BONNEVILLE POWER ADMINISTRATION

Integrated Program Review

Initial Publication, June 2020

Letter from the Administrator

The Bonneville Power Administration invites you to participate in the BP-22 Integrated Program Review (IPR). Your input will help inform our decisions to set capital and expense spending levels for the next rate period, covering fiscal years 2022 and 2023.

Customer engagement in past IPRs has played an important role in BPA's continued focus on controlling costs and keeping rates on a sustainable trajectory. We remain committed to this path and look forward to your continued involvement.

We recognize that the COVID-19 pandemic has created uncertainty for our customers. This IPR will serve as a baseline of costs for the BP-22 rates, though BPA acknowledges the need to remain flexible and adaptable to the changing conditions, which may warrant revisiting some of these proposed spending levels in an IPR-2 in the early part of 2021. Even if the outlook improves, an IPR-2 may still be warranted to factor in any impacts that may arise related to the Columbia River System Operations (CRSO) review.

After discussing these challenges with customers and considering our options for providing rate relief, BPA is proposing to suspend its Financial Reserves Policy Surcharge (FRP Surcharge) for the remainder of the current rate period by initiating an expedited rate proceeding in June, conducted under Section 7(i) of the Northwest Power Act. In addition, we can take immediate advantage of contractual flexibilities and provide support through extended payment agreements, which are available to power and transmission customers on a case-by-case basis. We will continue to assess the flexibilities BPA can extend to customers to help alleviate the economic challenges and are committed to working together in these unprecedented times.

Given the current circumstances, we believe it is as important as ever for BPA to take a pragmatic approach to program spending levels consistent with trustworthy stewardship and maintaining collaborative relationships. We will seek to ensure BPA's long-term financial strength by remaining anchored on the financial objectives laid out in our strategic and financial plans while being responsive to immediate short term needs.

The program spending levels we are proposing in this IPR are consistent with the 2018-2023 Strategic Plan objective of holding the sum of program costs, by business line, at or below the rate of inflation through 2028. For the FY 2022-2023 rate period, we are proposing to absorb approximately $63 million annually in inflation. We are keeping IPR costs flat for Power Services, and keeping the increase in costs for Transmission Services at the rate of inflation to ensure tolerable funding levels necessary to support safety, compliance, reliability and market transformation activities.

It has been very challenging to keep program cost increases below the rate of inflation over the past few years while continuing to maintain reliability and the same quality of service for BPA's products and services. Doing so once again demonstrates how far we have come in our effort to strengthen our financial planning and analysis capabilities. Rather than using costs from the previous rate period as a starting point, we used an integrated financial planning model as a planning platform that provides a common lens in which to view the impacts of key strategic

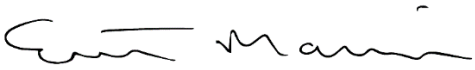
decisions for the agency. The model uses key assumptions and takes into consideration BPA's statutory obligations and authorities, financial policies and established practices, and our financial health objectives – producing IPR expense and capital limits that guided the development of our proposed spending levels. Adhering to these limits has required a sustained and continued focus on cost management and led us to make difficult trade-offs that are highlighted throughout this document. The key areas of upward cost pressure are hourly and salaried wage inflation and Information Technology investments.

One significant change in this IPR is the integration of program plans. These are designed to provide a management framework to better align costs and priorities with agency goals and help drive strategic use of limited budgetary resources. This IPR serves as a transitional phase to the program plan construct, with change management in process across BPA to realize full maturity over time.

I hope you will join us for the virtual IPR kickoff on June 15, when we will begin a public dialogue to establish adequate funding levels for our priorities, discuss trade-offs and balance risks to our strategy execution. This meeting will initiate a 30-day public comment period on our proposed spending levels. More information, including meeting details and presentation materials, will be posted on BPA's website.

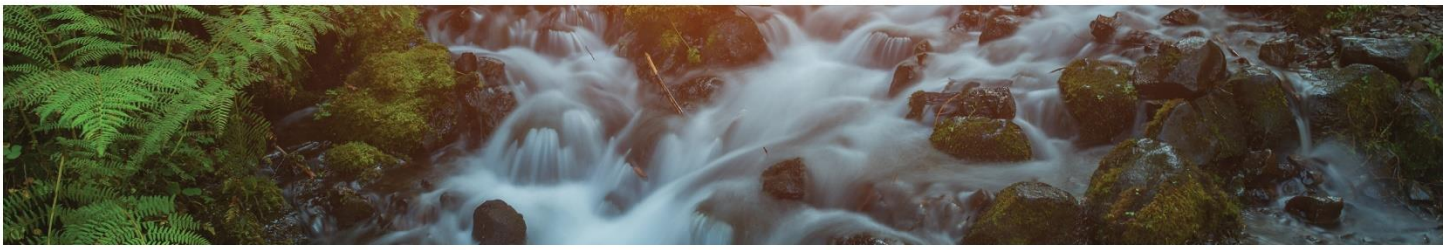
Thank you for your engagement and support as we work together to sustain BPA's role as an engine of the region's economic prosperity and environmental sustainability.

Sincerely,



Elliot E. Mainzer
Administrator and CEO

Table of Contents



1 Introduction

The Integrated Program Review (IPR) occurs every two years, before each rate case, giving interested parties an opportunity to review and comment on BPA's proposed spending levels. The IPR integrates both long-term capital forecasts and near-term program spending levels for the next rate period into one forum. The final spending levels will serve as a foundation for developing the power and transmission rates for the next rate period, fiscal years (FY) 2022 and 2023.

This IPR proposal is guided by BPA's commitment to the objectives of its 2018-2023 Strategic Plan, and the proposed spending levels balance the agencies priorities, cost commitments, and internal competitiveness targets. Because these spending levels inform the power and transmission rates, BPA's first priority is to ensure the funding levels are sufficient and reasonable to fund the agency's priorities several years into the future. Future cost uncertainty is a factor in establishing sufficient and reasonable spending levels because of this gap in time between when spending levels are established in the IPR and when BPA actually operates the business consistent with those spending levels. This also provides BPA with the ability through time to further align the work of the organization to make the best use of these budgetary resources at the time they are needed.

BPA also acknowledges the necessity of being adaptable in this time of economic uncertainty resulting from the COVID-19 pandemic. These proposed spending levels are a baseline of expectations. BPA will continue to monitor the impacts of COVID-19, and may conduct an IPR-2 in early 2021 to revisit the impacted areas.

BPA incorporated the program plan framework into this IPR. Operating plans and program plans provide a two-year comprehensive and integrated view of the business, workforce and financial performance of each program. Power and Transmission each have an operating plan that organizes all of the activities necessary to run the business into programs that can be mapped to the strategic plan. Enterprise Services, which combines the Chief Administrative Office and Corporate organizations, and Environment, Fish & Wildlife also each have a program plan – and these programs are mapped to the Power and Transmission Operating Plans increasing cost transparency, alignment and prioritization to the strategic goals.

