorialized by modifying the BiOp in 2008. Additional consultation is occurring as part of the larger USFWS bull trout consultation.
- In 2010 USFWS designated critical habitat for bull trout (following USFWS's issuance in 2000 of a BiOp for FCRPS impacts on bull trout). The Action Agencies (Corps, Reclamation, and Bonneville) are preparing a biological assessment covering FCRPS operational effects on bull trout and designated bull trout critical habitat.
- In May 2008, NOAA issued a FCRPS BiOp for 13 listed species of salmon and steelhead, supplemented in a 2010 Supplemental BiOp that incorporated the Action Agency's Adaptive Management Implementation Plan, and further supplemented in a 2014 Supplemental BiOp. On January 17, 2014, NOAA released its 2014 Supplemental BiOp. In May 2016, the Federal District Court for the District of Oregon invalidated the BiOp on numerous grounds and found that the Corps and Reclamation violated the National Environmental Policy Act (NEPA) when they issued decision documents to implement the BiOp. The court ordered NOAA to complete a new BiOp by December 31, 2018, and ordered the Corps and Reclamation to complete a NEPA process in 2021. Most recently, in an order issued March 27, 2017, the court ordered additional spill beginning in 2018 and continuing through the BiOp remand period.
- In July 2008, USFWS and NOAA issued Willamette River BiOps to address impacts from 13 federal dams on salmon, steelhead, Oregon chub, and bull trout. Implementation of a BiOp measure related to hatchery fish in the McKenzie River was the subject of litigation in Federal District Court. The Action Agencies are currently engaged in discussions with NOAA related to BiOp implementation for downstream passage and for hatchery consultations.

Under these collective BiOps, the Action Agencies have committed to implement hydro, habitat, hatchery, and other actions throughout the Columbia River Basin to address impacts stemming from the operation of the federal hydro-electric dams on ESA-listed fish, and to ensure that operations of the federal dams do not jeopardize the continued existence of the ESA listed species or adversely modify their designated critical habitat.

The Action Agencies also signed the 2008 Columbia Basin Fish Accords (Fish Accords or Accords) with five Northwest Tribes and the states of Idaho and Montana. In 2009, an agreement was signed with the state of Washington and federal agencies (the state of Washington Estuary agreement). And in 2012, the Action Agencies signed an agreement with the Kalispel Tribe of Indians covering Albeni Falls Dam and FCRPS operations. Wildlife settlement agreements have been signed with the states of Oregon and Idaho to help complete mitigation for the flooding and inundation caused by FCRPS dams operating in those states. These Fish Accords and settlements complement the BiOps and provide firm commitments to prioritize mitigation actions and secure funding over the life of the agreements.

As noted above, BiOps, Fish Accords, and wildlife settlement commitments are integrated along with other projects and implemented through the Program under the Northwest Power Act. They provide the basis for the Bonneville Fish and Wildlife Program's planned capital investment.

Accomplishments

- Issued final Record of Decision for the FYs 2018-2019 rate case on July 26, 2017.
- Completed rotor pedestal installation at John Day Dam.
- Completed spillway gate modifications at Albeni Falls Dam.
- Completed powerhouse 2 transformer refurbishment at Bonneville Dam.
- The returns of adult salmon and steelhead to the Columbia River system from 2009 to 2017 vary by species, but many stocks (especially Snake River fall chinook and Snake River sockeye) have returned at the highest numbers in decades. Research shows that survival of juvenile salmon and steelhead migrating down the Snake and Columbia rivers

has improved in recent years and is on track to meet performance standards of 96 percent survival per dam for spring-migrating fish and 93 percent survival for summer migrants.

Explanation of Changes

Bonneville’s budget includes \$308.7 million in FY 2019 for Power Services capital, which is a 5.3 percent increase over the FY 2018 forecasted level. The FY 2019 level reflects a continuing need for investment in the hydroelectric system assets and funding necessary to implement the BiOps, Fish Accords, and other Columbia Basin Fish and Wildlife activities.

The FY 2019 budget increases the levels for Associated Projects (+\$21.9 million) and decreases the level for Fish & Wildlife (-\$6.5 million), relative to FY 2018.

Strategic Management

Bonneville provides electric power while supporting the achievement of its vital responsibilities for fish and wildlife, energy efficiency, renewable resources, and low-cost power in the Pacific Northwest region. Bonneville will continue to implement the following strategies to serve the region:

1. Bonneville coordinates its power operational activities with the Corps, Reclamation, NERC, regional electric reliability councils, its customers, and other stakeholders to provide the most efficient use of federal assets.
2. Ongoing work with the Corps and Reclamation is focused on improving the reliability of the FCRPS, increasing its generation efficiency, and optimizing hydro facility operation.
3. Bonneville is committed to funding efforts to protect listed fish and wildlife species in the Columbia Basin under the ESA and working closely with the Council, regional fisheries managers, and other federal agencies to prioritize and manage projects to mitigate fish and wildlife affected by the FCRPS.
4. Bonneville’s utility customers have been, and continue to be, a critical part of Bonneville’s collaborative efforts to promote and foster the efficient use of energy.
5. Bonneville has assisted with a DOE Wind Power crosscutting initiative to strengthen energy security.

The following external factors present the most significant risk and impact to overall achievement of the strategies listed above:

1. Continually changing regional economic and institutional conditions;
2. Competitive dynamics; and
3. Ongoing changes in the electric industry.

Associated Projects

Overview

Bonneville will work with both the Corps and Reclamation to reach mutual agreement on budgeting and scheduling capital improvement projects that are cost-effective and provide system or site-specific enhancements, increase system reliability, or provide generation efficiencies.

The work is focused on improving the reliability of the FCRPS and on increasing its generation efficiency or capacity through turbine runner replacements, optimizing hydro facility operation, and new unit construction. Also, limited investments may be made in joint-use facilities that are beneficial to both the FCRPS operations and to other Corps and Reclamation project purposes.

Corps of Engineers Projects

(\$K)		
FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
167,830	157,972	122,298

Bonneville Dam:

- FY 2017. Completed powerhouse 2 transformer refurbishment. Continued main unit breaker and station service reconfiguration, and generator step up (GSU) transformer instrumentation. Began powerhouse 2 roof replacement, and fire protection projects for the control room and both oil storage rooms.
- FY 2018. Continue GSU transformer instrumentation and powerhouse 2 roof replacement. Continue main unit breaker and station service reconfiguration, tailrace gantry crane rehabilitation, and fire protection projects. Begin powerhouse 2 tailrace gantry crane rehabilitation.
- FY 2019. Continue GSU transformer instrumentation, powerhouse 2 roof replacement, main unit breaker and station service reconfiguration, tailrace gantry crane rehabilitation and fire protection projects.

John Day Dam:

- FY 2017. Completed rotor pedestal installation. Continued draft tube bulkhead refurbishment, Baldwin Lima Hamilton (BLH) turbine hub upgrades, 500kV disconnect replacement, and station service transformer replacement. Began SQ board (switchgear) replacement, emergency gantry crane replacement and Heating, Ventilating, Air Conditioning (HVAC) system upgrade.
- FY 2018. Complete draft tube bulkhead refurbishment. Continue 500kV disconnect replacement, station service transformer replacement, and HVAC system upgrade, emergency gantry crane replacement and SQ board replacement.
- FY 2019. Complete station service transformer replacements. Continue 500kV disconnect replacement, HVAC system upgrade, emergency gantry crane replacement and SQ board replacement. Begin powerhouse roof replacement.

The Dalles Dam:

- FY 2017. Continued transformer replacements, elevator rehabilitation, SR panel (switchgear) replacement, arc flash hazard reduction, and emergency crane rehabilitation. Began fish unit breaker replacement.
- FY 2018. Complete elevator rehabilitation. Continue transformer replacements, fish unit breaker replacement, SR panel replacement, arc flash hazard reduction and emergency crane rehabilitation.
- FY 2019. Continue transformer replacements, fish unit breaker replacement, SR panel replacement arc flash hazard reduction and emergency crane rehabilitation. Begin control room modernization and fish units runner replacement and generator rewinds.

Willamette Plants:

- FY 2017. Completed Hills Creek turbine runner and generator rewind, Cougar powerhouse and transformer oil water separator, Detroit digital governors replacement and Lost Creek butterfly valves replacement. Continued Foster bridge crane rehabilitation, Cougar digital governors, Hills Creek spillway gate rehabilitation, Detroit spillway gate

rehabilitation and design for electric reliability upgrades at Foster. Continued Generic Data Acquisition and Control System (GDACS) installation and communication system upgrade at all Willamette Valley plants. Began powerhouse roof replacement at Cougar and turbine platform installations at all Willamette Valley plants.

- FY 2018. Complete Hills Creek spillway gate rehabilitation and digital governor replacements at Cougar. Continue Foster bridge crane rehabilitation, Detroit spillway gate rehabilitation, GDACS and turbine platform installations at all Willamette Valley plants, electrical reliability upgrades at Foster, and powerhouse roof replacement at Cougar Dam. Begin main unit breaker and electrical reliability upgrades and begin bridge crane replacement at Green Peter. Begin turbine and generator rehabilitation at Foster and bridge crane replacement at Lost Creek.
- FY 2019. Complete Foster bridge crane rehabilitation. Continue Detroit spillway gate rehabilitation, GDACS installation across the Willamette Valley, powerhouse bridge crane upgrades at Green Peter, electrical reliability upgrades and turbine and generator rehabilitation at Foster, powerhouse roof replacement at Cougar, main unit breaker and electrical reliability upgrades and bridge crane replacement at Green Peter, and bridge crane replacement at Lost Creek. Begin turbine runner replacement and generator rewinds at Green Peter. Begin installation of powerhouse and transformer oil water separators at Lookout Point and main unit breakers and electrical reliability upgrades at Hills Creek. Begin electrical reliability upgrades at Lookout Point.

Albeni Falls Dam:

- FY 2017. Completed spillway gate modifications. Continued station service switchgear replacement. Continued design for transformer replacement.
- FY 2018. Continue station service switchgear replacement. Continue design for transformer replacement.
- FY 2019. Complete station service switchgear replacement. Begin installation of main unit transformers.

Libby Dam:

- FY 2017. Continued powerhouse DC emergency lighting system installation and control console replacement.
- FY 2018. Complete powerhouse DC emergency lighting system installation. Continue control console replacement. Begin intake gantry crane replacement.
- FY 2019. Complete control console replacement. Continue gantry crane replacement.

Chief Joseph Dam:

- FY 2017. Completed utility corridor upgrades, generator cooling system upgrades and units 17-27 exciter replacements. Completed turbine runner replacements and DC and preferred AC upgrade. Began upgrades for station service units and intake and tailrace gantry crane replacements.
- FY 2018. DC and preferred AC upgrade. Continue intake and tailrace gantry crane replacement and upgrades for station service units. Begin generator rewinds.
- FY 2019. Complete intake and tailrace gantry crane replacement. Continue generator rewinds and upgrades for station service units. Begin powerhouse HVAC upgrade.

Dworshak Dam

- FY 2017. Completed digital governor upgrade. Continued exciter replacement, unit 3 stator and cooler replacement, and tailrace crane rehabilitation.
- FY 2018. Complete unit 3 stator and cooler replacement. Continue exciter replacement, and tailrace crane rehabilitation.
- FY 2019. Complete exciter replacement. Continue tailrace crane rehabilitation.

McNary Dam

- FY 2017. Continued turbine design, main unit cooling water strainers replacement, 4160-480V station service rehabilitation, and powerhouse bridge crane skew control. Began drainage system oil water separator.
- FY 2018. Complete powerhouse bridge crane skew control. Continue 4160-480V station service rehabilitation, turbine design and replacement, drainage system oil water separator and main unit cooling water strainers replacement. Begin spillway gates rehabilitation.
- FY 2019. Complete 4160-480V station service rehabilitation, main unit water strainers replacement, and drainage system oil water separator. Continue spillway gate rehabilitation and turbine design and replacement. Purchase 230kV transformer. Begin exciters upgrade.

Ice Harbor Dam

- FY 2017. Continued Units 1-3 turbine runner replacements and stator winding replacements. Began main unit surface air cooler upgrades and station service transformer replacements.
- FY 2018. Continue Units 1-3 turbine runner replacements, stator winding replacements, main unit surface air cooler upgrades, and station service transformer replacements. Begin 115kV disconnect upgrade.
- FY 2019. Complete station service transformer replacements and main unit surface air cooler upgrades. Continue Units 1-3 turbine runner replacements, stator winding replacements, and 115kV disconnect upgrade.

Little Goose Dam

- FY 2017. Continued station service transformers replacement, bridge crane rehabilitation, drainage and unwatering pump replacement, and oil water separator projects.
- FY 2018. Complete station service transformers replacement, bridge crane rehabilitation, and oil water separator project. Continue drainage and unwatering pump replacement.
- FY 2019. Complete drainage and unwatering pump replacement. Begin DC system and LV switchgear upgrade.

Lower Granite Dam

- FY 2017. Completed Unit 1 BLH linkage upgrade, digital governor upgrade and powerhouse HVAC system upgrade. Continued bridge crane rehabilitation.
- FY 2018. Complete bridge crane rehabilitation. Begin isophase bus and housing upgrade, drainage system oil water separator and DC system and LV switchgear upgrade. Purchase spare main unit bearing.
- FY 2019. Complete isophase bus and housing upgrade and drainage system oil water separator. Continue DC system and LV switchgear upgrade.

Lower Monumental Dam

- FY 2017. Completed Unit 1 BLH linkage upgrade and generator rewind, as well as drainage and unwatering pumps replacement. Continued governor replacements. Began breaker replacements.
- FY 2018. Complete breaker replacements. Continue governor replacements.
- FY 2019. Completed governor replacements. Begin drainage system oil water separator installation.

Bureau of Reclamation Projects

(\$K)

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
39,041	84,823	142,437

Grand Coulee Dam

- FY 2017. Continued Units 22 and 23 wicket gate replacements, Supervisory Control and Data Acquisition (SCADA) replacement, G22-24 wear ring replacements, Units 1-18 windings, core, exciter and governor replacements, and compressed air system upgrades. Began Units 11-18 transformer replacements, and firehouse construction.
- FY 2018. Complete Units 22 and 23 wicket gate replacements and firehouse construction. Continue SCADA replacement, Units 11-18 transformer replacements and G22-24 wear ring replacements, Units 1-18 windings, core, exciter and governor replacements, and compressed air system upgrades. Begin crane control upgrades and Third Powerplant roof replacement
- FY 2019. Complete compressed air system upgrades. Continue SCADA replacement, Units 11-18 transformer replacements, G22-24 wear ring replacements, Units 1-18 windings, core, exciter and governor replacements, crane control upgrades and Third Powerplant roof replacement.

Keys Pump Generating Plant

- FY 2017. Completed PG7-PG12 circuit breaker replacement. Continued P5 and P6 impeller and core replacement and rewinds. Continued P1-P6 exciters, relays and unit controls and PG7-12 governors, exciters, relays and unit controls. Continued phase reversal switch replacement.
- FY 2018. Continue P5 and P6 impeller and core replacement and rewinds. Continue P1-P6 exciters, relays and unit controls and PG7-12 governors, exciters, relays and unit controls. Continue phase reversal switch replacement.
- FY 2019. Continue P5 and P6 impeller and core replacement and rewinds. Continue P1-P6 exciters, relays and unit controls and PG7-12 governors, exciters, relays and unit controls. Continue phase reversal switch replacement. Begin KP10B transformer replacement.

Hungry Horse Dam

- FY 2017. Continued SCADA replacement, and main unit transformer fire protection system replacement. Began powerplant crane controls and control room panel revisions.
- FY 2018. Continue powerplant crane controls, SCADA replacement, control room panel revisions, and main unit transformer fire protection system replacement.
- FY 2019. Complete SCADA replacement. Continue powerplant crane controls, control room panel revisions and main unit transformer fire protection system replacement.

Chandler Dam

- FY 2017. No capital projects underway.
- FY 2018. Begin design for Units 1 and 2 generator rewinds.
- FY 2019. Continue design for Units 1 and 2 generator rewinds.

Palisades Dam

- FY 2017. Continued microwave system backbone modernization, turbine runner replacement and switchyard modernization. Began arc flash mitigation.
- FY 2018. Complete turbine runner replacement. Continue microwave system backbone modernization, switchyard modernization, and arc flash mitigation.
- FY 2019. Complete arc flash mitigation, microwave system backbone modernization and switchyard modernization.

Green Springs Dam

- FY 2017. Continued exciter replacement.
- FY 2018. Continue exciter replacement.
- FY 2019. Complete exciter replacement.

Black Canyon Dam

- FY 2017. No capital projects underway.
- FY 2018. Begin switchyard replacement, trash rake system, and Units 1 and 2 upgrades.
- FY 2019. Continue switchyard replacement, trash rake system, and Units 1 and 2 upgrades.

Anderson Ranch Dam

- FY 2017. Completed station service upgrade.
- FY 2018. Begin design for turbine runner replacement.
- FY 2019. Continue Begin design for turbine runner replacement.

Roza Dam

- FY 2017. Continued switchyard rehabilitation and breaker upgrade.
- FY 2018. Continue switchyard rehabilitation and breaker upgrade.
- FY 2019. Continue switchyard rehabilitation and breaker upgrade.

Minidoka Dam

- FY 2017. Continued Units 8 and 9 governor replacements. Continued switchyard modernization, arc flash mitigation, and microwave system backbone modernization.
- FY 2018. Complete Units 8 and 9 governor replacements. Continue switchyard modernization, arc flash mitigation, and microwave system backbone modernization.
- FY 2019. Complete arc flash mitigation. Continue switchyard modernization and microwave system backbone modernization.

**Fish & Wildlife
(\$K)**

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
5,402	50,532	44,000

Overview

Bonneville continues to develop budgets for the suite of fish and wildlife mitigation projects originally adopted in FY 2007 based on recommendations from the Council. Bonneville reaffirmed and expanded many project-specific commitments in subsequent agreements and processes, including BiOps and Fish Accords, and since then, virtually all these projects received independent science review through the Council and its project review processes. Bonneville’s funding decisions embrace many of the management objectives and priorities in the Program and continue to integrate ESA compliance as described in the NOAA Fisheries’ and USFWS’s FCRPS BiOps. Coordination continues among Bonneville, Council, federal resource management agencies, states, tribes, and others to support the projects that satisfy Bonneville’s mitigation responsibilities.

Bonneville intends to continue implementing the kinds of capital projects listed below. These projects are based upon the best available science and are regionally important in that they provide high priority mitigation and protection actions for fish and wildlife populations affected by the construction and operation of the FCRPS dams. Projects and facilities listed below deliver direct on-the-ground benefits to both ESA listed and non-listed fish and wildlife throughout the Columbia River Basin and have been evaluated and coordinated with the Council, state, federal and tribal fish and wildlife resource managers, local governments, watershed and environmental groups, and other interested parties. Specifically, as capital construction projects, hatchery facilities typically go through the Council’s three-step process, which includes development of a Master Plan, environmental compliance, ESA consultation, value engineering analysis, and review by the Independent Science Review Panel.

The three types of fish and wildlife projects that Bonneville capitalizes are as follows:

- 1) Fish passage structures – Structures funded with capital that enhance fish access to habitat in the Columbia River Basin include wells, ladders, screens, pumping, culverts, diversion (irrigation) consolidation, piping to reduce water loss, irrigation efficiencies (drip irrigation), lining of ditches (seepage reduction), removal of objects impeding fish passage or pushup dams, and construction-related habitat restoration.
- 2) Hatchery facility construction – Projects and activities relating to the construction, improvement, and replacement of fish hatcheries, including related satellite facilities (acclimation ponds and collection weirs). This may also include construction-related habitat restoration.
- 3) Land acquisition and stewardship – Land acquisition projects protect, enhance, and maintain instream wetland and riparian habitat and provide credit to Bonneville, such as habitat units (HUs) or acres for wildlife or instream miles for resident fish, to fulfill the legal obligation of Bonneville to mitigate the impacts from construction and operation of the FCRPS.

Fish supplementation, production, and related hatchery facilities that may require capital funds in FY 2019 include the following:

The Consolidated Appropriations Act, 2016 (Public Law 114-113) provided Expenditure Authority for the following projects:

- Shoshone Paiute Trout Hatchery: The Shoshone Paiute Tribes of the Duck Valley Reservation propose that Bonneville fund the purchase and/or construction of a trout hatchery. The Tribes would own and operate the hatchery to produce trout for stocking in reservoirs located on the Duck Valley Reservation. Bonneville would fund the capital expenditure to meet contemporary aquaculture standards and achieve fish production goals. The Tribes believe they can reduce federal reservoir stocking costs—some of which Bonneville pays now on an annual basis.

- Spokane Tribal Hatchery: The Spokane Tribal Hatchery, funded by Bonneville in 1989 as partial mitigation for the impacts of the FCRPS, is owned and operated by the Spokane Tribe of Indians. The facility spawns, incubates, and rears Kokanee salmon and rainbow trout near Wellpinit, WA. In June 2015, the Tribe and Bonneville signed a 20-year agreement renewing commitments to operate and maintain the facility. The renewed agreement also plans to upgrade aging infrastructure, including ground water pumps and rearing containers. Contracting for this work began in FY 2017.

- Snake River Sockeye Weirs: Bonneville funds efforts implemented by the Idaho Department of Fish and Game and the Shoshone Bannock Tribes to rebuild Snake River sockeye throughout their historic range. The combination of substantially increased numbers of returning adults as well as the completion of the Springfield Sockeye Hatchery in 2013 and its associated increased production has created the need for Bonneville to potentially fund the construction, operation, and maintenance of weirs to further sockeye management objectives.

The FY 2014 Omnibus Appropriations Act (Public Law No. 113-76) provided Expenditure Authority for the following projects:

- John Day Reprogramming and Construction: This project is being proposed by the Columbia River Inter-Tribal Fish Commission (CRITFC) under the Accords to work on the balance between upriver and down river salmon hatchery production mitigating for John Day and The Dalles Dams. Final reprogramming facilities and locations are still being analyzed by the Tribes, the Corps, and Bonneville. The project area encompasses the mainstem Columbia River from the base of McNary Dam downstream to The Dalles Dam. Capital dollars for this project will integrate with the Corps funds constructing additions to new or existing FCRPS hatchery facilities to accommodate the reprogramming of hatchery fish.

- Columbia River Basin White Sturgeon Hatchery: This project, proposed by the CRITFC under the Accords, will mitigate for white sturgeon population declines due to consistent poor recruitment upstream of Bonneville Dam. Expected production at a new or existing facility will be 15,000 - 20,000 yearling white sturgeon per year. The final project may include broodstock collection and holding, rearing wild-spawned juveniles, and acclimating juveniles prior to release. The site of the existing Marion Drain sturgeon facilities operated by Yakama Nation has been proposed as a location, near Toppenish, Washington. The project team is working on additional analyses to respond to Council comments and to begin the environmental review process.

- Kelt Reconditioning and Reproductive Success Evaluation Research: CRITFC, under the Accords, is proposing a facility to recondition female steelhead (kelts) after they have spawned. The fish will be held and fed until they have rematured and then be released into the Snake River where they will contribute to the spawning run. The capital portion of the project is expected to be constructed in the Snake River Basin, potentially at Lower Granite Dam. As specified in the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, Bonneville will implement the kelt reconditioning plan to improve the productivity of Snake River basin B-run steelhead populations that are listed for protection under the ESA. NOAA's analysis of Prospective Actions indicates that a combination of transportation, kelt reconditioning, and in-stream passage improvements (e.g., spill-flow modifications) could increase kelt returns enough to increase the number of returning Snake River B-run steelhead spawners to Lower Granite Dam by a target of six percent. The Master Plan for the facility is currently in step 2 of 3 in the amended, shortened Council 3 step process.

Ongoing Projects (Expenditure Authority previously received):

- Crystal Springs Hatchery Facilities: This proposed project is for facilities for rearing and out-planting resident and anadromous fish in central and southern Idaho. The facility would be located near the American Falls Reservoir in Idaho. It may produce Yellowstone cutthroat, a resident fish, and anadromous fish including Snake River spring chinook salmon, Snake River steelhead, and Snake River sockeye. The facility is expected to produce up to one million chinook smolts annually. The facility is sponsored by the Shoshone-Bannock Tribes under their Accord, who are expected to operate and manage the facility once it is complete. Currently the project is delayed due to water issues at the site, and tentative year for a Record of Decision (ROD) signing is expected in FY 2019.

- Redfish Lake Sockeye Salmon program: The Snake River sockeye salmon, an Evolutionarily Significant Unit (ESU), was listed under the Endangered Species Act in 1991 (56 FR 58619). The Snake River Sockeye Salmon Captive Broodstock Program has prevented the extinction of endangered Snake River sockeye salmon. The program has been able to help successfully conserve the genetic resources of the founding population and began producing fish for rebuilding the naturally spawning population in Redfish Lake. The program uses state of the art hatchery facilities and fish husbandry protocols, genetic support, and monitoring and evaluation to continue rebuilding numbers of fish. Currently, the program retains replicate, captive broodstock within multiple facilities (Eagle Fish Hatchery located in Idaho state and Burley Creek Fish Hatchery and Manchester Research Station, both located in Washington state). Eggs produced from these locations are transferred to other facilities (Springfield Fish Hatchery and Burley Creek Fish Hatchery) for release programs. The project continues to expand by increasing the capacity of existing facilities and also by acquiring a new facility under the Idaho Fish Accord. The newly constructed Springfield Fish Hatchery located in Idaho produces additional smolts as called for in the NOAA Fisheries FCRPS BiOp. The expanded smolt releases have already resulted in an increase in the abundance and productivity of the naturally-spawning population. This strategy will greatly increase the likelihood of higher adult returns. Additional expansions include improvements at the Redfish Lake Creek trap and Sawtooth Fish Hatchery weir to hold/trap an increased number of adults to support increased smolt production from Springfield Fish Hatchery. The biological goals are to increase the number of adults spawning naturally in the Sawtooth Valley and transition the captive broodstock to a conventional hatchery production program that uses anadromous adults as broodstock.

- Klickitat Production Expansion: In 2008, the Klickitat River Master Plan was submitted by the Yakama Nation, reviewed by the Independent Science Review Panel, recommended with comments by the Council and approved by Bonneville. The plan's original goals were to protect and increase naturally producing populations of spring chinook and steelhead, localize brood collection of harvest stocks (fall chinook and coho), while protecting the biological integrity and the genetic diversity of indigenous fish stocks in the sub-basin. In 2009, a component of the Master Plan was implemented. Upgrades to Lyle Falls Fishway and Castile Falls Fishway were completed and a new bridge was constructed at Klickitat Hatchery. In July 2009, a new Klickitat Hatchery Complex EIS was initiated to examine options for the development and operation of new production and supplementation facilities, acclimation alternatives and additional upgrades to the existing hatchery facility. The Yakama Nation issued a revised Master Plan, July 2012, providing updates to their fish management plans. Bonneville put the NEPA process on hold while the Yakama Nation refined its proposal in response to site and budgetary limitations and comments on the draft EIS. Since that time, the National Marine Fisheries Service (NMFS) has completed their Mitchell Act EIS and BiOp, helping inform funding authority responsibilities in the subbasin. A new scope of work has been negotiated with the Yakama Nation and a revised Master Plan was submitted to Council in fall 2017, targeting design and construction activities to the expansion of the current spring chinook program only, from 600,000 to 800,000 smolt converting to a wild brood collection program along with general water supply and water abatement upgrades. Bonneville is finalizing plans to cancel the past NEPA process and initiate a new EIS process. Construction will occur after Bonneville issues a ROD and after NMFS, Bonneville and the Yakama Nation sign a three way funding agreement establishing expectations for operations and maintenance funding within the subbasin.

- Hood River Production Facility: This project has been ongoing since the early 1990s. It currently produces 150,000 spring chinook salmon smolts and 50,000 winter steelhead smolts annually. The Powerdale Dam Fish Trap formerly provided the foundation for many of the activities associated with implementation of the Hood River Production Program. These include monitoring escapement, collecting life history characteristics, and broodstock acquisition. PacificCorps' demolition of its Powerdale Dam and the associated fish trapping facility in 2010 necessitated the development of alternative adult broodstock trapping sites. One permanent fish trap on the West Fork of the Hood River was completed in 2013, and a temporary trapping site is operational on the East Fork Hood River. A permanent trap site on the East Fork is currently being evaluated. The Hood River Production Program has four primary goals: 1) re-establish naturally sustaining runs of spring chinook in the Hood River; 2) re-build naturally sustaining runs of winter steelhead in the Hood River; 3) maintain genetic characteristics of Hood River fish populations; and 4) provide fish for sustainable harvest by both sport and tribal fishers.

- Mid-Columbia Coho Restoration: This Yakama Accord project's vision is to re-establish naturally reproducing coho salmon populations in the Wenatchee River and Methow River sub-basins at biologically sustainable levels which provide significant

harvest in most years. This program will construct a facility on the Wenatchee River for holding and spawning broodstock, incubating eggs, and rearing juveniles. Additional semi-natural ponds will also be constructed in the Wenatchee and Methow sub-basins for acclimating smolts prior to their release. The phased approach, including associated facilities, incorporates development of a mid-Columbia hatchery broodstock, local adaptation to tributaries in the Wenatchee and Methow Basins, and habitat restoration that will benefit coho as well as ESA-listed spring chinook, steelhead, and bull trout. Major facility construction is expected to occur over the FYs 2017-2019 timeframe.

- Walla Walla Hatchery: The Walla Walla Hatchery is proposed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) under their Accord. The Tribes would own and operate the hatchery, which will produce up to 500,000 spring chinook smolts annually for release into the Walla Walla River. A 30 percent design was completed in June 2015, however due to budget overruns, the project has been on hold. A draft EIS was completed in September 2016. The design and construction of the expanded hatchery has successfully been rebid with construction expected to commence in summer 2018. The facility will hold, spawn, incubate and rear spring chinook on the South Fork Walla Walla River near Milton-Freewater, Oregon.

- Yakima Coho Facility: This hatchery is proposed by the Confederated Tribes and Bands of the Yakama Nation under the Yakama Nation Accord, and is presented in the Yakima River Subbasin Summer and Fall Run Chinook and Coho Salmon Hatchery Master Plan. The Yakama Nation would own and operate the hatchery which will produce up to 700,000 coho smolts using broodstock collected at Roza and Sunnyside dams. Bonneville holds the design and construction contract on behalf of the Yakama Nation. The 50 percent design is complete and the 90 percent design is undergoing internal review. Bonneville published a draft EIS on March 17, 2017, and published a final EIS in October 2017 and will issue a Record of Decision once water rights are secured, estimated by Tribe to be in February or March 2018. If approved, construction would likely begin in spring 2018.

Potential non-construction capital Wildlife and Resident Fish Habitat Acquisitions (including Conservation Easements) eligible for capitalization are:

- Albeni Falls Wildlife Mitigation
- Willamette Wildlife Habitat Acquisitions
- Libby and Hungry Horse Reservoirs Resident Fish Acquisitions
- Southern Idaho Habitat Acquisitions

Activities and Explanation of Changes

FY 2018 Estimate	FY 2019 Estimate	Explanation of Changes FY 2019 vs FY 2018 Estimate
Power Services – Capital \$293,327,000	\$308,735,000	+\$15,408,000/+5.3%
Associated Projects \$242,795,000 Milestones ¹ : <ul style="list-style-type: none"> • Complete unit 3 stator and cooler replacement at Dworshak. • Complete elevator rehabilitation at The Dalles. • Complete draft tube bulkhead refurbishment at John Day. • Complete turbine runner replacement at Palisades. 	\$264,735,000 Milestones: <ul style="list-style-type: none"> • Complete compressed air system upgrades at Grand Coulee. • Complete SCADA replacement at Hungry Horse. • Complete arc flash mitigation at Minidoka. • Complete exciter replacement at Green Springs. • Complete station service switchgear replacement at Albeni Falls. 	+\$21,940,000/+9.0% <ul style="list-style-type: none"> • The increase reflects a reshaping of funding needs for investment in the hydroelectric system assets.
Fish & Wildlife \$50,532,000 Milestones: <ul style="list-style-type: none"> • Continue implementation of the Program, BiOps and Fish Accords. 	\$44,000,000 Milestones: <ul style="list-style-type: none"> • Continue implementation of the Program, BiOps and Fish Accords. 	\$-6,532,000/-12.9% <ul style="list-style-type: none"> • Small decrease but will continue long-term, planned effort to reshape funding necessary to implement the BiOps, Fish Accords, Columbia River Basin Fish and Wildlife activities.

¹ FY 2018 milestones have been updated from the FY 2018 Congressional submission due to updated forecasts.

**Transmission Services – Capital
Funding Schedule by Activity
Funding (\$K)**

	FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate	FY 2019 vs FY 2018	
				\$	%
Transmission Services – Capital					
Main Grid	11,815	2,804	39,968	37,165	1325.6%
Area & Customer Services	30,528	76,389	47,871	-28,518	-37.3%
Upgrades & Additions	44,587	76,290	71,708	-4,582	-6.0%
System Replacements	210,088	310,759	329,519	18,760	6.0%
Projects Funded in Advance	141,470	42,052	41,125	-927	-2.2%
Total, Transmission Services - Capital	438,489	508,293	530,191	21,897	4.3%

Outyears (\$K)

	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate
Transmission Services - Capital					
Main Grid	39,968	89,710	97,447	119,643	63,329
Area & Customer Services	47,871	40,932	56,420	46,479	47,463
Upgrades & Additions	71,708	51,177	51,678	50,985	46,166
System Replacements	329,519	409,493	382,122	380,572	401,191
Projects Funded in Advance	41,125	35,855	34,705	34,645	32,581
Total, Transmission Services - Capital	530,191	627,167	622,371	632,324	590,730

Transmission Services – Capital

Overview

Transmission Services (TS) is responsible for about 75 percent of the Pacific Northwest’s high-voltage transmission. TS provides funding for all additions and upgrades (Expansion Investments), and replacements (Sustain Investments) to the Bonneville transmission system, resulting in reliable service to northwest generators and transmission customers. The Bonneville transmission system also facilitates the sale and exchange of power to and from the region. The TS Capital Program is structured with a balanced focus on Expansion and Sustain investments.

In addition to replacing aging and obsolete equipment, TS continues to make significant infrastructure improvements and additions to the system to assure reliable transmission in the Northwest. These improvements and additions will help the Bonneville transmission system continue to comply with national reliability standards and remove constraints that limit economic trade or the ability to maintain the system. Many of the proposed TS projects will be funded through Bonneville lease-purchase agreements. The lease-purchases obligate Bonneville to make expenditures to acquire the use of the related facilities and are identified on an as needed basis. Bonneville may also make related expenditures to facilitate lease-purchase opportunities. Consistent with the FY 2018 Budget Request, the FY 2019 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville.

Expansion Investments

Expansion investments continue to make significant infrastructure improvements and additions to the Bonneville transmission system to assure reliable transmission operations in the Northwest and fall into two categories:

- Internally driven Expansion requests, which are derived from system engineering studies, technology innovation research, system operations and maintenance functions, and system event analysis.
- Externally driven Expansion Investment requests, which are derived from governmental initiatives and regulations, consumer demand, and the integration of customer load service and generation needs.

These investments are categorized into:

1. Main Grid – System investments affecting the major interties or internal paths and flowgates that transfer bulk power across the system.
2. Area & Customer Service – System investments related to geographical load service areas.
3. Upgrades & Additions – Upgrades are system investments that replace existing assets to increase capacity, reliability, or functionality and Additions are net new assets added to the system.
4. Projects Funded in Advance – System investments that are requested, and funded in advance, by customers.

Congressionally-approved Production Tax Credits (PTC) for renewable energy enacted in 2005 were extended through 2016. The PTC begins to phase out after 2018. The incentives created by these credits, along with Renewable Portfolio Standards (RPS) mandates implemented by the states of Oregon, Washington, and California, have spurred a large number of renewable interconnection requests to the Bonneville transmission grid. As of September 2017, Bonneville has interconnected a total of 5,265 MW of renewable qualified generation. Bonneville has more than 9,000 MW in additional renewable (wind, solar, biomass, geothermal, etc.) interconnection requests still remaining in the study queue. Solar interconnection requests are currently making up the majority of the new requests in Bonneville’s queue. The current projections are possibly 8,500 of renewable generation interconnected MW by 2025. Much of the remaining generation demand is the result of the Renewable Portfolio Standards enacted by Oregon and Washington that require utilities to acquire more than 8,000 MW of renewable energy in the Northwest by 2025. Exports to California are limited now by California laws and are expected to remain at 2,000 MW to 2,500 MW during the same period. Also in the interconnection queue is approximately 800 MW of natural gas fired generation. Efficiency improvements to the FCRPS hydro units that qualify as renewable are also proposed between 2017 and 2023.

In June 2008, Bonneville’s first Network Open Season (NOS) received 153 requests from 28 customers for 6,410 MW of new service, about three-fourths for wind energy integration. Bonneville subsequently offered 1,782 MW of new transmission service on its existing system. Bonneville identified four new Main Grid capital projects from the 2008 NOS: (1) McNary-John Day 500 kV transmission line (part of West of McNary Reinforcements Group 1); (2) Big Eddy-Knight 500 kV transmission line and substation (part of West of McNary Reinforcements Group 2); (3) Central Ferry- Lower Monumental

500 kV Reinforcement (formerly Little Goose Area Reinforcement); and (4) I-5 Corridor 500 kV Reinforcement. Construction of the McNary-John Day 500 kV transmission line is complete and Bonneville has completed construction of the Big Eddy-Knight project and the Central Ferry-Lower Monumental 500 kV Reinforcement project. On May 18, 2017, Bonneville announced its decision to not build the I-5 Corridor Reinforcement Project. Bonneville continues to work with constituents and stakeholders to study more cost effective options to mitigate the current limitations along this path. Public meetings began in July 2017 to address alternatives to building.

Bonneville's 2009, 2010, 2013, and 2016 study processes for new Transmission Service Requests (TSR) total 11,027 MW, including 5,240 MW of wind project interconnection and 240 MW of solar project interconnection. The 2010 study process identified the Montana to Washington project, for which environmental review was begun, however, the requests to support this project have been subsequently withdrawn and so all work on the project was terminated. The 2016 study process re-identified the Montana to Washington and Garrison to Ashe projects to move new wind generation in Montana to the Northwest. The 2013 study process identified upgrades to the Monroe-Novelt Hill 230-kV transmission line which were re-identified for additional new requests in the 2016 study process. The 2016 study process also identified network upgrades in Central Oregon, Walla Walla and across the Raver-Paul flowgate. Efforts are currently underway to evaluate the financial impacts and move forward with required agreements and processes within the TSR Study and Expansion Process (TSEP).

Sustain Investments

Sustain investments are made to maintain the health of the existing infrastructure to assure reliable transmission in the Northwest. These replacements enable continued compliance with national reliability standards, replace aging and obsolete equipment, and remove constraints that limit economic trade or the ability to maintain the transmission system.