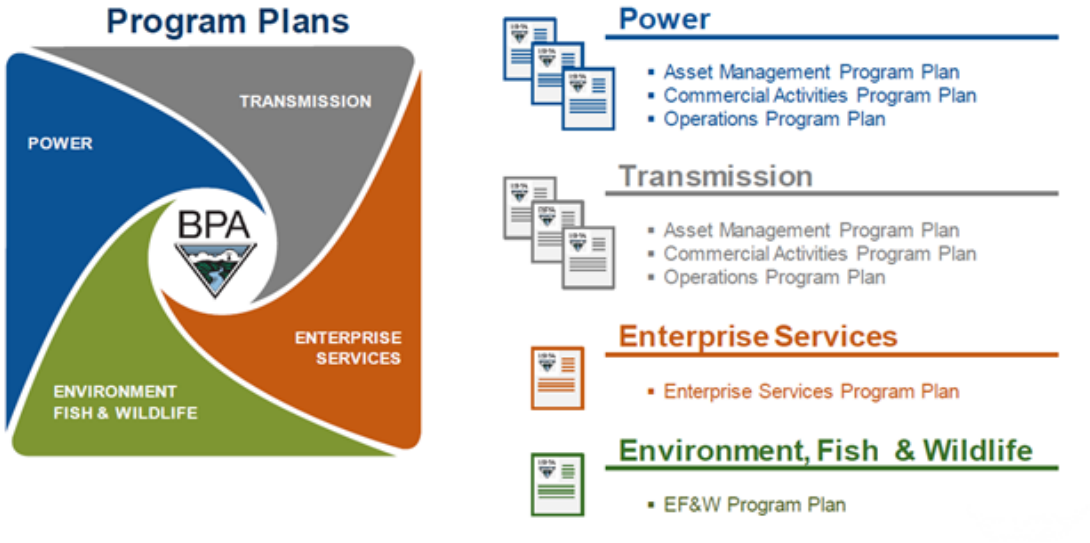


Figure 1 Program Plan framework

1.1 IPR Scope

BPA's power and transmission rate case will establish the rates that recover the costs for BPA's products, services, and programs for FY 2022 and FY 2023. The expense and capital spending levels determined in the IPR process are just one component of costs and factors used in setting rates. All other costs considered in the rate-setting process are out of the scope of the IPR. The figure below outlines all assumptions and inputs that will be considered in the rate-setting process.

Figure 2 Rates

Program estimates are provided for the following in the IPR Publication, but are not described in detail during the process:

- Long-term contract generating projects
- Settlement payments, such as Residential exchange program
- Transmission acquisitions and ancillary services
- Reimbursable projects

Proposed spending levels reflect BPA's current estimate of its costs and does not represent actual budget decisions made in the budgetary process proposed by the executive branch. Rather the IPR costs are part of the costs to be recovered in rates for power and transmission.

2 Spending Level Development

Development of the proposed capital spending levels were informed by longer-term Strategic Asset Management Plans (SAMPs) that guide prioritization of spending for the portfolio of assets, and short-term, tactical asset plans that detail specific investments to be made each fiscal year. Development of the proposed expense spending levels are consistent with BPA's integrated financial planning model and BPA's strategic plan objectives.

2.1 Expense Spending Level Development

Executives led this IPR spending level development from the beginning, with the strategic plan goal of keeping spending levels at or below inflation and with a view toward our rate competitiveness and long-term financial outlook. Spending levels were also considered in the context of the overall revenue requirement with our integrated financial planning model, allowing BPA to step away from pure cost cutting measures and take a holistic approach to business decisions made in this process. Within these constraints, executives evaluated and prioritized the cost of services within each program against the value provided to BPA's strategic objectives. Combined with the program plan framework, this approach to spending level development is an improvement to our cost-management capability, as it supports cost determination in the context of BPA's strategic priorities and the entire financial picture.

The starting assumption was for IPR costs to remain flat for each area, consistent with BPA's financial plan and the approach for the last IPR. Executives conducted prioritization and trade-off discussions about costs that could be reduced or eliminated and significant risks posed. Through this process, the agency prioritized funding for two areas: Grid Modernization and Information Technology. Grid Modernization directly supports modernizing the federal power and transmission system operations and supporting technology in support of our strategic plan. Maintaining Information Technology's spending level consistent with BP-20 presented significant risks, and increases are required to maintain current operations while meeting the basic needs of the organization. These are discussed in each program plan section of this document, and provide customers and stakeholders transparency into the internal deliberations conducted to arrive at these proposed funding levels.

This IPR proposal includes an undistributed reduction totaling $13.5 million. This targeted reduction serves as the goal for a new initiative to instill long term structural cost reductions. An executive led team has been formed within BPA with a charter to determine the appropriate actions to resolve the $13.5 million reduction with a focus on sustaining these reductions over many years. In contrast to

many cost reducing measures that are short term in nature, this initiative turns the focus to structural, longer term cost impacts. The reductions need to be identified and implemented so that the savings are realized in fiscal years 2022 and 2023. BPA will report out on progress periodically.

For this initial IPR, the expense spending levels are shown in the table below for Power and Transmission and describe the proposed change in expense spending levels from the BP-20 rate period showing no increase for Power and an average annual increase of $24.7 million for Transmission.

These proposed spending levels are $65.7 million below inflation per year for Power, and right at inflation per year for Transmission.

Table 1 Initial IPR expense

($millions)	Average BP-20 Rate Case	Average BP-22 Initial IPR	Delta
Power	1,298.8	1,298.8	(0.0)
Transmission	489.8	514.5	24.7
Total	**1,788.6**	**1,813.3**	**24.7**

The figure below shows BPA's IPR program cost trajectory over the past eight rate periods, including BP-22. Since it issued the 2018-2023 Strategic Plan, BPA has demonstrated a commitment to cost discipline by holding program costs significantly below inflation. This also shows where BPA's program costs would be if agency costs had increased at the rate of inflation.