In 2009, TS began implementing best practice frameworks that provide a standardized structure and approach to Asset Management. As a result, TS's Asset Management Strategies, derived from Agency Strategies, drive Bonneville's Asset Plans, which determine its capital and expense investment priorities. Sustain investments are forecasted, prioritized within asset programs, and optimized across the asset base for asset planning and approval. We now bundle both sustain and expand capital projects in an effort to improve executability and lower risks and costs. TS's capital program is still fluid and subject to changes as the complexity of the transmission system produces unexpected needs resulting from equipment failure, climate/weather incidents, changes in performance and/or operation of connected systems, outage schedules and conflicts, updated regulations, customer interconnection requests, etc. For these and other reasons, specificity with Sustain investments in the transmission system is somewhat limited.

The TS Sustain Program Asset Programs include:

1. Steel Lines – Transmission lines with steel structures including footings, insulators assemblies, vibration dampers, grounding systems, conductor, ground wire.
2. Wood Lines – Transmission lines with wood structures including cross arm systems, insulator assemblies, vibration dampers, grounding systems, conductor, ground wire.
3. Rights-of-Way – Real property including land parcels, easements, use right, access roads.
4. AC Substations – Substations managing AC current including transformers, reactors, shunt capacitors, power circuit breakers, circuit switchers, series capacitors, disconnect switches.
5. Power System Controls and System Telecommunications – Control and communication equipment including SCADA, transfer trips, fiber, communications, SONET, Telephone, RAS.
6. System Protection and Control – Control equipment including relays, Control Houses, meters.
7. DC Substations – Celilo DC converter station, Static VAR Compensators, DC control systems.
8. Control Centers – Various control equipment and software.
9. Tools and Equipment Acquisition Program (TEAP) –Tools, equipment, fleet.
10. Facilities – Non-electric facilities including warehouses, operational structures, hanger, maintenance centers.
11. Aircraft – Fixed wing and rotary aircraft.

Notwithstanding that the capital program for TS is subject to change, Bonneville has identified several general areas where capital program investment will occur.

Bonneville will continue to fund fiber optic communications facilities needed to meet Bonneville's projected operational needs. To the extent that these investments create temporary periods of excess fiber optic capacity, such dark fiber capacity can be made available to telecommunications providers and to non-profits to meet public benefit internet access needs for rural areas and other needs in Bonneville's service area. Bonneville's investments in fiber optics, including the role of the private sector in building fiber optic networks, is consistent with the "Fiber Optic Cable Plan" submitted to Congress on May 24, 2000, accompanying the FY 2000 Energy and Water Development Appropriations Act. In accordance with this plan, when possible, Bonneville will establish partnerships with fiber optic facility and service providers to meet its needs.

In December 2004, Congress passed and the President signed the Commercial Spectrum Enhancement Act (CSEA, Title II of P.L. 108-494), creating the Spectrum Relocation Fund (SRF) to streamline the relocation of federal systems from certain spectrum bands to accommodate commercial use by facilitating reimbursement to affected agencies of relocation costs. The Federal Communications Commission has auctioned licenses for reallocated federal spectrum, which will facilitate the provision of Advanced Wireless Services to consumers. Funds were made available to agencies in FY 2007 for relocation of communications systems operating on the affected spectrum. These funds are mandatory and will remain available until expended, and agencies will return to the SRF any amounts received in excess of actual relocation costs. The estimated Bonneville cost of this relocation was \$48.7 million. The project was completed in November 2013 with a cost of approximately \$40 million and the operational system performance was being observed during FY 2014 and early FY 2015 to determine that it has achieved comparable capability as defined under the CSEA. Bonneville determined in December 2014 that comparable capability had been achieved.

Bonneville began participating in a new spectrum relocation effort in FY 2015. The NTIA has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The FCC held an auction of this spectrum on November 13, 2014. Bonneville received an additional \$5.2 million from the Spectrum Relocation Fund on July 29, 2015, to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment.

As part of the Homeland Security Presidential Directives, Bonneville has completed a physical security assessment of all critical facilities and is implementing security enhancements at these facilities. These security enhancements increase controlled access to Bonneville's facilities and provide video surveillance and monitoring capabilities.

Accomplishments

- Issued final Record of Decision for the FYs 2018-2019 rate case on July 26, 2017.
- Integrated 5,081 MW of wind through September 2017 on Bonneville's transmission system.
- Completed construction of the Alvey Substation Reactors.
- Completed construction of the McNary Substation 500/230 kV Bank Addition.
- Completed construction of the Bell-Boundary #DC SONET Ring Upgrade.

Explanation of Changes

Bonneville's budget includes \$530.1 million in FY 2019 for TS Capital which is a 4.3 percent increase from the FY 2018 forecasted level. The increase reflects increased investment in Main Grid and Systems Replacements.

The FY 2019 budget increases the levels for Main Grid (+\$37.2 million) and System Replacements (+\$18.8 million). The budget decreases levels for Area & Customer Services (-\$28.5 million) Upgrades & Additions (-\$4.6 million) and PFIA (-\$0.9 million).

Strategic Management

Bonneville provides transmission and energy services while integrating renewable resources in the Pacific Northwest. Bonneville will continue to implement the following strategies to serve the region:

1. To improve system adequacy, reliability, and availability, Bonneville has embarked on major transmission infrastructure projects. The projects reinforce the region's transmission system and help deliver the region's future power needs. These projects address multiple challenges, such as integration of renewable energy, the need to relieve a number of congested transmission paths, the challenge to keep up with growing energy demands, and the need to meet changing regulatory and customer requirements.
2. Open access policy in support of competitive markets for load and generation.
3. The replacement of aging assets is vital to the reliability of the existing transmission system. To that end, TS has developed specific long-term strategies for the following asset categories:
 - a. Substations AC
 - b. Power System Control/System Telecommunications
 - c. Wood Lines
 - d. Steel Lines
 - e. Rights of Way (ROW), (Land Rights, Access Roads, and Vegetation Management)
 - f. System Protection and Control
 - g. Control Centers
 - h. Non-Electric Facilities

The following external factors present the strongest impact to overall achievement of the program's strategic goal:

- Continually changing economic and institutional conditions
- Competitive dynamics
- Ongoing changes in the electric industry
- Siting issues

Main Grid (\$K)		
FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
11,815	2,804	39,968

Overview

Bonneville’s strategic objectives for Main Grid projects are to assure compliance with the NERC and Western Electricity Coordinating Council (WECC) reliability criteria, provide voltage support, provide a reliable transmission system for open access, and provide for relief of transmission system congestion. During this budgeting period, projects are planned that will provide transmission reinforcement and voltage support to major load areas that are primarily west of the Cascade Mountains.

Continued investments in Main Grid assets include:

I-5 Corridor Reinforcement

- FY 2017. Completed NEPA work. On May 18, 2017, Bonneville announced that it will not build this project.

Big Eddy-Knight (West of McNary Reinforcements Group 2)

- FY 2017. Completed fiber addition.

Monroe Line Re-termination

- FY 2017. Completed design and began construction.
- FY 2018. Continue construction.
- FY 2019. Complete construction.

Continue Planning Studies to: (all years)

- Identify infrastructure additions.
- Identify projects driven by NERC and WECC reliability criteria.
- Identify system reactive needs to mitigate unacceptable low or high voltage problems and other system additions.
- Relieve transmission system congestion and integrate new generation facilities.

Area & Customer Service

(\$K)

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
30,528	76,389	47,871

Overview

Bonneville’s strategic objective for Area and Customer Service projects is to assure that Bonneville meets reliability standards and contractual obligations to its load service areas.

Continued investments in Area & Customer Service assets include:

Hooper Springs Substation

- FY 2017. Continued construction.
- FY 2018. Continue construction.
- FY 2019. Continue construction.

Midway-Grandview 115 kV Line upgrade

- FY 2017. Continued construction.
- FY 2018. Complete construction.

Puget Sound Area Northern Intertie (PSANI)

- FY 2017. Continued construction.
- FY 2018. Continue construction.
- FY 2019. Complete construction.

Alvey Substation Reactors

- FY 2017. Completed construction.

McNary Substation 500/230 kV Bank Addition

- FY 2017. Completed construction.

Paul Substation 500 kV Shunt Reactor Addition

- FY 2017. Continued construction.
- FY 2018. Complete construction.

Big Eddy Breaker Additions

- FY 2018. Begin design.
- FY 2019. Begin construction.

Drummond 115kV Breaker Additions

- FY 2017. Completed design and began construction.
- FY 2018. Complete construction.

Midway–Ashe Double Circuit 230kV Line

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Complete construction.

Carlton Substation Upgrade

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Complete construction.

Conkelley Substation Retirement

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.

Continuous Activities (all years)

- Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for Bonneville's service area.

**Upgrades & Additions
(\$K)**

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
44,587	76,290	71,708

Overview

Bonneville’s strategic objectives for Upgrades and Additions are to replace older 60 Hz (Hertz) communications and controls with newer technology including fiber optics in order to maintain or enhance the capabilities of the transmission system; to implement special remedial action control schemes to accommodate new generation and mitigate immediate operational and market constrained paths; and to support communications and remedial action schemes, among other proposals.

During this budget period, Bonneville will complete design, material acquisition, construction, and activation of several fiber optics facilities to provide bandwidth capacity and high-speed data transfers to eventually replace microwave analog radios, which are technologically obsolete and nearing the end of their useful life. Temporarily, in some areas, excess dark fiber capacity is being offered for a term to telecommunications providers or to public entities such as public utilities, schools, libraries, and hospitals, providing them access to high-speed telecommunication services as a public benefit.

Continued investments in Upgrades & Additions assets include:

VHF Radio System Upgrade

- FY 2017. Continued construction.
- FY 2018. Continue construction.
- FY 2019. Continue construction.

Synchrophasor Project

- FY 2017. Continued construction.
- FY 2018. Complete construction.

Bell-Boundary #DC SONET Ring Upgrade

- FY 2017. Completed construction.

Operational Megabit Ethernet (OMET) System

- FY 2017. Continued construction.
- FY 2018. Continue construction.
- FY 2019. Complete construction.

500 kV Spares at Wind Integration Substations

- FY 2017. Continued construction.
- FY 2018. Continue construction.
- FY 2019. Complete construction.

Continuous Activities (all years)

- Upgrading two miles of fiber between Bonneville Power House and Bonneville Control House.
- Planning, design, material acquisition, and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths.
- Planning, design, material acquisition, and construction of various system additions and upgrades necessary to maintain a reliable system for Bonneville’s service area.
- Construction of secondary fiber related projects and digital radio system upgrades to improve the operational telecommunication system.
- Material procurement and construction to upgrade the main fiber optic backbone system (#KC and #NC systems).

**System Replacements
(\$K)**

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
210,088	310,759	329,519

Overview

Bonneville’s strategic objectives for the Sustain Program are to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: (1) replacing high voltage transformers and power circuit breakers which are at or near the end of their useful life; (2) replacing risky, outdated and obsolete control and communications equipment and systems, including mandated replacements due to legislation; and (3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system. Transmission Services uses a total economic cost model to determine priorities for replacement.

Continued investments in System Replacements assets include:

Continuous Activity (all years)

Non-Electric Replacements

- Continue non-electric replacements as necessary.
- Continue the design, material acquisition, and construction for the Access Road program capital component and the Land Rights program capital component in support of the Lines and ROW Programs.
- Continue design and construction of capital improvements for identified existing facilities.
- Continue replacement of tools, equipment, vehicle fleet, fixed wing aircraft, and rotary aircraft infrastructure.
 - Specific investments include the acquisition of four replacement aircraft (two fixed wing and two rotary wing) during FY 2018 and FY 2019 to replace aging assets, utilizing General Services Administration exchange sale authority, and to comply with new Federal Aviation Administration regulations. Two additional rotary aircraft will be replaced in FY 2020.

Electric Replacements

- Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. Such replacements include relays, annunciators, oscillographs, metering, and various types of communication related equipment replacing and migrating analog to digital technology and SCADA equipment.
- Continue replacement of under-rated and high maintenance substation equipment.
- Continue replacing insulators and refurbishing foundations on 500 kV Lines.
- Continue replacement of older generations of digital equipment that is obsolete.
- Continue replacing critical, operational tools and business systems at the Dittmer and Munro Control Centers.
- Continue replacing deteriorating wood pole transmission line structures, spacer dampers, and insulators.

**Projects Funded in Advance
(\$K)**

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
141,470	42,052	41,125

Overview

This category includes those facilities and/or equipment where Bonneville retains control or ownership but which are funded or financed by a third party or with reserves, either in total or in part.

Continued investments in PFIA assets include:

Umatilla Electrical Cooperative - Phase 2

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Complete construction.

Summit Ridge Wind Project

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Complete construction.

Bakeoven Wind Project

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.

Quennett Creek Load Service Project

- FY 2017. Began and completed design and began construction.
- FY 2018. Complete construction.

PacifiCorps' Ponderosa Project

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.

Midway Ashe Line Project

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Complete construction.

Avangrid Montague 1 Wind Project

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.

Invenergy's Heppner Wind Project

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.

Morrow Solar Project

- FY 2017. Began design.
- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.

Willow Creek Fiber Addition Project

- FY 2018. Begin design.
- FY 2019. Complete design and begin construction.

2 Morrow Energy LLC's Ella 3 Wind Project

- FY 2019. Begin design.

Whistling Ridge 230 kV Ring Bus Project

- FY 2019. Begin design.

Continuous Activity (all years)

- Continue to integrate various new generation and line/load projects into Bonneville transmission grid based on requests placed and processed in accordance with transmission tariff.
- Continue planning studies to identify system impacts and needs regarding proposed new generation projects.
- Engineer and begin construction of several large wind generation interconnection substations.

Activities, Milestones, and Explanation of Changes

FY 2018 Estimate	FY 2019 Estimate	Explanation of Changes FY 2019 vs FY 2018 Estimate
Transmission Services – Capital \$508,293,000	\$530,191,000	+\$21,897,000/+4.3%
Main Grid \$2,804,000	\$39,968,000	+\$37,165,000/+1325.6%
Milestones: <ul style="list-style-type: none"> • Continue construction of Monroe-Echo Lake 500 kV Line Re-termination #2. 	Milestones: <ul style="list-style-type: none"> • Complete construction of Monroe-Echo Lake 500 kV Line Re-termination #2. 	<ul style="list-style-type: none"> • The increase is due to increased construction planned for FY 2019.
Area & Customer Service \$76,389,000	\$47,871,000	-\$28,518,000/-37.3%
Milestones: <ul style="list-style-type: none"> • Complete construction of Midway-Grandview 115kV Line upgrade. • Complete construction of Paul Substation 500kV Reactor. • Complete design and begin construction of Midway- Ashe Double Circuit 230kV line. • Continue construction of the PSANI project. • Complete construction of Drummond 115kV Breaker Additions. 	Milestones: <ul style="list-style-type: none"> • Complete construction of Carlton Substation Upgrade. • Complete construction of the PSANI project. • Complete construction of Midway- Ashe Double Circuit 230kV line. • Continue construction of Hooper Springs Substation. 	<ul style="list-style-type: none"> • The decrease reflects projects under construction nearing completion.

FY 2018 Estimate	FY 2019 Estimate	Explanation of Changes FY 2019 vs FY 2018 Estimate
<p>Upgrades & Additions \$76,290,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue construction of 500kV spares at wind integration substations. • Complete construction at multiple sites of the Synchrophasor project. 	<p>\$71,708,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Complete construction of 500kV spares at wind integration substations. • Continue construction of VHF Radio System Upgrade. 	<p>\$-4,582,000/-6.0%</p> <ul style="list-style-type: none"> • The decrease reflects the movement of spare transformers for wind projects between years.
<p>Systems Replacements \$310,759,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue design and construction of capital improvements for identified existing facilities. • Continue non-electric replacements as necessary. • Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. 	<p>\$329,519,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue design and construction of capital improvements for identified existing facilities. • Continue non-electric replacements as necessary. • Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. 	<p>+\$18,760,000/+6.0%</p> <ul style="list-style-type: none"> • The increase reflects an increase in the number of replacement projects.
<p>Projects Funded in Advanced \$42,052,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. 	<p>\$41,125,000</p> <p>Milestones:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. 	<p>\$-927,000/-2.2%</p> <ul style="list-style-type: none"> • Slight decrease, however, milestones remain the same.

**Capital Information Technology & Equipment/Capitalized Bond Premium
Funding Schedule by Activity
Funding (\$K)**

	FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate	FY 2019 vs FY 2018	
				\$	%
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	11,328	26,860	26,860	0	0.0%
Capitalized Bond Premium	0	2,000	2,000	0	0.0%
Total, Capital IT & Equipment/Capitalized Bond Premium	11,328	28,860	28,860	0	0.0%

Outyears (\$K)

	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	26,860	2,880	14,257	7,267	9,292
Capitalized Bond Premium	2,000	2,000	2,000	2,000	2,000
Total, Capital IT & Equipment/Capitalized Bond Premium	28,860	4,880	16,257	9,267	11,292

Capital Information Technology & Equipment/Capitalized Bond Premium

Overview

Capital Information Technology (IT) provides for the acquisition of general and some dedicated special purpose capital information technologies, and acquisition of special-use capital and IT equipment in support of Bonneville's strategic objectives. This category also includes Bonneville's on-going efforts to facilitate delivery of a highly resilient organization able to anticipate, withstand, and effectively respond to disruptive events affecting it and its partners in the Northwest region. The four main areas of resiliency focus continue to include asset management, emergency management, crisis management, and continuity of operations.

Bonneville continues to move its IT infrastructure to a more efficient architecture. This FY 2019 Budget supports this effort. IT continues to eliminate redundancies in tools and applications, establish an agency-wide IT architecture with standardized IT purchasing criteria, standardize software licensing processes and minimize agency liabilities through stronger contracts, apply continuous improvement practices to IT project management, and implement an agency IT portfolio cost management strategy. The IT estimates in this FY 2019 Budget under Capital IT and Equipment include all IT functions within the agency except TS grid operations. See the Capital Program – TS section of this budget for additional discussion of grid operations-related IT requirements acquisitions.

Capital equipment provides for the acquisition of general and some dedicated special purchases of capital office furniture and equipment.

Bonneville can incur a bond premium when it repays a U.S. Treasury bond before the due date. When bonds are refinanced and premiums are incurred, the bond premiums can be capitalized. Historically, Bonneville generally has chosen to finance capitalized bond premiums with bonds issued to the U.S. Treasury, as envisioned by the Transmission Act.

**Capital IT & Equipment
(\$K)**

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
11,328	26,860	26,860

Overview

This category includes enhancements to Bonneville’s information technology processes to provide cost effective efficiencies for secure, timely, and accurate information. Investments will enable continued enhancements to Bonneville’s enterprise systems that are designed to link key information systems throughout Bonneville and improve business processes. Current efforts include continued functional process improvements in areas not included in the initial development phase. Other investments include acquisition of capital office furniture and equipment, capital automated data processing (ADP) based administrative telecommunications equipment, ADP equipment (hardware), and support of capital software development for certain Bonneville programs.

Continued investments in Capital IT & Equipment assets include:

Continuous Activity (all years)

Capital system developments in support of:

- Corporate IT Projects
- IT Infrastructure Projects
- Power IT Projects
- Transmission Services IT Projects (excluding grid operations)

**Capitalized Bond Premium
(\$K)**

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
0	2,000	2,000

Overview

Continue to assess financial market and when cost-effective, refinance available bonds as prudent.

Activities, Milestones, and Explanation of Changes

FY 2018 Estimate	FY 2019 Estimate	Explanation of Changes FY 2019 vs FY 2018 Estimate
Capital Information Technology & Equipment/Capitalized Bond Premium \$28,860,000	\$28,860,000	\$0/0.0%
Capital Information Technology & Equipment \$26,860,000 Milestones: Capital system developments in support of: <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	\$26,860,000 Milestones: Capital system developments in support of: <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	\$0/0.0% <ul style="list-style-type: none"> • No change in funding.
Capitalized Bond Premium \$2,000,000 Milestones: <ul style="list-style-type: none"> • Possible refinancing of outstanding federal bonds. 	\$2,000,000 Milestones: <ul style="list-style-type: none"> • Possible refinancing of outstanding federal bonds. 	\$0/0.0% <ul style="list-style-type: none"> • No change in funding.

**Power Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate	FY 2019 vs FY 2018	
				\$	%
Power Services - Operating Expenses					
Production	934,440	1,102,855	1,098,201	-4,655	-0.4%
Associated Projects Costs	438,145	476,762	475,160	-1,602	-0.3%
Fish & Wildlife	254,556	276,713	276,704	-10	0.0%
Residential Exchange Program	219,265	315,984	318,350	2,366	0.7%
NW Power & Conservation Council	10,766	11,624	11,914	290	2.5%
Energy Efficiency & Renewable Resources	149,693	164,599	165,247	648	0.4%
Total, Power Services - Operating Expenses	2,006,864	2,348,537	2,345,575	-2,962	-0.1%

Outyears (\$K)

	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate
Power Services - Operating Expenses					
Production	1,098,201	1,055,615	1,108,912	1,119,992	1,136,775
Associated Projects Costs	475,160	493,874	508,132	522,848	538,000
Fish & Wildlife	276,704	281,812	286,915	292,322	297,873
Residential Exchange Program	318,350	251,015	250,645	265,744	265,744
NW Power & Conservation Council	11,914	12,149	12,397	12,658	12,926
Energy Efficiency & Renewable Resources	165,247	173,274	172,634	175,275	170,682
Total, Power Services - Operating Expenses	2,345,575	2,267,738	2,339,635	2,388,839	2,422,000

Power Services – Operating Expense

Overview

Production includes all Bonneville non-federal debt service (including Energy Northwest debt service), O&M costs for power system generation resources (including a large nuclear plant, business operations, and short- and long-term power purchases³), electric utility marketing of power, and oversight of the FCRPS hydroelectric projects and CGS. Bonneville develops products and services to meet the needs of Bonneville’s customers and stakeholders and acquires power as needed.

In FY 2010, Bonneville completed a long-term Resource Program to guide potential future resource acquisitions needed to meet Bonneville’s supply obligations. In the event that Bonneville does acquire output from a resource on a long-term basis, Bonneville will modify its budget to reflect the acquisition.

Associated Projects Costs represents funding for operation and maintenance costs for the FCRPS hydroelectric projects, minor additions, improvements and replacements, and liabilities of the Corps and Reclamation hydroelectric projects in the Pacific Northwest, which serve many purposes. All agencies emphasize efficient power production from existing facilities and improvement of the performance and availability of power generating units. Bonneville pays additional financing costs of the FCRPS facilities through its Interest Expense and Capital Transfer budget programs. Bonneville provides funding for the operations and maintenance costs that are part of the USFWS’s Lower Snake River Compensation Plan (LSRCP) hatcheries. Bonneville is responsible for annual payments to the Confederated Tribes of the Colville Reservation for their contribution to the production of hydropower by the Grand Coulee Dam in accordance with the Settlement Agreement between the United States and the Colville Tribes (April 1994).

Bonneville’s Fish and Wildlife Program provides for extensive protection, mitigation, and enhancement of Columbia River Basin fish and wildlife adversely affected by the development and operation of the FCRPS. Bonneville satisfies its fish and wildlife responsibilities by funding projects and activities designed to be consistent with the Program under the Northwest Power Act. Through the Program, Bonneville also implements measures to aid in the protection of fish and wildlife in the Columbia River and its tributaries, both listed as threatened or endangered as well as unlisted, under the ESA (see ESA discussion in the Power Services – Capital Overview section).

Bonneville’s mitigation expenditures will focus on activities that benefit Columbia River Basin fish and wildlife resources, following priorities established through ESA consultations, agreements with resource managers, and the Program, including actions that:

- increase survival of ESA-listed and non-listed fish at FCRPS dams and reservoirs;
- increase survival of ESA-listed and non-listed fish throughout their life cycle by protecting and enhancing important habitat areas;
- protect and enhance important wildlife habitat;
- use hatcheries to contribute to conservation and recovery of ESA-listed and non-listed fish;
- provide offsite mitigation projects and habitat, passage, and other improvements that address factors limiting improvements of target species; and
- support a focused and well-coordinated research, monitoring, and evaluation program.

The Energy and Water Development Appropriations Act of 1996 added section 4(h)(10)(D) to the Northwest Power Act, directing the Council to appoint an ISRP “to review a sufficient number of projects” proposed to be funded through Bonneville’s annual fish and wildlife budget “to adequately ensure that the list of prioritized projects recommended is consistent with the Program.” The Northwest Power Act further states that “in making its recommendations to Bonneville,

³ Including expenses associated with the use of power financial instruments to hedge Bonneville's exposure to market price risk and certain index sales contract provisions as permitted by Bonneville's internal power transacting risk management guidance.

the Council shall consider the impact of ocean conditions on fish and wildlife populations and shall determine whether the projects employ cost effective measures to achieve program objectives.” Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council has shifted to a multi-year project review cycle during which the ISRP reviews categories of projects grouped together.

The Council’s major activities include the periodic preparation of a Northwest Conservation and Electric Power Plan (a 20-year electric energy demand and resources forecast and conservation program – known as the Power Plan) and the Fish and Wildlife Program. The Northwest Power Act directs that expenses of the Council, subject to certain limits based on forecasted Bonneville power sales, shall be included in Bonneville’s annual budget to Congress. The cost of funding the Council is recovered through Bonneville’s power rates.

Bonneville’s Energy Efficiency program promotes the efficient use of energy in the Pacific Northwest and acquires conservation resources consistent with the Council’s Power Plan. Such actions will: 1) meet energy efficiency targets; 2) achieve a least cost resource mix; 3) lessen the cost impacts of power purchases; 4) avoid the costs of ramping programs and infrastructure up and down; 5) extend the value of the FCRPS to customers; and 6) build the region’s resource portfolio with energy efficiency. Bonneville is also exploring how best to integrate demand-side management, distributed generation, and other leading edge technologies into its generation and transmission planning processes.

Bonneville’s Energy Efficiency program offers several ways for customer utilities to participate in energy efficiency. Program components include: (1) standard offer efficiency measures and custom projects, which result in customer proposals to conserve energy through such programs as residential weatherization; commercial lighting; heating, ventilation, and air conditioning (HVAC); industrial processes and lighting; and irrigated agriculture; (2) third-party delivery programs, such as Simple Steps Smart Savings, Energy Smart Industrial, and the Green Motors programs; and (3) programs to help regional federal installations reduce energy use, including federal hatcheries and irrigation districts, and to support the Corps of Engineers and Bureau of Reclamation in their efforts to reduce energy use; (4) efficiency achieved independently through the market or through codes and standards, i.e. Momentum Savings; and (5) market transformation through the Northwest Energy Efficiency Alliance (NEEA).

Bonneville’s Energy Efficiency budgets reflect BPA’s commitment to acquire Public Power’s share of the Northwest Power and Conservation Planning Council’s 7th Power Plan which forecasts regional electricity demand and resource strategies for the next 20 years. The 7th Power Plan preferred resource strategy calls for the region to acquire 1,400 aMW of energy efficiency by 2021. Bonneville is pursuing a plan to achieve a portion of that goal (573.1 aMW).

In meeting its energy efficiency goals, Bonneville may employ resource acquisition agreements, as authorized by Northwest Power Act section 6, and customer self-funded conservation as well as research, evaluation, contract support, NEEA support, and emerging technology development.

The Residential Exchange Program (REP) was created by the Northwest Power Act to extend the benefits of low-cost federal power to the residential and farm customers of Pacific Northwest electric utilities that have high average system costs. Currently, the region’s six investor-owned utilities (IOUs) and two of the region’s consumer-owned utilities are actively participating in the REP. Payments under the REP are made to individual IOUs based on the difference between Bonneville’s utility-specific Priority Firm (PF) Exchange rates and each utility’s average system cost (ASC), times a utility’s residential and farm loads. ASCs are determined in accordance with the 2008 Average System Cost Methodology (ASCM). Participating utility ASCs are established in a public process that occurs prior to and during Bonneville’s power rate cases. Bonneville’s utility-specific PF Exchange rates are determined each rate period. As described below, Bonneville and regional parties reached a settlement of the REP in 2011 under which the total amount of REP benefits available to the IOUs was established through 2028. Payments to the IOUs are made monthly based on historical invoiced exchange loads and the terms of the settlement.

Over the past decade, and prior to the settlement, regional parties filed multiple lawsuits challenging Bonneville’s implementation of the REP. These lawsuits were consolidated into four cases that were stayed before the U.S. Court of

Appeals for the Ninth Circuit. On July 26, 2011, Bonneville adopted a regionally supported settlement, referred to as the 2012 REP Settlement. Under the settlement, the region's six IOUs will receive about \$4.1 billion in REP payments over the 17-year term of the settlement, beginning at \$182.1 million in FY 2012, and increasing to \$286.1 million in FY 2028. In addition to this settlement, Bonneville has reached related REP settlements with two consumer-owned utilities. A single challenge to the 2012 REP Settlement was dismissed by the U.S. Court of Appeals for the Ninth Circuit in October of 2013.

Explanation of Changes

Bonneville's budget includes \$2,346 million in FY 2019 for Power Services operating expenses, which is a 0.1 percent decrease over the FY 2018 forecasted level.

The FY 2019 budget increases the level for Residential Exchange (+2.4 million), NW Power & Conservation Council (+\$0.3 million), and Energy Efficiency & Renewable Resources (+\$0.6 million) and decreases the level for Production (-\$4.7 million), Associated Projects (-\$1.6 million) and Fish & Wildlife (-\$10 thousand).

Production (\$K)		
FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
934,440	1,102,855	1,098,201

Overview

Power Purchases: Includes power purchased to cover power supply obligations as well as balancing loads with generation from the hydro system. These purchases can be made in the form of long-term purchases to meet supply obligations based on long-term planning requirements or they can be made within the year due to the monthly shape of the loads and the monthly shape of the hydroelectric generation. Also, purchases can be made within the month and within the day to fill shortages due to fluctuations in the hydro system and load.

Power Scheduling/Marketing: Schedule and market (buy/sell) electric energy with Bonneville customers and the Pacific Northwest’s interconnected utilities. Scheduling includes Power Services’ implementation of physical and memo power schedules and associated transmission schedules, implementation of Electronic Tagging (ETag) in accordance with NERC and in accordance with FERC, and implementation of electronic scheduling.

Columbia Generating Station (CGS): Bonneville has acquired full lifetime project capability of CGS. CGS is on a 24-month fuel and outage cycle. A maintenance and refueling outage occurred in the spring of 2017 and will again in FY 2019.

Continued investments in Production include:

Continuous Activity (all years)

- Provide oversight of all power supply contracts and related projects from which Bonneville purchases generation capability to ensure that all Bonneville approval rights are protected; coordinate, communicate, and administer agreements, issues, and programs between Bonneville and the project owners.
- Provide wind resource integration services for wind generation.
- Power Purchases.
- Power Scheduling/Marketing.
- Provide oversight of all contracts signed to date. Pursue cost-effective means to mitigate capacity demands associated with interconnecting large amounts of wind into the Bonneville system.
- Pursue acquisition of additional cost-effective generation to meet load growth.
- Provide oversight on the wind resource integration services currently purchased by public power customers and offer additional renewable resource shaping services to such customers using wind generation to serve their load.

**Associated Projects
(\$K)**

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
438,145	476,762	475,160

Overview

Support FCRPS project costs and work to strengthen interagency and regional relationships to improve project performance, supporting functions, and to better understand project resource requirements and costs. This helps to maintain FCRPS reliability and system performance, as well as to attain Bonneville’s strategic business objectives.

Continued investments in Associated Projects include:

Continuous Activity (all years)

Bureau of Reclamation:

- Continue direct funding Reclamation O&M power activities.

Corps of Engineers:

- Continue direct funding Corps O&M power activities.

**Fish & Wildlife
(\$K)**

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
254,556	276,713	276,704

Overview

Bonneville implements a mature fish and wildlife mitigation program based on recommendations made by the region’s fish and wildlife management agencies and tribes to the Council. Several recent Council reviews have made additional fish and wildlife project recommendations to Bonneville. Bonneville, in coordination with the Council, reviews new and on-going projects for consistency with the Program and purposes of the Northwest Power Act. Bonneville reviews and resets project-specific funding commitments annually, including projects under the FCRPS BiOps and other agreements. Bonneville informs its funding decisions with the management objectives and priorities in the Program (including ISRP reviews) and the Accords as it integrates their implementation with actions necessary to fulfill ESA responsibilities. Regular coordination on implementation priorities continues among Bonneville, the Council, federal resource management agencies, states, Tribes, and others.

Continued investments in Fish & Wildlife include:

Continuous Activity (all years)

- Anadromous Fish: Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, and the Willamette and Southern Idaho agreements. Prioritize projects that address the factors that contribute most to mitigation success and that fulfill Bonneville’s responsibility for mitigating the impacts from the FCRPS. Implement and develop activities that protect and enhance tributary and estuary habitat, improve mainstream habitat, reduce potentially harmful hatchery practices on ESA-listed populations, and contribute to sustainable fisheries.
- Resident Fish: Implement activities to mitigate the impacts of the FCRPS on lamprey, sturgeon, and bull trout and promote the reproduction and recruitment of Kootenai River white sturgeon. These activities have been selected in response to the USFWS’s 2000 bull trout and 2006 Libby BiOp, the Program, and the Fish Accords.
- Mitigation using resident fish to offset anadromous fish losses (substitution): mitigate for reservoir power operation impacts to resident fish and wildlife by seeking projects that benefit both simultaneously. Those resident fish habitat acquisition projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited for both fish and wildlife where appropriate.
- Wildlife: Use existing Bonneville policies to continue the current effort to mitigate wildlife in a manner consistent with the Program and fulfill commitments in wildlife agreements such as the Kalispel Agreement, Willamette Wildlife Agreement, and Southern Idaho Wildlife Agreement. Those wildlife projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited against both wildlife and fish obligations according to Bonneville’s crediting policy and applicable mitigation contracts.

Residential Exchange, Northwest Power and Conservation Council, and Energy Efficiency & Renewable Resources
((\$K)

FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
379,724	492,207	495,511

Overview

Residential Exchange Program (REP)

- Includes forecasted REP benefits based on the 2012 REP Settlement.

Northwest Power and Conservation Council

- Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance and fish and wildlife program activities.

Energy Efficiency Resources

- Conservation Purchases: Provide programmatic savings reimbursements and energy efficiency incentives to Bonneville customers to purchase conservation savings. This includes performance payments and Energy Smart Reserved Power payments for federal installations and fish hatcheries and irrigation districts.
- Conservation Infrastructure: All support for programs and operations, including third-party program implementation, contract support, market research (Momentum Savings research), evaluation, and emerging technology research.
- Market Transformation: Support for NEEA’s market transformation initiatives. NEEA identifies barriers and opportunities to increase the market adoption of efficiency by leveraging its regional partnerships.

Activities, Milestones, and Explanation of Changes

FY 2018 Estimate	FY 2019 Estimate	Explanation of Changes FY 2019 vs FY 2018 Estimate
Power Services - Operating Expense \$2,348,537,000	\$2,345,575,000	\$-2,962,000/-0.1%
Production \$1,102,855,000 Milestones: <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	\$1,098,201,000 Milestones: <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	\$-4,655,000/-0.4% <ul style="list-style-type: none"> • The decrease is primarily due to lower CGS costs.
Associated Project Costs \$476,762,000 Milestones: <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	\$475,160,000 Milestones: <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	\$-1,602,000/-0.3% <ul style="list-style-type: none"> • The small decrease reflects changes to security, biological opinion requirements, non-routine extraordinary maintenance, WECC/NERC compliance activities, and improvements, replacements, and minor additions at the projects.
Fish & Wildlife Costs \$276,713,000 Milestones: <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Southern Idaho Agreement, and the Willamette Agreement. 	\$276,704,000 Milestones: <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Willamette Agreement, and the Southern Idaho Agreement. 	\$-10,000/0.0% <ul style="list-style-type: none"> • No material change in funding. The costs reflect funding associated with the Biological Opinions, Fish Accord commitments, and Northwest Power Act activities.

FY 2018 Estimate	FY 2019 Estimate	Explanation of Changes FY 2019 vs FY 2018 Estimate
Residential Exchange Program \$315,984,000 Milestones: <ul style="list-style-type: none"> Continue to provide REP benefits. 	\$318,350,000 Milestones: <ul style="list-style-type: none"> Continue to provide REP benefits. 	+\$2,366,000/+0.7% <ul style="list-style-type: none"> The increase reflects the scheduled rise in the amount of REP payments payable to the IOUs prescribed by the Residential Exchange Settlement.
NW Power & Conservation Council \$11,624,000 Milestones: <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	\$11,914,000 Milestones: <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	+\$290,000/+2.5% <ul style="list-style-type: none"> The increase reflects continuing emphasis on the NW Power and Conservation Council.
Energy Efficiency & Renewable Resources \$164,599,000 Milestones: <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads. Continue to support utility incentive programs. Continue to support regional energy efficiency programs. Continue supporting energy efficiency at direct serve federal agencies. 	\$165,247,000 Milestones: <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads. Continue to support utility incentive programs. Continue to support regional energy efficiency programs. Continue supporting energy efficiency at direct serve federal agencies. 	+\$648,000/+0.4% <ul style="list-style-type: none"> The increase reflects continuing emphasis on the energy efficiency program consistent with the Power Plan.

**Transmission Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate	FY 2019 vs FY 2018	
				\$	%
Transmission Services - Operating Expense					
Engineering	110,378	111,753	112,591	838	0.8%
Operations	168,254	192,265	193,255	989	0.5%
Maintenance	194,346	205,387	206,999	1,612	0.8%
Total, Transmission Services - Operating Expense	472,978	509,405	512,844	3,440	0.7%

Outyears (\$K)

	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate
Transmission Services - Operating Expense					
Engineering	112,591	129,956	134,736	141,816	147,820
Operations	193,255	197,311	197,338	199,935	202,558
Maintenance	206,999	210,435	215,093	219,757	224,443
Total, Transmission Services - Operating Expense	512,844	537,702	547,167	561,507	574,820

Transmission Services – Operating Expense

Overview

This activity provides for the transmission system services of engineering, operations, and maintenance for Bonneville's electric transmission system, and the associated power system control and communication facilities. Primary strategies of this program are: 1) maintain the safety and reliability of the transmission system; 2) increase the focus on meeting customers' needs; 3) optimize the transmission system; 4) provide open and non-discriminatory transmission access; and 5) improve Bonneville's cost effectiveness. Consistent with the FY 2018 Budget Request, the FY 2019 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville.

Explanation of Changes

Bonneville's budget includes \$512.8 million in FY 2019 for TS operating expense which is a 0.7 percent increase over the FY 2018 forecasted level. The increase reflects continuing operation and maintenance of Bonneville's transmission assets.

The FY 2019 budget increases the levels for Engineering (+\$0.8 million), Operations (+\$1.0 million), and Maintenance (+\$1.6 million).