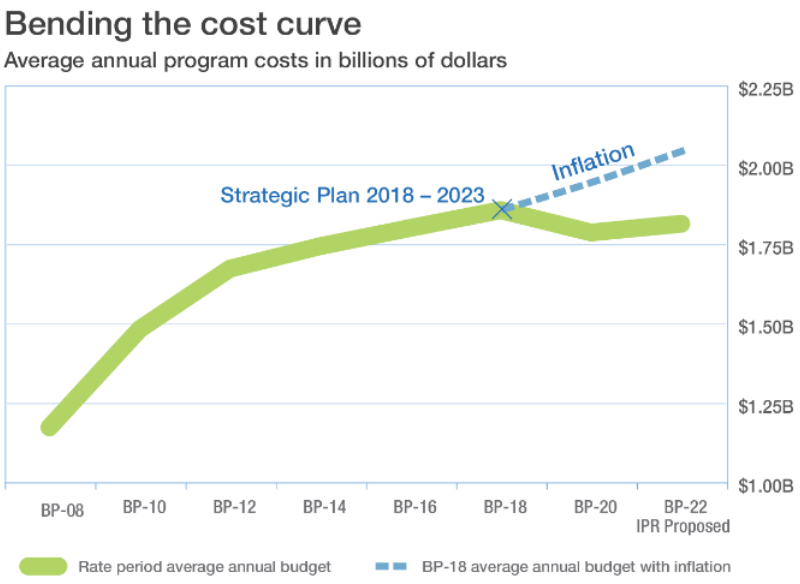


Figure 3 Bending the cost curve

2.2 Capital Spending Level Development

The Federal Columbia River Power System (FCRPS) portfolio of assets provides power and transmission products and services to Idaho, Oregon, Washington, western Montana and small parts of eastern Montana, California, Nevada, Utah and Wyoming. It includes 31 federal hydroelectric plants with over 200 generating units, 15,000 circuit miles of high-voltage transmission lines, approximately 300 substations, and the facilities, fleet, security and IT assets to support them.

In addition, BPA funds the capital and operation and maintenance (O&M) of the Columbia Generating Station, a 1,207 MW nuclear generation plant, and funds capital for Fish and Wildlife habitat protection for tributary passage, fish hatcheries, conservation land acquisitions and improvements at federal dams.

In all, BPA provides nearly a third of the power generated in the Northwest and about 75% of the high voltage transmission. A robust asset management strategy and plan for deployment of capital is essential. BPA's assets vary in age, type and geographic location. BPA makes investment decisions that are prioritized based on asset criticality to maintain reliability and support other mission, strategic and financial plan objectives. These key factors and others are considered in determining which capital projects to execute over the FY 2022-2023 rate period.

2.2.1 General Spending Level Development

BPA's strategic plan includes a goal to modernize assets and system operations with an objective of administering an industry-leading asset management program, which is essential to sustaining BPA's long-term financial strength.

To support this goal, BPA has adopted industry-leading asset management practices that guide spending level development and asset management decisions across the agency. Central to this goal is to more closely align BPA's asset management processes with ISO 55000 Asset Management, which is an internationally recognized standard for life-cycle asset management.

BPA has provided substantial training to over 100 employees and certified a large majority of them over the past several years, re-designed components of BPA's capital decision process, and significantly improved its capability to analyze individual capital projects and portfolios of capital work, all with an aim to better align to industry leading standards. Alignment across BPA allows for life-cycle economic and risk-informed asset decisions across all of the agency's asset categories: federal hydro, transmission, facilities, fleet, information technology, and fish and wildlife.

While each of these asset categories is at a different level of maturity in adopting the Institute of Asset Management (IAM) framework, BPA is committed to this continuous improvement process in order to make the best capital allocation decisions in support of BPA's mission objectives. The key building blocks necessary to achieve that alignment are development of longer-term Strategic Asset Management Plans (SAMPs) that guide prioritization of spending for the portfolio of assets, and

short-term, tactical, asset plans that detail specific investments to be made each fiscal year in alignment with the long-term SAMPs. BPA's SAMPs guide our capital investments by:

- Understanding our assets' criticality, health, and risks.
- Establishing risk-based asset performance objectives such as lost generation and reliability using leading analytical methods to prioritize capital investments and maintenance activities to achieve the highest-risk informed benefit.

During FY 2020 BPA completed SAMPs for six categories (federal hydro, transmission, IT, fleet, facilities, and fish and wildlife) that informed the spending levels for this IPR. This analysis underwent significant planning and prioritization following the ISO 55000 framework. BPA's largest asset categories, federal hydro and transmission, have spent several years refining their planning and prioritization processes to work toward overcoming several challenges, including aging infrastructure and resource constraints to execute the planned amount of capital work. These SAMPs provide roadmaps for managing the health, performance, costs and risks of the assets owned or leased by BPA.

The Federal Hydro program develops capital investment forecasts for the SAMP by calculating the optimal time to replace equipment such that asset life-cycle costs (risk, opportunity and replacement costs) are minimized. This optimal scenario sets the baseline to which other scenarios are compared. Various levels of capital investment are modeled to determine the incremental differences in net present value compared to the optimal scenario. The goal is to identify a level of investment that is achievable for BPA and its generating partners, fits within BPA's cost-management goals and captures as much of the value of the optimal scenario as possible. This analysis sets the strategic direction and general timing for when and where capital investments should be made based on asset condition, criticality and risk. BPA and its generating partners use this information to collaboratively develop the Federal Columbia River Power System (FCRPS) System Asset Plan. The System Asset Plan builds on the analysis produced for the SAMP by identifying specific investments to address the replacement needs identified in the SAMP as well as incorporating input directly for Corps, Reclamation and their respective facilities. Priorities are reassessed on an annual basis when BPA and its generating partners optimize the System Asset Plan based on the costs and benefits of each investment.

The Transmission program continues to leverage the total economic cost (TEC) models and now the criticality, health and risk (CHR) methodology to develop its capital investment forecasts. The TEC models are developed at the program level and inform program funding, while the CHR methodology provides an assessment for each asset that can then be rolled up to a program level using analytical methods to consider both the reliability and health to minimize long-term risks. The results of these analyses show a need to accelerate the rate of asset replacements in the near term, focusing on the programs that have the highest-risk scores for system performance issues. To be able to achieve the increased capital spending forecasts, Transmission has chosen to outsource certain work to expand its execution capabilities. By having the additional resources for execution, Transmission expects to

increase execution capacity to meet the demand in capital spending, focusing on the highest-risk assets on the transmission system.

Managing an industry-leading asset management program supports the goals of the strategic plan and BPA's mission objectives. BPA operates in a capital-intensive industry with aging assets that need to be replaced and modernized so that BPA continues providing reliable service and opportunities to access new markets. Investing in the right assets at the right time while using asset management processes within the ISO 55000 and CHR frameworks are critical to BPA's success. These frameworks allow BPA to use a systematic and repeatable approach to asset investment that ensures BPA and its partners can meet Power and Transmission customer needs efficiently and responsively while maintaining competitive products and service, all while strengthening BPA's long-term financial health.

2.2.2 Asset Overview

Operating in a capital-intensive industry involves managing the life-cycle costs of a wide array of assets and, in BPA's case, managing those assets across a widespread geographic area. Physical assets — such as hydroelectric dams, transmission lines, substations, information systems and investment in fish and wildlife mitigation — enable BPA and its partners to deliver on its mission and vision. Below are brief descriptions of the assets funded and managed by BPA.

Federal hydro assets are comprised of 31 federal hydroelectric plants with over 200 generating units. Installed generating capacity is over 22,000 MW; over the last five years an annual average of 74 million megawatt-hours of electricity has been generated, which can provide power to 6.75 million households. Twenty-one of the plants are owned and operated by the U.S. Army Corps of Engineers and 10 by the Bureau of Reclamation.

Transmission assets include over 15,000 circuit miles of high-voltage transmission lines, approximately 300 substations, nearly 400 dedicated communications sites, and over 195,000 acres of transmission line corridor rights-of-way. Transmission assets also include hardware and software applications for grid operations. Transmission assets are owned or leased by BPA.

Facilities assets include 2.8 million square feet of system control centers, substation control houses, communications buildings, administrative offices, maintenance shops, warehouses and other non-electric plant. BPA owns and operates over 1,000 buildings at 450 sites in five states and manages 885,000 square feet of commercially leased administrative building assets.

Security assets protect 112 facilities and complexes across BPA's service area. Electronic security assets include servers, software, network infrastructure, thermal detection devices, access control devices, sensors and cameras. Physical security assets include signage, fences, gates, pedestrian ingress/egress points, ballistic window protection, and lock/key programs. These achieve regulatory compliance, grid reliability, and security effectiveness through intrusion protection, monitoring and access control.

IT assets include desktops, laptops, printers, mobile devices such as smart phones and tablets, and other office automation hardware and software; servers, operating systems, electronic storage systems, and other data center hardware and software; telephone systems and handsets, and data, voice and video network systems; and applications for a range of business purposes. These assets are owned by, leased, subscribed, or licensed to BPA.

Fish and Wildlife assets include habitat protection for tributary passage, fish hatcheries, and conservation land acquisitions. The assets also include fish and wildlife improvements at federal dams and fish hatcheries. The assets are owned and operated by federal and state agencies, conservation organizations, tribes and private property owners.

Fleet assets consist of 1,400 owned assets, 865 leased assets, 150 stationary generators and 700 specialized components/attachments. BPA's fleet mainly consists of specialized equipment for transmission system maintenance, general construction equipment and material handling equipment. BPA's fleet is housed at 15 locations throughout BPA's service territory.

Columbia Generating Station, a non-federal 1,207 MW nuclear generation plant is owned, operated and managed by Energy Northwest. BPA pays all costs incurred by the plant and receives 100% of its output. Proposed O&M and capital project costs are based on Energy Northwest's Columbia Long-Range Plan (LRP). The LRP is established through a rigorous Energy Northwest process that looks at challenges and constraints that need to be overcome to meet Columbia's mission and support continued operation as a part of a robust asset management program. BPA and Energy Northwest work collaboratively to systematically monitor and update the LRP annually in support of BPA's financial and strategic goals.

2.2.3 Strategic Challenges

BPA's mission, strategic plan, and financial plan provide the objectives and the parameters within which the asset management program functions. With our aging infrastructure, the asset management program must balance objectives and constraints to maximize the long-term operational and economic value of power and transmission system assets. This is accomplished by maintaining and investing in the system so that:

- Existing assets operate efficiently and effectively and provide the capacity and capabilities needed to meet reliability, availability, environmental, health and safety, security and other standards.
- New investments are risk-informed and consider the entire asset portfolio. Analysis should include the total life-cycle cost of that investment with current information on the criticality, health and risk (CHR) of the proposed investment in context of the whole asset category portfolio.

All this must be accomplished while navigating a number of strategic challenges described below.

Managing the risks of aging infrastructure

In order to manage the risk of aging infrastructure, BPA has adopted a standardized, systematic asset management program which focuses on criticality, health, and risk of its assets, as opposed to asset age.

Our strategic challenge is to develop and implement the programs and processes needed with competing priorities, limited budgets and human resource limitations. BPA is making progress on this every year, assisting BPA to:

- Understand our risk portfolio by asset category.
- Enhance our ability to make risk-informed decisions for prioritizing capital projects.
- Change our maintenance practices to focus on assets based on criticality and risk.
- Optimize asset value and manage asset life-cycle costs.
- Provide the foundation to strategically plan for the future.

Managing technological change

The strategic plan describes the necessity of ensuring BPA's assets are compatible with emerging markets and advanced technologies. For some classes of equipment, such as telecommunications and control systems equipment, technological obsolescence remains a major risk in meeting operational demands, maintaining long-term system reliability and managing costs. Technological advances are instrumental to the success of many industry-wide initiatives occurring in the Pacific Northwest and throughout the West, such as integrating variable energy resources, enhancing the reliability and efficiency of system operations, deploying demand response programs and enabling energy storage devices. Nearly every facet of technological change in the generation and transmission of power now includes some form of information technology. These capabilities must be considered in the overall IT enterprise architecture with a specific emphasis on availability, reliability and cyber security.

Managing environmental factors

Understanding of climate science, seismic behavior and risks to the bulk electric system continue to evolve, particularly in the Pacific Northwest for extreme weather events and a Cascadia Subduction Zone earthquake. BPA must invest to strengthen, replace or enhance transmission, federal hydro, and supporting facilities' infrastructure to provide resilience and safety when extreme events occur. Inherent in the ability to be resilient through these types of events is to ensure the continued operation of the IT infrastructure that underlies all power generation and transmission activities.

Managing increasing demands on the power and transmission system

In recent years, demands on the transmission and power system to integrate renewable resources and data centers has been significant and has led to new transmission and federal hydro system

infrastructure to provide the balancing reserves for renewable energy while maintaining operations for fish passage. In the future, BPA will likely need to rely on existing capacity and flexibility to meet demands.

Meet evolving compliance requirements

The Energy Policy Act of 2005 subjects BPA and all utilities to a wide range of North American Electric Reliability Corporation reliability standards enforced by the Western Electricity Coordinating Council. The challenge that BPA and similar entities face is the amount and rate of change in reliability standards since their inception. A larger share of BPA's investment in transmission is now being driven by reliability and other regulatory requirements.

Growth in security and continuity of operations requirements to protect critical infrastructure has been rapid. BPA's information technology systems must conform to evolving federal and industry-mandated laws and regulations.

Implement Endangered Species Act and National Environmental Policy Act requirements

The U.S. Army Corps of Engineers, Bureau of Reclamation and BPA, as co-lead agencies, have prepared the Columbia River System Operations Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA). NEPA requires federal agencies to review and disclose the environmental effects of taking an action. The action referred to in this EIS is not one specific act, but is rather a multi-faceted approach to system operations, maintenance, and configuration of the 14 Federal dam and reservoir projects in Idaho, Montana, Oregon and Washington, called the Columbia River System (CRS). We prepared this document in response to the need to review and update management of the CRS, including evaluating impacts to resources in the context of new information and changed conditions in the Columbia River basin. Information and insights from this process has enabled the development of a comprehensive approach to management of the CRS that meets multiple statutory authorities and complies with all applicable laws and regulations.