Engineering (\$K)		
FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
110,378	111,753	112,591

Overview

Continue efforts to identify best methods for improving system reliability and maintenance practices, and continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system.

Continued investments in Engineering include:

Continuous Activity (all years)

- **Research and Development (R&D):** Conduct research focused on technologies related to business challenges Bonneville faces including reliability, energy efficiency, and integration of renewable energy resources. Technologies of interest are identified in Bonneville's Technology Roadmaps. A portfolio of research is selected every year through Bonneville's Portfolio Decision Framework.
- **System Development Planning and Analysis:** Continue providing technical support and asset planning to deploy the Asset Management approach to sustain existing assets and expand the system to meet Agency objectives.
- **Technical Support:** Provide technical support activities, such as transmission system planning and studies to optimize portions of the system. Provide support for non-wires solutions studies and pilot projects.
- **Capital-to-Expense Adjustments:** Conduct annual analysis of Bonneville's outstanding capital work orders to assess whether they should be expensed. As obsolete inventory is identified and disposed of, it is expensed.
- **Regulatory Fees:** WECC dues and loop flow payments, Department of Commerce/National Telecommunications and Information Administration licensing costs for radio frequencies, DOE Radio Spectrum staff and contractor support, and NERC Critical Infrastructure Protection (CIP) compliance program costs. Includes membership in ColumbiaGrid, a transmission planning organization in the region.
- **Reimbursable Transactions:** Enter into written agreements with federal and non-federal entities that have work or services to be performed by Bonneville staff at the expense of the benefiting entities. The projects must be beneficial, under agreed upon criteria, to Bonneville operations and to the federal or non-federal entity involved or otherwise be aligned with or supportive of Bonneville's strategic objectives. Additionally, these activities generally contribute to more efficient or reliable construction of the federal transmission system or otherwise enhance electric service to the region.
- **Leased and Other Costs:** Includes leases, lease purchases, and other costs of financing transmission, delivery, and voltage support facilities when such arrangements are operationally feasible and cost effective to deliver power. Leases and lease purchases enable Bonneville to continue to invest in infrastructure to support a safe and reliable system for the transmission of power. Other costs included are the accrued interest costs associated with Large Generator Interconnection Agreements (LGIA).

Operations		
(\$K)		
FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
168,254	192,265	193,255

Overview

Substation Operations: Perform operations functions necessary to provide electric service to customers and to protect the federal investment in electric equipment and other facilities. Includes equipment adjustments, switching lines and equipment during emergencies or maintenance, isolating damaged equipment, restoring service to customers, inspecting equipment, and reading meters.

Power System Dispatching and Supporting Functions: Perform central dispatching, control, and monitoring of the electric operation of the federal transmission system. Also includes load, frequency, and voltage control of federal generating plants, and coordinating long- and short-term outages of system equipment. In addition, provides technical engineering support of dispatching function and provides all technical and systems support for Dittmer Control Center (DCC) and Munro Control Center (MCC).

Marketing and Sales: Provide management and direction of transmission rates, and provide business strategy in marketing of transmission and ancillary products and services of Transmission Services. Involve customers and constituents in the process of product and rate development. Maintain accurate and complete historical records of current and past legacy transmission agreements. Provide guidance for current and future transmission contract negotiations. Provide financial analysis of market strategies. Monitor and report on the financial health of Transmission Services. Support cost management by effective reporting and analysis of current expenditures. Ensure official budget submittals reflect current management financial strategies and adequately fund transmission programs.

Transmission Scheduling: Provide non-discriminatory, open access to the Bonneville transmission system consistent with Bonneville's Open Access Transmission Tariff (OATT). Schedule transmission capacity to eligible Bonneville customers, which include customers acquiring services under Use of Facilities (UFT), Formula Power Transmission (FPT), Integration of Resources (IR), and Part II or Part III of the OATT. Manage the reservations and scheduling of all transmission services associated with the OATT. Update practices, policies, and commercial systems to accommodate a large diversity of resources, including wind.

Continuous Activity (all years):

- Continue to operate within parameters of NERC and WECC.
- Continue support of increased compliance activities related to the reliability of the transmission system, including cyber security.
- Continue developing facilities, policies, procedures, and implementing systems to support integrating the diversity of resources into the transmission grid.
- Continue preparation for increased complexity of transmission scheduling, power system operations, and dispatching, including congestion management and outage scheduling.
- Continue developing the Dittmer Scheduling Center and Munro Scheduling Center facilities to support continuous real time scheduling operations from both facilities.
- Continue developing a long-term approach to optimize transmission availability through streamlined, cost-effective, and sustainable processes.
- Continue to address succession planning issues across key functions.
- Continue development and implementation of business systems and tools.

Maintenance (\$K)		
FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate
194,346	205,387	206,999

Overview

In all aspects of maintenance, Bonneville is continuing the use of Reliability Centered Maintenance (RCM) practices. The use of RCM practices is focused on improving system reliability, increasing availability, and meeting new and existing compliance regulations at lowest lifecycle costs. In addition Bonneville is deploying Asset Management to optimize maintain/replace decision making. Maintenance costs are expected to increase as Bonneville addresses the aging transmission system, meeting reliability standards, including vegetation management, and environmental constraints associated with construction, enhancement, and maintenance of the system. The Bonneville transmission system encompasses 15,238 circuit miles on over 11,860 right-of-way miles (many of these miles are through rugged, inaccessible terrain).

Continued investments in Maintenance include:

Continuous Activity (all years)

- Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets.
- Continue refining processes and procedures for monitoring and tracking compliance activities related to the reliability of the transmission system.
- Continue to improve system availability performance through new maintenance procedures and work practices.
- Continue to develop and implement work practices and procedures for implementation of a new specialty crew using bare-hand live line practices for maintenance of high-voltage transmission lines.
- Continue increased emphasis on replacement of line hardware (life extension programs for insulators, connectors, dampers, and fiber optic cable hardware).
- Continue to prepare for the impact of an expected high attrition rate among Bonneville’s aging workforce by recruiting apprentices and replacements for critical minimum crew size workload positions.
- Increase outage-scheduling planning and coordination to increase customer satisfaction and system availability.
- Maintain vegetation management levels to ensure system reliability.
- Continue access road work to provide reliable access to facilities and ensure environmental compliance.
- Continue improving environmental stewardship.

Transmission Line Maintenance: Maintain and repair 15,238 circuit miles of high voltage transmission lines, of which over 7,617 km (4,734 circuit miles) are 500 kV transmission extra-high voltage (EHV). Maintenance of EHV lines is two and one-half times more labor-intensive than maintenance of lower transmission voltages, although more efficient in transmission of power. This responsibility includes maintaining transmission rights-of-way to ensure system reliability, safety, and environmental compliance. Adopt work practices that improve system availability, reliability, and compliance.

Right-of-Way Maintenance: Maintain over 11,860 of Bonneville’s right-of-way miles. This responsibility includes vegetation management, danger tree management, and access road maintenance to ensure system reliability, safety, and environmental compliance. Adopt procedures and processes that improve system availability, reliability, environmental compliance, and reliability compliance. Continue to deploy new technologies such as LiDAR (Light Detection and Ranging) to reliably and cost-effectively manage vegetation.

Substation Maintenance: Maintain and repair the transmission system power equipment located in Bonneville’s 260 substations. Work includes inspections, diagnostic testing, and predictive and condition-based maintenance.

System Protection Maintenance: Maintain relaying metering and remedial action scheme equipment used to control and protect the electrical transmission system and to meter energy transfers for the purpose of revenue billing. Additionally, field-engineering services provide technical advice and assure the correct operation of power system relaying and special control systems used to support interregional energy transmission capabilities.

Power System Control Maintenance: Test, repair, and provide field engineering support of Bonneville’s highly complex equipment, communications, and control systems, including seven major microwave systems, fiber optic systems, and other critical communications and control equipment that support the power system.

Non-Electric Plant Maintenance: Maintain and manage Bonneville’s non-electric facilities. Includes site, building, and building utility maintenance; custodial services; station utility; and other maintenance service activities, as well as facilities asset management on Bonneville-owned or Bonneville-leased non-electric facilities.

Maintenance Standards and Engineering: Establish, monitor, and update system maintenance standards, policies, and procedures, and review and update long-range plans for maintenance of the electric power transmission system.

Activities, Milestones, and Explanation of Changes

FY 2018 Estimate	FY 2019 Estimate	Explanation of Changes FY 2019 vs FY 2018 Estimate
Transmission Services - Operating Expense \$509,405,000	\$512,844,000	+\$3,440,000/0.7%
Engineering \$111,753,000 Milestones: <ul style="list-style-type: none"> • Continue efforts to identify best methods for improving system reliability and maintenance practices. • Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	\$112,591,000 Milestones: <ul style="list-style-type: none"> • Continue efforts to identify best methods for improving system reliability and maintenance practices. • Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	+\$838,000/+0.8% <ul style="list-style-type: none"> • The increase reflects emphasis on system reliability standards compliance and research and development.
Operations \$192,265,000 Milestones: <ul style="list-style-type: none"> • Continue to operate within parameters of NERC and WECC. • Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	\$193,255,000 Milestones: <ul style="list-style-type: none"> • Continue to operate within parameters of NERC and WECC. • Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	+\$989,000/+0.5% <ul style="list-style-type: none"> • The increase reflects continued emphasis on reliability compliance activities, resource integration activities, key strategic initiatives, security, and control center systems support.
Maintenance \$205,387,000 Milestones: <ul style="list-style-type: none"> • Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	\$206,999,000 Milestones: <ul style="list-style-type: none"> • Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	+\$1,612,000/+0.8% <ul style="list-style-type: none"> • The increase reflects implementation of facilities asset management plans, continued implementation of live-line crew, NERC/WECC compliance activities related to land rights and vegetation management, continuing maintenance program activities, including system protection, right-of-way, line maintenance, and performance improvements.

**Interest, Pension, and Post-retirement Benefits
Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate	FY 2019 vs FY 2018	
				\$	%
Interest, Pension, and Post-retirement Benefits					
BPA Bond Interest (Net)	146,381	155,425	166,605	11,180	7.2%
BPA Appropriation Interest	8,628	1,659	1,518	-141	-8.5%
Corps of Engineers Appropriation Interest	86,576	76,370	76,472	102	0.1%
Lower Snake River Comp Plan Interest	16,572	225	206	-19	-8.5%
Bureau of Reclamation Appropriation Interest	12,434	6,700	6,009	-691	-10.3%
Bond Premiums Paid/Discounts (not capitalized)	0	0	556	556	0.0%
Subtotal, Interest – Operating Expense	270,590	240,379	251,366	10,987	4.6%
Additional Pension, and Post-retirement Benefits	27,026	29,908	31,152	1,245	4.2%
Total, Interest, Pension, and Post-retirement Benefits	297,617	270,287	282,519	12,232	4.5%

Outyears (\$K)

	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate
Interest, Pension, and Post-retirement Benefits					
BPA Bond Interest (Net)	166,605	199,164	230,752	261,948	291,925
BPA Appropriation Interest	1,518	0	0	0	0
Corps of Engineers Appropriation Interest	76,472	78,755	80,081	81,606	78,384
Lower Snake River Comp Plan Interest	206	206	206	206	157
Bureau of Reclamation Appropriation Interest	6,009	5,173	3,911	2,624	1,942
Bond Premiums Paid/Discounts (not capitalized)	556	6,638	6,710	8,419	8,669
Subtotal, Interest – Operating Expense	251,366	289,935	321,660	354,802	381,077
Additional Pension, and Post-retirement Benefits	31,152	39,754	41,398	43,451	45,356
Total, Interest, Pension, and Post-retirement Benefits	282,519	329,690	363,058	398,253	426,432

Bonneville Power Administration/
Interest, Pension and Post-retirement Benefits –
Operating Expense

Interest, Pension and Post-retirement Benefits Operating Expense

Overview

Interest expense provides for interest due on bonds issued to the U.S. Treasury and appropriations repayment responsibilities. The appropriation repayments relate to capital investment in FCRPS hydroelectric generating and transmission facilities of Bonneville, and the Corps and Reclamation. Investments were financed by Congressional appropriations and Bonneville borrowings from the U.S. Treasury. Bonneville repays these amounts through revenue raised in its power sales and transmission services revenues.

Since initially receiving U.S. Treasury borrowing authority in 1974 under the Transmission Act, all of Bonneville's U.S. Treasury borrowing has been at market rates. As of October 1, 1996, all of Bonneville's repayment obligations on FCRPS appropriated investment (Corps and Reclamation FCRPS investment and Bonneville investment financed with appropriations prior to the Transmission Act that were unpaid as of September 30, 1996) were restructured and assigned new current-market interest rates. The Bonneville Appropriations Refinancing Act of 1996 (Refinancing Act) called for re-setting (reducing) the unpaid principal of FCRPS appropriations and reassigning (increasing) interest rates. New principal amounts were established as of the beginning of FY 1997 at the present value of the principal and annual interest payments Bonneville would make to the U.S. Treasury for these obligations in the absence of the legislation, plus \$100.0 million. The new principal amounts were assigned prevailing market interest rates as of October 1, 1996. Bonneville's outstanding appropriations repayment obligations at the end of FY 1996 were \$6.6 billion with a weighted average interest rate of 3.4 percent. The refinancing reduced the principal amount to \$4.1 billion with a weighted average interest rate of 7.1 percent. Implementation of the refinancing took place in 1997 after audited actual financial data were available. Pursuant to the legislation, Bonneville submitted its calculations and interest rate assignments implementing the Refinancing Act to the U.S. Treasury for its review and approval. The U.S. Treasury approved the implementation calculations in July 1997. The Refinancing Act also calls for all future FCRPS appropriations to be assigned prevailing U.S. Treasury yield curve interest rates. Bonneville's outstanding appropriations may be prepaid prior to their stated maturities.

Interest estimates are a function of costs of U.S. Treasury borrowing to Bonneville, repayment status of outstanding FCRPS investments, and projected additions to FCRPS plant in service. These estimates may change over time depending on forecasted market conditions. The interest cost estimates include the impact of Bonneville's appropriation refinancing legislation.

Federal employees associated with the operation of the FCRPS participate in either the Civil Service Retirement System or the Federal Employees Retirement System. Employees may also participate in the Federal Employees Health and Benefit Program and the Federal Employee Group Life Insurance Program. All such postretirement systems and programs are sponsored by the Office of Personnel Management; therefore, Bonneville does not record any accumulated plan assets or liabilities related to the administration of such programs. Bonneville makes additional annual contributions to the General Fund of the U.S. Treasury (receipt account 892889) related to the Federal post-retirement benefit programs provided to employees associated with the operation of the FCRPS. These payments were begun with the FY 1998 Administration's budget which assumed Bonneville would prospectively cover the unfunded liability that accrues in fiscal years after FY 1997 of the Civil Service Retirement and Disability Fund (Disability Fund), the Employees Health Benefits Fund (Health Fund), and the Employees Life Insurance Fund (Insurance Fund) that it had not covered prior to FY 1998. Bonneville's additional annual contributions include amounts relating to pension and post-retirement benefits for Bonneville and the power-related portion of the Corps and Reclamation projects.

**Capital Transfers
Funding Schedule by Activity
Funding (\$K)**

Capital Transfers

	FY 2017 Actuals	FY 2018 Estimate	FY 2019 Estimate	FY 2019 vs FY 2018	
				\$	%
BPA Bond Amortization ¹	0	90,100	370,213	280,113	310.9%
Reclamation Appropriation Amortization	161,131	11,754	14,236	2,483	21.1%
BPA Appropriation Amortization	112,071	1,956	21,053	19,097	976.4%
Corps Appropriation Amortization	405,445	78,991	3,135	-75,856	-96.0%
Lower Snake River Comp Plan Amortization	230,065	325	0	-325	-100.0%
Total, Capital Transfers	908,712	183,126	408,637	225,511	123.1%

Outyears (\$K)

Capital Transfers

	FY 2019 Estimate	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate
BPA Bond Amortization ¹	370,213	296,890	329,659	275,909	347,634
Reclamation Appropriation Amortization	14,236	21,480	21,901	11,608	0
BPA Appropriation Amortization	21,053	0	0	0	0
Corps Appropriation Amortization	3,135	0	0	63,634	24,536
Lower Snake River Comp Plan Amortization	0	0	0	897	230
Total, Capital Transfers	408,637	318,370	351,560	352,048	372,400

Overview

This activity conveys funds to the U.S. Treasury for repayment of certain FCRPS costs not included in the Associated Project Costs budget. Since capital transfers are cash transactions, they are not considered budget obligations.

¹ Bonneville "Bond(s)" in this FY 2019 Budget refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act (P.L. 93-454), which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

**Bonneville Power Administration
Performance Measures**

In accordance with the Government Performance and Results Act (GPRA) Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program.

	FY 2017	FY 2018	FY 2019
Performance Goal (Measure)	BPA Hydropower Generation Efficiency Performance - Achieve 97.5% Heavy-Load-Hour Availability (HLHA) through efficient performance of Federal hydro-system processes and assets, including joint efforts of BPA, Army Corps of Engineers, and Bureau of Reclamation. HLHA is actual machine capacity available during heavy-load hours (0700-2200 Monday-Saturday), divided by planned available capacity during heavy-load hours.		
Target	≥ 97.5 percent	≥ 97.5 percent	≥ 97.5 percent
Result	Met - 99.9	TBD	TBD
Endpoint Target	Maintain at least 97.5% Heavy-Load-Hour Availability		
Performance Goal (Measure)	BPA Repayment of Federal Power Investment to Keep Costs Low - Meet planned annual repayment of principal on Federal power investments to help keep costs low consistent with sound business principles.		
Target	≥ 100 percent	≥ 100 percent	≥ 100 percent
Result	Met - 100	TBD	TBD
Endpoint Target	Continue to meet planned annual repayment of principal		
Comment	As a capital-intensive business, with constant requirements to maintain extensive generation and transmission system assets across the region, meeting BPA's planned federal annual repayment is vital to maintaining a high credit rating which enables access to lower cost non-federal capital to make needed system investments.		
Performance Goal (Measure)	BPA System Reliability Performance - NERC Rating - Attain average North American Electric Reliability Corporation (NERC) compliance ratings for NERC Control Performance Standard 1 (CPS1) of greater than or equal to 100 percent.		
Target	≥ 100 percent	≥ 100 percent	≥ 100 percent
Result	Met - 151.3	TBD	TBD
Endpoint Target	Continually ensure the reliability of the electrical grid by attaining a NERC CPS1 rating of equal to or greater than 100 percent each year.		
Comment	CPS1 measures generation/load balance on one-minute intervals.		

Additional Tables

**BONNEVILLE POWER ADMINISTRATION
TOTAL OBLIGATIONS/OUTLAYS**

Current Services
(in millions of dollars)

	2017		2018		2019		2020	2021	2022	2023
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	219	219	316	316	318	318	251	251	266	266
2 Power Services ^{2/}	1,967	1,967	1,580	1,580	1,573	1,573	1,549	1,617	1,643	1,675
3 Transmission Services	770	770	976	976	1,002	1,002	1,129	1,135	1,159	1,131
4 Conservation & Energy Efficiency	150	150	165	165	165	165	173	173	175	171
5 Fish & Wildlife	260	260	327	327	321	321	320	321	321	327
6 Interest/ Pension ^{4/}	298	298	270	270	283	283	330	363	398	426
7 Associated Project Cost - Capital	207	207	243	243	265	265	313	339	346	352
8 Capital Equipment	11	11	27	27	27	27	3	14	7	9
9 Planning Council	11	11	12	12	12	12	12	12	13	13
10 Misc. Accounting Adjs.	0	0	0	0	0	0	0	0	0	0
11 Projects Funded in Advance	141	141	42	42	41	41	36	35	35	35
12 Capitalized Bond Premiums	0	0	2	2	2	2	2	2	2	2
13 TOTAL OBLIGATIONS/ OUTLAYS ^{3/}	4,034	4,034	3,959	3,959	4,009	4,009	4,119	4,261	4,365	4,407

REVENUES AND REIMBURSEMENTS

Current Services
(in millions of dollars)

BP-1 SUMMARY	FISCAL YEAR									
	2017		2018		2019		2020	2021	2022	2023
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
14 Revenues ^{5/}	3,525	3,525	3,944	3,944	3,945	3,945	4,033	4,121	4,207	4,294
15 Project Funded in Advance	141	141	42	42	41	41	36	35	35	35
16 TOTAL	3,666	3,666	3,986	3,986	3,986	3,986	4,069	4,156	4,242	4,329
BUDGET AUTHORITY (NET) ^{6/}	429		606		419		629	625	629	577
17 OUTLAYS (NET) ^{6/7/8}	383		(27)				49	105	123	79

These notes are an integral part of this table.

^{1/} This FY 2019 budget includes capital and expense estimates based on final spending proposals from Bonneville's 2016 IPR/ CIR and IPR 2 processes.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

^{4/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{5/} Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

^{6/} Bonneville received \$48.7 million of additional budget authority in FY 2007 to accommodate the work necessary to relocate the radio spectrum consistent with the Commercial Spectrum Enhancement Act (P.L. 108-494). In accordance with Federal law, Bonneville plans to return the forecasted unused balance of approximately \$8.2 million to the U.S. Treasury as soon as the National Telecommunications Information Administration notifies the Federal Communications Commission that the DOE relocation effort is complete.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, continuing restructuring of the electric industry, and other reasons.

^{8/} FY 2017 Net Outlays are based on Bonneville's FY 2017 audited actuals. FYs 2018 and 2019 Net Outlays are calculated using Bonneville's revenue forecast from the BP-18 rate case. FYs 2020 and 2021 assume no growth in Offsetting Collections compared to FYs 2018 and 2019. FYs 2022 and 2023 assume a growth in Offsetting Collections based on standard inflation factors.

EXPENSED OBLIGATIONS/OUTLAYS ^{1,4/}
Current Services
(in millions of dollars)
FISCAL YEAR

BP-2

	2017		2018		2019		2020	2021	2022	2023
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	219	219	316	316	318	318	251	251	266	266
2 Power Services ^{2/}	1,967	1,967	1,580	1,580	1,573	1,573	1,549	1,617	1,643	1,675
3 Transmission Services	473	473	509	509	513	513	538	547	562	575
4 Conservation & Energy Efficiency	150	150	165	165	165	165	173	173	175	171
5 Fish & Wildlife	255	255	277	277	277	277	282	287	292	298
6 Interest/ Pension ^{3/}	298	298	270	270	283	283	330	363	398	426
7 Planning Council	11	11	12	12	12	12	12	12	13	13
8 TOTAL EXPENSE	3,371	3,371	3,128	3,128	3,141	3,141	3,135	3,250	3,349	3,423
9 Projects Funded in Advance	141	141	42	42	41	41	36	35	35	35

CAPITAL OBLIGATIONS/OUTLAYS ^{1/}

Current Services
(in millions of dollars)

BP-2 continued

	2017		2018		2019		2020	2021	2022	2023
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
	FISCAL YEAR									
10 Transmission Services	297	297	466	466	489	489	591	588	598	556
11 Associated Project Cost	207	207	243	243	265	265	313	339	346	352
12 Fish & Wildlife	5	5	51	51	44	44	38	34	29	29
13 Capital Equipment	11	11	27	27	27	27	3	14	7	9
14 Capitalized Bond Premiums	0	0	2	2	2	2	2	2	2	2
15 TOTAL CAPITAL INVESTMENTS	521	521	788	788	827	827	948	976	981	949
16 TREASURY BORROWING AUTHORITY TO										
17 FINANCE CAPITAL OBLIGATIONS ^{4/}	521		788		827		948	976	981	949

These notes are an integral part of this table.

^{1/} This FY 2019 budget includes capital and expense estimates based on final spending proposals from Bonneville's 2016 IPR/ CIR and IPR 2 processes.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

^{2/} Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{4/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

CURRENT SERVICES
(in millions of dollars)

CAPITAL TRANSFERS

	FISCAL YEAR						
	2017 Pymts	2018 Pymts	2019 Pymts	2020 Pymts	2021 Pymts	2022 Pymts	2023 Pymts
Amortization:							
18 BPA Bonds	0	90	370	297	330	276	348
19 Reclamation Appropriations	161	12	14	21	22	12	0
20 BPA Appropriations	112	2	21	0	0	0	0
21 Corps Appropriations	405	79	3	0	0	64	25
22 Lower Snake River Comp Plan Amortization	230	0	0	0	0	1	0
23 TOTAL CAPITAL TRANSFERS	909	183	409	318	352	352	372
24 FULL-TIME EQUIVALENT (FTE)	2,891	3,000	3,000	3,000	3,000	3,000	3,000

PROGRAM & FINANCING SUMMARY

Current Services
(in millions of dollars)

Identification Code 89-4045-0-3-271

	est.						
	2017	2018	2019	2020	2021	2022	2023
Program by activities							
Operating expenses							
0.01 Power Services	1,468	1,103	1,098	1,056	1,109	1,120	1,137
0.02 Residential Exchange Program	219	316	318	251	251	266	266
Associated Project Costs							
0.05 Bureau of Reclamation	148	165	163	171	176	182	187
0.06 Corps of Engineers	247	256	256	265	273	281	289
0.07 Colville Settlement	17	23	23	23	24	24	25
0.19 U.S. Fish & Wildlife Service	26	33	33	35	35	36	37
0.20 Planning Council	11	12	12	12	12	13	13
0.21 Fish & Wildlife	255	277	277	282	287	292	298
0.23 Transmission Services	473	509	513	538	547	562	575
0.24 Conservation & Energy Efficiency	150	165	165	173	173	175	171
0.25 Interest	272	240	251	290	322	355	381
0.26 Pension and Health Benefits ^{1/}	27	30	31	40	41	43	45
0.91 Total operating expenses ^{2/}	3,312	3,128	3,141	3,135	3,250	3,349	3,423
Capital investment							
1.01 Power Services	207	243	265	313	339	346	352
1.02 Transmission Services	297	466	489	591	588	598	556
1.04 Fish & Wildlife	5	51	44	38	34	29	29
1.05 Capital Equipment	11	27	27	3	14	7	9
1.06 Capitalized Bond Premiums	0	2	2	2	2	2	2
1.07 Total Capital Investment ^{3/}	521	788	827	948	976	981	949
2.01 Projects Funded in Advanced	141	42	41	36	35	35	35
10.00 Total obligations ^{4/}	3,974	3,959	4,009	4,119	4,261	4,365	4,407

These notes are an integral part of this table.

^{1/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{2/} Assumes expense obligations, not accrued expenses.

Power Services includes Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} Assumes capital obligations, not capital expenditures.

^{4/} This FY 2019 budget includes capital and expense estimates based on final spending proposals from Bonneville's 2016 IPR/ CIR and IPR 2 processes.

For purposes of this table, this FY 2019 budget reflects, for FY 2017, actual third party financing expense only for PFIA.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

Program and Financing (continued)
 Current Services
 (in millions of dollars)

	est.						
	2017	2018	2019	2020	2021	2022	2023
Financing:							
1000 Unobligated balance available, start of year. ^{5/}	13	13	11	0	0	0	0
1050 Unobligated balance available, end of year. ^{5/}	13	11	10	0	0	0	0
1900 Budget authority (gross)	3,971	4,592	4,405	4,698	4,781	4,871	4,904
Budget Authority:							
1400 Permanent Authority: Authority to borrow from Treasury (indefinite) ^{6/}	250	789	827	947	977	982	950
1800 Spending authority from off-setting collections	3,521	3,986	3,986	4,069	4,156	4,242	4,327
1825 Portion applied to debt reduction	0	(183)	(408)	(318)	(352)	(353)	(373)
1850 Spending authority from offsetting collections (adjusted)	776	3,803	3,578	3,751	3,804	3,889	3,954
900 Total obligations	3,973	3,959	4,009	4,119	4,261	4,365	4,407
4110 Outlays (gross)	3,973	3,959	4,009	4,119	4,261	4,365	4,407
Adjustments to budget authority and outlays:							
Deductions for offsetting collections:							
4120 Federal funds	(73)	(90)	(90)	(90)	(90)	(90)	(90)
4121 Interest on Federal Securities	(8)						
4123 Non-Federal sources	(3,444)	(3,896)	(3,896)	(3,979)	(4,066)	(4,152)	(4,237)
4130 Total, offsetting collections	(3,525)	(3,986)	(3,986)	(4,069)	(4,156)	(4,242)	(4,327)
4160 Budget authority (net)	429	606	419	629	625	629	577
4170 Outlays (net)^{7/8/}	383	(27)	23	49	105	123	79

These notes are an integral part of this table.

^{5/} Reflects estimated cost for radio spectrum fund.

^{6/} The Permanent Authority: Authority to borrow (indefinite) from the U.S. Treasury amounts reflect both Bonneville's capital program financing needs and either the use of, or creation of, deferred borrowing. Deferred borrowing is created when, as a cash and debt management decision, Bonneville uses cash from revenues to liquidate capital obligations in lieu of borrowing at that time from the U.S. Treasury. This temporary use of cash on hand instead of borrowed funds creates the ability in future years to borrow money, when fiscally prudent. The FY 1989 Energy and Water Development Appropriations Act (P.L. 100-371 Of 7/19/88) confirmed that Bonneville has authority to incur obligations in excess of U.S. Treasury borrowing authority and cash in the BPA fund.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, continuing restructuring of the electric industry, and other reasons.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

^{8/} FY 2017 Net Outlays are based on Bonneville's FY 2017 audited actuals. FYs 2018 and 2019 Net Outlays are calculated using Bonneville's revenue forecast from the BP-18 rate case. FYs 2020 and 2021 assume no growth in Offsetting Collections compared to FYs 2018 and 2019. FYs 2022 and 2023 assume a growth in Offsetting Collections based on standard inflation factors.

**BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)**

BP-4A

	Fiscal Year							
	2017				2018			
	Net Capital		Net Capital		Net Capital		Bonds Out-	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	3,573	3,031	4,472	4,758	4,094	3,552	4,993	5,009
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	521	521	521	250	788	788	788	788
Treasury Borrowing (Cash)								
Less:								
BPA Bond Amortization	0	0	0	0	90	90	90	90
Net Increase/(Decrease):	521	521	521	250	698	698	698	698
Cum.-End-of-Year: Total	4,094	3,552	4,993	5,009	4,792	4,250	5,691	5,707
Total Remaining Treasury Borrowing Amount				2,691				1,993
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2019 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2018-2023.

Cumulative advance amortization payments as of the end of FY 2017 are \$5,130 million.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4B

	2019				2020			
	Net Capital		Net Bonds		Net Capital		Net Bonds	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	4,804	4,262	5,703	5,757	5,261	4,719	6,160	6,214
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing Treasury Borrowing (Cash)	827	827	827	827	948	948	948	948
Less:								
Total BPA Bond Amortization	370	370	370	370	297	297	297	297
Net Increase/(Decrease):								
Total	457	457	457	457	651	651	651	651
Cum.-End-of-Year: Total	5,261	4,719	6,160	6,214	5,912	5,370	6,811	6,865
Total Remaining Treasury Borrowing Amount				1,486				835
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

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Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2019 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtednesses issued and sold by Bonneville to the U.S. Treasury.

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Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2018-2023.

Cumulative advance amortization payments as of the end of FY 2017 are \$5,130 million.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4C

Fiscal Year

	2021				2022			
	Net Capital		Net Capital		Net Capital		Net Capital	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	5,912	5,370	6,811	6,865	6,558	6,016	7,457	7,511
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	976	976	976	976	981	981	981	981
Treasury Borrowing (Cash)								
Less:								
Total BPA Bond Amortization	330	330	330	330	276	276	276	276
Net Increase/(Decrease):								
Total	646	646	646	646	705	705	705	705
Cum.-End-of-Year: Total	6,558	6,016	7,457	7,511	7,263	6,721	8,162	8,216
Total Remaining Treasury Borrowing Amount				189				(516)
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2019 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtednesses issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2018-2023.

Cumulative advance amortization payments as of the end of FY 2017 are \$5,130 million.

**BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES**

(in millions of dollars)

BP-4D

	Fiscal Year			
	2023			
	Net Capital			
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
Start-of-Year: Total	7,263	6,721	8,162	8,216
Plus: Annual Increase				
Cum.-Annual Treasury Borrowing	951	951	951	951
Treasury Borrowing (Cash)				
Less:				
Total BPA Bond Amortization	348	348	348	348
Net Increase/(Decrease):				
Total	603	603	603	603
Cum.-End-of-Year: Total	7,866	7,324	8,765	8,819
Total Remaining Treasury Borrowing Amount				(1,119)
Total Legislated Treasury Borrowing Amount				7,700

These notes are an integral part of this table.

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2019 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2018-2023.

Cumulative advance amortization payments as of the end of FY 2017 are \$5,130 million.

**BONNEVILLE POWER ADMINISTRATION
POTENTIAL THIRD PARTY FINANCING TRANSPARENCY**
(in millions of dollars)

BP-5

	Fiscal Year						
	2017	2018	2019	2020	2021	2022	2023
Transmission Services - Capital							
Main Grid	12	3	40	90	97	120	63
Area & Customer Services	31	76	48	41	56	46	47
Upgrades & Additions	45	76	72	51	52	51	46
System Replacements	210	311	330	409	382	381	399
Projects Funded in Advance	141	42	41	36	35	35	35
Total, Transmission Services - Capital	438	508	530	627	622	632	591

Associated Project Costs - Capital

	2017	2018	2019	2020	2021	2022	2023
Associated Project Costs	207	243	265	313	339	346	352
Projects Funded in Advance ^{1/}	0	0	0	0	0	0	0
Total, Associated Project Costs - Capital	207	243	265	313	339	346	352

Federal and Non-Federal Funding

	2017	2018	2019	2020	2021	2022	2023
Projects Funded in Advance	141	42	41	36	35	35	35
U.S. Treasury Borrowing Authority	504	709	754	905	926	943	908

Scenario

	2017	2018	2019	2020	2021	2022	2023
Projects Funded in Advance ^{1/}	0	0	0	0	0	0	0
Third Party Financing	150	117	122	148	147	149	139
Alternate Treasury Borrowing Authority	NA	592	632	757	779	794	769

These notes are an integral part of this table.

1/ In this instance, Projects Funded in Advance represents prepayment of Power customers' bills reimbursed by future credits and third party non-federal financing for Conservation initiatives.

The table above shows both the potential use of U.S. Treasury borrowing authority for transmission capital projects based on this FY 2019 budget and the use adjusted for potential third-party financing to fund appropriate capital expenditures when feasible in lieu of U.S. Treasury borrowing. Estimates included in this FY 2019 budget are uncertain and may change due to revised capital investment plans, changing economic conditions, and an evolving financial market environment. The estimates of third-party financing included in the table show a reduction in the use of U.S. Treasury borrowing and do not reflect the actual notional third party financing commitment Bonneville may enter into in that particular year. The difference of reduction in use of U.S. Treasury borrowing and the actual notional third party financing commitment is primarily due to the difference in the timing of financing transactions between U.S. Treasury and third-party financing for capital projects with multi-year construction schedules.

Bonneville's Third Party Financing for Transmission Services consists primarily of lease-purchase agreements, which are capitalized obligations that enable Bonneville to acquire the use of transmission facilities over time. Bonneville also undertakes the construction and installation of facilities from funds that customers advance to Bonneville for construction of BPA-owned facilities that assist the customers in obtaining necessary transmission service from Bonneville. These customers receive monetary payment credits in bills for transmission services from Bonneville up to the amount of funds advanced to Bonneville, plus interest.

Bonneville's historical Third Party Financing amounts may vary over time due to re-assignment of certain lease-purchase agreements to Treasury Financing.

Bonneville Status of U.S. Treasury Borrowing with Potential Third Party Financing & PFIA Scenario

With the potential use of third party financing assumed in the scenario above, Bonneville's total remaining U.S. Treasury Borrowing Amount would be extended to the following amounts. See BP-4 BPA Status of Treasury Borrowing- Current Services.

	Fiscal Year						
	2017	2018	2019	2020	2021	2022	2023
Start-of-Year: Total Bonds Outstanding	4,758	5,009	5,590	5,925	6,428	6,927	7,483
Plus:							
U.S. Treasury Borrowing (Cash)	250	788	827	948	976	981	951
Less:							
Potential Third Party Financing & PFIA	NA	117	122	148	147	149	139
BPA Bond Amortization	-	90	370	297	330	276	348
Net Increase/(Decrease) Bonds Outstanding:	250	581	335	503	499	556	464
Cum.-End-of-Year: Total	5,009	5,590	5,925	6,428	6,927	7,483	7,947
Total Remaining U.S. Treasury Borrowing Amount	2,691	2,110	1,775	1,272	773	217	(247)
Total Legislated U.S. Treasury Borrowing Amount	7,700	7,700	7,700	7,700	7,700	7,700	7,700

U.S. TREASURY PAYMENTS

(in millions of dollars)

	FISCAL YEAR						
	2017	2018	2019	2020	2021	2022	2023
A. INTEREST ON BONDS & APPROPRIATIONS							
Bonneville Bond Interest							
1 Bonneville Bond Interest (net)	113	155	167	199	231	262	292
2 AFUDC ^{1/}	33	33	33	34	35	36	35
Appropriations Interest							
3 Bonneville	9	2	2	0	0	0	0
4 Corps of Engineers ^{2/}	87	76	76	79	80	82	78
5 Lower Snake River Comp. Plan	17	0	0	0	0	0	0
6 Bureau of Reclamation ^{3/}	12	7	6	5	4	3	2
7 Bond Premiums paid/Discounts (not capitalized)	0	0	1	7	7	8	9
8 Total Bond and Approp. Interest	271	273	284	324	357	391	416
B. ASSOCIATED PROJECT COST							
9 Bureau of Reclamation Irrigation Assistance	51	27	57	24	15	16	13
10 Bureau of Rec. O & M ^{4/}	0	0	0	0	0	0	0
11 Corps of Eng. O & M ^{4/}	0	0	0	0	0	0	0
12 L. Snake River Comp. Plan O & M ^{4/}	0	0	0	0	0	0	0
13 Total Assoc. Project Costs	51	27	57	24	15	16	13
C. CAPITAL TRANSFERS							
Amortization							
14 Bonneville Bonds ^{6/}	0	90	370	297	330	276	348
15 Bureau of Reclamation Appropriations	161	12	14	21	22	12	0
16 Corps of Engineers Appropriations	405	79	3	0	0	64	25
17 Lower Snake River Comp. Plan	230	0	0	0	0	1	0
18 Bonneville Appropriations	112	2	21	0	0	0	0
19 Total Capital Transfers	909	183	409	318	352	352	372
D. OTHER PAYMENTS							
20 Unfunded Post-Retirement Liability ^{5/}	27	30	31	40	41	43	45
21 TOTAL TREASURY PAYMENTS	1,258	514	781	706	764	802	847

These notes are an integral part of this table.

^{1/} This interest cost is capitalized and included in BPA's Transmission System Development, System Replacements, and Associated Projects Capital programs. AFUDC is financed through the sale of bonds.