The CRS Biological Opinions are the analyses and findings resulting from the consultations under the Endangered Species Act (ESA) with NOAA's National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) on the preferred alternative identified in the CRSO EIS for the operation and maintenance of the CRS. NMFS consults primarily on impacts to ESA-listed salmon and steelhead, while USFWS consults on ESA-listed bull trout and Kootenai River white sturgeon. NMFS and USFWS are expected to issue final biological opinions in the summer of 2020. The timing of the consultation with USFWS was aligned with the consultation with NMFS since the proposed action is identical. Any impacts from the EIS or biological opinions may warrant the need for an IPR-2 as no impacts have been factored in at this time.

Navigating COVID-19 pandemic impacts

Possible long-term impacts of the COVID-19 pandemic will remain uncertain for some time. While the impact on our capital construction and spending should be minimal by BP-22, longer term impacts such as a structural shift in power usage may need to be considered as BP-22 approaches.

2.2.4 Proposed Capital Spending

The capital levels in the table below are a result of BPA's Strategic Asset Management Plan development for each asset category, and balance the priorities of BPA's mission, strategic and financial plan objectives. The spending levels will allow BPA to continue to operate a reliable system while mitigating many of the strategic challenges. Detailed information on capital spending for FY 2022 and 2023 are described in the relevant program sections of this document.

Updates to two significant emerging projects are included in the IPR capital spending plan: the estimate for the replacement of the Dittmer Control Center (with the proposed Vancouver Control Center project section 4.1.1) and the capital needs for the grid modernization (refer to section 5.2).

Table 2 Capital Spending by Asset Category

($thousands)	Actuals		Rate Case		Proposed IPR	
Asset Category Direct Spending	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Transmission Direct	231,277	224,169	297,068	304,530	312,000	327,000
Federal Hydro	186,639	186,505	238,000	256,000	264,120	281,260
Columbia Generating Station	109,250	99,455	75,729	93,206	115,377	113,780
Facilities	9,690	19,148	29,646	23,254	74,200	88,200
Fish & Wildlife	30,669	22,313	47,266	47,266	43,000	43,000
Information Technology	14,135	9,748	20,910	20,906	19,928	19,828
Fleet	7,026	5,844	4,825	5,325	10,000	12,000
Security	7,171	6,919	7,000	7,000	8,000	8,200
Environment	6,785	6,165	5,557	5,557	5,580	5,590
Direct Total	**602,644**	**580,266**	**726,001**	**763,044**	**852,205**	**898,858**
Transmission Indirects	50,907	51,046	54,747	55,569	53,390	54,072
Corporate Indirects	49,851	46,888	46,873	47,041	46,765	47,052
PFIA	32,907	57,201	65,457	50,061	45,000	50,000
AFUDC	27,958	27,361	29,185	30,198	35,317	37,811
Grand Total	**764,266**	**762,762**	**922,263**	**945,912**	**1,032,676**	**1,087,793**

Table 3 Capital Spending by Asset Category, Outyear Summary

($thousands)	Capital Outyears							
Asset Category Direct Spending	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Transmission Direct	385,000	534,600	498,000	392,000	314,000	314,000	321,067	328,130
Federal Hydro	300,000	306,850	313,647	320,466	327,538	334,875	342,435	350,292
Columbia Generating Station	96,525	121,814	86,922	91,282	101,718	114,609	114,232	133,493
Facilities	78,300	4,300	22,500	23,000	25,700	25,600	27,800	21,100
Fish & Wildlife	30,000	25,000	15,000	15,000	15,000	15,000	15,000	15,000
IT	19,028	18,428	16,728	20,474	20,938	21,417	21,899	22,381
Fleet	14,000	14,200	14,200	14,400	14,400	14,200	14,200	14,200
Security	8,500	8,700	9,000	7,000	8,200	9,200	9,400	8,600
Environment	5,600	5,610	5,620	5,630	5,640	5,650	5,660	5,670
Direct Total	**936,953**	**1,039,502**	**981,617**	**889,252**	**833,134**	**854,551**	**871,693**	**898,866**
Transmission Indirects	54,755	55,437	56,119	56,801	57,484	58,166	58,848	59,531
Corporate Indirects	48,187	49,316	50,428	51,572	52,737	53,861	54,958	56,039
PFIA	40,000	30,000	30,000	30,000	30,000	30,000	30,675	31,350
AFUDC	41,187	46,283	52,372	56,932	58,405	58,390	57,919	56,893
Grand Total	**1,121,082**	**1,220,538**	**1,170,536**	**1,084,557**	**1,031,760**	**1,054,968**	**1,074,093**	**1,102,679**

3 Power Services

Power Services is responsible for marketing federal power and in particular firm power sold under the long-term Regional Dialogue power sales contracts. Power's costs include the cost of federal and nonfederal power, fish and wildlife mitigation and energy efficiency. BPA is the designated marketer of power produced by the FCRPS. In addition, BPA has acquired and includes power produced by several non-federal resources, including the Columbia Generating Station nuclear plant, and small hydro projects and wind projects. In combination with the FCRPS this portfolio of resources is known as the Federal Base System.

Power Services is focused on improving its cost-competitiveness while maintaining the reliability and flexibility of its carbon-free generating resources, modernizing its operations and delivering other regional benefits. The unfolding economic impacts of the COVID-19 pandemic further drive BPA's desire to actively manage the cost of its wholesale products to support our customers and the communities they serve.

Delivering on Power's objectives while absorbing six years of inflationary pressures requires rigorous cost-management discipline and the support of BPA's generating partners.

In line with these considerations, Power Services is proposing to maintain its capital program at $300 million annually to continue essential investments in long-term generation reliability and increased capacity and is proposing to hold its BP-22 IPR expense spending levels flat, continuing the trend begun in FY 2018. Power must overcome cost pressures and manage risks for each of its major program areas, which are highlighted below.

Bureau of Reclamation and Corps of Engineers O&M Both the Corps and the Bureau are demonstrating their commitment to cost management while continuing to provide safe, reliable operations by recalibrating programs to operate at BP-20 spending levels. Holding budgets flat requires absorbing roughly $25 million in inflation annually. Doing so is likely to require reprioritization or deferral of planned and non-routine maintenance, which could increase forced outage factors at key generating facilities.

Columbia Generating Station O&M Operation and maintenance expenses for Columbia Generating Station are also proposed to remain relatively flat compared to the BP-20 Rate Case. Operating within these constraints is made possible by accelerating $72 million in capital projects along with continued cost optimization efforts, reductions in staff through attrition, and deferral of select expense projects.

Energy Efficiency The Energy Efficiency program expects the cost of energy efficiency acquisition to rise as the most cost-effective opportunities are exhausted. Holding acquisition costs flat will make it more challenging to meet conservation savings forecasted in BPA's Resource Program and the Northwest Power and Conservation Council's Power Plan.