^{2/} Includes interest on construction funding for Corp of Engineers (Corps) fish bypass facilities at Corps dams in the Columbia River Basin, including Lower Monumental, Ice Harbor, and The Dalles.

^{3/} Includes payments paid by Reclamation to the U.S. Treasury on behalf of Bonneville.

^{4/} Costs for power O&M is funded directly by Bonneville as follows (in millions):

	FISCAL YEAR	2017	2018	2019	2020	2021	2022	2023
Bureau of Reclamation		148	165	163	171	176	182	187
Corps of Engineers		247	256	256	265	273	281	289
Subtotal Bureau and Corps		395	421	419	436	449	462	476
Lower Snake River Comp. Plan		26	33	33	35	35	36	37
Total		421	454	452	470	484	498	513

^{5/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{6/} In this FY 2019 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

Does not include Treasury bond premiums on refinanced Treasury bonds.

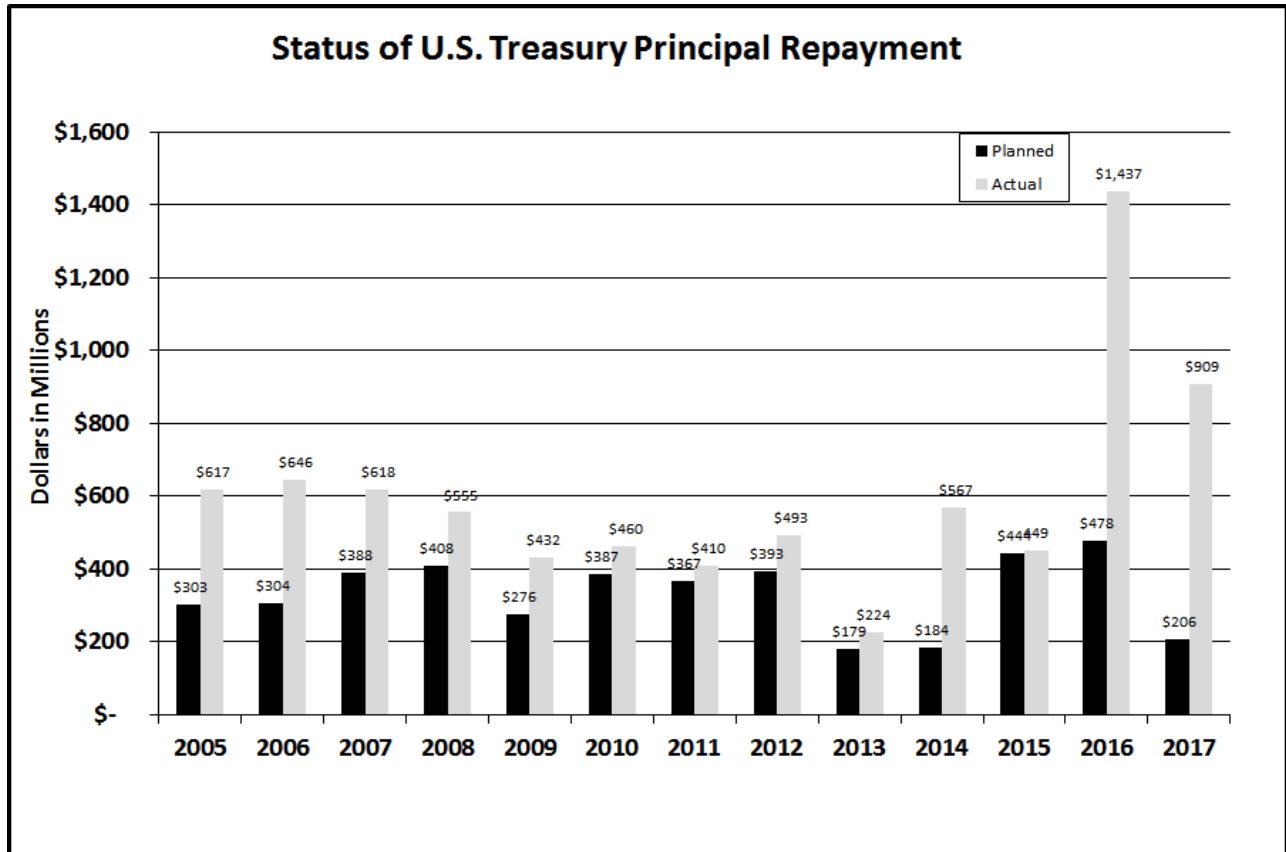


Chart Notes

^{1/} This chart displays principal repayment only.

^{2/} U.S. Treasury payment outyear estimates for planned amortization of principal are based on rate case estimates when available and are planned amortization for future rate case periods. These estimates may change due to revised capital investment plans, actual U.S. Treasury borrowing, and advanced amortization payments. Bonneville’s aggregate FY 2017 U.S. Treasury payment was \$1,258 million, composed of \$909 million in principal repayment, which included \$778 million in early retirement of higher interest rate U.S. Treasury debt, \$271 million in interest, and \$78 million for other costs.

^{3/} FYs 2002-2012 payments include portions of future planned amortization amounts consistent with Bonneville's capital strategy plan and the Bonneville /Energy Northwest debt optimization program.

^{4/} Advance amortization due to sale of transmission facilities includes \$12.7 million in FY 2003, \$5.3 million in FY 2006, \$2.0 million in FY 2011, \$0.4 million in FY 2013 and \$0.4 million in FY 2014, and \$0.6 million in FY 2017.

^{5/} The cumulative amount of actual advance amortization payments as of the end of FY 2017 is \$5,130 million.

^{6/} FYs 2014-2018 include advance amortization under the Regional Cooperation Debt initiative with Energy Northwest (EN) under which EN extended maturities on Bonneville-backed debt which enabled the early amortization of higher cost appropriations.

OBJECT CLASSIFICATION STATEMENT

(in millions of dollars)

ESTIMATES

	2017 act.	2018	2019
11.1 Full-time permanent	263	274	277
11.3 Other than full-time permanent	-	-	-
11.5 Other personnel compensation	61	64	64
11.9 Total personnel compensation	324	337	342
12.1 Civilian personnel benefits	119	124	125
13.0 Benefits for former personnel	-	-	-
21.0 Travel and transportation of persons	9	10	10
22.0 Transportation of things	-	-	-
23.1 Rental payments to GSA	1	1	1
23.2 Rents, other	0	0	0
23.3 Communication, utilities & misc. charges	9	9	9
25.1 Consulting Services	16	16	16
25.2 Other Services	2,423	2,346	2,376
25.5 R & D Contracts	13	11	11
26.0 Supplies and materials	52	54	54
31.0 Equipment	427	444	450
32.0 Lands and structures	249	259	263
41.0 Grants, subsidies, contributions	38	41	42
43.0 Interest and dividends	295	307	311
99.0 Total obligations	3,973	3,959	4,009

Estimate of Receipts
(in millions of dollars)

	Fiscal Year						
	2017	2018	2019	2020	2021	2022	2023
Reclamation Interest	12	7	6	5	4	3	2
Reclamation Amortization	161	12	14	21	22	12	0
Reclamation O&M	0	0	0	0	0	0	0
Reclamation Irrig. Assist.	51	27	57	24	15	16	13
Revenues Collected by Reclamation Distributed in Treasury Account (credit)	-13	-7	-7	-7	-7	-7	-7
Colville Settlement (credit)	-5	-5	-5	-5	-5	-5	-5
Total 1/ Reclamation Fund	206	34	65	39	29	18	3
Corps O&M							
CSRS	27	30	31	40	41	43	45
Total 2/ Repayments on misc.costs	27	30	31	40	41	43	45

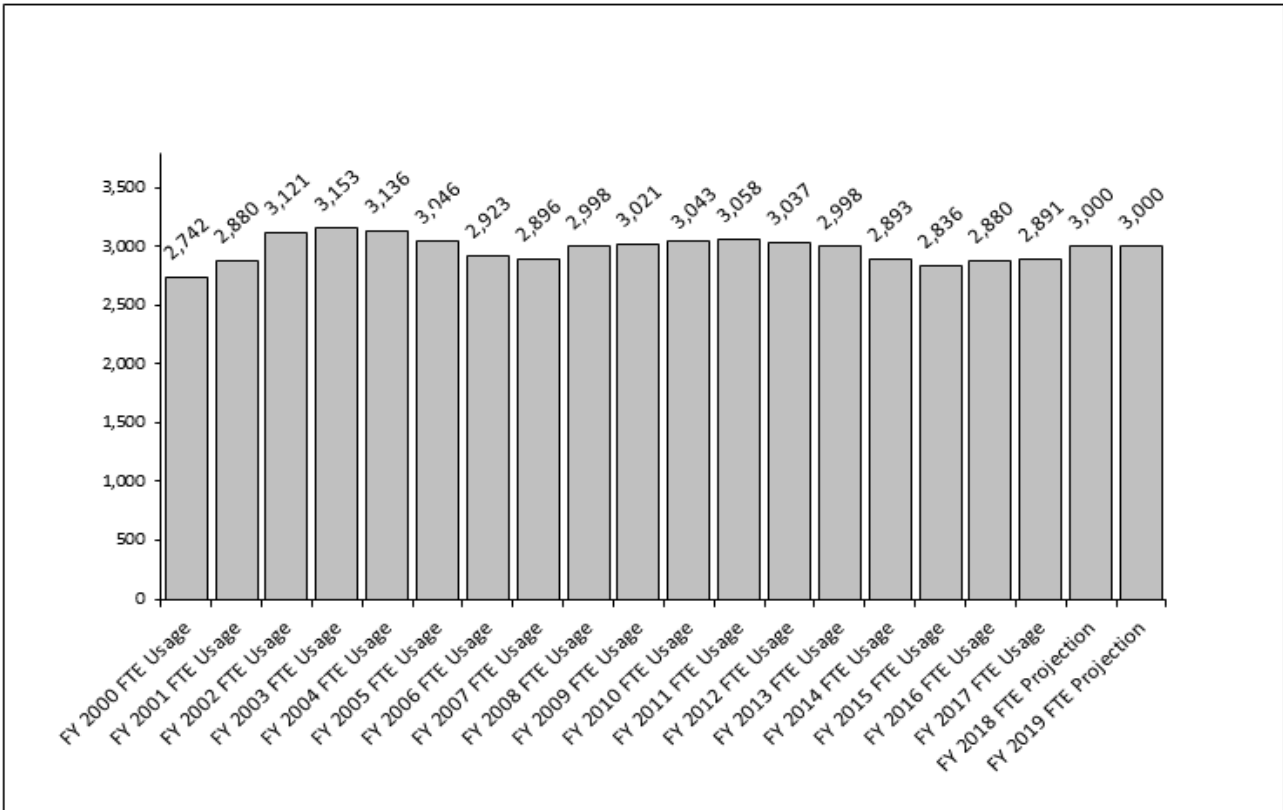
1/ Includes amortization of appropriations and irrigation assistance, and interest costs for Reclamation. The cost of power O&M for Reclamation is no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfer to Account #895000.26

2/ The costs of power O&M for the Corps and Lower Snake River Comp. Plan are no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfers to Account #892889, Repayments on misc. recoverable costs, not otherwise classified. Costs for power O&M is funded directly by Bonneville as follows (in millions)

	2017	2018	2019	2020	2021	2022	2023
Bureau of Reclamation	148	165	163	171	176	182	187
Corps of Engineers	247	256	256	265	273	281	289
Lower Snake River Comp. Plan	26	33	33	35	35	36	37
Total	421	454	452	470	484	498	513

See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

BONNEVILLE FTE



Actual FTE data is consistent with DOE personnel reports.

FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing transmission marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.

Total Cost of BPA Fish & Wildlife Actions

COST ELEMENT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
CAPITAL INVESTMENTS ^{1/}											
BPA FISH AND WILDLIFE	35.2	25.5	27.4	40.0	90.2	57.5	52.1	37.4	21.4	16.0	5.4
BPA SOFTWARE DEVELOPMENT COSTS	1.0	1.3	0.6	1.2	0.8	0.4	0.0	0.1	1.4	1.2	1.4
ASSOCIATED PROJECTS (FEDERAL HYDRO)	60.4	37.3	135.7	56.4	103.0	114.5	103.6	101.7	81.4	34.1	58.9
TOTAL CAPITAL INVESTMENTS	96.6	64.2	163.7	97.6	193.9	172.3	155.7	139.2	104.1	51.4	65.6
PROGRAM EXPENSES											
BPA DIRECT FISH AND WILDLIFE PROGRAM	139.5	148.9	177.9	199.6	221.1	248.9	239.0	231.8	258.2	258.1	254.7
FISH & WILDLIFE SOFTWARE EXPENSE COSTS							0.2	0.3	0.1	0.0	0.0
SUPPLEMENTAL MITIGATION PROGRAM EXPENSES ^{2/}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
REIMBURSABLE/DIRECT-FUNDED PROJECTS ^{3/}											
O & M LOWER SNAKE RIVER HATCHERIES	19.3	19.4	20.8	23.3	24.5	22.0	28.7	31.0	30.9	28.6	26.0
O & M CORPS OF ENGINEERS	32.9	34.4	34.3	36.5	40.3	41.1	39.2	47.8	46.4	48.2	47.5
O & M BUREAU OF RECLAMATION	3.9	4.3	4.5	5.2	5.0	5.3	5.6	6.6	2.6	6.0	7.0
NW POWER AND CONSERVATION COUNCIL ALLOCATED @ 50%	4.2	4.1	4.7	4.7	4.5	4.6	5.0	4.9	4.9	5.4	5.4
SUBTOTAL (REIMB/DIRECT-FUNDED)	60.3	62.2	64.3	69.7	74.3	73.0	78.5	90.3	84.9	88.2	85.9
TOTAL OPERATING EXPENSES	199.7	211.1	242.1	269.3	295.3	321.9	317.70	322.40	343.17	346.34	340.61
PROGRAM RELATED FIXED EXPENSES ^{4/}											
INTEREST EXPENSE	76.0	76.9	78.7	80.5	79.2	80.6	89.1	83.4	89.2	85.6	58.6
AMORTIZATION EXPENSE	22.9	24.4	24.6	25.0	28.3	30.2	35.7	38.7	41.3	42.5	42.5
DEPRECIATION EXPENSE	14.0	14.9	16.7	18.0	19.6	20.7	18.6	19.2	20.1	20.1	20.3
TOTAL FIXED EXPENSES	112.9	116.2	120.0	123.5	127.2	131.5	143.4	141.3	150.6	148.2	121.4
GRAND TOTAL PROGRAM EXPENSES	312.7	327.3	362.1	392.8	422.6	453.4	461.1	463.7	493.7	494.6	462.0
FORGONE REVENUES AND POWER PURCHASES											
FOREGONE REVENUES	282.6	273.5	142.8	99.4	156.7	152.2	135.5	122.7	195.8	76.6	9.6
BPA POWER PURCH. FOR FISH ENHANCEMENT	120.7	274.9	240.3	310.1	70.7	38.5	85.8	196.2	67.5	50.3	(20.5)
TOTAL FOREGONE REVENUES AND POWER PURCHASES	403.3	548.5	383.1	409.5	227.4	190.7	221.3	318.9	263.3	126.9	(10.9)
TOTAL PROGRAM EXPENSES, FOREGONE REVENUES, & POWER PURCHASES	716.0	875.8	745.3	802.3	649.9	644.1	682.4	782.6	757.0	621.5	451.1
CREDITS											
4(b)(10)(C)	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)	(77.7)	(72.6)	(53.7)
FISH COST CONTINGENCY FUND											
TOTAL CREDITS	(66.1)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)	(77.7)	(72.6)	(53.7)

This information has been made publicly available by BPA on 3/25/2008. The figures shown are consistent with audited actuals that contain Agency approved financial information, except for foregone revenues and power purchases which are estimates and do not contain Agency approved financial information

1/ Capital Investments include both BPA's direct Fish and Wildlife Program capital investments, funded by BPA's Treasury borrowing, and "Associated Projects", which include capital investments at Corps of Engineers' and Bureau of Reclamation projects, funded by appropriations and repaid by BPA. The negative amount in FY 1997 reflects a decision to reverse "plant-in-service" investment that was never actually placed into service. The annual expenses associated with these investments are included in "Program-Related Fixed Expenses", below.

2/ Includes High Priority and Action Plan Expenses and other supplemental programs.

3/ "Reimbursable/Direct-Funded Projects" includes the portion of costs BPA pays to or on behalf of other entities that is determined to be for fish and wildlife purposes.

4/ "Fixed Expenses" include depreciation, amortization and interest on investments on the Corps of Engineers' projects, and amortization and interest on the investments associated with BPA's direct Fish and Wildlife Program.

Bonneville Power Administration (Bonneville, BPA)

Proposed Appropriations Language

Expenditures from the Bonneville Power Administration Fund, established pursuant to Public Law 93-454, are approved for the Steigerwald Floodplain Restoration Project and, in addition, for official reception and representation expenses in an amount not to exceed \$5,000: Provided, that during fiscal year 2020, no new direct loan obligations may be made.

Explanation of Changes

Language is included to allow expenditures from the Bonneville Power Administration Fund for the Steigerwald Floodplain Restoration Project.

The proposed appropriations language restricts new direct loans in FY 2020 as in FY 2019. This bill language is drafted consistent with the Credit Reform Act of 1990.

Please Note - The FY 2020 Bonneville Power Administration Congressional Budget submission includes FY 2019 budget estimates.

Bonneville operates under a business-type budget under the Government Corporation Control Act, 31 U.S.C 9101-10 and on the basis of the self-financing authority provided by the Federal Columbia River Transmission System Act of 1974 (Transmission Act) (Public Law 93-454). Bonneville has authority to borrow from the U.S. Treasury under the Transmission Act, the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (Public Law 96-501) for acquisition of energy conservation and renewable energy resources, investment in fish facilities, and other purposes, the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), and other legislation. Authority to borrow from the U.S. Treasury is available to Bonneville on a permanent, revolving basis. The principal amount of U.S. Treasury borrowing outstanding at any time may not exceed \$7.70 billion.¹ Bonneville finances its approximate \$4.4 billion annual cost of operations and investments primarily using power and transmission revenues, and proceeds of borrowing from the U.S. Treasury.

This budget has been prepared in accordance with the Statutory Pay-As-You-Go Act (PAYGO) of 2010. Under PAYGO, all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories, which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

¹ The outstanding principal amount of bonds issued by Bonneville to the U.S. Treasury can be found in tables BP-4A – 4D in the Additional Tables section.

Bonneville Power Administration

Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2018 Actuals	2019 Original ^{1/2}	2019 Revised ^{1/2}	2020 Proposed
Capital Investment Obligations				
Associated Project Costs ^{3/}	199,438	264,735	264,735	238,000
Fish & Wildlife	30,669	44,000	44,000	47,266
Subtotal, Power Services	230,107	308,735	308,735	285,266
Transmission Services	253,494	489,066	489,066	479,172
Capital Equipment & Bond Premium	14,566	28,860	26,860	22,099
Total, Capital Obligations ^{3/}	498,167	826,661	824,661	786,537
Expensed and Other Obligations				
Expensed	3,205,885	3,140,939	3,136,029	2,867,867
Projects Funded in Advance	156,849	41,125	41,125	85,886
Total, Obligations	3,860,901	4,008,724	4,001,815	3,740,290
Capital Transfers (cash)	569,325	408,637	408,637	407,536
Bonneville Total	4,430,226	4,417,361	4,410,452	4,147,826
Bonneville Net Outlays	245,000	23,061	16,690	(166,596)
Full-time Equivalent (FTEs) ^{4/}	2,793	3,000	3,000	3,000

Public Law Authorizations include:

Bonneville Project Act of 1937, Public Law No. 75-329

Federal Columbia River Transmission System Act of 1974, Public Law No. 93-454

Regional Preference Act of 1964, Public Law No. 88-552

Flood Control Act of 1944, Public Law No. 78-543

Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act), Public Law No. 96-501

Outyear Funding Profile by Subprogram ^{1/}

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2021	2022	2023	2024
Capital Investment Obligations				
Associated Project Costs ^{3/}	256,000	281,000	300,000	306,000
Fish & Wildlife	47,266	43,000	43,000	40,000
Subtotal, Power Services	303,266	324,000	343,000	346,000
Transmission Services	481,725	475,383	514,510	532,878
Capital Equipment & Bond Premium	22,131	22,295	22,267	21,146
Total, Capital Obligations ^{3/}	807,122	821,677	879,777	900,024
Expensed and Other Obligations				
Expensed	3,091,644	3,214,129	3,327,246	3,400,958
Projects Funded in Advance	66,170	60,452	39,843	39,819
Total, Obligations	3,964,937	4,096,258	4,246,866	4,340,801
Capital Transfers (cash)	456,893	425,663	388,345	399,897
Bonneville Total	4,421,830	4,521,921	4,635,211	4,740,698
Bonneville Net Outlays	14,767	102,806	208,023	253,982
Full-time Equivalents (FTEs) ^{4/}	3,000	3,000	3,000	3,000

These notes are an integral part of this table.

- ^{1/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.
- ^{2/} Original estimates reflect Bonneville's FY 2019 Congressional Budget Submission. Revised estimates, consistent with Bonneville's annual near-term funding review process, provide notification to the Administration and Congress of updated capital and expense funding levels for FY 2019. The BPA estimates in this budget are consistent with 2018 initial IPR output numbers. Please see <https://www.bpa.gov/Finance/FinancialPublicProcesses/IPR/Pages/IPR-2018.aspx> for further information.
- ^{3/} Includes infrastructure investments to address the long-term electric power related needs of the Northwest and significant changes affecting Bonneville's power and transmission markets.
- ^{4/} As of September 30, 2018 DOE HR staff has reported FY 2018 BPA's FTE usage at 2,793.

Additional Notes

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Cumulative advance amortization payments as of the end of FY 2018 are \$5,503 million.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, continuing restructuring of the electric industry, and other reasons.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

FY 2018 Net Outlays are based on Bonneville's FY 2018 audited financial actuals. FY 2019 Net Outlays are calculated using Bonneville's revenue forecast from the BP-18 rate case. FYs 2020 to 2024 Net Outlays are based on 2018 Initial IPR assumptions and standard inflation factors.

FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing transmission marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.

Amounts in tables and schedules may not add to totals due to rounding.

Major Outyear Considerations

Bonneville's outyear estimates reflect ongoing efforts to achieve its long-term mission and strategic direction. The outyear estimates are developed with consideration and support of Bonneville's multi-year performance targets that lay out the course for achieving Bonneville's long-term objectives. Outyear capital investment levels support Bonneville's infrastructure program, hydro efficiency program, and its fish and wildlife mitigation projects.

Bonneville continues to incorporate the various aspects of the Energy Policy Act of 2005 related to its business, in particular the energy supply, conservation, and new energy technologies for the future that are highlighted in the legislation.

Overview and Accomplishments

Bonneville provides electric power, transmission, and energy efficiency throughout the Pacific Northwest. Bonneville serves a 300,000 square mile area including Oregon, Washington, Idaho, western Montana, and small parts of eastern Montana, California, Nevada, Utah, and Wyoming with a population of about 13.3 million people. Bonneville markets the electric power produced from 31 federal hydro projects in the Pacific Northwest owned by the U.S. Army Corps of Engineers (Corps) and the U.S. Department of Interior, Bureau of Reclamation (Reclamation)—the hydro projects are known as Associated Projects. Bonneville also markets power acquired from non-federal generating resources, including the power from a nuclear power plant, Columbia Generating Station (CGS). Bonneville uses the power from non-federal and federal projects primarily to meet the needs of its customer utilities. Bonneville currently maintains and operates 15,238 circuit miles of transmission lines, 260 substations, and associated power system control and communications facilities over which this electric power is delivered. Bonneville has capital and similar leases for certain transmission facilities. Bonneville also supports the protection and enhancement of fish and wildlife, and promotes conservation and energy efficiency, as part of its efforts to preserve and balance the economic and environmental benefits of the Federal Columbia River Power System (FCRPS).

The organization of Bonneville's FY 2020 Budget reflects Bonneville's business services basis for utility enterprise activities. Bonneville's two major areas of activity on a consolidated budget and accounting basis are Power Services (PS) and Transmission Services (TS) and include their related administrative costs. Power Services activities include line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program (REP), Associated Projects Operations & Maintenance (O&M) Costs, and Northwest Power and Conservation Council (Planning Council or Council). Transmission Services activities include line items for engineering, operations, and maintenance for Bonneville's electric transmission system.

The mission of Bonneville is to create and deliver the best value for its customers and constituents as it acts in concert with others to assure the Pacific Northwest has the following: (1) an adequate, efficient, economical, and reliable power supply; (2) an open access transmission system that is adequate for integrating and transmitting power from federal and non-federal generating units, providing service to Bonneville's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and (3) mitigation of the impacts on fish and wildlife from the federally owned hydroelectric projects from which BPA markets power. Bonneville is legally obligated under current law to provide cost-based rates and public and regional preference in its marketing of power. Bonneville establishes rates as low as possible consistent with sound business principles and sufficient to ensure the full recovery of all of its costs, including timely repayment of the federal investment in the system. Bonneville's vision is to advance a Northwest power and transmission system that is a national leader in providing high reliability, low rates consistent with sound business principles, responsible environmental stewardship, and accountability to the region, all through a commercially successful business. Bonneville pursues this vision consistent with its four core values of safety, trustworthy stewardship of the FCRPS, collaborative relationships, and operational excellence.

Current Financial Status

Bonneville is striving to enhance its competitive, cost-effective delivery of utility products and services and the continued delivery of the public benefits of its operations, while ensuring it continues to make its scheduled payments to the U.S. Treasury on time and in full. Bonneville recently published a Strategic and Financial plan for 2018-2023. The Strategic Plan has four goals: 1. Strengthen financial health, 2. Modernize assets and system operations, 3. Provide competitive power products and services, and 4. Meet transmission customer needs efficiently and responsively. Acting on these goals will put Bonneville on a path to become more competitive and responsive to customer needs, modernize our assets and operations to leverage and enable industry change, and deliver on our public responsibilities through a commercially successful business. This set of strategic goals is the central reference point for everything we will be doing at Bonneville over the next five years. Our business units and asset managers will develop operating plans and asset strategies to execute on these goals. Individual performance contracts and performance incentives will align with these goals as well.

Through rate-setting and attentive cost management efforts, Bonneville has maintained adequate financial reserves levels to assure full recovery of its costs and financial stability while meeting its overall responsibilities to the Pacific Northwest and U.S. taxpayers.

The Final Record of Decision for the FYs 2018-2019 rate case was issued on July 26, 2017. The rates were confirmed and approved by FERC on a final basis on March 19, 2018. The rates went into effect beginning October 1, 2017.

Preserving and Enhancing the FCRPS

The FCRPS is one of the nation's largest nearly carbon-free energy sources, and preserving and enhancing the value of the FCRPS for the future continues to be a major Bonneville focus. Bonneville's ongoing prioritization and execution of capital investment in transmission and FCRPS generation assets is the foundation for delivering clean, low cost power to support the communities and economies of the region well into the future.

Bonneville plays a key role in advancing energy efficiency across the region consistent with its statutes, including developing and promoting related technologies, and exploring demand-side management opportunities. Bonneville is making disciplined technology innovation investments and looking to apply new operational and market mechanisms that enhance the reliability, efficiency, and flexibility of system operations.

In addition to these efforts, Bonneville is committed to the quality of the Northwest's natural resources. Bonneville funds one of the largest fish and wildlife programs in the nation and continues to be a national leader on environmental protection and compliance.

Together, all of these efforts contribute to sustaining and advancing the region's resilience.

Program Performance

To validate and verify program performance, Bonneville conducts various internal and external reviews and audits. Bonneville conducts extensive reviews with regional stakeholders of both capital and expense programs. In addition, Bonneville's programmatic activities are subject to review by Congress, the U.S. Government Accountability Office (GAO), the DOE's Inspector General, and other governmental entities. Bonneville's financial statements are audited annually by an independent external auditor. Bonneville has received unqualified audit opinions since the mid-1980s and no material weaknesses have been identified in controls over financial reporting.

Legislative History

The Bonneville Project Act of 1937 provides the original statutory foundation for Bonneville's power marketing responsibilities and authorities. In 1974, passage of the Federal Columbia River Transmission System Act (Transmission Act) applied provisions of the Government Corporation Control Act (31 U.S.C. §§ 9101-9110) to Bonneville. The Transmission Act provides Bonneville with "self-financing" authority, establishes the Bonneville Fund (a permanent, indefinite appropriation) allowing Bonneville to use its revenues from electric power and transmission ratepayers to fund all programs without further appropriation, and first authorizing Bonneville to sell bonds to the U.S. Treasury.

In 1980, enactment of the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) expanded Bonneville's authorities, obligations, and responsibilities. The purpose of the act includes the following: to encourage electric energy conservation to meet regional electric power loads placed on Bonneville; to develop renewable energy resources within the Pacific Northwest; to assure the Northwest an adequate, efficient, economical, and reliable power supply; to promote regional participation and planning; and to protect, mitigate, and enhance the fish and wildlife of the Columbia River and its tributaries. The Northwest Power Act also established the statutory framework for Bonneville's administrative rate-setting process and established judicial review of Bonneville's final decisions in the U.S. Court of Appeals for the Ninth Circuit.

As of the end of FY 2018, Bonneville has revolving U.S. Treasury borrowing authority of \$7.7 billion of which approximately \$2.2 billion remains available to be drawn.

The Columbia River Treaty

The U.S. Government reached consensus on a high level position for negotiations of the post-2024 future of the Columbia River Treaty in June 2015, and received authorization to negotiate with Canada on the Columbia River Treaty in October 2016. Government Affairs Canada notified the United States State Department in December 2017 of Canada's mandate to negotiate the Columbia River Treaty with the United States. Negotiations began in spring 2018 and U.S. and Canadian officials completed a third round of negotiations on the Columbia River Treaty in Portland on October 17-18. Both the U.S. Department of State and Canadian negotiators discussed shared objectives and exchanged information on flood risk

management, hydropower and ecosystem considerations. The next negotiation took place on Dec. 12-13 in Vancouver, British Columbia and another town hall meeting is also being planned for early 2019.

Judicial and Regulatory Activity

The Energy Policy Act of 2005 authorized the Federal Energy Regulatory Commission (FERC) to approve and enforce mandatory electric reliability standards with which users, owners, and operators of the bulk power system, including Bonneville, are required to comply. These standards became enforceable on June 18, 2007, and compliance is monitored by the North American Electric Regulatory Corporation (NERC) and the regional reliability organizations.

Fish and Wildlife Program Overview

Bonneville is committed to funding its share of the region's efforts to protect and mitigate Columbia River Basin fish and wildlife. To the extent possible, Bonneville is integrating actions to protect species listed for protection under the Endangered Species Act (ESA) in response to the FCRPS Biological Opinions (BiOps), including the National Oceanic and Atmospheric Administration (NOAA) Fisheries Willamette River BiOp and the United States Fish and Wildlife Service's (USFWS) 2006 Libby Dam BiOp, with projects implemented consistent with the Council's Fish and Wildlife Program (Program). The Program, BiOps, and long-term agreements include prioritized strategies for mitigation actions to meet Bonneville's environmental compliance responsibilities under the ESA, Northwest Power Act, and other laws.

Included with the budget schedules section of this document is the current tabulation of Bonneville's fish and wildlife costs from FY 2007 through FY 2018.

Infrastructure Investments

Bonneville is reviewing infrastructure investments in the Pacific Northwest to meet transmission capacity and reliability needs and continues to support a competitive wholesale market in the Western Interconnection, which encompasses 14 western states, two Canadian provinces, and one Mexican state.

Bonneville has completed three major transmission lines since 2011 (i) the McNary-John Day line—completed in FY 2012 — adding 79 miles, (ii) the Big Eddy-Knight 500kV transmission line and substation project resumed construction in 2014 and was energized in November 2015, adding 28 miles, and (iii) the Central Ferry-Lower Monumental 500kV Reinforcement which began construction in May 2014 and was also energized in November 2015, adding 38 miles. Bonneville also completed the modernization of the Celilo Converter Station at the northern end of the 846-mile Pacific Direct Current Intertie. The station was energized in January 2016. Additionally, 265 miles of direct current line were upgraded to match the capacity of the station upgrade.

In FY 2012, Bonneville signed two agreements to participate with two investor-owned utilities in the environmental work and permitting for another transmission project, the proposed Boardman-to-Hemingway 500kV line. Participation in this preliminary review keeps Bonneville's options open for serving its six southeast Idaho preference customers following the expiration of legacy transmission service agreements. Bonneville has not made a decision to co-develop or purchase capacity in this project. On January 17, 2014, Public Law 113-76 was enacted, which provided Bonneville with expenditure authority approval to construct or participate in the construction of a transmission line to southeast Idaho, should Bonneville decide to continue pursuing that service arrangement.

On May 18, 2017, Bonneville announced its decision to not build the I-5 Corridor Reinforcement Project. Bonneville continues to work with constituents and stakeholders to study more cost effective options to mitigate the current limitations along this path. Public meetings began in July 2017 to address alternatives to building. Cumulative capitalized costs associated with this project of \$130.0 million were reclassified in fiscal year 2017 from Construction work in progress to a Regulatory asset on the Combined Balance Sheets, as these costs are expected to be recovered through future rates.

Bonneville is also continuing to evaluate additional transmission investments and non-wires solutions across the Pacific Northwest to improve reliability and support both load and renewable generation needs.

Bonneville has experienced significant growth within its balancing area in installed variable renewable generation, primarily in the form of wind generation. Since 2001, installed wind generation connected to Bonneville's transmission system has grown from 115 MWs to 5,081 MWs through September 2018. Of the 5,081 MW of connected wind, 2,764 MW is currently

in Bonneville's Balancing Authority Area (BAA). This substantial increase in variable renewable generation has resulted in additional uncertainties in the balance between load and generation required for maintaining a reliable grid. Wind is a non-dispatchable source of energy, meaning it cannot be relied upon for capacity. As a result, Bonneville has implemented and continues to study operational tools for integrating this variable generation more cost effectively and reliably. Further complicating matters, 846 MW of the wind energy currently in Bonneville's BAA is requesting to join different BAA's. Although this removes variable generation from Bonneville's BAA, these projects are still physically connected to Bonneville's system and continue to impact the daily operations of Bonneville. Off-setting the wind leaving Bonneville's BAA is the possibility that a large amount of utility scale solar photo-voltaic (PV) projects are being added to Bonneville's queue. Bonneville is currently studying approximately 4,000 MW of solar interconnection requests and new requests are coming in at an average rate of two per month. Solar, like wind, is a variable generation source, but its characteristics are different than wind. Bonneville will need to learn and adapt to this new generation type.

Bonneville is considering approaches, in addition to or in lieu of the use of its U.S. Treasury borrowing authority, to sustain funding for its infrastructure investment requirements. These approaches include financial reserves financing some amount of transmission investments, or seeking, when feasible, third party financing sources. See the BP-5 Potential Third Party Financing Transparency table in the budget schedules section of this document. This FY 2020 Budget assumes \$15 million of annual financial reserves financing in FYs 2018-2019 for transmission infrastructure capital, which is included in this budget under Projects Funded In Advance.

Consistent with the FY 2018 and FY 2019 Budget Requests, the FY 2020 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville.

Radio Spectrum Communications

Bonneville's wireless communication system is used to operate and control critical national transmission grid infrastructure in a reliable, secure, and safe manner. Bonneville's communication systems are designed to meet strict reliability/availability objectives required by NERC and Western Electricity Coordinating Council (WECC) standards. Concerning proper spectrum stewardship, Bonneville designs highly efficient radio systems that use minimal radio frequency (RF) channel bandwidths to meet critical mission needs. However, in certain circumstances, efficiently designed spectrum radio systems will require broad RF channels and/or lower state RF modulation schemes to meet existing and future requirements in order to meet operational and reliability/availability objectives.

In order to meet Bonneville's mission/operational requirements, RF communication equipment approved for system use goes through a rigorous evaluation and testing process. RF spectrum efficiency factors are considered during the evaluation/testing period. RF terminal equipment approved for use is normally purchased directly from vendors and is not typically supplied through a Request for Proposal process.

Bonneville's operational telecommunications and other capital equipment and systems are acquired using Bonneville's self-financing and procurement authorities. The Bonneville budget includes a system-wide electric reliability performance indicator, consistent with NERC rules, to track and evaluate performance.

Bonneville may share temporarily-available spare capacity on its RF communication system with other government agencies (both Federal and State), and with other electric utilities in the region whose power systems interconnect with Bonneville. Non-critical administrative traffic is typically supported by commercial carrier enterprises. However, to meet the North American Electric Reliability Corporation/ Western Electricity Coordinating Council (NERC/WECC) electrical bulk transmission requirements, Bonneville exclusively operates highly critical transmission control traffic over its private telecommunication system as Bonneville has no control over the reliability/availability of the commercial enterprise or on how quickly critical operational control circuits are restored to active service during an interruption.

For high capacity communication system applications, Bonneville considers and operates non-spectrum dependent alternatives such as fiber optic cable infrastructure systems.

During FY 2014, Bonneville began upgrading the Very High Frequency (VHF) land mobile system and installing a number of digital Synchronous Optical Network (SONET) rings typically consisting of fiber segments in combination with point-to-point microwave hops operating in the 4 GHz and 7/8 GHz bands. These various telecommunication systems operate within

Bonneville's approximate 300,000 square mile utility responsibility service territory (Oregon, Washington, Idaho, western Montana) with the majority of the RF infrastructure located in low population-rural areas.

The FCRPS hydroelectric projects, owned by the Corps and Reclamation, also utilize federal radio spectrum to preserve very high operational telecommunications and power system reliability.

In FY 2014, Bonneville completed work costing approximately \$40 million, funded through the Spectrum Relocation Fund, to relocate its operational telecommunication systems from the 1710-55 MHz radio spectrum bands to alternative federal radio spectrum bands, part of the AWS-1 Federal Spectrum Relocation. In accordance with Federal law, Bonneville plans to return the approximately \$8.2 million of excess funds to the U.S. Treasury, via the Spectrum Relocation Fund, as soon as the National Telecommunications and Information Administration (NTIA) officially notifies the Federal Communications Commission (FCC) that the DOE relocation effort is complete.

Bonneville began participating in a new spectrum relocation effort in FY 2015. The NTIA has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The FCC held an auction of this spectrum on November 13, 2014. Bonneville received an additional \$5.2 million from the Spectrum Relocation Fund on July 29, 2015 to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment. Bonneville received obligational authority to proceed with this relocation effort by apportionment on July 24, 2015.

Bonneville has worked to complete its move off of 1755-80 MHz in two stages. First, Bonneville moved off of the old federal frequencies and "retuned" to new alternate federal frequencies in the band segment of 1780-1850 MHz which is above the highest frequency that is involved in the auction. Three hops federal frequency moves/retuning were completed as of June 7, 2017. One remaining path, Happy Camp to Hilltop in northern California near the Oregon California Border, is being moved/retuned. As of July 31, 2018, Bonneville is off of the AWS-3 radio frequencies. The new radios, using new federal radio frequencies, have been installed, have been fully tested and are now being used. The old radios have been turned off. Bonneville has met the July 31, 2018 commitment date that we promised the NTIA. Bonneville still has additional work remaining to finish the construction related to the AWS-3 relocations. Bonneville will use the SRF relocation funds for about another two years. Second, Bonneville will complete its move of these four microwave hops to 7GHz-8GHz. This will take additional time because two of four hops require building construction to complete the work. AWS-3 funds will need to be retained by Bonneville for over five years after Bonneville first received AWS-3 funds, at least through FY 2020, to complete construction of two communications buildings. Bonneville will assure that "comparable capability" has been achieved for these four AWS-3 relocated Bonneville operational telecommunication hops.

Financial Mechanisms

Bonneville's program is treated as mandatory and nondiscretionary. Bonneville is "self-financed" with its own revenues and does not rely on annual appropriations from Congress. Under the Transmission Act, Bonneville funds the expense portion of its budget and repays the federal investment with revenues from electric power and transmission sales. Bonneville's revenues fluctuate for a variety of reasons, including in response to variations in market prices for fuels and stream flow in the Columbia River System due to variations in weather conditions and fish mitigation needs. Through FY 2018, Bonneville has returned approximately \$34.7 billion to the U.S. Treasury, of which about \$3.7 billion was for payment of FCRPS operation and maintenance (O&M) and other costs, \$16.0 billion for interest, and \$15.0 billion for amortization of appropriations and bonds.

In the FY 2020 Budget, the term Bonneville "bonds" refers to the debt instruments under which Bonneville receives advances of funds from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act, which defines "bonds" as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

In May 2018, debt instruments issued by non-federal entities but secured by payment and other financial commitments provided by Bonneville maintained their credit ratings as follows: Moody's at Aa1 with a stable outlook, Fitch at AA with a negative outlook, and Standard & Poor's at AA- with a stable outlook.

Bonneville and the U.S. Treasury have a comprehensive banking arrangement that covers Bonneville's short- and long-term federal borrowings. This provides Bonneville with the ability to borrow from the U.S. Treasury to finance capital

investments and, on a short-term basis, to cover Northwest Power Act-related operating expenses. This latter ability provides Bonneville with much needed liquidity to help manage within-year cash flow needs and mitigate risk. Access to this use of U.S. Treasury borrowing authority has been incorporated into and relied upon in Bonneville's rate-setting process.

Bonneville undertook a Power Prepayment Program in FY 2013 under which all Bonneville preference customers had an opportunity to submit formal offers to provide lump-sum payments to Bonneville as prepayments of a portion of their power purchases through September 30, 2028, the termination date of the Long-Term Regional Dialogue Power Sales Contracts. Bonneville accepted power prepayments from four preference customers, as described below.

Upon Bonneville's receipt of the agreed-to, lump-sum prepayments, the selected preference customers became entitled to future portions of their electricity from Bonneville without further payment. The power prepayments are and will be recognized in the customers' future power bills from Bonneville as fixed, equal monthly prepayment credits. In effect, the amount of electricity that is prepaid may vary by month, depending on Bonneville's power rates and rate schedules that apply to electricity purchases by the prepaying customers in the related month. Because this is structured as a variable amount prepayment and not as a fixed-price/fixed-amount type of prepayment, Bonneville maintains flexibility to establish rates for the electric power that is prepaid.

As a result of the FY 2013 Prepayment solicitation, Bonneville received \$340 million in prepayments, which Bonneville is using to fund needed FCRPS investments. The aggregate prepayment credits are set at \$2.55 million per month through FY 2028.

Depending on a variety of factors it is possible that Bonneville may seek to implement later phases of the Power Prepayment Program in connection with future FCRPS hydroelectric investment needs.

U.S. Treasury Payments and Budget Overview

Bonneville's FY 2018 payment to the U.S. Treasury was \$862 million. This was the 35th consecutive year that Bonneville made its scheduled payments to the U.S. Treasury on time and in full. The payment included \$569 million in principal, which included \$275 million in early retirement of higher interest rate U.S. Treasury debt, \$226 million for interest, \$27 million in irrigation assistance payments, and \$40 million in pension and post-retirement benefits. Total credits associated with fish mitigation and recovery that are applied toward Bonneville's U.S. Treasury payment were about \$70.2 million for FY 2018. These credits are established and applied under section 4(h)(10)(C) of the Northwest Power Act. The FYs 2019 and 2020 U.S. Treasury payments are currently estimated at \$776 million and \$702 million, respectively. The FY 2019 and 2020 4(h)(10)(C) credits are estimated to be \$92 million and \$90 million, respectively.

Estimates of interest and amortization levels for outyear U.S. Treasury payments are included in the FY 2018-2019 final transmission and power rates. Bond and Appropriations Interest will continue to be revised based on upcoming capital investments and debt management actions. These estimates may change due to revised capital investment plans and actual U.S. Treasury borrowing. In recent years, Bonneville has made amortization payments in excess of those scheduled in its FERC-approved rate filings resulting in a balance of advance repayment. The cumulative balance of advance amortization payments as of the end of FY 2018 was about \$5,503 million.

Bonneville has direct funding arrangements to fund the power-related portion of O&M and capital investments at the Corps and Reclamation facilities as well as the O&M costs of the U.S. Fish and Wildlife Service Lower Snake River Compensation Plan facilities. Direct funded Associated Projects capital costs, which had been funded exclusively through appropriations to the Corps and Reclamation prior to the initiation of direct funding, are now funded primarily from the proceeds of bonds issued by Bonneville to the U.S. Treasury. Certain power prepayments have also been a source of funds for direct funding. Bonneville's aggregate direct funding provided for capital and O&M was \$643 million in FY 2018.

Starting in FY 2014, Bonneville and Energy Northwest, the Washington state joint operating agency that owns and operates the Columbia Generating Station nuclear plant, have been working together to implement a new phase of integrated debt management for their combined total debt portfolios. The debt service of these portfolios is borne by Bonneville and recovered from Bonneville ratepayers through Bonneville's rates. Energy Northwest-related debt, as refinanced under this

effort, is called Regional Cooperation Debt. Bonneville currently has Energy Northwest Board approval for these types of transactions through FY 2020.

In FY 2018, BPA proposed an extension of the Regional Cooperation Debt program. This would extend the program through 2030 and involve up to \$3.5 billion of tax-exempt debt. This extension would be similar to the current Regional Cooperation Debt program in many ways but the proceeds could be used to prepay federal bonds or directly used for capital investments. The Energy Northwest Board approved this proposal on September 27, 2018.

An important component of Regional Cooperation Debt is the issuance of new bonds by Energy Northwest to refund outstanding bonds shortly before their maturities when substantial principal repayments are due. An equal amount of higher interest rate Federal debt will be repaid instead. The net effect of refunding Regional Cooperation Debt and prepaying higher interest rate federal obligations is that the weighted-average interest rate of Bonneville's overall debt portfolio has been and will be reduced. In addition, Bonneville's aggregate principal balance of debt outstanding (federal and non-federal) does not and will not increase by virtue of the Regional Cooperation Debt program.

Energy Northwest accelerated site restoration efforts for the Energy Northwest Nuclear Projects 1 and 4 in the summer of 2015 and these efforts continue.

This FY 2020 Budget proposes estimated accrued expenditures of \$2,868 million for operating expenses, \$86 million for Projects Funded in Advance (PFIA), \$787 million for capital investments, and \$408 million for capital transfers in FY 2020.

The estimated spending levels in this budget are still subject to change to accommodate competitive dynamics in the region's energy markets, debt management strategies, continuing changes in the electric industry, and other factors.

Budget Estimates and Planning

This FY 2020 Budget includes capital and expense estimates based on initial spending proposals from Bonneville's 2018 initial Integrated Program Review (IPR). FY 2018 costs are based on Bonneville's FY 2018 audited financial statements. Consistent with the FY 2018 and FY 2019 Budget Requests, the FY 2020 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville. The FY 2020 budget request also re-proposes to change BPA's statutory rate structure requirements from cost recovery to a market based structure that takes into consideration rates charged by comparable utilities and which could allow for faster recoupment of the taxpayer investment.

Capital investment levels reflect Bonneville's capital asset management process and external factors such as changes affecting the West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region and national energy security goals.

Bonneville utilizes a structured capital project selection process requiring submission of a standardized business case for review. Each business case consists of a description of the project, a clear statement of objectives, description and mitigation of risks, and a rigorous analysis of project costs and benefits including a status quo assumption and preferred alternatives. In addition, both annual and end-of-project targets are set for each project covering cost, scope, and schedule. Progress reports on these targets are provided to Bonneville's senior executives at least quarterly.

The FYs 2019-2024 revenue estimates in this budget, included in the Net Outlay formulation, are calculated consistent with cash management goals. The revenue estimates reflect assumed adjustments, which include the use of a combination of tools, including upcoming rate adjustment mechanisms, reduced cost estimates, a net revenue risk adjustment, debt management strategies, and/or short-term financial tools to manage net revenues and cash. The revenue estimates also include depreciation and U.S. Treasury repayment credit assumptions. These U.S. Treasury repayment credits offset, among other things, Bonneville's fish and wildlife program costs allocable to the non-power project purposes of the FCRPS, as provided under section 4(h)(10)(C) of the Northwest Power Act.

Overview of Detailed Justifications

In Bonneville's Detailed Justification Summaries, accrued expenditure is the basis of presenting Bonneville's program funding levels in the power and transmission rate making processes and the basis upon which Bonneville managers control

their resources to provide products and services. Accrued expenditures relate period costs to period performance. Traditional budget obligation requirements for Bonneville's budget are assumed on the Program and Financing Summary Schedule prepared in accordance with Office of Management & Budget Circular A-11.

The organization of Bonneville's FY 2020 Budget and these performance summaries reflect Bonneville's business services basis for utility enterprise activities. Bonneville's major areas of activity on a consolidated budget and accounting basis include power and transmission, with administrative costs included. Power Services includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program, Associated Projects O&M Costs, and the Council. Environmental activities are shown in the relevant Power Services and Transmission Services sections, as are reimbursable costs. Bonneville's interest expense, pension and post-retirement benefits, and capital transfers to the U.S. Treasury are shown by program.

The first section of performance summaries, Capital Investments, includes accrued expenditures for investments in electric utility and general plant associated with the FCRPS generation and transmission services, fish and wildlife, and capital equipment. These capital investments are estimated to require budget obligations and expected use of \$787 million in bonds to be issued and sold to the U.S. Treasury in FY 2020.

The near-term forecast of capital funding levels has undergone an extensive internal review as a result of Bonneville's development of asset management plans. These plans encompass project cost management initiatives, capital investment assessments, and categorization of capital projects to be funded based on risk and other factors. Consistent with Bonneville's near-term asset planning process and Bonneville's standard operating budget process, this FY 2020 Budget includes updated capital investment levels for FY 2019. Utilizing this review process helps Bonneville in its efforts as a participant in wholesale energy markets. Bonneville will continue to work with the Corps and Reclamation to optimize the mix of projects.

The second section of Bonneville's performance summaries, entitled Annual Operating Expenses, includes accrued expenditures for services and program activities financed by power sales revenues, transmission sales revenues, and projects funded in advance. For FY 2020, budget expense obligations are estimated at \$2,868 million. The total program requirements of all Bonneville programs include estimated budget obligations of \$4,148 million in FY 2020.

Evidence and Analysis in the Budget

Bonneville has undertaken several initiatives and processes to determine appropriate budget expenditures.

Bonneville's Integrated Program Review (IPR) process allows interested parties to see all relevant FCRPS expense and capital spending level estimates in the same forum. In addition, Bonneville's IPR process allows interested parties to review and comment on Bonneville's Strategic Asset Management Plans (SAMPs) and 10-year capital forecasts. The IPR occurs every two years, or just prior to each rate case, and provide participants with an opportunity to review and comment on Bonneville's program level estimates prior to spending levels being set for inclusion in rate cases. The 2016 IPR process concluded in the fall of 2016. Bonneville completed a second, targeted IPR (IPR2) process in early 2017 and used that information in preparing Bonneville's final rate proposal for FYs 2018-2019. BPA concluded the 2018 IPR in summer 2018, focusing on FYs 2020-2021.

Bonneville is focused on institutionalizing operational excellence – continuous improvement that produces more efficient and effective ways to deliver on Bonneville's mission and vision. In FY 2015, Bonneville re-focused its continuous improvement efforts to concentrate on seven Key Strategic Initiatives (KSIs). In FY 2017 the Business Transformation Office (BTO) was implemented in order to ensure that Bonneville's transformational initiatives, including the KSIs, are executed in the most efficient manner, from a time, cost and resource perspective. Additionally, the BTO will ensure KSI initiatives are aligned to Bonneville's strategy and operating environment and are focused on delivering the value as required by our customers. The BTO will mature foundational capabilities such as portfolio, project, business process management, and organizational change management. The BTO is establishing an Enterprise Architecture capability with the responsibility for developing a disciplined approach to modeling and aligning the organization's business capabilities, processes, information, technology, and resources to business models that support Bonneville's value chain and value system. Enterprise Architecture will bring together business and Information Technology to deliver quality and cost effective solutions for transformational initiatives.

Educational Activities

Bonneville is a supporter of science, technology, engineering, and math (collectively known as “STEM”) education programs. These programs provide support and encouragement to middle and high school students to study the sciences in school and to pursue careers in these fields. Working with Bonneville employees as volunteer ambassadors, the Bonneville education program provides value-added presentations, curricula, and activities to K-12 schools that enhance the learning experience for students and teachers, and extend awareness of the value of the region’s hydroelectric system to future generations. As a regional leader in STEM education, Bonneville also proudly supports and organizes an award-winning Science Bowl. Bonneville also sponsors Science Fair competitions for students in Washington State, as well as a First Robotics tournament championship.

**Power Services - Capital
Funding Schedule by Activity**

Funding (\$K)

Power Services – Capital
 Associated Project Costs
 Fish & Wildlife
Total, Power Services – Capital

FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate	FY 2020 vs FY 2019	
			\$	%
199,438	264,735	238,000	-26,735	-10.1%
30,669	44,000	47,266	+3,266	+7.4%
230,107	308,735	285,266	-23,469	-7.6%

Outyears (\$K)

Power Services – Capital
 Associated Project Costs
 Fish & Wildlife
Total, Power Services - Capital

FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate
238,000	256,000	281,000	300,000	306,000
47,266	47,266	43,000	43,000	40,000
285,266	303,266	324,000	343,000	346,000

Program Overview

Associated Project Costs provide for direct funding of additions, improvements, and replacements of existing Reclamation and Corps hydroelectric projects in the Pacific Northwest. The FCRPS hydro projects produce electric power that is marketed by Bonneville.

Maintaining the availability and increasing the efficiency of the FCRPS is critical to ensuring that the region has an adequate, efficient, economic, and reliable power supply. The FCRPS represents about 80 percent of Bonneville's firm power supply and includes 31 operating federal hydroelectric projects with over 200 generating units. These projects have an average age of about 50 years, with some that exceed 60 years of age. Through direct funding and the cooperation of the Corps and Reclamation, Bonneville uses its U.S. Treasury borrowing authority and other sources to make investments needed to restore generation availability and improve efficiency, reducing demand on Corps and Reclamation appropriations for power-related investments.

Since the beginning of direct funding in FY 1997, Bonneville, along with its joint operating partners, the Corps of Engineers and the Bureau of Reclamation, has improved system performance. In 1999, at the direction of Congress, Bonneville issued a report that it soon began to implement called the "Asset Management Strategy for the FCRPS." In this report, Bonneville concluded that it needed to invest nearly \$1 billion, in aggregate, in the hydroelectric projects over the ensuing 12 to 15 years. Supplementary analyses and experience with the system have revealed additional and ongoing investment needs.

These planned investments, included in the FY 2020 Budget estimates, will maintain the generation performance of the FCRPS. Moving forward with the cost-effective opportunities to expand the generation and to preserve and enhance the capability of the FCRPS is a smart, economic, and environmentally beneficial decision when compared to purchasing power from the market to serve growing Pacific Northwest electricity needs.

Fish and wildlife capital costs incurred by Bonneville are directed at activities that mitigate Columbia River Basin fish and wildlife resources. Bonneville uses capital to fund projects designed to increase juvenile and adult fish passage through the Columbia River system, to increase fish production and survival through construction of hatchery, acclimation and fish monitoring facilities, and to increase wildlife and resident fish populations through land acquisitions and habitat enhancement. These capital projects support both Northwest Power Act and ESA priorities and are integrated with the Program in order to efficiently meet Bonneville's responsibilities under the Northwest Power Act and other statutes to mitigate federal hydrosystem impacts to Columbia River Basin fish and wildlife.

Bonneville implements projects consistent with the Pacific Northwest Electric Power Planning Council's (Council) Columbia Basin Fish and Wildlife Program and the purposes of the Northwest Power Act. Under the Northwest Power Act, the Council must develop a Program that protects, mitigates, and enhances Columbia River Basin fish and wildlife affected by the federal and non-federal hydroelectric projects in the basin while assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply. The Program, the FCRPS BiOp, other BiOps, and Bonneville's long-term agreements include prioritized strategies for mitigation actions and projects to meet Bonneville's responsibilities under the Northwest Power Act, the ESA, the Federal Clean Water Act, and other laws. When issues arise that potentially trigger the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, Bonneville works with the Council and the regional fish and wildlife managers, customers, and tribes, as appropriate, to ensure ratepayers fund only appropriate mitigation.

Most projects recommended by the Council also undergo independent scientific review as directed by the 1996 Energy and Water Appropriations Act, which added section 4(h)(10)(D) to the Northwest Power Act. As a result, the Council appoints an Independent Scientific Review Panel (ISRP) "to review a sufficient number of projects" proposed to be funded through Bonneville's annual fish and wildlife budget "to adequately ensure that the list of prioritized projects recommended is consistent with the Program." The Northwest Power Act further states that "in making its recommendations to Bonneville, the Planning Council shall consider the impact of ocean conditions on fish and wildlife populations; and shall determine whether the projects employ cost effective measures to achieve program objectives." Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council uses a multi-year project review cycle during which the ISRP reviews categories of projects grouped together.

To comply with the ESA, Bonneville funds capital investment actions to avoid jeopardizing listed species. Guidance for those actions is found in the most recent BiOp issued by NOAA in 2008, as supplemented in 2010 and 2014, and the USFWS BiOp in 2006/2010.

- In February 2006, USFWS issued a BiOp for Libby Dam on the Kootenai River for white sturgeon and bull trout. A subsequent Settlement Agreement between USFWS and the Center for Biological Diversity was memorialized by modifying the BiOp in 2008. Additional consultation is occurring as part of the larger USFWS bull trout consultation.
 - In 2010 USFWS designated critical habitat for bull trout (following USFWS's issuance in 2000 of a BiOp for FCRPS impacts on bull trout). The Action Agencies (Corps, Reclamation, and Bonneville) are preparing a biological assessment covering FCRPS operational effects on bull trout and designated bull trout critical habitat.
 - In May 2008, NOAA issued an FCRPS BiOp for 13 listed species of salmon and steelhead, supplemented in a 2010 Supplemental BiOp that incorporated the Action Agencies' Adaptive Management Implementation Plan, and further supplemented in a 2014 Supplemental BiOp. On January 17, 2014, NOAA released its 2014 Supplemental BiOp. In May 2016, the Federal District Court for the District of Oregon invalidated the BiOp on numerous grounds and found that the Corps and Reclamation violated the National Environmental Policy Act (NEPA) when they issued decision documents to implement the BiOp. The court ordered NOAA to complete a new BiOp by December 31, 2018, and ordered the Corps and Reclamation to complete a NEPA process in 2021. In an order issued April 3, 2017, the court ordered additional spill beginning in 2018 and continuing through the BiOp remand period; this order was upheld by the Ninth Circuit Court of Appeals on April 2, 2018. The Action Agencies are now in consultations with NOAA on a new BiOp.
- In July 2008, USFWS and NOAA issued Willamette River BiOps to address impacts from 13 federal dams on salmon, steelhead, Oregon chub, and bull trout. Implementation of a BiOp measure related to hatchery fish in the McKenzie River was the subject of litigation in Federal District Court. The Action Agencies are currently engaged in discussions with NOAA related to BiOp implementation for downstream passage and for hatchery consultations.

Under these collective BiOps, the Action Agencies have committed to implement hydro, habitat, hatchery, and other actions throughout the Columbia River Basin to address impacts stemming from the operation of the federal hydro-electric dams on ESA-listed fish, and to ensure that operations of the federal dams do not jeopardize the continued existence of the ESA listed species or adversely modify their designated critical habitat.

The Action Agencies also signed the 2008 Columbia Basin Fish Accords (Fish Accords or Accords) with five Northwest Tribes and the states of Idaho and Montana. In 2009, an agreement was signed with the state of Washington and federal agencies (the state of Washington Estuary agreement). And in 2012, the Action Agencies signed an agreement with the Kalispel Tribe of Indians covering Albeni Falls Dam and FCRPS operations. Wildlife settlement agreements have been signed with the states of Oregon and Idaho to help complete mitigation for the flooding and inundation caused by the construction of FCRPS dams operating in those states. These Fish Accords and settlements complement the BiOps and provide firm commitments to prioritize mitigation actions and secure funding over the life of the agreements.

In October 2018, Bonneville and its federal partners Corps and Reclamation signed extension agreements with current Accords partners, namely certain states and tribes, to extend the Columbia Basin Fish Accords. The existing agreements expired September 30, 2018, and were extended from October 2018 until September 30, 2022, at the latest. The extension agreements commit nearly \$450 million for fish and wildlife protection and mitigation, which is likely to result in future expenses or regulatory assets. No amounts relating to the extension agreements were recognized in the fiscal year 2018 financial statements, as they were executed subsequent to the fiscal year end.

As noted above, BiOps, Fish Accords, and wildlife settlement commitments are integrated along with other projects and implemented through the Program under the Northwest Power Act. They provide the basis for the Bonneville Fish and Wildlife Program's planned capital investment.

Accomplishments

- The BP-18 rates were confirmed and approved by FERC on a final basis on March 19, 2018.

- Enhanced more than 700 stream miles by improving channel complexity, reconnecting floodplains, and improving fish passage
- Restored in-stream flow 53 cubic feet per second, and secured more than 500,000 acre-feet of water over the life of the projects
- Met key milestones for four major, new innovative fish hatcheries under the Columbia Basin Fish Accords
- Completed transformer improvements at Bonneville Dam Powerhouse 2
- Completed digital governor upgrades at Dworshak Dam
- Completed installation of circuit breakers at the Keys Pump Generating Plant
- Completed powerhouse roof replacements at Libby and Cougar dams
- Completed unit 3 generator repair at The John Day Dam
- Completed replacement of tailrace gantry crane at The Dalles Dam

Explanation of Changes

Bonneville’s budget includes \$285.3 million in FY 2020 for Power Services capital, which is a 7.6 percent decrease from the FY 2019 forecasted level. The FY 2020 level reflects additional cost management efforts while continuing to align with Bonneville’s strategic asset management plans which focus on the need for investment in the hydroelectric system assets and investments necessary to implement the BiOps, Fish Accords, and other Columbia Basin Fish and Wildlife activities.

The FY 2020 budget decreases the levels for Associated Projects (-\$26.7 million) and increases the level for Fish & Wildlife (+\$3.3 million), relative to FY 2019.

Strategic Management

Bonneville provides electric power while supporting the achievement of its vital responsibilities for fish and wildlife, energy efficiency, renewable resources, and low-cost power in the Pacific Northwest region. Bonneville will continue to implement the following strategies to serve the region:

1. Bonneville coordinates its power operational activities with the Corps, Reclamation, NERC, regional electric reliability councils, its customers, and other stakeholders to provide the most efficient use of federal assets.
2. Ongoing work with the Corps and Reclamation is focused on improving the reliability of the FCRPS, increasing its generation efficiency, and optimizing hydro facility operation.
3. Bonneville is committed to funding efforts to protect listed fish and wildlife species in the Columbia Basin under the ESA and working closely with the Council, regional fisheries managers, and other federal agencies to prioritize and manage projects to mitigate fish and wildlife affected by the FCRPS.
4. Bonneville’s utility customers have been, and continue to be, a critical part of Bonneville’s collaborative efforts to promote and foster the efficient use of energy.
5. Bonneville has assisted with a DOE Wind Power crosscutting initiative to strengthen energy security.

The following external factors present the most significant risk and impact to overall achievement of the strategies listed above:

1. Continually changing regional economic and institutional conditions;
2. Competitive dynamics; and
3. Ongoing changes in the electric industry.

Associated Projects

Overview

Bonneville will work with both the Corps and Reclamation to reach mutual agreement on budgeting and scheduling capital improvement projects that are cost-effective and provide system or site-specific enhancements, increase system reliability, or provide generation efficiencies.

The work is focused on improving the reliability of the FCRPS and on increasing its generation efficiency or capacity through turbine runner replacements, optimizing hydro facility operation, and new unit construction. Also, limited investments may be made in joint-use facilities that are beneficial to both the FCRPS operations and to other Corps and Reclamation project purposes.

Corps of Engineers Projects

(\$K)		
FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
166,668	122,298	123,071

Bonneville Dam:

- FY 2018. Continue generator step up (GSU) transformer instrumentation and powerhouse 2 roof replacement. Continue main unit breaker and station service reconfiguration, and tailrace gantry crane rehabilitation. Begin powerhouse 2 tailrace gantry crane rehabilitation and generator cooler replacements.
- FY 2019. Complete powerhouse 2 roof replacement. Continue GSU transformer instrumentation, main unit breaker and station service reconfiguration, and tailrace gantry crane rehabilitation. Begin generator fire protection projects and trash racks replacement.
- FY 2020. Complete GSU transformer instrumentation. Continue main unit breaker and station service reconfiguration, tailrace gantry crane rehabilitation, generator fire protection projects and trash racks replacement.

John Day Dam:

- FY 2018. Completed draft tube bulkhead refurbishment. Continued 500kV disconnect replacement, station service transformer replacement, Heating, Ventilating, Air Conditioning (HVAC) system upgrade, emergency gantry crane replacement and SQ board replacement.
- FY 2019. Complete station service transformer replacements and 500kV disconnect replacement. Continue HVAC system upgrade, emergency gantry crane replacement and SQ board replacement. Begin powerhouse roof replacement and trash rack crane replacement.
- FY 2020. Complete emergency gantry crane replacement. Continue HVAC system upgrade, emergency gantry crane replacement, SQ board replacement, powerhouse roof replacement and trash rack crane replacement. Begin control room fire protection upgrades.

The Dalles Dam:

- FY 2018. Continued transformer replacements, fish unit breaker replacement, SR panel replacement, and emergency gantry crane rehabilitation.
- FY 2019. Complete SR panel replacement. Continue transformer replacements, fish unit breaker replacement, and emergency gantry crane rehabilitation. Begin control room modernization and fish units runner replacement and generator rewinds.
- FY 2020. Continue transformer replacements, fish unit breaker replacement, emergency gantry crane rehabilitation, control room modernization and fish runner replacements and generator rewinds.

Willamette Plants:

- FY 2018. Completed Hills Creek spillway gate rehabilitation, and digital governor replacements at Cougar. Continued Foster Bridge crane rehabilitation, Detroit spillway gate rehabilitation, Generic Data Acquisition and Control System (GDACS) and turbine platform installations at all Willamette Valley plants, electrical reliability upgrades and turbine

rehabilitation at Foster, and powerhouse roof replacement at Cougar Dam. Began intake gantry crane replacement at Big Cliff.

- FY 2019. Complete Foster bridge crane rehabilitation and turbine platform installations in the Willamette Valley. Continue Detroit spillway gate rehabilitation, GDACS installation across the Willamette Valley, intake gantry crane replacement at Big Cliff, electrical reliability upgrades and turbine and generator rehabilitation at Foster, and powerhouse roof replacement at Cougar. Begin fire detection, HVAC and life safety improvements at Dexter.
- FY 2020. Complete GDACS installation across the Willamette Valley, Detroit spillway gate rehabilitation, and Big Cliff intake gantry crane replacement. Continue electrical reliability upgrades and turbine and generator rehabilitation at Foster, powerhouse roof replacement at Cougar, and fire detection, HVAC and life safety improvements at Dexter. Begin Dexter intake gantry crane.

Albeni Falls Dam:

- FY 2018. Continue station service switchgear replacement and spillway gate modifications. Continue design for transformer replacement.
- FY 2019. Complete station service switchgear replacement and spillway gate modifications. Begin installation of main unit transformers.
- FY 2020. Continue installation of main unit transformers.

Libby Dam:

- FY 2018. Complete powerhouse DC emergency lighting system installation. Continue system control console replacement. Begin hydropower critical spares warehouse. Begin intake gantry crane replacement.
- FY 2019. Complete system control console replacement and hydropower critical spares warehouse. Continue intake gantry crane replacement.
- FY 2020. Complete intake gantry crane replacement.

Chief Joseph Dam:

- FY 2018. Complete DC and preferred AC upgrade. Continue intake and tailrace gantry crane replacement. Begin system control console boards replacement.
- FY 2019. Complete intake and tailrace gantry crane replacement. Begin powerhouse HVAC upgrade and upgrades for station service units.
- FY 2020. Continue upgrades for station service units and powerhouse HVAC upgrade. Begin powerbus replacement.

Dworshak Dam

- FY 2018. Completed unit 3 stator and cooler replacement. Continued exciter replacement and tailrace crane rehabilitation.
- FY 2019. Complete exciter replacement. Continue tailrace crane rehabilitation.
- FY 2020. Complete tailrace crane rehabilitation. Begin life safety fire alarm system upgrades.

McNary Dam

- FY 2018. Completed powerhouse bridge crane skew control. Continued 4160-480V station service rehabilitation, turbine design and replacement, drainage system oil water separator and main unit cooling water strainers replacement. Begin spillway gates rehabilitation.
- FY 2019. Complete 4160-480V station service rehabilitation, main unit water strainers replacement, and drainage system oil water separator. Continue spillway gate rehabilitation and turbine design and replacement. Purchase 230kV transformer. Begin exciters upgrade, levee drainage pump station upgrades and station service units rehabilitation.
- FY 2020. Continue exciters upgrade, levee drainage pump station upgrades, turbine design and replacement, drainage system oil water separator, spillway gate rehabilitation, and station service units rehabilitation. Begin governor mechanical system rehabilitation, powerhouse control system upgrade, and intake gantry crane replacement.

Ice Harbor Dam

- FY 2018. Continued units 1-3 turbine runner replacements, stator winding replacements, main unit surface air cooler upgrades, and station service transformer replacements. Began 115kV disconnect upgrade and drainage system oil water separator installation.
- FY 2019. Complete drainage system oil water separator installation, stator winding replacements, 115kV disconnect upgrade and main unit surface air cooler upgrades. Continue Units 1-3 turbine runner replacements.
- FY 2020. Complete station service transformer replacements. Continue units 1-3 turbine runner replacements. Begin intake gantry crane controls upgrade and fish ladder entrance weir gates and hoists replacement.

Little Goose Dam

- FY 2018. Completed bridge crane rehabilitation. Continue station service transformers replacement and drainage and unwatering pump replacement.
- FY 2019. Complete station service transformers replacement. Continue drainage and unwatering pump replacement. Begin DC system and LV switchgear upgrade and headgate repair pit upgrade.
- FY 2020. Complete headgate repair pit upgrade, drainage and unwatering pump replacement and drainage system oil water separator installation. Continue DC system and LV switchgear upgrade.

Lower Granite Dam

- FY 2018. Completed bridge crane rehabilitation. Continued digital governor upgrade. Began isophase bus and housing upgrade, drainage system oil water separator and DC system and LV switchgear upgrade.
- FY 2019. Complete isophase bus and housing upgrade, digital governor upgrade and drainage system oil water separator. Continue DC system and LV switchgear upgrade.
- FY 2020. Complete DC system and LV switchgear upgrade.

Lower Monumental Dam

- FY 2018. Completed breaker replacements. Continued digital governor replacements, drainage system oil water separator installation, and drainage and unwatering pump replacements. Began DC system and LV switchgear upgrades.
- FY 2019. Complete digital governor replacements, drainage system oil water separator installation and drainage and unwatering pump replacements. Continue DC system and LV switchgear upgrades.
- FY 2020. Continue DC and LV switchgear upgrades. Begin headgate repair pit upgrades.

**Bureau of Reclamation Projects
(\$K)**

FY 2018 Actual | FY 2019 Estimate | FY 2020 Estimate

32,770

142,437

114,929

Grand Coulee Dam

- FY 2018. Continued firehouse construction, Supervisory Control and Data Acquisition (SCADA) replacement, Units G11-G18 transformer replacements and G22-24 wear ring replacements, left and right powerhouse bridge crane replacements, and compressed air system upgrades. Began G1-G18 penstock stoplogs and crane control upgrades, G21-G24 transformers replacement, and roof replacement in the Third Powerplant.
- FY 2019. Complete compressed air system upgrades. Continue SCADA replacement, Units G11-G18 transformer replacements, G22-24 wear ring replacements, left and right powerhouse bridge crane replacements, G1-G18 penstock stoplogs, crane control upgrades, G21-G24 transformers replacement and roof replacement in the Third Powerplant.
- FY 2020. Complete SCADA replacement, Third Powerplant roof replacement and G1-G18 penstock stoplogs. Continue Units G11-G18 transformer replacements, G22-G24 wear ring replacements, left and right powerhouse bridge crane replacements and crane control upgrades, G21-G24 transformers replacement and roof replacement in the Third Powerplant. Begin G1-G18 transformers replacement.

Keys Pump Generating Plant

- FY 2018. Continued P5 and P6 impeller and core replacement and rewinds. Continued P1-P6 exciters, relays and unit controls and PG7-12 governors, exciters, relays and unit controls. Continued phase reversal switch replacement.
- FY 2019. Continue P5 and P6 impeller and core replacement and rewinds. Continue P1-P6 exciters, relays and unit controls and PG7-12 governors, exciters, relays and unit controls. Continue phase reversal switch replacement. Begin KP10B transformer replacement.
- FY 2020. Complete P5 and P6 impeller and core replacement and rewinds, and phase reversal switch replacement. Continue P1-P6 exciters, relays and unit controls, KP10B transformer replacement and PG7-12 governors, exciters, relays and unit controls. Begin crane controls upgrade.

Hungry Horse Dam

- FY 2018. Continued powerplant crane controls, SCADA replacement, control room panel revisions, and main unit transformer fire protection system replacement.
- FY 2019. Complete SCADA replacement and control room panel revisions. Continue powerplant crane controls, main unit transformer fire protection system replacement.
- FY 2020. Continue powerplant crane controls, main unit transformer fire protection system replacement. Begin static exciters and governors replacement.

Chandler Dam

- FY 2018. No planned capital projects.
- FY 2019. No planned capital projects.
- FY 2020. No planned capital projects.

Palisades Dam

- FY 2018. Completed turbine runner replacement. Continued microwave system backbone modernization, and arc flash mitigation.
- FY 2019. Complete arc flash mitigation and microwave system backbone modernization.
- FY 2020. Complete switchyard modernization.

Green Springs Dam

- FY 2018. Continued excitation system replacement.
- FY 2019. Continue excitation system replacement.
- FY 2020. Complete excitation system replacement.

Black Canyon Dam

- FY 2018. Began switchyard replacement, trash rack system, and Units 1 and 2 upgrades.

- FY 2019. Continue switchyard replacement, trash rake system, and Units 1 and 2 upgrades.
- FY 2020. Continue switchyard replacement, trash rake system, and Units 1 and 2 upgrades.

Anderson Ranch Dam

- FY 2018. No planned capital projects.
- FY 2019. No planned capital projects.
- FY 2020. No planned capital projects.

Roza Dam

- FY 2018. Continued switchyard rehabilitation and breaker upgrade.
- FY 2019. Continue switchyard rehabilitation and breaker upgrade.
- FY 2020. Complete switchyard rehabilitation and breaker upgrade.

Minidoka Dam

- FY 2018. Completed Units 8 and 9 governor replacements. Continued switchyard modernization, arc flash mitigation, and microwave system backbone modernization.
- FY 2019. Complete arc flash mitigation and switchyard modernization projects. Continue microwave system backbone modernization.
- FY 2020. Complete microwave system backbone modernization.

Fish & Wildlife		
(\$K)		
FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
30,669	44,000	47,266

Overview

Bonneville continues to develop budgets for the suite of fish and wildlife mitigation projects originally adopted in FY 2007 based on recommendations from the Council. Bonneville reaffirmed and expanded many project-specific commitments in subsequent agreements and processes, including BiOps and Fish Accords, and since then, virtually all these projects received independent science review through the Council and its project review processes. Bonneville's funding decisions embrace many of the management objectives and priorities in the Program and continue to integrate ESA compliance as described in the NOAA Fisheries' and USFWS's FCRPS BiOps. Coordination continues among Bonneville, Council, federal resource management agencies, states, tribes, and others to support the projects that satisfy Bonneville's mitigation responsibilities.

Bonneville intends to continue implementing the kinds of capital projects listed below. These projects are based upon the best available science and are regionally important in that they provide high priority mitigation and protection actions for fish and wildlife populations affected by the construction and operation of the FCRPS dams. Projects and facilities listed below deliver direct on-the-ground benefits to both ESA listed and non-listed fish and wildlife throughout the Columbia River Basin and have been evaluated and coordinated with the Council, state, federal and tribal fish and wildlife resource managers, local governments, watershed and environmental groups, and other interested parties. Specifically, as capital construction projects, hatchery facilities typically go through the Council's three-step process, which includes development of a Master Plan, environmental compliance, ESA consultation, value engineering analysis, and review by the Independent Science Review Panel.

The three types of fish and wildlife projects that Bonneville capitalizes are as follows:

- 1) Fish passage structures – Structures funded with capital that enhance fish access to habitat in the Columbia River Basin include but not limited to wells, ladders, screens, pumping, culverts, diversion (irrigation) consolidation, piping to reduce water loss, irrigation efficiencies (drip irrigation), lining of ditches (seepage reduction), removal of objects impeding fish passage or pushup dams, and construction-related habitat restoration.
- 2) Hatchery facility construction – Projects and activities relating to the construction, improvement, and replacement of fish hatcheries, including related satellite facilities (acclimation ponds and collection weirs). This may also include construction-related habitat restoration.
- 3) Land acquisition and stewardship – Land acquisition projects protect, enhance, and maintain instream wetland and riparian habitat and provide credit to Bonneville, such as acres for wildlife or instream miles for resident fish, to fulfill the legal obligation of Bonneville to mitigate the impacts from construction and operation of the FCRPS.