Fish and Wildlife For the Fish and Wildlife Program, BPA expects that it will be able to meet its obligations under applicable laws, various BiOps, agreements and the Council Program at proposed funding levels. Concurrently, the program is committed to supporting BPA's strategic plan and financial health objectives, and will maintain flat budgets in relation to the BP-20 average. As it relates to the impacts of the CRSO, the co-lead agencies developed a Preferred Alternative that includes a combination of measures from all the alternatives with consideration of environmental, economic, and social effects. For BPA's wholesale power rates, the Preferred Alternative places additional BPA wholesale rate pressure of 2.7 percent relative to the No Action Alternative. These estimates compare the Preferred Alternative to the No Action Alternative, which is not the same as comparing the Preferred Alternative to current operations. Consequently, the estimates are not a comparison to the BP-20 wholesale power rates, which were set assuming the financial impact of the 2019-2021 Spill Operation Agreement, and therefore already include a substantial portion of the cost pressures found in the Preferred Alternative. The remaining rate pressure associated with the Preferred Alternative falls within a level that BPA has historically been able to mitigate through the costs over which it has significant control.

Enterprise Services As described in more detail in section 5, BPA is holding nearly all of its support services flat despite upward pressures on staffing costs. The increase in proposed funding levels for Enterprise Services' is related to Information Technology, primarily driven by new requirements for cyber security compliance, maintenance costs for new implementations and Gird Modernization projects, and increased costs for software licensing fees and maintaining the current enterprise system.

Other IPR Costs Proposed spending levels for the other programs in Power Services collectively equal those set in the BP-20 rate case, including expenditures for Renewables, Non-Generation Operations (Power Internal Support), and Post-Retirement Benefits. Achieving this spending level will require reprioritization of workload while continuing to constrain expenditures in all categories including federal staffing, service contracts and supplemental labor.

Potential impacts to the Revenue Requirement

BPA recognizes that its rates are more than the sum of IPR costs. BPA is required to establish rates to recover the costs of producing and transmitting electricity (operating and capital costs), the costs necessary to operate the agency, and the cost to repay the federal investment in the system. BPA includes all of these costs in both the power and transmission revenue requirements for setting rates.

As shown in the figure below, IPR costs are expected to represent less than half of this initial, and incomplete, look at the Power revenue requirement. Despite proposing to hold IPR costs flat, Power expects to see additional cost pressure from scheduled increases in the residential exchange settlement, the final decision on the CRSO EIS and continuing low market prices for surplus power sales. While these factors fall outside the scope of the IPR process, they nonetheless highlight the continued importance of managing controllable costs.

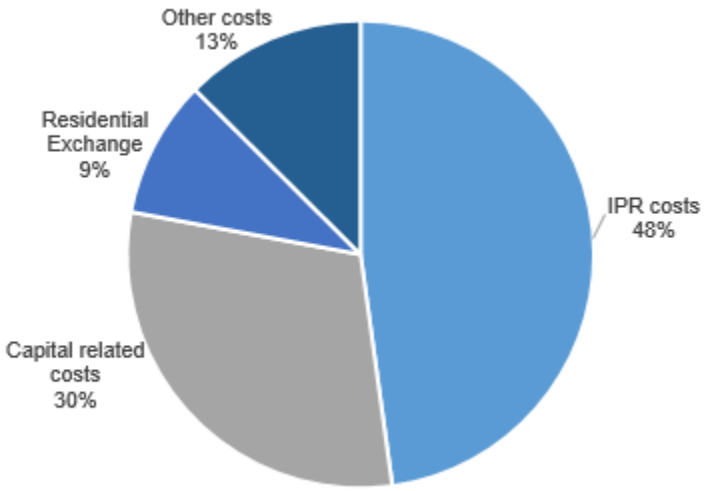


Figure 4 Power Potential Revenue Requirement

Table 4 summarizes the averages of IPR costs, other costs not detailed in IPR, and capital related costs for the BP-20 rate period and BP-22 initial proposal. The percent change in total costs column reflects the change in the total revenue requirement over the two year period. The annualized percent change in cost column reflects the annual percent change in the revenue requirement. These percent changes approximate the potential impact on power rates, but do not account for changes in loads, revenues, or power purchase expenses.

IPR Costs are based on the initial proposed spending levels.

Other costs are costs that are not fixed during the IPR process. Instead, they are determined by contracts, formulas, settlements, such as residential exchange, or are modeled in the rate case, such as Transmission Acquisition and Power Purchases. Forecasts of these costs are included in the IPR Publication in order to provide an initial view of these costs and their impact on the total revenue requirement. Other costs are forecast to increase by $5 million, due to a forecast increase of $10 million per year in residential exchange costs and $5.5 million per year due for the Spokane Settlement. These increases are partially offset by an assumed $10.5 million reduction in Transmission Acquisition expenses.

Capital related costs reflect how the cost of debt impacts the revenue requirement. This occurs through depreciation, amortization, accretion, net interest expense, and minimum-required-net revenue (MRNR). Relative to BP-20, Depreciation, Amortization, and Accretion are lower related to a change in accounting for the Columbia Generating Station amortization, resulting in an approximate $35 million per year decrease in amortization. Interest is lower largely due to debt refinancing and assumed lower cost debt issuances.

MRNR increases the revenue requirement when debt service and other cash expenses exceed accrued expenses, and occurs when cash repayment needs to exceed Depreciation, Amortization, and Accretion. In this case, MRNR is higher both due to the reduction in Amortization, as well as higher repayment starting in 2022.

Table 4 Draft Revenue Requirement Power Services

($thousands)	Average BP-20 Rate Case	Average BP-22 Initial IPR	$ Increase (Decrease)	% change in total costs	Annualized % change in Cost
IPR Costs	1,298,819	1,298,800	(19)	0.0%	0.0%
Other costs	594,717	599,792	5,075	0.2%	0.1%
Capital related costs					
Depreciation, amortization, and accretion	521,854	490,425	(31,429)	-1.2%	-0.6%
Net interest	236,056	191,557	(44,499)	-1.6%	-0.8%
MRNR *	58,235	135,106	76,871	2.8%	1.4%
Total revenue requirement	**2,709,681**	**2,715,680**	**5,999**	**0.2%**	**0.1%**

**MRNR does not include additional debt payments due to the leverage policy.*

Program Planning Framework

Power Services' direct costs are managed through BPA's business planning framework discussed earlier, in which a multi-year operating plan is coupled with two-year program plans. The Power Services Operating Plan aligns with BPA's mission, strategy and key operational outcomes. It also sets the framework for more detailed planning through its three program plans (Asset Management, Commercial Activities, and Operations).