Fish supplementation, production, and related hatchery facilities that may require capital funds in FY 2020 include the following:

Requesting Expenditure Authority for the following project:

- Steigerwald Project: The Steigerwald Floodplain Restoration Project is a collaborative project that will reconfigure the Port of Camas-Washougal's existing Columbia River levee system to reduce flood risk, reconnect 960 acres of Columbia River floodplain, and increase ecological function at the Steigerwald Lake National Wildlife Refuge. Specifically, the project will construct 1.6 miles of setback levee; completely remove 2.2 miles of existing levee; provide unobstructed access to floodplain and tributary habitats for salmonids and lamprey; and greatly reduce flood risk to the Port's Industrial Park and City of Washougal's wastewater treatment plant, which serves 15,000 residents. The lower Columbia Estuary Partnership is leading the project, which would provide seven survival benefit units (approximately 15% of the Action Agencies' total goal in the estuary). Partners include the Port, USFWS, Washington State Department of Transportation, City of Washougal, and several private landowners. Capital construction is scheduled to begin in FY 2020 and will last three years.

The Consolidated Appropriations Act, 2016 (Public Law 114-113) provided Expenditure Authority for the following projects:

- Shoshone Paiute Trout Hatchery: The Shoshone Paiute Tribes of the Duck Valley Reservation propose that Bonneville fund

the purchase or construction of a trout hatchery. The Tribes would own and operate the hatchery to produce trout for stocking in reservoirs located on the Duck Valley Reservation. Bonneville would fund the capital expenditure to meet contemporary aquaculture standards and achieve fish production goals. The Tribes believe they can reduce federal reservoir stocking costs—some of which Bonneville pays now on an annual basis.

- Spokane Tribal Hatchery: The Spokane Tribal Hatchery, funded by Bonneville in 1989 as partial mitigation for the impacts of the FCRPS, is owned and operated by the Spokane Tribe of Indians. The facility spawns, incubates, and rears Kokanee salmon and rainbow trout near Wellpinit, WA. In June 2015, the Tribe and Bonneville signed a 20-year agreement renewing commitments to operate and maintain the facility. The renewed agreement also plans to upgrade aging infrastructure, including ground water pumps and rearing containers. Contracting for this work began in FY 2017.

- Snake River Sockeye Weirs: Bonneville funds efforts implemented by the Idaho Department of Fish and Game and the Shoshone Bannock Tribes to rebuild Snake River sockeye throughout their historic range. The combination of substantially increased numbers of returning adults as well as the completion of the Springfield Sockeye Hatchery in 2013 and its associated increased production has created the need for Bonneville to potentially fund the construction, operation, and maintenance of weirs to further sockeye management objectives.

The FY 2014 Omnibus Appropriations Act (Public Law No. 113-76) provided Expenditure Authority for the following projects:

- John Day Reprogramming and Construction: This project is being proposed by the Columbia River Inter-Tribal Fish Commission (CRITFC) under the Accords to work on the balance between upriver and down river salmon hatchery production mitigating for John Day and The Dalles Dams. Final reprogramming facilities and locations are still being analyzed by the Tribes, the Corps, and Bonneville. The project area encompasses the mainstream Columbia River from the base of McNary Dam downstream to The Dalles Dam. Capital dollars for this project will integrate with the Corps funds constructing additions to new or existing FCRPS hatchery facilities to accommodate the reprogramming of hatchery fish.

- Columbia River Basin White Sturgeon Hatchery: This project, proposed by the CRITFC under the Accords, will mitigate for white sturgeon population declines due to consistent poor recruitment upstream of Bonneville Dam. Expected production at a new or existing facility will be 15,000 - 20,000 yearling white sturgeons per year. The final project may include broodstock collection and holding, rearing wild-spawned juveniles, and acclimating juveniles prior to release. The site of the existing Marion Drain sturgeon facilities operated by Yakama Nation has been proposed as a location, near Toppenish, Washington. The project team is working on additional analyses to respond to Council comments and to begin the environmental review process.

- Kelt Reconditioning and Reproductive Success Evaluation Research: CRITFC, under the Accords, is proposing a facility to recondition female steelhead (kelts) after they have spawned. The fish will be held and fed until they have rematured and then be released into the Snake River where they will contribute to the spawning run. The capital portion of the project is expected to be constructed in the Snake River Basin, potentially at Lower Granite Dam. As specified in the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, Bonneville will implement the kelt reconditioning plan to improve the productivity of Snake River basin B-run steelhead populations that are listed for protection under the ESA. NOAA's analysis of Prospective Actions indicates that a combination of transportation, kelt reconditioning, and in-stream passage improvements (e.g., spill-flow modifications) could increase kelt returns enough to increase the number of returning Snake River B-run steelhead spawners to Lower Granite Dam by a target of six percent. The Master Plan for the facility is currently in step 2 of 3 in the amended, shortened Council 3 step process.

Ongoing Projects (Expenditure Authority previously received):

- Crystal Springs Hatchery Facilities: This proposed project is for facilities for rearing and out-planting resident and anadromous fish in central and southern Idaho. The facility would be located near the American Falls Reservoir in Idaho. It may produce Yellowstone cutthroat, a resident fish, and anadromous fish including Snake River spring chinook salmon, Snake River steelhead, and Snake River sockeye. The facility is expected to produce up to one million chinook smolts annually. The facility is sponsored by the Shoshone-Bannock Tribes under their Accord, who are expected to operate and

manage the facility once it is complete. Crystal Springs' Environmental Impact Statement (EIS) and Record of Decision (ROD) have been "paused" pending the resolution of water quality issues. Final results won't be known until summer 2019, at which point a decision will be made to move forward (or not) with EIS/ROD.

- Redfish Lake Sockeye Salmon program: The Snake River sockeye salmon, an Evolutionarily Significant Unit (ESU), was listed under the Endangered Species Act in 1991 (56 FR 58619). The Snake River Sockeye Salmon Captive Broodstock Program has supported the survival of endangered Snake River sockeye salmon. The program has been able to help successfully conserve the genetic resources of the founding population and began producing fish for rebuilding the naturally spawning population in Redfish Lake. The program uses state of the art hatchery facilities and fish husbandry protocols, genetic support, and monitoring and evaluation to continue rebuilding numbers of fish. Currently, the program retains replicate, captive broodstock within multiple facilities (Eagle Fish Hatchery located in Idaho state and Burley Creek Fish Hatchery and Manchester Research Station, both located in Washington state). Eggs produced from these locations are transferred to other facilities (Springfield Fish Hatchery and Burley Creek Fish Hatchery) for release programs. The project continues to expand by increasing the capacity of existing facilities and also by acquiring a new facility under the Idaho Fish Accord. The newly constructed Springfield Fish Hatchery located in Idaho produces additional smolts as called for in the NOAA Fisheries FCRPS BiOp. The expanded smolt releases have already resulted in an increase in the abundance and productivity of the naturally-spawning population. This strategy will greatly increase the likelihood of higher adult returns. Additional expansions include improvements at the Redfish Lake Creek trap and Sawtooth Fish Hatchery weir to hold/trap an increased number of adults to support increased smolt production from Springfield Fish Hatchery. The biological goals are to increase the number of adults spawning naturally in the Sawtooth Valley and transition the captive broodstock to a conventional hatchery production program that uses anadromous adults as broodstock.

- Klickitat Production Expansion: In 2008, the Klickitat River Master Plan was submitted by the Yakama Nation, reviewed by the Independent Science Review Panel, recommended with comments by the Council and approved by Bonneville. The plan's original goals were to protect and increase naturally producing populations of spring chinook and steelhead, localize brood collection of harvest stocks (fall chinook and coho), while protecting the biological integrity and the genetic diversity of indigenous fish stocks in the sub-basin. In 2009, a component of the Master Plan was implemented. Upgrades to Lyle Falls Fishway and Castile Falls Fishway were completed and a new bridge was constructed at Klickitat Hatchery. In July 2009, a new Klickitat Hatchery Complex EIS was initiated to examine options for the development and operation of new production and supplementation facilities, acclimation alternatives and additional upgrades to the existing hatchery facility. The Yakama Nation issued a revised Master Plan, July 2012, providing updates to their fish management plans. Bonneville put the NEPA process on hold while the Yakama Nation refined its proposal in response to site and budgetary limitations and comments on the draft EIS. Since that time, the National Marine Fisheries Service (NMFS) has completed their Mitchell Act EIS and BiOp, helping inform funding authority responsibilities in the subbasin. A new scope of work has been negotiated with the Yakama Nation and a revised Master Plan was submitted to Council in fall 2017, targeting design and construction activities to the expansion of the current spring chinook program only, from 600,000 to 800,000 smolt converting to a wild brood collection program along with general water supply and water abatement upgrades. Bonneville is finalizing plans to cancel the past NEPA process and initiate a new EIS process. Construction will occur after Bonneville issues a ROD and after NMFS, Bonneville and the Yakama Nation sign a three way funding agreement establishing expectations for operations and maintenance funding within the subbasin.

- Hood River Production Facility: This project has been ongoing since the early 1990s. It currently produces 150,000 spring chinook salmon smolts and 50,000 winter steelhead smolts annually. The Powerdale Dam Fish Trap formerly provided the foundation for many of the activities associated with implementation of the Hood River Production Program. These include monitoring escapement, collecting life history characteristics, and broodstock acquisition. PacifiCorps' demolition of its Powerdale Dam and the associated fish trapping facility in 2010 necessitated the development of alternative adult broodstock trapping sites. One permanent fish trap on the West Fork of the Hood River was completed in 2013, and a temporary trapping site is operational on the East Fork Hood River. A permanent trap site on the East Fork is currently being evaluated. The Hood River Production Program has four primary goals: 1) re-establish naturally sustaining runs of spring chinook in the Hood River; 2) re-build naturally sustaining runs of winter steelhead in the Hood River; 3) maintain genetic characteristics of Hood River fish populations; and 4) provide fish for sustainable harvest by both sport and tribal fishers.

- Mid-Columbia Coho Restoration: This Yakama Accord project's vision is to re-establish naturally reproducing coho salmon populations in the Wenatchee River and Methow River sub-basins at biologically sustainable levels which provide significant harvest in most years. This program will construct a facility on the Wenatchee River for holding and spawning broodstock, incubating eggs, and rearing juveniles. Additional semi-natural ponds will also be constructed in the Wenatchee and Methow sub-basins for acclimating smolts prior to their release. The phased approach, including associated facilities, incorporates development of a mid-Columbia hatchery broodstock, local adaptation to tributaries in the Wenatchee and Methow Basins, and habitat restoration that will benefit coho as well as ESA-listed spring chinook, steelhead, and bull trout. Major facility construction is expected to occur over the FYs 2017-2020 timeframe.

- Walla Walla Hatchery: The Walla Walla Hatchery is proposed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) under their Accord. The Tribes would own and operate the hatchery, which will produce up to 500,000 spring chinook smolts annually for release into the Walla Walla River. A 30 percent design was completed in June 2015, however due to budget overruns, the project has been on hold. A draft EIS was completed in September 2016. Design and construction have been successfully rebid; the construction phase of Walla Walla Hatchery will not commence until spring or fall 2019, depending on data collection and analysis requirements by the state water authority. The facility will hold, spawn, incubate and rear spring chinook on the South Fork Walla Walla River near Milton-Freewater, Oregon.

- Yakima Coho Facility: This hatchery is proposed by the Confederated Tribes and Bands of the Yakama Nation under the Yakama Nation Accord, and is presented in the Yakima River Subbasin Summer and Fall Run Chinook and Coho Salmon Hatchery Master Plan. The Yakama Nation would own and operate the hatchery which will produce up to 700,000 coho smolts using broodstock collected at Roza and Sunnyside dams. Bonneville holds the design and construction contract on behalf of the Yakama Nation and will transfer ownership after construction is complete. Construction ground-breaking was August 22, 2018 with an estimated schedule for substantial completion by October 2019.

Potential non-construction capital Wildlife and Resident Fish Habitat Acquisitions (including Conservation Easements) eligible for capitalization are:

- Albeni Falls Wildlife Mitigation
- Willamette Wildlife Habitat Acquisitions
- Libby and Hungry Horse Reservoirs Resident Fish Acquisitions
- Southern Idaho Habitat Acquisitions

Activities and Explanation of Changes (\$K)

FY 2019 Estimate	FY 2020 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
Power Services – Capital \$308,735	\$285,266	-\$23,469/-7.6%
Associated Projects \$264,735	\$238,000	-\$26,735/-10.1%
Milestones ¹ :	Milestones:	<ul style="list-style-type: none"> • The decrease reflects a reshaping of funding needs for investment in the hydroelectric system assets.
<ul style="list-style-type: none"> • Complete compressed air system upgrades at Grand Coulee. • Complete SCADA replacement at Hungry Horse. • Complete arc flash mitigation at Minidoka. • Complete exciter replacement at Green Springs. • Complete station service switchgear replacement at Albeni Falls. 	<ul style="list-style-type: none"> • Complete GSU transformer instrumentation at Bonneville Dam. • Complete emergency gantry crane replacement at John Day Dam. • Complete GDACS installation across the Willamette Valley, Detroit spillway gate rehabilitation, and Big Cliff intake gantry crane replacement at Willamette Plants. • Complete intake gantry crane replacement at Libby Dam. • Complete upgrades for station service units and powerhouse HVAC upgrade at Chief Joseph Dam. • Complete tailrace crane rehabilitation at Dworshak Dam. • Complete station service transformer replacements at Ice Harbor Dam. • Complete DC system and LV switchgear upgrade at Lower Granite Dam. • Complete SCADA replacement, Third Powerplant roof replacement and G1-G18 penstock stoplogs at Grand Coulee Dam. • Complete P5 and P6 impeller and core replacement and rewinds, and phase reversal switch replacement at Keys Pump Generating Plant. 	

¹ FY 2019 milestones have been updated from the FY 2019 Congressional submission due to updated forecasts.

FY 2019 Estimate	FY 2020 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
Fish & Wildlife \$44,000 Milestones: <ul style="list-style-type: none"> Continue implementation of the Program, BiOps and Fish Accords. 	\$47,266 Milestones: <ul style="list-style-type: none"> Continue implementation of the Program, BiOps and Fish Accords. 	+\$3,266/+7.4% <ul style="list-style-type: none"> Small increase but will continue long-term, planned effort to reshape funding necessary to implement the BiOps, Fish Accords, Columbia River Basin Fish and Wildlife activities.

**Transmission Services – Capital
Funding Schedule by Activity
Funding (\$K)**

	FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate	FY 2020 vs FY 2019	
				\$	%
Transmission Services – Capital					
Main Grid	10,652	39,968	2,759	-\$37,209	-93.1%
Area & Customer Services	35,505	47,871	81,796	+33,925	+70.9%
Upgrades & Additions	29,251	71,708	56,696	-\$15,012	-20.9%
System Replacements	178,086	329,519	337,920	+8,401	+2.5%
Projects Funded in Advance	156,849	41,125	85,886	+44,761	+108.8%
Total, Transmission Services - Capital	410,343	530,191	565,057	+34,867	+6.6%

Outyears (\$K)

	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate
Transmission Services - Capital					
Main Grid	2,759	27,365	25,313	33,808	45,944
Area & Customer Services	81,796	91,867	74,912	69,733	56,442
Upgrades & Additions	56,696	50,024	69,295	105,036	121,705
System Replacements	337,920	312,470	305,862	305,933	308,787
Projects Funded in Advance	85,886	66,170	60,452	39,843	39,819
Total, Transmission Services - Capital	565,057	547,896	535,834	554,353	572,697

Transmission Services – Capital

Overview

Transmission Services (TS) is responsible for about 75 percent of the Pacific Northwest’s high-voltage transmission. TS provides funding for all additions and upgrades (Expansion Investments), and replacements (Sustain Investments) to the Bonneville transmission system, resulting in reliable service to Northwest generators and transmission customers. The Bonneville transmission system also facilitates the sale and exchange of power to and from the region. The TS Capital Program is structured with a balanced focus on Expansion and Sustain investments.

In addition to replacing aging and obsolete equipment, TS continues to make significant infrastructure improvements and additions to the system to assure reliable transmission in the Northwest. These improvements and additions will help the Bonneville transmission system continue to comply with national reliability standards and remove constraints that limit economic trade or the ability to maintain the system. Some of the proposed TS projects may be funded through Bonneville lease-purchase agreements. The lease-purchases obligate Bonneville to make expenditures to acquire the use of the related facilities and are identified on an as needed basis. Bonneville may also make related expenditures to facilitate lease-purchase opportunities. Consistent with the FY 2018 and FY 2019 Budget Requests, the FY 2020 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville.

Expansion Investments

Expansion investments continue to make significant infrastructure improvements and additions to the Bonneville transmission system to assure reliable transmission operations in the Northwest and fall into two categories:

- Internally driven Expansion requests, which are derived from system engineering studies, technology innovation research, system operations and maintenance functions, and system event analysis.
- Externally driven Expansion Investment requests, which are derived from governmental initiatives and regulations, consumer demand, and the integration of customer load service and generation needs.

These investments are categorized into:

1. Main Grid – System investments affecting the major interties or internal paths and flowgates that transfer bulk power across the system.
2. Area & Customer Service – System investments related to geographical load service areas.
3. Upgrades & Additions – Upgrades are system investments that replace existing assets to increase capacity, reliability, or functionality and Additions are net new assets added to the system.
4. Projects Funded in Advance – System investments that are requested, and funded in advance, by customers.

Congressionally-approved Production Tax Credits (PTC) for renewable energy enacted in 2005 was extended through 2016. The PTC begins to phase out after 2018. The incentives created by these credits, along with Renewable Portfolio Standards (RPS) mandates implemented by the states of Oregon, Washington, and California, have spurred a large number of renewable interconnection requests to the Bonneville transmission grid. As of July 2018, Bonneville has interconnected a total of 5,336 MW of renewable qualified generation. Bonneville has more than 10,000 MW in additional renewable (wind, solar, biomass, geothermal, etc.) interconnection requests still remaining in the study queue. Solar interconnection requests are currently making up the majority of the new requests in Bonneville’s queue. The current projections are possibly 9,000 MW of renewable generation interconnected by 2025. Much of the remaining generation demand is the result of the Renewable Portfolio Standards enacted by Oregon and Washington that require utilities to acquire more than 8,000 MW of renewable energy in the Northwest by 2025. Exports to California are limited now by California laws and are expected to remain at 2,000 MW to 2,500 MW during the same period. Also in the interconnection queue is approximately 1,500 MW of natural gas fired generation. Efficiency improvements to the FCRPS hydro units that qualify as renewable are also proposed between 2018 and 2024.

In June 2008, Bonneville’s first Network Open Season (NOS) received 153 requests from 28 customers for 6,410 MW of new service, about three-fourths for wind energy integration. Bonneville subsequently offered 1,782 MW of new transmission service on its existing system. Bonneville identified four new Main Grid capital projects from the 2008 NOS: (1) McNary-John Day 500 kV transmission line (part of West of McNary Reinforcements Group 1); (2) Big Eddy-Knight 500 kV transmission line and substation (part of West of McNary Reinforcements Group 2); (3) Central Ferry- Lower Monumental 500 kV Reinforcement (formerly Little Goose Area Reinforcement); and (4) I-5 Corridor 500 kV Reinforcement. Construction of the McNary-John Day 500 kV transmission line is complete. Bonneville has completed construction of the Big Eddy-Knight

project and the Central Ferry-Lower Monumental 500 kV Reinforcement project is complete. On May 18, 2017, Bonneville announced its decision to not build the I-5 Corridor Reinforcement Project. Bonneville continues to work with constituents and stakeholders to study more cost effective options to mitigate the current limitations along this path. Public meetings began in July 2017 to address alternatives to building.

Bonneville's 2009, 2010, 2013, and 2016 study processes for new Transmission Service Requests (TSR) total 11,027 MW, including 5,240 MW of wind project interconnection and 240 MW of solar project interconnection. The 2010 study process identified the Montana to Washington project, for which environmental review was begun, however, the requests to support this project have been subsequently withdrawn and so all work on the project was terminated. The 2016 study process re-identified the Montana to Washington and Garrison to Ashe projects to move new wind generation in Montana to the Northwest. The 2013 study process identified upgrades to the Monroe-Novelly Hill 230-kV transmission line which were re-identified for additional new requests in the 2016 study process. The 2016 study process also identified network upgrades in Central Oregon, Walla Walla, Washington and across the Raver-Paul flowgate. Efforts are currently underway to evaluate the financial impacts and move forward with required agreements and processes within the TSR Study and Expansion Process (TSEP).

Sustain Investments

Sustain investments are made to maintain the health of the existing infrastructure to assure reliable transmission in the Northwest. These replacements enable continued compliance with national reliability standards, replace aging and obsolete equipment, and remove constraints that limit economic trade or the ability to maintain the transmission system.

In 2009, TS began implementing best practice frameworks that provide a standardized structure and approach to Asset Management. As a result, TS's Asset Management Strategies, derived from the Agency's Strategic Plan, drive Bonneville's Asset Plans, which determine its capital and expense investment priorities. Sustain investments are forecasted, prioritized within asset programs, and optimized across the asset base for asset planning and approval. Bonneville now bundles both sustain and expand capital projects in an effort to improve execution and to lower risks and costs. TS's capital program does remain somewhat fluid and subject to changes as the complexity of the transmission system produces unexpected needs resulting from equipment failure, climate/weather incidents, changes in performance and/or operation of connected systems, outage schedules and conflicts, updated regulations, customer interconnection requests, etc. For these and other reasons, specificity with Sustain investments in the transmission system is somewhat limited.

The TS Sustain Program Asset Programs include:

1. Steel Lines – Transmission lines with steel structures including footings, insulators assemblies, vibration dampers, grounding systems, conductor, ground wire.
2. Wood Lines – Transmission lines with wood structures including cross arm systems, insulator assemblies, vibration dampers, grounding systems, conductor, ground wire.
3. Rights-of-Way – Real property including land parcels, easements, use right, access roads.
4. AC Substations – Substations managing AC current including transformers, reactors, shunt capacitors, power circuit breakers, circuit switchers, series capacitors, disconnect switches.
5. Power System Controls and System Telecommunications – Control and communication equipment including SCADA, transfer trips, fiber, communications, SONET, Telephone, RAS.
6. System Protection and Control – Control equipment including relays, Control Houses, meters.
7. DC Substations – Celilo DC converter station, Static VAR Compensators, DC control systems.
8. Control Centers – Various control equipment and software.
9. Tools and Equipment Acquisition Program (TEAP) –Tools, equipment, fleet.
10. Facilities – Non-electric facilities including warehouses, operational structures, hangar, and maintenance centers.

Notwithstanding that the capital program for TS is subject to change, Bonneville has identified several general areas where capital investments will occur.

Bonneville will continue to fund fiber optic communications facilities needed to meet Bonneville's projected operational needs. To the extent that these investments create temporary periods of excess fiber optic capacity, such dark fiber capacity can be made available to telecommunications providers and to non-profits to meet public benefit internet access needs for rural areas and other needs in Bonneville's service area. Bonneville's investments in fiber optics, including the

role of the private sector in building fiber optic networks, is consistent with the “Fiber Optic Cable Plan” submitted to Congress on May 24, 2000, accompanying the FY 2000 Energy and Water Development Appropriations Act. In accordance with this plan, when possible, Bonneville will establish partnerships with fiber optic facility and service providers to meet its needs.

In December 2004, Congress passed and the President signed the Commercial Spectrum Enhancement Act (CSEA, Title II of P.L. 108-494), creating the Spectrum Relocation Fund (SRF) to streamline the relocation of federal systems from certain spectrum bands to accommodate commercial use by facilitating reimbursement to affected agencies of relocation costs. The Federal Communications Commission has auctioned licenses for reallocated federal spectrum, which will facilitate the provision of Advanced Wireless Services to consumers. Funds were made available to agencies in FY 2007 for relocation of communications systems operating on the affected spectrum. These funds are mandatory and will remain available until expended, and agencies will return to the SRF any amounts received in excess of actual relocation costs. The estimated Bonneville cost of this relocation was \$48.7 million. The project was completed in November 2013 with a cost of approximately \$40 million and the operational system performance was being observed during FY 2014 and early FY 2015 to determine that it has achieved comparable capability as defined under the CSEA. Bonneville determined in December 2014 that comparable capability had been achieved.

Bonneville began participating in a new spectrum relocation effort in FY 2015. The NTIA has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The FCC held an auction of this spectrum on November 13, 2014. Bonneville received an additional \$5.2 million from the Spectrum Relocation Fund on July 29, 2015, to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment.

As part of the Homeland Security Presidential Directives, Bonneville has completed a physical security assessment of all critical facilities and is implementing security enhancements at these facilities. These security enhancements increase controlled access to Bonneville’s facilities and provide video surveillance and monitoring capabilities.

Accomplishments

- The BP-18 rates were confirmed and approved by FERC on a final basis on March 19, 2018.
- Integrated 5,336 MW of renewable energy through July 2018 on Bonneville’s transmission system.
- Completed construction of the Alvey Substation Reactors.
- Completed construction of the McNary Substation 500/230 kV Bank Addition.
- Completed construction of the Bell-Boundary #DC SONET Ring Upgrade.
- Completed the rebuilding of the Midway-Grandview and Midway-Moxee 115kv Lines.

Explanation of Changes

Bonneville’s budget includes \$565.1 million in FY 2020 for TS Capital which is a 6.6 percent increase from the FY 2019 forecasted level. The FY 2020 budget decreases the levels for Main Grid (-\$37.2 million) and Upgrades & Additions (-\$15 million). The budget increases levels for Area & Customer Services (+\$33.9 million), System Replacements (+\$8.4 million), and PFIA (+\$44.8 million).

Strategic Asset Management

Transmission Services provides transmission and energy services while integrating renewable resources across the Pacific Northwest. This effort is coordinated throughout Bonneville in conjunction with the newly developed Strategic Asset Management Plan (SAMP). TS continues to implement integrated detailed Asset Plans to serve the region:

1. To improve system adequacy, reliability, and availability, Bonneville has embarked on major transmission infrastructure projects. The identified projects reinforce the transmission system and help meet the region’s future power needs. These projects address multiple challenges, such as integration of renewable energy, the need to relieve a number of congested transmission paths, the challenge to keep up with growing energy demands, and the need to meet changing regulatory and customer requirements.
2. Open access policy in support of competitive markets for load and generation.

3. The replacement of aging assets is vital to the reliability of the existing transmission system. To that end, TS has developed specific long-term strategies for the following asset categories:
 - a. Substations AC
 - b. Power System Control/System Telecommunications
 - c. Wood Lines
 - d. Steel Lines
 - e. Rights of Way (ROW), (Land Rights, Access Roads, and Vegetation Management)
 - f. System Protection and Control
 - g. Control Centers
 - h. Non-Electric Facilities

The following external factors present the strongest impact to overall achievement of the program's strategic goal:

- Continually changing economic and institutional conditions
- Competitive dynamics
- Ongoing changes in the electric industry
- Siting issues

Main Grid (\$K)		
FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
10,652	39,968	2,759

Overview

Bonneville’s strategic objectives for Main Grid projects are to assure compliance with the NERC and Western Electricity Coordinating Council (WECC) reliability criteria, provide voltage support, provide a reliable transmission system for open access, and provide for relief of transmission system congestion. During this budgeting period, projects are planned that will provide transmission reinforcement and voltage support to major load areas that are primarily west of the Cascade Mountains.

Continued investments in Main Grid assets include:

Monroe Line Re-termination

- FY 2018. Continue construction.
- FY 2019. Continue construction.
- FY 2020. Complete construction.

Schultz-Wautoma 500KV Series Capacitors

- FY 2018. Begin design.
- FY 2019. Begin construction.
- FY 2020. Continue construction

Continue Planning Studies to: (all years)

- Identify infrastructure additions.
- Identify projects driven by NERC and WECC reliability criteria.
- Identify system reactive needs to mitigate unacceptable low or high voltage problems and other system additions.
- Relieve transmission system congestion and integrate new generation facilities.

Area & Customer Service

(\$K)

FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
35,505	47,871	81,796

Overview

Bonneville’s strategic objective for Area and Customer Service projects is to assure that Bonneville meets reliability standards and contractual obligations to its load service areas.

Continued investments in Area & Customer Service assets include:

Hooper Springs Substation

- This project will now be constructed and owned by Lower Valley Energy.

Midway-Grandview 115 kV Line upgrade

- FY 2018. Completed construction.

Puget Sound Area Northern Intertie (PSANI)

- FY 2018. Continue construction.
- FY 2019. Continue construction.
- FY 2020. Complete construction.

Alvey Substation Reactors

- FY 2018. Completed construction.

McNary Substation 500/230 kV Bank Addition

- FY 2018. Completed construction.

Paul Substation 500 kV Shunt Reactor Addition

- FY 2018. Completed construction.

Big Eddy Breaker Additions

- FY 2019. Begin design.
- FY 2020. Begin construction.

Drummond 115kV Breaker Additions

- FY 2018. Completed construction.

Midway –Ashe Double Circuit 230kV Line

- FY 2018. Complete scoping.
- FY 2019. Begin design.
- FY 2020. Begin construction.

Carlton Substation Upgrade

- FY 2018. Complete scoping.
- FY 2019. Begin design.
- FY 2020. Begin construction.

Conkelley Substation Retirement

- FY 2018. Complete scoping.
- FY 2019. Complete design.
- FY 2020. Begin construction.

Continuous Activities (all years)

Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for Bonneville's service area.

Upgrades & Additions

(\$K)

FY 2018 actual	FY 2019 Estimate	FY 2020 Estimate
29,251	71,708	56,696

Overview

Bonneville's strategic objectives for Upgrades and Additions are to replace older 60 Hz (Hertz) communications and controls with newer technology including fiber optics in order to maintain or enhance the capabilities of the transmission system; to implement special remedial action control schemes to accommodate new generation and mitigate immediate operational and market constrained paths; and to support communications and remedial action schemes, among other proposals.

During this budget period, Bonneville will complete design, material acquisition, construction, and activation of several fiber optics facilities to provide bandwidth capacity and high-speed data transfers to eventually replace microwave analog radios, which are technologically obsolete and nearing the end of their useful life. Temporarily, in some areas, excess dark fiber capacity is being offered for a term to telecommunications providers or to public entities such as public utilities, schools, libraries, and hospitals, providing them access to high-speed telecommunication services as a public benefit.

Continued investments in Upgrades & Additions assets include:

VHF Radio System Upgrade

- FY 2018. Continue construction.
- FY 2019. Continue construction.
- FY 2020. Continue construction.

Synchrophasor Project

- FY 2018. Completed construction.

Bell-Boundary #DC SONET Ring Upgrade

- FY 2018. Continue construction.
- FY 2019. Complete construction.

Operational Megabit Ethernet (OMET) System

- FY 2018. Continue construction.
- FY 2019. Continue construction.
- FY 2020. Continue construction.

500 kV Spares at Wind Integration Substations

- FY 2018. Continue construction.
- FY 2019. Complete construction.

Continuous Activities (all years)

- Upgrading two miles of fiber between Bonneville Power House and Bonneville Control House.
- Planning, design, material acquisition, and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths.
- Planning, design, material acquisition, and construction of various system additions and upgrades necessary to maintain a reliable system for Bonneville's service area.
- Construction of secondary fiber related projects and digital radio system upgrades to improve the operational telecommunication system.
- Material procurement and construction to upgrade the main fiber optic backbone system (#KC and #NC systems).

**System Replacements
(\$K)**

FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
178,086	329,519	337,920

Overview

Bonneville’s strategic objectives for the Sustain Program are to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: (1) replacing high voltage transformers and power circuit breakers which are at or near the end of their useful life; (2) replacing risky, outdated and obsolete control and communications equipment and systems, including mandated replacements due to legislation; and (3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system. Transmission Services uses a total economic cost model to determine priorities for replacement.

Continued investments in System Replacements assets include:

Continuous Activity (all years)

Non-Electric Replacements

- Continue non-electric replacements as necessary.
- Continue the design, material acquisition, and construction for the Access Road program capital component and the Land Rights program capital component in support of the Lines and ROW Programs.
- Continue design and construction of capital improvements for identified existing facilities.
- Continue replacement of tools, equipment, and vehicle fleet.

Electric Replacements

- Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. Such replacements include relays, annunciators, oscillographs, metering, and various types of communication related equipment replacing and migrating analog to digital technology and SCADA equipment.
- Begin design and replacement of the Keeler and Maple Valley SVC units. Completion scheduled for FY2020.
- Continue replacement of under-rated and high maintenance substation equipment.
- Continue replacing insulators and refurbishing foundations on 500 kV Lines.
- Continue replacement of older generations of digital equipment that is obsolete.
- Continue replacing critical, operational tools and business systems at the Dittmer and Munro Control Centers.
- Continue replacing deteriorating wood pole transmission line structures, spacer dampers, and insulators.

**Projects Funded in Advance
(\$K)**

FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
156,849	41,125	85,886

Overview

This category includes those facilities and/or equipment where Bonneville retains control or ownership but which are funded or financed by a third party or with reserves, either in total or in part.

Continued investments in PFIA assets include:

Umatilla Electrical Cooperative - Phase 2

- FY 2018. Complete design and begin construction.
- FY 2019. Complete construction.

Summit Ridge Wind Project

- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.
- FY 2020. Continue construction.

Bakeoven Wind Project

- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.
- FY 2020. Complete construction.

Quenett Creek Load Service Project

- FY 2018. Begin construction.
- FY 2019. Complete construction.

PacifiCorps' Ponderosa Project Vitesse

- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.
- FY 2020. Complete construction.

Midway-Ashe Line Project

- FY 2018. Complete scoping.
- FY 2019. Complete design.
- FY 2020. Begin construction.

Avangrid Montague 1 Wind Project

- FY 2018. Complete design and begin construction.
- FY 2019. Continue construction.
- FY 2020. Complete construction.

Invenergy's Heppner Wind Project

- FY 2019. Begin design.
- FY 2020. Begin construction.

Morrow Solar Project

- FY 2019. Complete design and begin construction.
- FY 2020. Continue construction.

Willow Creek Fiber Addition Project

- FY 2018. Begin design.
- FY 2019. Complete design and begin construction.
- FY 2020. Complete construction.

2 Morrow Energy LLC's Ella 3 Wind Project

- FY 2019. Begin design.
- FY 2020. Begin construction.

Whistling Ridge 230 kV Ring Bus Project

- FY 2020. Begin design.

Continuous Activity (all years)

- Continue to integrate various new generation and line/load projects into Bonneville transmission grid based on requests placed and processed in accordance with transmission tariff.
- Continue planning studies to identify system impacts and needs regarding proposed new generation projects.
- Engineer and begin construction of several large wind generation interconnection substations.

Activities, Milestones, and Explanation of Changes (\$K)

FY 2019 Estimate	FY 2020 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
Transmission Services – Capital \$530,191	\$565,057	+\$34,867/+6.6%
Main Grid \$39,968	\$2,759	-\$37,209/-93.1%
Milestones:	Milestones:	
<ul style="list-style-type: none"> • Continue construction of Monroe 500 kV Line Re-termination #2. • Begin construction of Schultz-Wautoma 500Kv Series Capacitors 	<ul style="list-style-type: none"> • Complete construction of Monroe 500 kV Line Re-termination #2. • Continue construction of Schultz-Wautoma 500Kv Series Capacitors. 	<ul style="list-style-type: none"> • The decrease is due to decreased construction planned for FY 2020.
Area & Customer Service \$47,871	\$81,796	+\$33,925/+70.9%
Milestones:	Milestones:	
<ul style="list-style-type: none"> • Begin design of the Carlton Substation Upgrade. • Complete design of the Midway-Ashe double circuit 230KV line. • Continue construction of the PSANI project. • Complete design of the Conkelley Upgrade 	<ul style="list-style-type: none"> • Begin construction of Carlton Substation Upgrade. • Begin construction of Midway- Ashe Double Circuit 230kV line. • Complete construction of the PSANI project. • Begin construction of Conkelley Upgrade. 	<ul style="list-style-type: none"> • The increase reflects increased construction planned for FY 2020.

FY 2019 Estimate	FY 2020 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
Upgrades & Additions \$71,708 Milestones: <ul style="list-style-type: none"> Complete construction of 500kV spares at wind integration substations. 	\$56,696 Milestones: <ul style="list-style-type: none"> Continue construction of VHF Radio System Upgrade. 	-\$15,012/-20.9% <ul style="list-style-type: none"> The decrease reflects the movement of spare transformers for wind projects between years.
Systems Replacements \$329,519 Milestones: <ul style="list-style-type: none"> Continue design and construction of capital improvements for identified existing facilities. Continue non-electric replacements as necessary. Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. Begin design and construction of Keeler-Maple Valley SVC Upgrade 	\$337,920 Milestones: <ul style="list-style-type: none"> Continue design and construction of capital improvements for identified existing facilities. Continue non-electric replacements as necessary. Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. Complete construction of Keeler-Maple Valley Upgrade. 	+\$8,401/+2.5% <ul style="list-style-type: none"> The increase reflects increased construction planned for FY 2020.
Projects Funded in Advanced \$41,125	\$85,886	+\$44,761/+108.8%

FY 2019 Estimate	FY 2020 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
<p>Milestone:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. • Continue construction of Bakeoven Series Capacitors • Complete construction of Quenett Creek Project. • Continue construction of PacifiCorps' Project Vitesse. • Continue construction of Avangrid Montague 1 project • Begin design of Invenergy's Heppner Wind Project • Complete design and begin construction of Morrow Solar Project. 	<p>Milestones:</p> <ul style="list-style-type: none"> • Continue to integrate new generation as requested. • Continue planning studies on needs and impacts of proposed new generation. • Complete construction of Bakeoven Series Capacitors • Complete construction of PacifiCorps' Project Vitesse. • Complete construction of Avangrid Montague 1 project • Begin construction of Invenergy's Heppner Wind Project • Complete construction of Morrow Solar Project. 	<ul style="list-style-type: none"> • The Projects Funded In Advance (PFIA) funding increases in FY 2020 over FY 2019 are due to several multi-year projects scheduled to be designed in FY 2019 (10- 15% of project cost) with material purchases, equipment purchases, and construction occurring in FY 2020.

**Capital Information Technology & Equipment/Capitalized Bond Premium
Funding Schedule by Activity
Funding (\$K)**

	FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate	FY 2020 vs FY 2019	
				\$	%
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	14,566	26,860	22,099	-4,761	-17.7%
Capitalized Bond Premium	0	0	0	0	0.0%
Total, Capital IT & Equipment/Capitalized Bond Premium	14,566	26,860	22,099	-4,761	-17.7%

Outyears (\$K)

	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate
Capital Information Technology (IT) & Equipment/Capitalized Bond Premium					
Capital IT & Equipment	22,099	22,131	22,295	22,267	21,146
Capitalized Bond Premium	0	0	0	0	0
Total, Capital IT & Equipment/Capitalized Bond Premium	22,099	22,131	22,295	22,267	21,146

Capital Information Technology & Equipment/Capitalized Bond Premium

Overview

Capital Information Technology (IT) provides for the acquisition of general and some dedicated special purpose capital information technologies, and acquisition of special-use capital and IT equipment in support of Bonneville's strategic objectives. This category also includes Bonneville's on-going efforts to facilitate delivery of a highly resilient organization able to anticipate, withstand, and effectively respond to disruptive events affecting it and its partners in the Northwest region. The four main areas of resiliency focus continue to include asset management, emergency management, crisis management, and continuity of operations.