Program plans are designed to provide a cross-departmental view of the business, workforce and financial performance of Power Services. As illustrated in the Power Services Summary table below, most of Power's traditional budget categories fall cleanly under a single plan. Aligning internal costs to the program structure was more complicated; the bulk of the effort began with FY 2020 spending. Due to these financial reporting changes, trends in Power's internal costs are represented at the aggregate level, while future IPR funding levels are projected by program. BPA continues to refine its tracking and reporting of cost components to facilitate cost management. More detail on the focus areas for each program is provided at the beginning of those sections.

Figure 5 shows each program within Power Services, and their percent of the total average proposed spending levels.

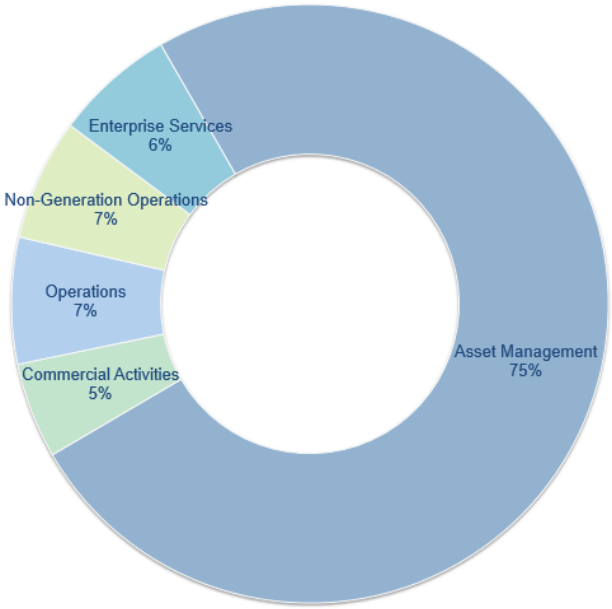


Figure 5 Power Services Expense Summary by Program

Table 5 shows the program costs described in IPR, Table 6 shows the capital costs, and Table 7 shows the other costs estimated but not described in IPR. The tables reflect the actuals for FY 2018 and FY 2019, the final spending levels for the BP-20 rate period, and the proposed spending levels for the BP-22 rate period.

Table 5 Power Services Summary, IPR costs

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Columbia Generating Station	268,140	323,519	262,471	319,506	263,172	320,219	290,988	291,695
Corps Of Engineers	245,085	253,007	252,557	252,557	252,557	252,557	252,557	252,557
Fish & Wildlife	248,031	228,540	249,603	250,031	247,508	247,196	249,817	247,352
Bureau Of Reclamation	152,613	161,138	153,609	151,623	153,609	151,623	152,616	152,616
Lower Snake Hatcheries	31,392	26,794	30,483	30,483	31,000	31,000	30,483	31,000
Asset Management Total	**945,261**	**992,997**	**948,723**	**1,004,200**	**947,846**	**1,002,594**	**976,462**	**975,220**
Conservation Purchases	81,923	57,959	67,000	67,000	67,357	67,357	67,000	67,357
Commercial Activities Total	**81,923**	**57,959**	**67,000**	**67,000**	**67,357**	**67,357**	**67,000**	**67,357**
Renewables	34,692	35,865	36,523	34,869	34,418	29,467	35,696	31,943
Conservation Infrastructure	21,148	19,608	27,296	27,296	27,300	27,300	27,296	27,300
Market Transformation	11,824	11,658	12,050	12,050	11,800	11,800	12,050	11,800
Low-Income and Tribal Weatherization	5,523	5,727	5,739	5,853	6,005	6,005	5,796	6,005
Distributed Energy Resources	1,193	907	855	855	215	215	855	215
NW Power & Conservation Council	10,969	11,275	11,725	11,956	11,545	11,797	11,840	11,671
Operations Total	**85,349**	**85,040**	**94,188**	**92,879**	**91,283**	**86,584**	**93,533**	**88,934**
Asset Management	8,367	9,484	12,773	12,980	8,162	8,239	12,877	8,200
Commercial Activities	24,282	23,200	39,852	40,890	27,488	28,196	40,371	27,842
Operations	37,573	37,918	30,191	31,053	48,700	50,421	30,622	49,560
Non-Generation Operations Total	**70,222**	**70,602**	**82,816**	**84,922**	**84,350**	**86,856**	**83,869**	**85,603**
Enterprise Services' G&A Allocations	59,965	63,600	57,859	57,644	65,330	65,966	57,752	65,648
Post-retirement benefits	20,601	21,088	19,577	20,831	18,666	19,354	20,204	19,010
Enterprise Services G&A Total	**80,567**	**84,689**	**77,436**	**78,475**	**83,996**	**85,320**	**77,955**	**84,658**
Undistributed reduction	**0**	**0**	**0**	**0**	**-2,971**	**-2,971**	**0**	**-2,971**
Costs Described in IPR Total	**1,263,323**	**1,291,287**	**1,270,162**	**1,327,476**	**1,271,860**	**1,325,740**	**1,298,819**	**1,298,800**

Table 6 Power Services, Capital

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Corps of Engineers	157,664	151,084	123,071	117,963	216,296	229,286	120,517	222,791
Columbia Generating Station	109,250	99,455	75,729	93,206	115,377	113,780	84,468	114,578
Bureau of Reclamation	28,975	35,421	114,929	138,037	47,824	51,974	126,483	49,899
Fish and Wildlife	30,669	22,313	47,266	47,266	43,000	43,000	47,266	43,000
AFUDC	12,994	13,241	15,904	16,493	21,066	22,140	16,199	21,603
IT Asset Category	4,923	36	3,900	3,900	4,300	2,600	3,900	3,450
Asset Management Total	**344,475**	**321,550**	**380,799**	**416,865**	**447,863**	**462,780**	**398,832**	**455,321**

Table 7 Power Services Summary for Other Costs

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
Other Costs	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Residential Exchange & IOU Settlements	241,464	241,276	249,094	249,059	259,000	259,000	249,077	259,000
Power Services Transmission Acquisition	201,595	168,641	221,643	217,308	211,443	206,604	219,475	209,023
Contract Augmentation & Power Purchases	180,740	336,288	86,035	74,002	86,035	74,002	80,019	80,019
Operating Generation Settlement	20,219	19,643	22,997	22,997	27,749	27,500	22,997	27,625
Long-Term Contract Generating Projects	10,837	11,628	12,709	13,250	12,884	13,471	12,979	13,178
Non-Operating Generation	5,996	9,462	8,000	8,000	8,000	8,000	8,000	8,000
Reimbursable Energy Efficiency Development	382	691	1,631	1,531	2,341	2,375	1,581	2,358
Legacy	558	443	590	590	590	590	590	590
Other Costs Total	**661,791**	**788,073**	**602,698**	**586,737**	**608,042**	**591,542**	**594,718**	**599,792**

Table 8 shows the forecasted capital for FY 2024 through FY 2031.