Bonneville continues to move its IT infrastructure to a more efficient architecture. This FY 2020 Budget supports this effort. IT continues to eliminate redundancies in tools and applications, establish an agency-wide IT architecture with standardized IT purchasing criteria, standardize software licensing processes and minimize agency liabilities through stronger contracts, apply continuous improvement practices to IT project management, and implement an agency IT portfolio cost management strategy. The IT estimates in this FY 2020 Budget under Capital IT and Equipment include all IT functions within the agency except TS grid operations. See the Capital Program – TS section of this budget for additional discussion of grid operations-related IT requirements acquisitions.

Capital equipment provides for the acquisition of general and some dedicated special purchases of capital office furniture and equipment.

Bonneville can incur a bond premium when it repays a U.S. Treasury bond before the due date. When bonds are refinanced and premiums are incurred, the bond premiums can be capitalized. Historically, Bonneville generally has chosen to finance capitalized bond premiums with bonds issued to the U.S. Treasury, as envisioned by the Transmission Act.

**Capital Information Technology & Equipment
(\$K)**

FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
14,566	26,860	22,099

Overview

This category includes enhancements to Bonneville’s information technology processes to provide cost effective efficiencies for secure, timely, and accurate information. Investments will enable continued enhancements to Bonneville’s enterprise systems that are designed to link key information systems throughout Bonneville and improve business processes. Current efforts include continued functional process improvements in areas not included in the initial development phase. Other investments include acquisition of capital office furniture and equipment, capital automated data processing (ADP) based administrative telecommunications equipment, ADP equipment (hardware), and support of capital software development for certain Bonneville programs.

Continued investments in Capital IT & Equipment assets include:

Continuous Activity (all years)

Capital system developments in support of:

- Corporate IT Projects
- IT Infrastructure Projects
- Power IT Projects
- Transmission Services IT Projects (excluding grid operations)

**Capitalized Bond Premium
(\$K)**

FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
0	0	0

Overview

Continue to assess financial market and when cost-effective, refinance available bonds as prudent.

Activities, Milestones, and Explanation of Changes (\$K)

FY 2019 Estimate	FY 2020 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
Capital Information Technology & Equipment/Capitalized Bond Premium \$26,860	\$22,099	-\$4,761/-17.7%
Capital Information Technology & Equipment \$26,860 Milestones: Capital system developments in support of: <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	\$22,099 Milestones: Capital system developments in support of: <ul style="list-style-type: none"> • Corporate IT Projects • IT Infrastructure Projects • Power IT Projects • Transmission Services IT Projects 	-\$4,761/-17.7% <ul style="list-style-type: none"> • The decrease reflects a reshaping of funding needs for investment in the IT system assets.
Capitalized Bond Premium \$0	\$0	\$0/0.0%

**Power Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate	FY 2020 vs FY 2019	
				\$	%
Power Services - Operating Expenses					
Production	912,166	1,098,201	961,002	-137,198	-14.3%
Associated Projects Costs	449,323	475,160	476,646	+1,486	+0.3%
Fish & Wildlife	247,263	276,083	275,719	-364	-0.1%
Residential Exchange Program	241,464	318,350	257,122	-61,228	-23.8%
NW Power & Conservation Council	10,969	11,914	11,789	-125	-1.1%
Energy Efficiency & Renewable Resources	162,833	165,152	158,053	-7,099	-4.5%
Total, Power Services - Operating Expenses	2,024,018	2,344,860	2,140,331	-204,528	-9.6%

Outyears (\$K)

	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate
Power Services - Operating Expenses					
Production	961,002	1,161,821	1,202,773	1,267,819	1,281,217
Associated Projects Costs	476,646	474,660	485,187	495,973	506,929
Fish & Wildlife	275,719	276,147	282,139	288,289	294,547
Residential Exchange Program	257,122	255,399	261,069	266,891	272,816
NW Power & Conservation Council	11,789	12,004	12,270	12,544	12,823
Energy Efficiency & Renewable Resources	158,053	156,513	159,987	163,555	167,186
Total, Power Services - Operating Expenses	2,140,331	2,336,544	2,403,425	2,495,071	2,535,518

Power Services – Operating Expense

Overview

Production includes certain Bonneville non-federal debt service (including Energy Northwest debt service), O&M costs for power system generation resources (including a large nuclear plant, business operations, and short- and long-term power purchases³), electric utility marketing of power, and oversight of the FCRPS hydroelectric projects and CGS. Bonneville develops products and services to meet the needs of Bonneville’s customers and stakeholders and acquires power as needed.

In FY 2018, Bonneville completed a long-term Resource Program. The purpose of the program is to assess Bonneville’s need for power and reserves and develop an acquisition strategy to meet those needs. In the event that Bonneville does acquire output from a resource on a long-term basis, Bonneville will modify its budget to reflect the acquisition.

Associated Projects Costs represents funding for operation and maintenance costs for the FCRPS hydroelectric projects, minor additions, improvements and replacements, and costs of the Corps and the Reclamation hydroelectric projects in the Pacific Northwest, which serve many purposes. All agencies emphasize efficient power production from existing facilities and improvement of the performance and availability of power generating units. Bonneville pays additional financing costs of the FCRPS facilities through its Interest Expense and Capital Transfer budget programs. Bonneville provides funding for the operations and maintenance costs that are part of the USFWS’s Lower Snake River Compensation Plan (LSRCP) hatcheries. Bonneville is responsible for annual payments to the Confederated Tribes of the Colville Reservation for their contribution to the production of hydropower by the Grand Coulee Dam in accordance with the Settlement Agreement between the United States and the Colville Tribes (April 1994).

Bonneville’s Fish and Wildlife Program provides for extensive protection, mitigation, and enhancement of Columbia River Basin fish and wildlife adversely affected by the development and operation of the FCRPS. Bonneville satisfies its fish and wildlife responsibilities by funding projects and activities designed to be consistent with the Program under the Northwest Power Act. Through the Program, Bonneville also implements measures to aid in the protection of fish and wildlife in the Columbia River and its tributaries, both listed as threatened or endangered as well as unlisted, under the ESA (see ESA discussion in the Power Services – Capital Overview section).

Bonneville’s mitigation expenditures will focus on activities that benefit Columbia River Basin fish and wildlife resources, following priorities established through ESA consultations, agreements with resource managers, and the Program, including actions that:

- increase survival of ESA-listed and non-listed fish at FCRPS dams and reservoirs;
- increase survival of ESA-listed and non-listed fish throughout their life cycle by protecting and enhancing important habitat areas;
- protect and enhance important wildlife habitat;
- use hatcheries to contribute to conservation and recovery of ESA-listed and non-listed fish;
- provide offsite mitigation projects and habitat, passage, and other improvements that address factors limiting improvements of target species; and
- support a focused and well-coordinated research, monitoring, and evaluation program.

The Energy and Water Development Appropriations Act of 1996 added section 4(h)(10)(D) to the Northwest Power Act, directing the Council to appoint an ISRP “to review a sufficient number of projects” proposed to be funded through Bonneville’s annual fish and wildlife budget “to adequately ensure that the list of prioritized projects recommended is consistent with the Program.” The Northwest Power Act further states that “in making its recommendations to Bonneville, the Council shall consider the impact of ocean conditions on fish and wildlife populations and shall determine whether the projects employ cost effective measures to achieve program objectives.” Today, most mitigation projects funded by

³ Including expenses associated with the use of power financial instruments to hedge Bonneville's exposure to market price risk and certain index sales contract provisions as permitted by Bonneville's internal power transacting risk management guidance.

Bonneville receive ISRP review as part of the Council recommendation process. The Council has shifted to a multi-year project review cycle during which the ISRP reviews categories of projects grouped together.

The Council's major activities include the periodic preparation of a Northwest Conservation and Electric Power Plan (a 20-year electric energy demand and resources forecast and conservation program – known as the Power Plan) and the Fish and Wildlife Program. The Northwest Power Act directs that expenses of the Council, subject to certain limits based on forecasted Bonneville power sales, shall be included in Bonneville's annual budget to Congress. The cost of funding the Council is recovered through Bonneville's power rates.

Bonneville's Energy Efficiency program promotes the efficient use of energy in the Pacific Northwest and acquires conservation resources. Such actions will: 1) meet energy efficiency targets; 2) achieve a least cost resource mix; 3) lessen the cost impacts of power purchases; 4) avoid the costs of ramping programs and infrastructure up and down; 5) extend the value of the FCRPS to customers; and 6) build the region's resource portfolio with energy efficiency. Bonneville is also exploring how best to integrate demand-side management, distributed generation, and other leading edge technologies into its generation and transmission planning processes.

Bonneville's Energy Efficiency program offers several ways for customer utilities to participate in energy efficiency. Program components include: (1) standard offer efficiency measures and custom projects, which result in customer proposals to conserve energy through such programs as residential weatherization; commercial lighting; heating, ventilation, and air conditioning (HVAC); industrial processes and lighting; and irrigated agriculture; (2) third-party delivery programs, such as Simple Steps Smart Savings, Energy Smart Industrial, and the Green Motors programs; and (3) programs to help regional federal installations reduce energy use, including federal hatcheries and irrigation districts, and to support the Corps of Engineers and Bureau of Reclamation in their efforts to reduce energy use; (4) efficiency achieved independently through the market or through codes and standards, i.e. Momentum Savings; and (5) market transformation through the Northwest Energy Efficiency Alliance (NEEA).

Bonneville's Energy Efficiency budgets reflect BPA's commitment to acquire energy efficiency supportive of the Northwest Power and Conservation Planning Council's 7th Power Plan, which forecasts regional electricity demand and resource strategies for the next 20 years. The 7th Power Plan's preferred resource strategy calls for the region to acquire 1,400 aMW of energy efficiency between 2016 and 2021. Bonneville is pursuing a plan to achieve a portion of that goal (581 aMW). Bonneville recently updated its Resource Program to complement the Council's plan, isolating BPA's specific electricity demand obligations and potential resource strategies. Incorporating findings from Bonneville's Resource Program will optimize BPA's energy efficiency acquisitions but may reduce savings achievement by up to 5%.

In meeting its energy efficiency goals, Bonneville may employ resource acquisition agreements, as authorized by Northwest Power Act section 6, and customer self-funded conservation as well as research, evaluation, contract support, NEEA support, and emerging technology development.

The Residential Exchange Program (REP) was created by the Northwest Power Act to extend the benefits of low-cost federal power to the residential and small farm loads of Pacific Northwest electric utilities that have high average system costs. These benefits are passed directly to the consumers. Currently, the region's six investor-owned utilities (IOUs) and two of the region's consumer-owned utilities are actively participating in the REP. Payments under the REP are made to individual IOUs based on the difference between Bonneville's utility-specific Priority Firm (PF) Exchange rates and each utility's average system cost (ASC), times a utility's residential and small farm loads. ASCs are determined in accordance with the 2008 Average System Cost Methodology (ASCM). Participating utility ASCs are established in a public process that occurs prior to and during Bonneville's power rate cases. Bonneville's utility-specific PF Exchange rates are determined each rate period. As described below, Bonneville and regional parties reached a settlement of the REP in 2011 under which the total amount of REP benefits available to the IOUs was established through 2028. Payments to the IOUs are made monthly based on historical invoiced exchange loads and the terms of the settlement.

Over the past decade, and prior to the settlement, regional parties filed multiple lawsuits challenging Bonneville's implementation of the REP. These lawsuits were consolidated into four cases that were stayed before the U.S. Court of

Appeals for the Ninth Circuit. On July 26, 2011, Bonneville adopted a regionally supported settlement, referred to as the 2012 REP Settlement. Under the settlement, the region's six IOUs will receive about \$4.1 billion in REP payments over the 17-year term of the settlement, beginning at \$182.1 million in FY 2012, and increasing to \$286.1 million in FY 2028. In addition to this settlement, Bonneville has reached related REP settlements with two consumer-owned utilities. A single challenge to the 2012 REP Settlement was dismissed by the U.S. Court of Appeals for the Ninth Circuit in October of 2013.

Explanation of Changes

Bonneville's budget includes \$2,140.3 million in FY 2020 for Power Services operating expenses, which is a reduction of 8.7 percent over the FY 2019 forecasted level.

The FY 2020 budget increases the level for Associated Projects Costs (+\$1.5 million) and decreases the Residential Exchange (-\$61.2 million), Planning Council (-\$0.1 million), Energy Efficiency & Renewable Resources (-\$7.1 million), Production (-\$137.2 million), and Fish & Wildlife (-\$0.4 million).

Production (\$K)		
FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
912,166	1,098,201	961,002

Overview

Power Purchases: Includes power purchased to cover power supply obligations as well as balancing loads with generation from the hydro system. These purchases can be made in the form of long-term purchases to meet supply obligations based on long-term planning requirements or they can be made within the year due to the monthly shape of the loads and the monthly shape of the hydroelectric generation. Also, purchases can be made within the month and within the day to fill shortages due to fluctuations in the hydro system and load.

Power Scheduling/Marketing: Schedule and market (buy/sell) electric energy with Bonneville customers and the Pacific Northwest's interconnected utilities. Scheduling includes Power Services' implementation of physical and memo power schedules and associated transmission schedules, implementation of Electronic Tagging (ETag) in accordance with NERC and in accordance with FERC, and implementation of electronic scheduling.

Columbia Generating Station (CGS): Bonneville has acquired full lifetime project capability of CGS. CGS is on a 24-month fuel and outage cycle. Maintenance and refueling outage occurred in the spring of 2017 and will again in FY 2019.

Continued investments in Production include:

Continuous Activity (all years)

- Provide oversight of all power supply contracts and related projects from which Bonneville purchases generation capability to ensure that all Bonneville approval rights are protected; coordinate, communicate, and administer agreements, issues, and programs between Bonneville and the project owners.
- Provide wind resource integration services for wind generation.
- Power Purchases.
- Power Scheduling/Marketing.
- Provide oversight of all contracts signed to date. Pursue cost-effective means to mitigate capacity demands associated with interconnecting large amounts of wind into the Bonneville system.
- Pursue acquisition of additional cost-effective generation to meet load growth.
- Provide oversight on the wind resource integration services currently purchased by public power customers and offer additional renewable resource shaping services to such customers using wind generation to serve their load.

Associated Projects
(\$K)

FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
449,323	475,160	476,646

Overview

Support FCRPS project costs and work to strengthen interagency and regional relationships to improve project performance, supporting functions, and to better understand project resource requirements and costs. This helps to maintain FCRPS reliability and system performance, as well as to attain Bonneville’s strategic business objectives.

Continued investments in Associated Projects include:

Continuous Activity (all years)

Bureau of Reclamation:

- Continue direct funding Reclamation O&M power activities.

Corps of Engineers:

- Continue direct funding Corps O&M power activities.

Fish & Wildlife
((\$K)

FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
247,263	276,083	275,719

Overview

Bonneville implements a mature fish and wildlife mitigation program based on recommendations made by the region’s fish and wildlife management agencies and tribes to the Council. Several recent Council reviews have made additional fish and wildlife project recommendations to Bonneville. Bonneville, in coordination with the Council, reviews new and on-going projects for consistency with the Program and purposes of the Northwest Power Act. Bonneville reviews and resets project-specific funding commitments annually, including projects under the FCRPS BiOps and other agreements. Bonneville informs its funding decisions with the management objectives and priorities in the Program (including ISRP reviews) and the Accords as it integrates their implementation with actions necessary to fulfill ESA responsibilities. Regular coordination on implementation priorities continues among Bonneville, the Council, federal resource management agencies, states, Tribes, and others.

Continued investments in Fish & Wildlife include:

Continuous Activity (all years)

- Anadromous Fish: Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, and the Willamette and Southern Idaho agreements and 2018 Accord extensions. Prioritize projects that address the factors that contribute most to mitigation success and that fulfill Bonneville’s responsibility for mitigating the impacts from the FCRPS. Implement and develop activities that protect and enhance tributary and estuary habitat, improve mainstream habitat, reduce potentially harmful hatchery practices on ESA-listed populations, and contribute to sustainable fisheries.
- Resident Fish: Implement activities to mitigate the impacts of the FCRPS on lamprey, sturgeon, and bull trout and promote the reproduction and recruitment of Kootenai River white sturgeon. These activities have been selected in response to the USFWS’s 2000 bull trout and 2006 Libby BiOp, the Program, and the Fish Accords.
- Mitigation using resident fish to offset anadromous fish losses (substitution): mitigate for reservoir power operation impacts to resident fish and wildlife by seeking projects that benefit both simultaneously. Those resident fish habitat acquisition projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited for both fish and wildlife where appropriate.
- Wildlife: Use existing Bonneville policies to continue the current effort to mitigate wildlife in a manner consistent with the Program and fulfill commitments in wildlife agreements such as the Kalispel Agreement, Willamette Wildlife Agreement, and Southern Idaho Wildlife Agreement. Those wildlife projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited against both wildlife and fish obligations according to Bonneville’s crediting policy and applicable mitigation contracts.

Residential Exchange, Northwest Power and Conservation Council, and Energy Efficiency & Renewable Resources
(\$K)

FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
415,266	495,416	426,964

Overview

Residential Exchange Program (REP)

- Includes forecasted REP benefits based on the 2012 REP Settlement.

Northwest Power and Conservation Council

- Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance and fish and wildlife program activities.

Energy Efficiency Resources

- Conservation Purchases: Provide programmatic savings reimbursements and energy efficiency incentives to Bonneville customers to purchase conservation savings. This includes performance payments and Energy Smart Reserved Power payments for federal installations and fish hatcheries and irrigation districts.
- Conservation Infrastructure: All support for programs and operations, including third-party program implementation, contract support, market research (Momentum Savings research), evaluation, and emerging technology research.
- Market Transformation: Support for NEEA’s market transformation initiatives. NEEA identifies barriers and opportunities to increase the market adoption of efficiency by leveraging its regional partnerships.

Activities, Milestones, and Explanation of Changes (\$K)

FY 2019 Estimate	FY 2020 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
Power Services - Operating Expense \$2,344,860	\$2,140,331	-\$204,529/-9.6%
Production \$1,098,201	\$961,002	-\$137,198/-14.3%
Milestones: <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	Milestones: <ul style="list-style-type: none"> • Continue to provide oversight of all signed contracts. • Continue to provide wind resource integration services for customer wind generation. 	<ul style="list-style-type: none"> • The decrease is primarily due to lower CGS and support costs.
Associated Project Costs \$475,160	\$476,646	+\$1,486/+0.3%
Milestones: <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	Milestones: <ul style="list-style-type: none"> • Continue direct funding of Corps and Reclamation O&M power activities. 	<ul style="list-style-type: none"> • The small increase reflects changes to security, biological opinion requirements, non-routine extraordinary maintenance, WECC/NERC compliance activities, and improvements, replacements, and minor additions at the projects.
Fish & Wildlife Costs \$276,083	\$275,719	-\$364/-0.1%
Milestones: <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Southern Idaho Agreement, and the Willamette Agreement, and 2018 Accord extensions. 	Milestones: <ul style="list-style-type: none"> • Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the Fish Accords, the Washington Estuary Agreement, the Kalispel Agreement, the Willamette Agreement, and the Southern Idaho Agreement, and 2018 Accord extensions. 	<ul style="list-style-type: none"> • No material change in funding. The costs reflect funding associated with the Biological Opinions, Fish Accord commitments, and Northwest Power Act activities.
Residential Exchange Program \$318,350	\$257,122	-\$61,228/-23.8%
Milestones: <ul style="list-style-type: none"> • Continue to provide REP benefits. 	Milestones: <ul style="list-style-type: none"> • Continue to provide REP benefits. 	<ul style="list-style-type: none"> • The decrease reflects the lower scheduled in the amount of REP payments payable to the IOUs prescribed by the Residential Exchange Settlement.
NW Power & Conservation Council \$11,914	\$11,789	-\$125/-1.1%

FY 2019 Estimate	FY 2020 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
<p>Milestones:</p> <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	<p>Milestones:</p> <ul style="list-style-type: none"> Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities. 	<ul style="list-style-type: none"> The decrease reflects our cost cutting effort while continuing emphasis on the NW Power and Conservation Council.
<p>Energy Efficiency & Renewable Resources \$165,152</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads. Continue to support utility incentive programs. Continue to support regional energy efficiency programs. Continue supporting energy efficiency at direct serve federal agencies. 	<p>\$158,053</p> <p>Milestones:</p> <ul style="list-style-type: none"> Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads. Continue to support utility incentive programs. Continue to support regional energy efficiency programs. Continue supporting energy efficiency at direct serve federal agencies. 	<p>-\$7,099/-4.5%</p> <ul style="list-style-type: none"> The decrease reflects our cost cutting effort while continuing emphasis on the energy efficiency program consistent with the Power Plan.

**Transmission Services – Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate	FY 2020 vs FY 2019	
				\$	%
Transmission Services - Operating Expense					
Engineering	72,076	96,886	74,075	-22,811	-23.5%
Operations	189,922	200,837	205,697	+4,860	+2.4%
Maintenance	200,538	215,121	212,379	-2,742	-1.3%
Total, Transmission Services - Operating Expense	462,536	512,844	492,151	-20,693	-4.2%

Outyears (\$K)

	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate
Transmission Services - Operating Expense					
Engineering	74,075	80,131	81,663	83,233	84,828
Operations	205,697	200,383	203,170	206,010	208,889
Maintenance	212,379	213,573	217,072	220,648	224,279
Total, Transmission Services - Operating Expense	492,151	494,087	501,905	509,891	517,996

Transmission Services – Operating Expense

Overview

This activity provides for the transmission system services of engineering, operations, and maintenance for Bonneville's electric transmission system, and the associated power system control and communication facilities. Primary goals of this program are: 1) maintain the safety and reliability of the transmission system; 2) increase the focus on meeting customers' needs; 3) optimize the transmission system; 4) provide open and non-discriminatory transmission access; and 5) improve Bonneville's cost effectiveness. Consistent with the FY 2018 and FY 2019 Budget Requests, the FY 2020 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville.

Explanation of Changes

Bonneville's budget includes \$492.1 million in FY 2020 for TS operating expense which is a 4 percent decrease over the FY 2019 forecasted level. The decrease still reflects continuing operation and maintenance of Bonneville's transmission assets.

The FY 2020 budget decreases the levels for Engineering (-\$22.8 million) and Maintenance (-\$2.7 million) and increases the level for Operations (+\$4.9 million).

Engineering (\$K)		
FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
72,076	96,886	74,075

Overview

Continue efforts to identify best methods for improving system reliability and maintenance practices, and continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system.

Continued investments in Engineering include:

Continuous Activity (all years)

- **Research and Development (R&D):** Conduct research focused on technologies related to business challenges Bonneville faces including reliability, energy efficiency, and integration of renewable energy resources. Technologies of interest are identified in Bonneville's Technology Roadmaps. A portfolio of research is selected every year through Bonneville's Portfolio Decision Framework.
- **System Development Planning and Analysis:** Continue providing technical support and asset planning to deploy the Asset Management approach to sustain existing assets and expand the system to meet Agency objectives.
- **Technical Support:** Provide technical support activities, such as transmission system planning and studies to optimize portions of the system. Provide support for non-wires solutions studies and pilot projects.
- **Capital-to-Expense Adjustments:** Conduct annual analysis of Bonneville's outstanding capital work orders to assess whether they should be expensed. As obsolete inventory is identified and disposed of, it is expensed.
- **Regulatory Fees:** WECC dues and loop flow payments, Department of Commerce/National Telecommunications and Information Administration licensing costs for radio frequencies, DOE Radio Spectrum staff and contractor support, and NERC Critical Infrastructure Protection (CIP) compliance program costs. Includes membership in ColumbiaGrid, a transmission planning organization in the region.
- **Reimbursable Transactions:** Enter into written agreements with federal and non-federal entities that have work or services to be performed by Bonneville staff at the expense of the benefiting entities. The projects must be beneficial, under agreed upon criteria, to Bonneville operations and to the federal or non-federal entity involved or otherwise be aligned with or supportive of Bonneville's strategic objectives. Additionally, these activities generally contribute to more efficient or reliable construction of the federal transmission system or otherwise enhance electric service to the region.
- **Leased and Other Costs:** Includes leases, lease purchases, and other costs of financing transmission, delivery, and voltage support facilities when such arrangements are operationally feasible and cost effective to deliver power. Leases and lease purchases enable Bonneville to continue to invest in infrastructure to support a safe and reliable system for the transmission of power. Other costs included are the accrued interest costs associated with Large Generator Interconnection Agreements (LGIA).

Operations (\$K)		
FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
189,922	200,837	205,697

Overview

Substation Operations: Perform operations functions necessary to provide electric service to customers and to protect the federal investment in electric equipment and other facilities. Includes equipment adjustments, switching lines and equipment during emergencies or maintenance, isolating damaged equipment, restoring service to customers, inspecting equipment, and reading meters.

Power System Dispatching and Supporting Functions: Perform central dispatching, control, and monitoring of the electric operation of the federal transmission system. Also includes load, frequency, and voltage control of federal generating plants, and coordinating long- and short-term outages of system equipment. In addition, provides technical engineering support of dispatching function and provides all technical and systems support for Dittmer Control Center (DCC) and Munro Control Center (MCC).

Marketing and Sales: Provide management and direction of transmission rates, and provide business strategy in marketing of transmission and ancillary products and services of Transmission Services. Involve customers and constituents in the process of product and rate development. Maintain accurate and complete historical records of current and past legacy transmission agreements. Provide guidance for current and future transmission contract negotiations. Provide financial analysis of market strategies. Monitor and report on the financial health of Transmission Services. Support cost management by effective reporting and analysis of current expenditures. Ensure official budget submittals reflect current management financial strategies and adequately fund transmission programs.

Transmission Scheduling: Provide non-discriminatory, open access to the Bonneville transmission system consistent with Bonneville’s Open Access Transmission Tariff (OATT). Schedule transmission capacity to eligible Bonneville customers, which include customers acquiring services under Use of Facilities (UFT), Formula Power Transmission (FPT), Integration of Resources (IR), and Part II or Part III of the OATT. Manage the reservations and scheduling of all transmission services associated with the OATT. Update practices, policies, and commercial systems to accommodate a large diversity of resources, including wind.

Continuous Activity (all years):

- Continue to operate within parameters of NERC and WECC.
- Continue support of increased compliance activities related to the reliability of the transmission system, including cyber security.
- Continue developing facilities, policies, procedures, and implementing systems to support integrating the diversity of resources into the transmission grid.
- Continue preparation for increased complexity of transmission scheduling, power system operations, and dispatching, including congestion management and outage scheduling.
- Continue developing the Dittmer Scheduling Center and Munro Scheduling Center facilities to support continuous real time scheduling operations from both facilities.
- Continue developing a long-term approach to optimize transmission availability through streamlined, cost-effective, and sustainable processes.
- Continue to address succession planning issues across key functions.
- Continue development and implementation of business systems and tools.

Maintenance (\$K)		
FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate
200,538	215,121	212,379

Overview

In all aspects of maintenance, Bonneville is continuing the use of Reliability Centered Maintenance (RCM) practices. The use of RCM practices is focused on improving system reliability, increasing availability, and meeting new and existing compliance regulations at lowest lifecycle costs. In addition Bonneville is deploying Asset Management to optimize maintain/replace decision making. Maintenance costs are expected to increase as Bonneville addresses the aging transmission system, meeting reliability standards, including vegetation management, and environmental constraints associated with construction, enhancement, and maintenance of the system. The Bonneville transmission system encompasses 15,238 circuit miles on over 11,860 right-of-way miles (many of these miles are through rugged, inaccessible terrain).

Continued investments in Maintenance include:

Continuous Activity (all years)

- Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets.
- Continue refining processes and procedures for monitoring and tracking compliance activities related to the reliability of the transmission system.
- Continue to improve system availability performance through new maintenance procedures and work practices.
- Continue to develop and implement work practices and procedures for implementation of a new specialty crew using bare-hand live line practices for maintenance of high-voltage transmission lines.
- Continue increased emphasis on replacement of line hardware (life extension programs for insulators, connectors, dampers, and fiber optic cable hardware).
- Continue to prepare for the impact of an expected high attrition rate among Bonneville’s aging workforce by recruiting apprentices and replacements for critical minimum crew size workload positions.
- Increase outage-scheduling planning and coordination to increase customer satisfaction and system availability.
- Maintain vegetation management levels to ensure system reliability.
- Continue access road work to provide reliable access to facilities and ensure environmental compliance.
- Continue improving environmental stewardship.

Transmission Line Maintenance: Maintain and repair 15,238 circuit miles of high voltage transmission lines, of which over 4,734 circuit miles are 500 kV transmission extra-high voltage (EHV). Maintenance of EHV lines is two and one-half times more labor-intensive than maintenance of lower transmission voltages, although more efficient in transmission of power. This responsibility includes maintaining transmission rights-of-way to ensure system reliability, safety, and environmental compliance. Adopt work practices that improve system availability, reliability, and compliance.

Right-of-Way Maintenance: Maintain over 11,860 of Bonneville’s right-of-way miles. This responsibility includes vegetation management, danger tree management, and access road maintenance to ensure system reliability, safety, and environmental compliance. Adopt procedures and processes that improve system availability, reliability, environmental compliance, and reliability compliance. Continue to deploy new technologies such as LiDAR (Light Detection and Ranging) to reliably and cost-effectively manage vegetation.

Substation Maintenance: Maintain and repair the transmission system power equipment located in Bonneville’s 260 substations. Work includes inspections, diagnostic testing, and predictive and condition-based maintenance.

System Protection Maintenance: Maintain relaying metering and remedial action scheme equipment used to control and protect the electrical transmission system and to meter energy transfers for the purpose of revenue billing. Additionally,

field-engineering services provide technical advice and assure the correct operation of power system relaying and special control systems used to support interregional energy transmission capabilities.

Power System Control Maintenance: Test, repair, and provide field engineering support of Bonneville's highly complex equipment, communications, and control systems, including seven major microwave systems, fiber optic systems, and other critical communications and control equipment that support the power system.

Non-Electric Plant Maintenance: Maintain and manage Bonneville's non-electric facilities. Includes site, building, and building utility maintenance; custodial services; station utility; and other maintenance service activities, as well as facilities asset management on Bonneville-owned or Bonneville-leased non-electric facilities.

Maintenance Standards and Engineering: Establish, monitor, and update system maintenance standards, policies, and procedures, and review and update long-range plans for maintenance of the electric power transmission system.

Activities, Milestones, and Explanation of Changes (\$K)

FY 2019 Estimate	FY 2020 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
Transmission Services - Operating Expense \$512,844	\$492,151	-\$20,693/-4.2%
Engineering \$96,886 Milestones: <ul style="list-style-type: none"> Continue efforts to identify best methods for improving system reliability and maintenance practices. Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	\$74,075 Milestones: <ul style="list-style-type: none"> Continue efforts to identify best methods for improving system reliability and maintenance practices. Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system. 	-22,811/-23.5% <ul style="list-style-type: none"> The decrease reflects our cost tightening effort and emphasis on system reliability standards compliance and research and development.
Operations \$200,837 Milestones: <ul style="list-style-type: none"> Continue to operate within parameters of NERC and WECC. Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	\$205,697 Milestones: <ul style="list-style-type: none"> Continue to operate within parameters of NERC and WECC. Continue support of increased compliance activities related to the reliability of the transmission system including cyber security. 	+\$4,860/+2.4% <ul style="list-style-type: none"> The increase reflects continued emphasis on reliability compliance activities, resource integration activities, key strategic initiative, security, and control center systems support.
Maintenance \$215,121 Milestones: <ul style="list-style-type: none"> Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	\$212,379 Milestones: <ul style="list-style-type: none"> Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets. 	-\$2,742/-1.3% <ul style="list-style-type: none"> The decrease reflects implementation of facilities asset management plans, continued implementation of live-line crew, NERC/WECC compliance activities related to land rights and vegetation management, continuing maintenance program activities, including system protection, right-of-way, line maintenance, and performance improvements.

**Interest, Pension, and Post-retirement Benefits
Operating Expense
Funding Schedule by Activity
Funding (\$K)**

	FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate	FY 2020 vs FY 2019	
				\$	%
Interest, Pension, and Post-retirement Benefits					
BPA Bond Interest (Net)	161,755	161,411	136,903	-24,508	-15.2%
BPA Appropriation Interest	532	1,518	0	-1,518	-100.0%
Corps of Engineers Appropriation Interest	62,902	76,472	51,611	-24,861	-32.5%
Lower Snake River Comp Plan Interest	157	206	122	-84	-40.8%
Bureau of Reclamation Appropriation Interest	2,016	6,009	1,150	-4,859	-80.9%
Bond Premiums Paid/Discounts (not capitalized)	(2,000)	556	6,584	6,028	1084.8%
Subtotal, Interest – Operating Expense	225,362	246,172	196,370	-49,802	-20.2%
Additional Pension, and Post-retirement Benefits	39,969	31,152	38,015	6,862	22.0%
Total, Interest, Pension, and Post-retirement Benefits	266,531	277,324	234,385	-42,941	-15.5%

Outyears (\$K)

	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate
Interest, Pension, and Post-retirement Benefits					
BPA Bond Interest (Net)	136,903	157,177	207,369	226,639	249,514
BPA Appropriation Interest	0	0	0	0	0
Corps of Engineers Appropriation Interest	51,611	50,508	52,192	52,445	53,797
Lower Snake River Comp Plan Interest	122	122	122	122	122
Bureau of Reclamation Appropriation Interest	1,150	1,150	1,150	1,150	1,150
Bond Premiums Paid/Discounts (not capitalized)	6,584	11,932	6,951	0	0
Subtotal, Interest – Operating Expense	196,370	220,889	267,784	280,356	304,583
Additional Pension, and Post-retirement Benefits	38,015	40,124	41,015	41,929	42,860
Total, Interest, Pension, and Post-retirement Benefits	234,385	261,013	308,799	322,285	347,443

Interest, Pension and Post-retirement Benefits Operating Expense

Overview

Interest expense provides for interest due on bonds issued to the U.S. Treasury and appropriations repayment responsibilities. The appropriation repayments relate to capital investment in FCRPS hydroelectric generating and transmission facilities of Bonneville, and the Corps and Reclamation. Investments were financed by Congressional appropriations and Bonneville borrowings from the U.S. Treasury. Bonneville repays these amounts through revenue raised in its power sales and transmission services revenues.

Since initially receiving U.S. Treasury borrowing authority in 1974 under the Transmission Act, all of Bonneville's U.S. Treasury borrowing has been at market rates. As of October 1, 1996, all of Bonneville's repayment obligations on FCRPS appropriated investment (Corps and Reclamation FCRPS investment and Bonneville investment financed with appropriations prior to the Transmission Act that were unpaid as of September 30, 1996) were restructured and assigned new current-market interest rates. The Bonneville Appropriations Refinancing Act of 1996 (Refinancing Act) called for re-setting (reducing) the unpaid principal of FCRPS appropriations and reassigning (increasing) interest rates. New principal amounts were established as of the beginning of FY 1997 at the present value of the principal and annual interest payments Bonneville would make to the U.S. Treasury for these obligations in the absence of the legislation, plus \$100.0 million. The new principal amounts were assigned prevailing market interest rates as of October 1, 1996. Bonneville's outstanding appropriations repayment obligations at the end of FY 1996 were \$6.6 billion with a weighted average interest rate of 3.4 percent. The refinancing reduced the principal amount to \$4.1 billion with a weighted average interest rate of 7.1 percent. Implementation of the refinancing took place in 1997 after audited actual financial data were available. Pursuant to the legislation, Bonneville submitted its calculations and interest rate assignments implementing the Refinancing Act to the U.S. Treasury for its review and approval. The U.S. Treasury approved the implementation calculations in July 1997. The Refinancing Act also calls for all future FCRPS appropriations to be assigned prevailing U.S. Treasury yield curve interest rates. Bonneville's outstanding appropriations may be prepaid prior to their stated maturities.

Interest estimates are a function of costs of U.S. Treasury borrowing to Bonneville, repayment status of outstanding FCRPS investments, and projected additions to FCRPS plant in service. These estimates may change over time depending on forecasted market conditions. The interest cost estimates include the impact of Bonneville's appropriation refinancing legislation.

Federal employees associated with the operation of the FCRPS participate in either the Civil Service Retirement System or the Federal Employees Retirement System. Employees may also participate in the Federal Employees Health and Benefit Program and the Federal Employee Group Life Insurance Program. All such postretirement systems and programs are sponsored by the Office of Personnel Management; therefore, Bonneville does not record any accumulated plan assets or liabilities related to the administration of such programs. Since 1997, Bonneville has made additional annual contributions to the General Fund of the U.S. Treasury (receipt account 892889) related to the Federal post-retirement benefit programs provided to employees associated with the operation of the FCRPS.

**Capital Transfers
Funding Schedule by Activity
Funding (\$K)**

Capital Transfers

	FY 2018 Actual	FY 2019 Estimate	FY 2020 Estimate	FY 2020 vs FY 2019	
				\$	%
BPA Bond Amortization ¹	287,000	370,213	351,940	-18,273	-4.9%
Reclamation Appropriation Amortization	17,000	14,236	0	-14,236	-100.0%
BPA Appropriation Amortization	7,000	21,053	0	-21,053	-100.0%
Corps Appropriation Amortization	258,000	3,135	55,596	52,461	1673.3%
Lower Snake River Comp Plan Amortization	325	0	0	0	0.0%
Total, Capital Transfers	569,325	408,637	407,536	-1,101	-0.3%

Outyears (\$K)

Capital Transfers

	FY 2020 Estimate	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate
BPA Bond Amortization ¹	351,940	456,893	425,663	388,345	399,897
Reclamation Appropriation Amortization	0	0	0	0	0
BPA Appropriation Amortization	0	0	0	0	0
Corps Appropriation Amortization	55,596	0	0	0	0
Lower Snake River Comp Plan Amortization	0	0	0	0	0
Total, Capital Transfers	407,536	456,893	425,663	388,345	399,897

Overview

¹ Bonneville "Bond(s)" in this FY 2020 Budget refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act (P.L. 93-454), which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

This activity conveys funds to the U.S. Treasury for repayment of certain FCRPS costs not included in the Associated Project Costs budget. Since capital transfers are cash transactions, they are not considered budget obligations.

Additional Tables

**BONNEVILLE POWER ADMINISTRATION
TOTAL OBLIGATIONS/OUTLAYS**

Current Services
(in millions of dollars)

FISCAL YEAR

	2018		2019		2020		2021	2022	2023	2024
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
BP-1 SUMMARY ^{1/3/}										
1 Residential Exchange Program	241	241	318	318	257	257	255	261	267	273
2 Power Services ^{2/}	1,814	1,814	1,574	1,574	1,439	1,439	1,636	1,688	1,764	1,788
3 Transmission Services	716	716	1,002	1,002	971	971	976	977	1,024	1,051
4 Conservation & Energy Efficiency	163	163	165	165	158	158	157	160	164	167
5 Fish & Wildlife	278	278	320	320	323	323	323	325	331	335
6 Interest/ Pension ^{4/}	266	266	277	277	234	234	261	309	322	347
7 Associated Project Cost - Capital	199	199	265	265	238	238	256	281	300	306
8 Capital Equipment	15	15	27	27	22	22	22	22	22	21
9 Planning Council	11	11	12	12	12	12	12	12	13	13
10 Projects Funded in Advance	157	157	41	41	86	86	66	60	40	40
11 Capitalized Bond Premiums	0	0	0	0	0	0	0	0	0	0
12 TOTAL OBLIGATIONS/ OUTLAYS^{3/}	3,861	3,861	4,002	4,002	3,740	3,740	3,965	4,096	4,247	4,341

REVENUES AND REIMBURSEMENTS

Current Services
(in millions of dollars)

BP-1 SUMMARY	FISCAL YEAR									
	2018		2019		2020		2021	2022	2023	2024
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
13 Revenues ^{5/}	3,497	3,497	3,944	3,944	3,821	3,821	3,884	3,933	3,999	4,047
14 Project Funded in Advance	157	157	41	41	86	86	66	60	40	40
15 TOTAL	3,654	3,654	3,985	3,985	3,907	3,907	3,950	3,993	4,039	4,087
16 BUDGET AUTHORITY (NET) ^{6/}	181		416		379		350	396	491	500
17 OUTLAYS (NET) ^{6/7/8}		245		17		(167)	15	103	208	254

These notes are an integral part of this table.

^{1/} This FY 2020 budget includes capital and expense estimates based on initial spending proposals from Bonneville's 2018 IPR process.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

- ^{2/} Power Services doesn't include Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.
- ^{3/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.
- ^{4/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.
- ^{5/} Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.
- ^{6/} Bonneville received \$48.7 million of additional budget authority in FY 2007 to accommodate the work necessary to relocate the radio spectrum consistent with the Commercial Spectrum Enhancement Act (P.L. 108-494). In accordance with Federal law, Bonneville plans to return the forecasted unused balance of approximately \$8.2 million to the U.S. Treasury as soon as the National Telecommunications Information Administration notifies the Federal Communications Commission that the DOE relocation effort is complete.
- ^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, continuing restructuring of the electric industry, and other reasons.
- ^{8/} FY 2018 Net Outlays are based on Bonneville's FY 2018 audited financial actuals. FY 2019 Net Outlays are calculated using Bonneville's revenue forecast from the BP-18 rate case. FYs 2020 to 2024 Net Outlays are based on 2018 Initial IPR assumptions and standard inflation factors.

EXPENSED OBLIGATIONS/OUTLAYS ^{1,4/}
Current Services
(in millions of dollars)
FISCAL YEAR

BP-2	2018		2019		2020		2021	2022	2023	2024
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	241	241	318	318	257	257	255	261	267	273
2 Power Services ^{2/}	1,814	1,814	1,574	1,574	1,439	1,439	1,636	1,688	1,764	1,788
3 Transmission Services	463	463	513	513	492	492	494	502	510	518
4 Conservation & Energy Efficiency	163	163	165	165	158	158	157	160	164	167
5 Fish & Wildlife	247	247	276	276	276	276	276	282	288	295
6 Interest/ Pension ^{3/}	266	266	277	277	234	234	261	309	322	347
7 Planning Council	11	11	12	12	12	12	12	12	13	13
8 TOTAL EXPENSE	3,206	3,206	3,136	3,136	2,868	2,868	3,092	3,214	3,327	3,401
9 Projects Funded in Advance	157	157	41	41	86	86	66	60	40	40

CAPITAL OBLIGATIONS/OUTLAYS ^{1/}

Current Services
(in millions of dollars)

	2018		2019		2020		2021	2022	2023	2024
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
BP-2 continued										
10 Transmission Services	253	253	489	489	479	479	482	475	515	533
11 Associated Project Cost	199	199	265	265	238	238	256	281	300	306
12 Fish & Wildlife	31	31	44	44	47	47	47	43	43	40
13 Capital Equipment	15	15	27	27	22	22	22	22	22	21
14 Capitalized Bond Premiums	0	0	0	0	0	0	0	0	0	0
15 TOTAL CAPITAL INVESTMENTS	498	498	825	825	787	787	807	822	880	900
16 TREASURY BORROWING AUTHORITY TO										
17 FINANCE CAPITAL OBLIGATIONS ^{4/}	498		825		787		807	822	880	900

These notes are an integral part of this table.

^{1/} This FY 2020 budget includes capital and expense estimates based on initial spending proposals from Bonneville's 2018 IPR process.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

^{2/} Power Services doesn't include Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

^{3/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{4/} This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

CURRENT SERVICES
(in millions of dollars)

CAPITAL TRANSFERS

	FISCAL YEAR						
	2018 Pymts	2019 Pymts	2020 Pymts	2021 Pymts	2022 Pymts	2023 Pymts	2024 Pymts
Amortization:							
18 BPA Bonds	287	370	352	457	426	388	400
19 Reclamation Appropriations	17	14	0	0	0	0	0
20 BPA Appropriations	7	21	0	0	0	0	0
21 Corps Appropriations	258	3	56	0	0	0	0
22 Lower Snake River Comp Plan Amortization	0	0	0	0	0	0	0
23 TOTAL CAPITAL TRANSFERS	569	409	408	457	426	388	400
24 FULL-TIME EQUIVALENT (FTE)	2,793	3,000	3,000	3,000	3,000	3,000	3,000

PROGRAM & FINANCING SUMMARY

Current Services

(in millions of dollars)

Identification Code 89-4045-0-3-271

	est.						
	2018	2019	2020	2021	2022	2023	2024
Program by activities							
Operating expenses							
0.01 Power Services	1,365	1,098	961	1,162	1,203	1,268	1,281
0.02 Residential Exchange Program	241	318	257	255	261	267	273
Associated Project Costs							
0.05 Bureau of Reclamation	153	163	165	163	166	170	174
0.06 Corps of Engineers	245	256	256	256	261	267	273
0.07 Colville Settlement	20	23	23	23	23	24	24
0.19 U.S. Fish & Wildlife Service	31	33	33	33	34	35	36
0.20 Planning Council	11	12	12	12	12	13	13
0.21 Fish & Wildlife	247	276	276	276	282	288	295
0.23 Transmission Services	463	513	492	494	502	510	518
0.24 Conservation & Energy Efficiency	163	165	158	157	160	164	167
0.25 Interest	226	246	196	221	268	280	305
0.26 Pension and Health Benefits ^{1/}	40	31	38	40	41	42	43
0.91 Total operating expenses ^{2/}	3,206	3,135	2,867	3,092	3,214	3,327	3,401
Capital investment							
1.01 Power Services	199	265	238	256	281	300	306
1.02 Transmission Services	253	489	479	482	475	515	533
1.04 Fish & Wildlife	31	44	47	47	43	43	40
1.05 Capital Equipment	15	27	22	22	22	22	21
1.06 Capitalized Bond Premiums	0	0	0	0	0	0	0
1.07 Total Capital Investment ^{3/}	498	825	787	807	822	880	900
2.01 Projects Funded in Advance	157	41	86	66	60	40	40
10.00 Total obligations ^{4/}	3,861	4,001	3,739	3,965	4,096	4,247	4,341

These notes are an integral part of this table.

^{1/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

^{2/} Assumes expense obligations, not accrued expenses.

Power Services doesn't include Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

Bonneville makes an accounting adjustment to the production services component of FY 2018 Bonneville's audited actual obligations. This past year adjustment relates primarily to long-term obligation requirements consistent with Bonneville's FY 2018 Combined Schedules of Budgetary Resources and the GTAS FY 2018 Treasury reports for Bonneville.

^{3/} Assumes capital obligations, not capital expenditures.

^{4/} This FY 2020 budget includes capital and expense estimates based on initial spending proposals from Bonneville's 2018 IPR process.

For purposes of this table, this FY 2020 budget reflects, for FY 2018, forecasted third party financing expense only for PFIA.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

Program and Financing (continued)
 Current Services
 (in millions of dollars)
 est.

	2018	2019	2020	2021	2022	2023	2024
Financing:							
1000 Unobligated balance available, start of year. ^{5/}	13	12	10	0	0	0	0
1050 Unobligated balance available, end of year. ^{5/}	12	10	8	0	0	0	0
1900 Budget authority (gross)	3,859	4,401	4,286	4,300	4,389	4,530	4,587
Budget Authority:							
1400 Permanent Authority: Authority to borrow from Treasury (indefinite) ^{6/}	809	825	787	807	822	880	900
1800 Spending authority from off-setting collections	3,654	3,985	3,907	3,950	3,993	4,039	4,087
1825 Portion applied to debt reduction	(287)	(409)	(408)	(457)	(426)	(388)	(400)
1850 Spending authority from offsetting collections (adjusted)	446	3,576	3,499	3,493	3,568	3,650	3,687
900 Total obligations	3,861	4,002	3,740	3,965	4,096	4,247	4,341
4110 Outlays (gross)	3,861	4,002	3,740	3,965	4,096	4,247	4,341
Adjustments to budget authority and outlays:							
Deductions for offsetting collections:							
4120 Federal funds	(63)	(90)	(90)	(90)	(90)	(90)	(90)
4121 Interest on Federal Securities	(5)						
4123 Non-Federal sources	(3,586)	(3,895)	(3,817)	(3,860)	(3,903)	(3,949)	(3,997)
4130 Total, offsetting collections	(3,654)	(3,985)	(3,907)	(3,950)	(3,993)	(4,039)	(4,087)
4160 Budget authority (net)	181	416	379	350	396	491	500
4170 Outlays (net) ^{7/8/}	245	17	(167)	15	103	208	254

These notes are an integral part of this table.

^{5/} Reflects estimated cost for radio spectrum fund.

^{6/} The Permanent Authority: Authority to borrow (indefinite) from the U.S. Treasury amounts reflect both Bonneville's capital program financing needs and either the use of, or creation of, deferred borrowing. Deferred borrowing is created when, as a cash and debt management decision, Bonneville uses cash from revenues to liquidate capital obligations in lieu of borrowing at that time from the U.S. Treasury. This temporary use of cash on hand instead of borrowed funds creates the ability in future years to borrow money, when fiscally prudent. The FY 1989 Energy and Water Development Appropriations Act (P.L. 100-371 Of 7/19/88) confirmed that Bonneville has authority to incur obligations in excess of U.S. Treasury borrowing authority and cash in the BPA fund. Total includes BPA's self-financing activities and funds for Radio Spectrum Relocation. In addition, BPA has negotiated with the U.S. Treasury access to a \$750 million short term note.

^{7/} Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, continuing restructuring of the electric industry, and other reasons.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps.

Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

^{8/} FY 2018 Net Outlays are based on Bonneville's FY 2018 audited financial actuals. FY 2019 Net Outlays are calculated using Bonneville's revenue forecast from the BP-18 rate case. FYs 2020 to 2024 Net Outlays are based on 2018 Initial IPR assumptions and standard inflation factors.

**BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES**

BP-4A

	Fiscal Year							
	2018				2019			
	Net Capital		Net Capital		Net Capital		Net Capital	
	Net Capital	Obs Subject	Net Capital	Bonds Out-	Net Capital	Obs Subject	Net Capital	Bonds Out-
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
Start-of-Year: Total	4,094	3,552	4,993	5,009	4,305	3,763	5,204	5,531
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	498	498	498	809	825	825	825	825
Treasury Borrowing (Cash)								
Less:								
BPA Bond Amortization	287	287	287	287	370	370	370	370
Net Increase/(Decrease):	211	211	211	522	454	454	454	454
Cum.-End-of-Year: Total	4,305	3,763	5,204	5,531	4,760	4,218	5,659	5,985
Total Remaining Treasury Borrowing Amount				2,169				1,715
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2020 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2018-2019.

Cumulative advance amortization payments as of the end of FY 2018 are \$5,503 million.

Total includes BPA's self-financing activities and funds for Radio Spectrum Relocation. In addition, BPA has negotiated with the U.S. Treasury access to a \$750 million short term note.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4B

	2020				2021			
	Net Capital		Net Capital	Bonds Out-	Net Capital		Net Capital	Bonds Out-
	Net Capital Obs	Obs Subject to BA			Net Capital Obs	Obs Subject to BA		
Start-of-Year: Total	4,760	4,218	5,659	5,985	5,194	4,652	6,093	6,420
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	787	787	787	787	807	807	807	807
Treasury Borrowing (Cash)								
Less:								
Total BPA Bond Amortization	352	352	352	352	457	457	457	457
Net Increase/(Decrease):								
Total	435	435	435	435	350	350	350	350
Cum.-End-of-Year: Total	5,194	4,652	6,093	6,420	5,544	5,002	6,443	6,770
Total Remaining Treasury Borrowing Amount				1,280				930
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2020 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtednesses issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2018-2019.

Cumulative advance amortization payments as of the end of FY 2018 are \$5,503 million.

Total includes BPA's self-financing activities and funds for Radio Spectrum Relocation. In addition, BPA has negotiated with the U.S. Treasury access to a \$750 million short term note.

BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES
(in millions of dollars)

BP-4C

Fiscal Year

	2022				2023			
	Net Capital		Net Bonds		Net Capital		Net Bonds	
	Net Capital	Obs Subject	Net Capital	Bonds Out-	Net Capital	Obs Subject	Net Capital	Bonds Out-
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
Start-of-Year: Total	5,544	5,002	6,443	6,770	5,940	5,398	6,839	7,166
Plus: Annual Increase								
Cum.-Annual Treasury Borrowing	822	822	822	822	880	880	880	880
Treasury Borrowing (Cash)								
Less:								
Total BPA Bond Amortization	426	426	426	426	388	388	388	388
Net Increase/(Decrease):								
Total	396	396	396	396	491	491	491	491
Cum.-End-of-Year: Total	5,940	5,398	6,839	7,166	6,432	5,890	7,331	7,658
Total Remaining Treasury Borrowing Amount				534				42
Total Legislated Treasury Borrowing Amount				7,700				7,700

These notes are an integral part of this table.

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

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**BONNEVILLE POWER ADMINISTRATION
BPA STATUS of U.S. TREASURY BORROWING
CURRENT SERVICES**

(in millions of dollars)

BP-4D

	Fiscal Year			
	2024			
	Net Capital		Net Capital Expend.	Bonds Out- Standing
	Net Capital Obs	Obs Subject to BA		
Start-of-Year: Total	6,432	5,890	7,331	7,658
Plus: Annual Increase				
Cum.-Annual Treasury Borrowing	900	900	900	900
Treasury Borrowing (Cash)				
Less:				
Total BPA Bond Amortization	400	400	400	400
Net Increase/(Decrease):				
Total	500	500	500	500
Cum.-End-of-Year: Total	6,932	6,390	7,831	8,158
Total Remaining Treasury Borrowing Amount				(458)
Total Legislated Treasury Borrowing Amount				7,700

These notes are an integral part of this table.

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2020 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually is assumed as part of TS capital-PFIA for FYs 2018-2019.

Cumulative advance amortization payments as of the end of FY 2018 are \$5,503 million.

Total includes BPA's self-financing activities and funds for Radio Spectrum Relocation. In addition, BPA has negotiated with the U.S. Treasury access to a \$750 million short term note.

**BONNEVILLE POWER ADMINISTRATION
POTENTIAL THIRD PARTY FINANCING TRANSPARENCY**

(in millions of dollars)

BP-5

		Fiscal Year						
		2018	2019	2020	2021	2022	2023	2024
Transmission Services - Capital	Main Grid	11	40	3	27	25	34	46
	Area & Customer Services	36	48	82	92	75	70	56
	Upgrades & Additions	29	72	57	50	69	105	122
	System Replacements	178	330	338	312	306	306	309
	Projects Funded in Advance	157	41	86	66	60	40	40
	Total, Transmission Services - Capital	410	530	565	548	536	554	573

Associated Project Costs - Capital

	Requirement	Fiscal Year						
		2018	2019	2020	2021	2022	2023	2024
		Associated Project Costs	199	265	238	256	281	300
Projects Funded in Advance ^{1/}	0	0	0	0	0	0	0	
Total, Associated Project Costs - Capital	199	265	238	256	281	300	306	

Federal and Non-Federal Funding

	Source	Fiscal Year						
		2018	2019	2020	2021	2022	2023	2024
Projects Funded in Advance		157	41	86	66	60	40	40
U.S. Treasury Borrowing Authority		453	754	717	738	756	815	839

Scenario

	Scenario	Fiscal Year						
		2018	2019	2020	2021	2022	2023	2024
		Projects Funded in Advance ^{1/}	0	0	0	0	0	0
Third Party Financing		150	122	120	120	119	129	133
Alternate Treasury Borrowing Authority		NA	632	597	617	638	686	706

These notes are an integral part of this table.

1/ In this instance, Projects Funded in Advance represents prepayment of Power customers' bills reimbursed by future credits and third party non-federal financing for Conservation initiatives.

The table above shows both the potential use of U.S. Treasury borrowing authority for transmission capital projects based on this FY 2020 budget and the use adjusted for potential third-party financing to fund appropriate capital expenditures when feasible in lieu of U.S. Treasury borrowing. Estimates included in this FY 2020 budget are uncertain and may change due to revised capital investment plans, changing economic conditions, and an evolving financial market environment. The estimates of third-party financing included in the table show a reduction in the use of U.S. Treasury borrowing and do not reflect the actual notional third party financing commitment Bonneville may enter into in that particular year. The difference of reduction in use of U.S. Treasury borrowing and the actual notional third party financing commitment is primarily due to the difference in the timing of financing transactions between U.S. Treasury and third-party financing for capital projects with multi-year construction schedules.

Bonneville's Third Party Financing for Transmission Services consists primarily of lease-purchase agreements, which are capitalized obligations that enable Bonneville to acquire the use of transmission facilities over time. Bonneville also undertakes the construction and installation of facilities from funds that customers advance to Bonneville for construction of BPA-owned facilities that assist the customers in obtaining necessary transmission service from Bonneville. These customers receive monetary payment credits in bills for transmission services from Bonneville up to the amount of funds advanced to Bonneville, plus interest.

Bonneville's historical Third Party Financing amounts may vary over time due to re-assignment of certain lease-purchase agreements to Treasury Financing.

Bonneville Status of U.S. Treasury Borrowing with Potential Third Party Financing & PFIA Scenario

With the potential use of third party financing assumed in the scenario above, Bonneville's total remaining U.S. Treasury Borrowing Amount would be extended to the following amounts. See BP-4 BPA Status of Treasury Borrowing- Current Services.

	Fiscal Year						
	2018	2019	2020	2021	2022	2023	2024
Start-of-Year: Total Bonds Outstanding	5,009	5,531	5,863	6,178	6,408	6,685	7,048
Plus:							
U.S. Treasury Borrowing (Cash)	809	825	787	807	822	880	900
Less:							
Potential Third Party Financing & PFIA	150	122	120	120	119	129	133
BPA Bond Amortization	287	370	352	457	426	388	400
Net Increase/(Decrease) Bonds Outstanding:	522	332	315	230	277	363	367
Cum.-End-of-Year: Total	5,531	5,863	6,178	6,408	6,685	7,048	7,415
Total Remaining U.S. Treasury Borrowing Amount	2,169	1,837	1,522	1,292	1,015	652	285
Total Legislated U.S. Treasury Borrowing Amount	7,700	7,700	7,700	7,700	7,700	7,700	7,700

U.S. TREASURY PAYMENTS

(in millions of dollars)

	FISCAL YEAR						
	2018	2019	2020	2021	2022	2023	2024
A. INTEREST ON BONDS & APPROPRIATIONS							
Bonneville Bond Interest							
1 Bonneville Bond Interest (net)	130	161	137	157	207	227	250
2 AFUDC ^{1/}	31	33	35	34	35	33	31
Appropriations Interest							
3 Bonneville	1	2	0	0	0	0	0
4 Corps of Engineers ^{2/}	63	76	52	51	52	52	54
5 Lower Snake River Comp. Plan	0	0	0	0	0	0	0
6 Bureau of Reclamation ^{3/}	2	6	1	1	1	1	1
7 Bond Premiums paid/Discounts (not capitalized)	-2	1	7	12	7	0	0
8 Total Bond and Approp. Interest	226	279	232	255	302	313	336
B. ASSOCIATED PROJECT COST							
9 Bureau of Reclamation Irrigation Assistance	27	57	24	15	16	13	15
10 Bureau of Rec. O & M ^{4/}	0	0	0	0	0	0	0
11 Corps of Eng. O & M ^{4/}	1	0	0	0	0	0	0
12 L. Snake River Comp. Plan O & M ^{4/}	0	0	0	0	0	0	0
13 Total Assoc. Project Costs	28	57	24	15	16	13	15
C. CAPITAL TRANSFERS							
Amortization							
14 Bonneville Bonds ^{6/}	287	370	352	457	426	388	400
15 Bureau of Reclamation Appropriations	17	14	0	0	0	0	0
16 Corps of Engineers Appropriations	258	3	56	0	0	0	0
17 Lower Snake River Comp. Plan	0	0	0	0	0	0	0
18 Bonneville Appropriations	7	21	0	0	0	0	0
19 Total Capital Transfers ^{8/}	569	409	408	457	426	388	400
D. OTHER PAYMENTS							
20 Unfunded Post-Retirement Liability ^{5/}	40	31	38	40	41	42	43
21 TOTAL TREASURY PAYMENTS	862	776	702	767	785	756	794

These notes are an integral part of this table.

- ^{1/} This interest cost is capitalized and included in BPA's Transmission System Development, System Replacements, and Associated Projects Capital programs. AFUDC is financed through the sale of bonds.
- ^{2/} Includes interest on construction funding for Corp of Engineers (Corps) fish bypass facilities at Corps dams in the Columbia River Basin, including Lower Monumental, Ice Harbor, and The Dalles.
- ^{3/} Includes payments paid by Reclamation to the U.S. Treasury on behalf of Bonneville.
- ^{4/} Costs for power O&M is funded directly by Bonneville as follows (in millions):

	FISCAL YEAR						
	2018	2019	2020	2021	2022	2023	2024
Bureau of Reclamation	153	163	165	163	166	170	174
Corps of Engineers	245	256	256	256	261	267	273
Subtotal Bureau and Corps	398	419	420	418	427	437	447
Lower Snake River Comp. Plan	31	33	33	33	34	35	36
Total	429	452	454	452	462	472	482

- ^{5/} See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.
- ^{6/} In this FY 2020 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.
Does not include Treasury bond premiums on refinanced Treasury bonds.
- ^{8/} FY 2018 data reflects rate case planned capital transfer.

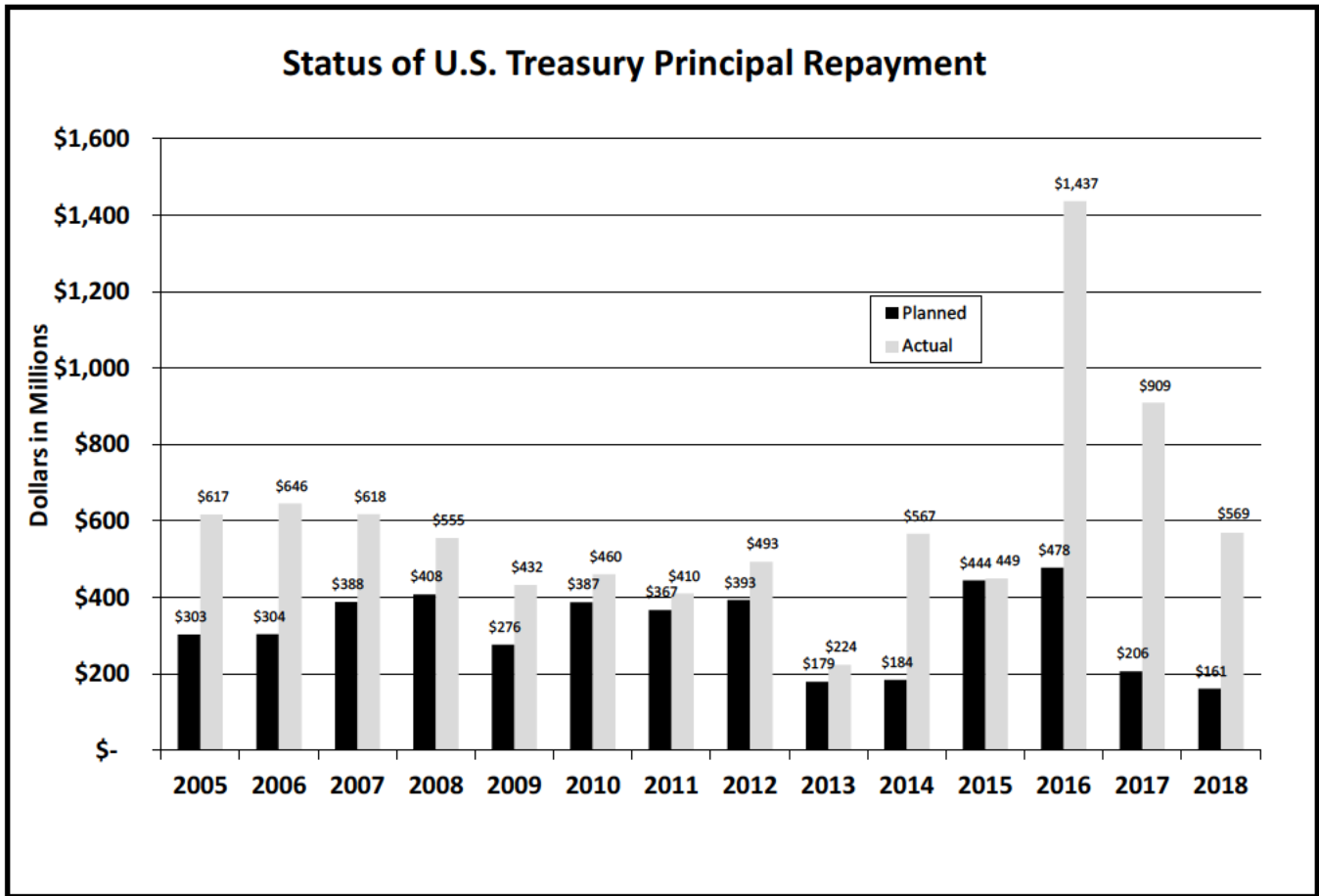


Chart Notes

^{1/} This chart displays principal repayment only.

^{2/} U.S. Treasury payment outyear estimates for planned amortization of principal are based on rate case estimates when available and are planned amortization for future rate case periods. These estimates may change due to revised capital investment plans, actual U.S. Treasury borrowing, and advanced amortization payments. Bonneville’s aggregate FY 2018 U.S. Treasury payment was \$862 million, composed of \$569 million in principal repayment (including \$275 million in early retirement of higher interest rate U.S. Treasury debt), \$226 million in interest, and \$68 million for other costs.

^{3/} FYs 2002-2012 payments include portions of advance amortization amounts consistent with Bonneville's capital strategy plan and the Bonneville /Energy Northwest debt optimization program.

^{4/} Advance amortization due to sale of transmission facilities includes \$12.7 million in FY 2003, \$5.3 million in FY 2006, \$2.0 million in FY 2011, \$0.4 million in FY 2013 and \$0.4 million in FY 2014, and \$0.6 million in FY 2017.

^{5/} The cumulative amount of actual advance amortization payments as of the end of FY 2018 is \$5,503 million.

^{6/} FYs 2014-2018 include advance amortization under the Regional Cooperation Debt initiative with Energy Northwest (EN) under which EN extended maturities on Bonneville-backed debt which enabled the early amortization of higher cost appropriations.

OBJECT CLASSIFICATION STATEMENT

(in millions of dollars)

ESTIMATES

	2018 act.	2019	2020
11.1 Full-time permanent	280	327	305
11.3 Other than full-time permanent	1	1	1
11.5 Other personnel compensation	45	52	48
11.9 Total personnel compensation	326	379	355
12.1 Civilian personnel benefits	115	134	125
13.0 Benefits for former personnel	-	-	-
21.0 Travel and transportation of persons	4	5	5
22.0 Transportation of things	4	4	4
23.1 Rental payments to GSA	1	1	1
23.2 Rents, other	21	25	23
23.3 Communication, utilities & misc. charges	7	8	8
25.1 Consulting Services	73	85	79
25.2 Other Services	2,810	2,782	2,603
25.5 R & D Contracts	7	6	2
26.0 Supplies and materials	29	34	32
31.0 Equipment	140	163	152
32.0 Lands and structures	87	102	95
41.0 Grants, subsidies, contributions	30	35	33
43.0 Interest and dividends	205	238	223
99.0 Total obligations	3,860	4,002	3,739

Estimate of Receipts
(in millions of dollars)

	Fiscal Year						
	2018	2019	2020	2021	2022	2023	2024
Reclamation Interest	2	6	1	1	1	1	1
Reclamation Amortization	17	14	0	0	0	0	0
Reclamation O&M	0	0	0	0	0	0	0
Reclamation Irrig. Assist.	27	57	24	15	16	13	15
Revenues Collected by Reclamation Distributed in Treasury Account (credit)	-17	-7	-7	-7	-7	-7	-7
Colville Settlement (credit)	-5	-5	-5	-5	-5	-5	-5
Total 1/ Reclamation Fund	24	65	13	4	5	2	4
Corps O&M							
CSRS	40	31	38	40	41	42	43
Total 2/ Repayments on misc.costs	40	31	38	40	41	42	43

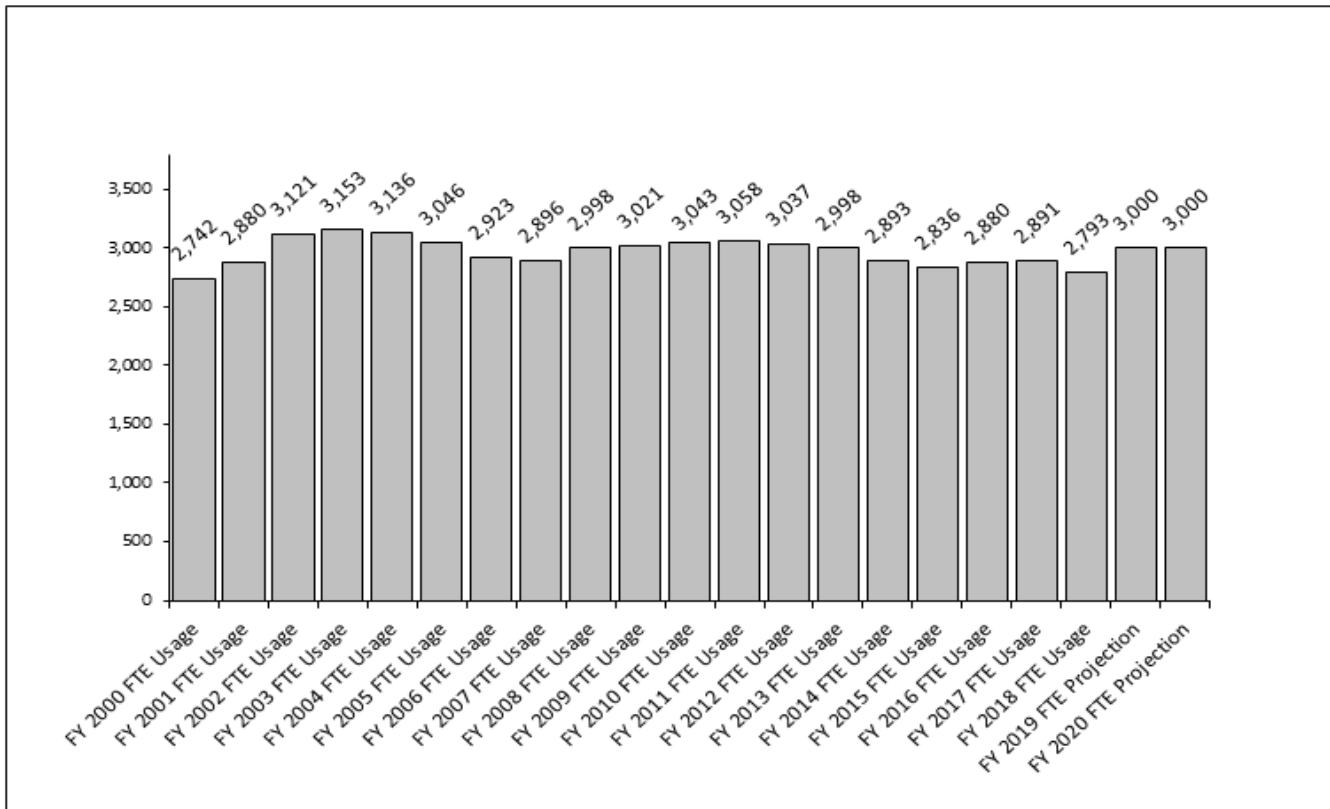
1/ Includes amortization of appropriations and irrigation assistance, and interest costs for Reclamation. The cost of power O&M for Reclamation is no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfer to Account #895000.26

2/ The costs of power O&M for the Corps and Lower Snake River Comp. Plan are no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfers to Account #892889, Repayments on misc. recoverable costs, not otherwise classified. Costs for power O&M is funded directly by Bonneville as follows (in millions)

	2018	2019	2020	2021	2022	2023	2024
Bureau of Reclamation	153	163	165	163	166	170	174
Corps of Engineers	245	256	256	256	261	267	273
Lower Snake River Comp. Plan	31	33	33	33	34	35	36
Total	429	452	454	452	462	472	482

See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

BONNEVILLE FTE



These notes are an integral part of this chart.

1. Actual FTE data is consistent with DOE personnel reports.
2. FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing transmission marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.
3. As of September 30, 2018 DOE HR staff has reported FY 2018 BPA's FTE usage at 2,793.

Total Cost of BPA Fish & Wildlife Actions (\$ in millions)

COST ELEMENT	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CAPITAL INVESTMENTS ^{1/}											
BPA FISH AND WLDLFE	25.5	27.4	40.0	90.2	57.5	52.1	37.4	21.4	16.0	5.4	30.7
BPA SOFTWARE DEVELOPMENT COSTS	1.3	0.6	1.2	0.8	0.4	0.0	0.1	1.4	1.2	1.4	0.8
ASSOCIATED PROJECTS (FEDERAL HYDRO)	37.3	135.7	56.4	103.0	114.5	103.6	101.7	81.4	34.1	58.9	51.8
TOTAL CAPITAL INVESTMENTS	64.2	163.7	97.6	193.9	172.3	155.7	139.2	104.1	51.4	65.7	83.2
PROGRAM EXPENSES											
BPA DIRECT FISH AND WILDLIFE PROGRAM	148.9	177.9	199.6	221.1	248.9	239.0	231.8	258.2	258.1	254.7	258.7
FISH & WILDLIFE SOFTWARE EXPENSE COSTS	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.1
SUPPLEMENTAL MITIGATION PROGRAM EXPENSES ^{2/}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
REIMBURSABLE/DIRECT-FUNDED PROJECTS ^{3/}											
O & M LOWER SNAKE RIVER HATCHER ES	19.4	20.8	23.3	24.5	22.0	28.7	31.0	30.9	28.6	26.0	31.4
O & M CORPS OF ENGINEERS	34.4	34.3	36.5	40.3	41.1	39.2	47.8	46.4	48.2	46.8	47.1
O & M BUREAU OF RECLAMATION	4.3	4.5	5.2	5.0	5.3	5.6	6.6	2.6	6.0	7.0	5.2
NW POWER AND CONSERVATION COUNCL ALLOCATED @ 50%	4.1	4.7	4.7	4.5	4.6	5.0	4.9	4.9	5.4	5.4	5.5
SUBTOTAL (RE MB/D RECT-FUNDED)	62.2	64.3	69.7	74.3	73.0	78.5	90.3	84.9	88.2	85.2	89.2
TOTAL OPERATING EXPENSES	211.1	242.1	269.3	295.3	321.9	317.70	322.40	343.17	346.34	339.90	347.97
PROGRAM RELATED FIXED EXPENSES ^{4/}											
INTEREST EXPENSE	76.9	78.7	80.5	79.2	80.6	89.1	83.4	89.2	85.6	58.6	41.0
AMORTIZATION EXPENSE	24.4	24.6	25.0	28.3	30.2	35.7	38.7	41.3	42.5	42.5	43.4
DEPRECIATION EXPENSE	14.9	16.7	18.0	19.6	20.7	18.6	19.2	20.1	20.1	20.3	20.8
TOTAL FIXED EXPENSES	116.2	120.0	123.5	127.2	131.5	143.4	141.3	150.6	148.2	121.4	105.1
GRAND TOTAL PROGRAM EXPENSES	327.3	362.1	392.8	422.5	453.4	461.1	463.7	493.7	494.6	461.3	453.0
FORGONE REVENUES AND POWER PURCHASES											
FOREGONE REVENUES	273.5	142.8	99.4	156.7	152.2	135.5	122.7	195.8	76.6	9.6	2.9
BPA POWER PURCH. FOR FISH ENHANCEMENT	274.9	240.3	310.1	70.7	38.5	85.8	196.2	67.5	50.3	(20.5)	24.3
TOTAL FOREGONE REVENUES AND POWER PURCHASES	548.5	383.1	409.5	227.4	190.7	221.3	318.9	263.3	126.9	(10.9)	27.2
TOTAL PROGRAM EXPENSES, FOREGONE REVENUES, & POWER PURCHASES	875.8	745.3	802.3	649.9	644.1	682.4	782.6	757.0	621.5	450.4	480.2
CREDITS											
4(h)(10)(C)	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)	(77.7)	(72.6)	(53.7)	(70.2)
TOTAL CREDITS	(100.5)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)	(77.7)	(72.6)	(53.7)	(70.2)

This information has been made publicly available by BPA. The figures shown are consistent with audited actuals that contain Agency approved financial information, except for forgone revenues and power purchases which are estimates and do not contain Agency approved financial information

1/ Capital Investments include both BPA's direct Fish and Wildlife Program capital investments, funded by BPA's Treasury borrowing, and "Associated Projects", which include capital investments at Corps of Engineers' and Bureau of Reclamation projects, funded by appropriations and repaid by BPA. The annual expenses associated with these investments are included in "Program-Related Fixed Expenses", below.

2/ Includes High Priority and Action Plan Expenses and other supplemental programs.

3/ "Reimbursable/Direct-Funded Projects" includes the portion of costs BPA pays to or on behalf of other entities that is determined to be for fish and wildlife purposes.

4/ "Fixed Expenses" include depreciation, amortization and interest on investments on the Corps and Bureau's projects, and amortization and interest on the investments associated with BPA's direct Fish and Wildlife Program.