Table 8 Power Services Capital Outyear Summary

($thousands)	Capital Outyears							
	2024	2025	2026	2027	2028	2029	2030	2031
Corps of Engineers	256,656	269,006	269,926	273,102	234,960	196,496	231,379	240,702
Columbia Generating Station	96,525	121,814	86,922	91,282	101,718	114,609	114,232	133,493
Bureau of Reclamation	43,344	37,844	43,721	47,364	92,578	138,379	111,056	109,590
Fish and Wildlife	30,000	25,000	15,000	15,000	15,000	15,000	15,000	15,000
AFUDC	23,072	23,823	24,484	25,109	25,745	26,399	26,947	27,377
IT Asset Category	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300
Total	**452,897**	**480,787**	**443,353**	**455,157**	**473,301**	**494,183**	**501,914**	**529,462**

3.1 Asset Management

75% of Power IPR program costs

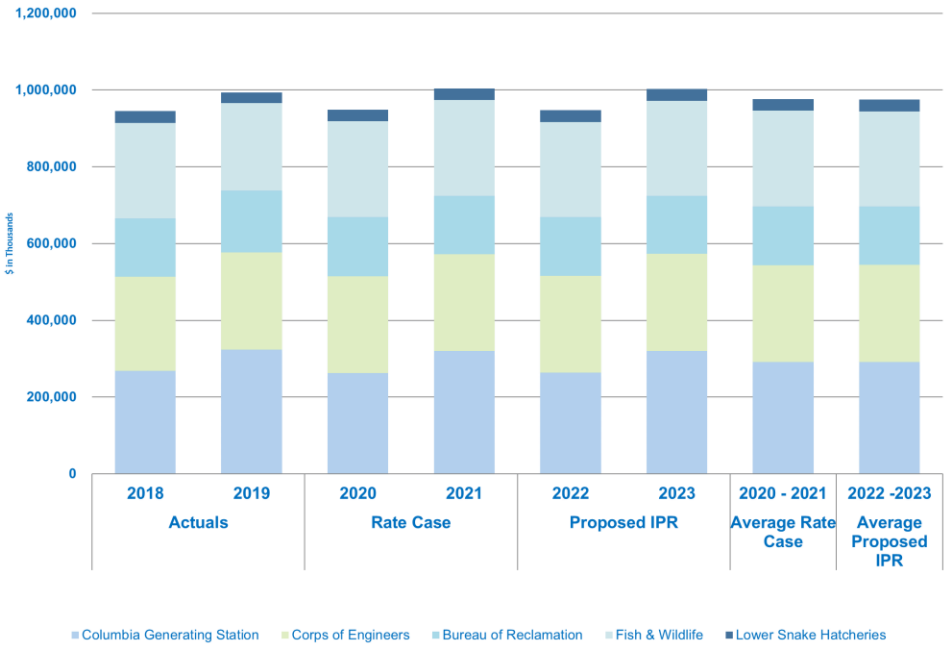


Figure 6 Power Asset Management, Expense Overview

Program cost details

Table 9 Power Asset Management, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Columbia Generating Station	268,140	323,519	262,471	319,506	263,172	320,219	290,988	291,695
Corps Of Engineers	245,085	253,007	252,557	252,557	252,557	252,557	252,557	252,557
Fish & Wildlife	248,031	228,540	249,603	250,031	247,508	247,196	249,817	247,352
Bureau Of Reclamation	152,613	161,138	153,609	151,623	153,609	151,623	152,616	152,616
Lower Snake Hatcheries	31,392	26,794	30,483	30,483	31,000	31,000	30,483	31,000
Total	**945,261**	**992,997**	**948,723**	**1,004,200**	**947,846**	**1,002,594**	**976,462**	**975,220**

Table 10 Power Asset Management, Capital Detail

($thousands)	Proposed IPR		Capital Outyears							
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Corps of Engineers	216,296	229,286	256,656	269,006	269,926	273,102	234,960	196,496	231,379	240,702
Columbia Generating Station	115,377	113,780	96,525	121,814	86,922	91,282	101,718	114,609	114,232	133,493
Bureau of Reclamation	47,824	51,974	43,344	37,844	43,721	47,364	92,578	138,379	111,056	109,590
Fish and Wildlife	43,000	43,000	30,000	25,000	15,000	15,000	15,000	15,000	15,000	15,000
AFUDC	21,066	22,140	23,072	23,823	24,484	25,109	25,745	26,399	26,947	27,377
IT Asset Category	4,300	2,600	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300
Capital Total	**447,863**	**462,780**	**452,897**	**480,787**	**443,353**	**455,157**	**473,301**	**494,183**	**501,914**	**529,462**

The Asset Management Program Plan is the largest of the three in overall expense. It includes BPA's direct funding of and internal support for the operation and maintenance of the hydropower and nuclear generating assets whose power BPA sells. Those generating assets are owned and operated by the U.S. Army Corps of Engineers, the Bureau of Reclamation, and Energy Northwest. Also included in the Asset Management Program Plan is BPA's support for offsite mitigation for the FCRPS' impacts on Fish and Wildlife. The internal costs associated with this program are included in Section 3.4.

3.1.1 Federal Hydro Expense & Capital Program

Description

The FCRPS is the largest hydropower system in the United States, supplying power (energy and capacity) worth nearly $2 billion annually at wholesale to customers in the Pacific Northwest that serve retail consumers. The system inherently carries with it the value of avoided carbon dioxide emissions. The FCRPS dams are multi-purpose and were authorized for flood control, navigation, irrigation and power production.

The mission of the federal hydropower program is to be trusted stewards of FCRPS assets in order to preserve their significant benefits for many years into the future. The goal, therefore, is to maximize the value of every dollar spent to fulfill our obligations to provide low-cost reliable power and trustworthy stewardship of the FCRPS.

Current asset condition

The average FCRPS unit age is more than 50 years with many components still in service from original construction. For Main Stem Columbia, Headwater, Lower Snake and Local Support asset classes, about 30 percent of assets have exceeded their design lives. For Area Support plants, closer to 50 percent have exceeded their design lives.

Although design life is one indicator of when to replace an asset, the actual condition of the asset is the key consideration. FCRPS equipment condition is assessed using the hydroAMP condition

assessment framework, a methodology used throughout the world for hydro asset condition assessment. In total, the condition of more than 9,000 pieces of FCRPS equipment and equipment systems are tracked using the hydroAMP application. Condition ratings for each asset type are based on a set of objective condition indicators related to operational performance, maintenance history, physical inspection and age. Condition indicators are weighted and summed to derive a condition score.

In each of the FCRPS strategic classes, at least 50 percent of the assets are in good or fair condition. Of the assets in marginal and poor condition, more than half are powertrain components that can reduce generation if they become unreliable. Avoiding such lost generation is a primary goal of the hydro asset plan. The chart below summarizes the current asset condition in each strategic class.

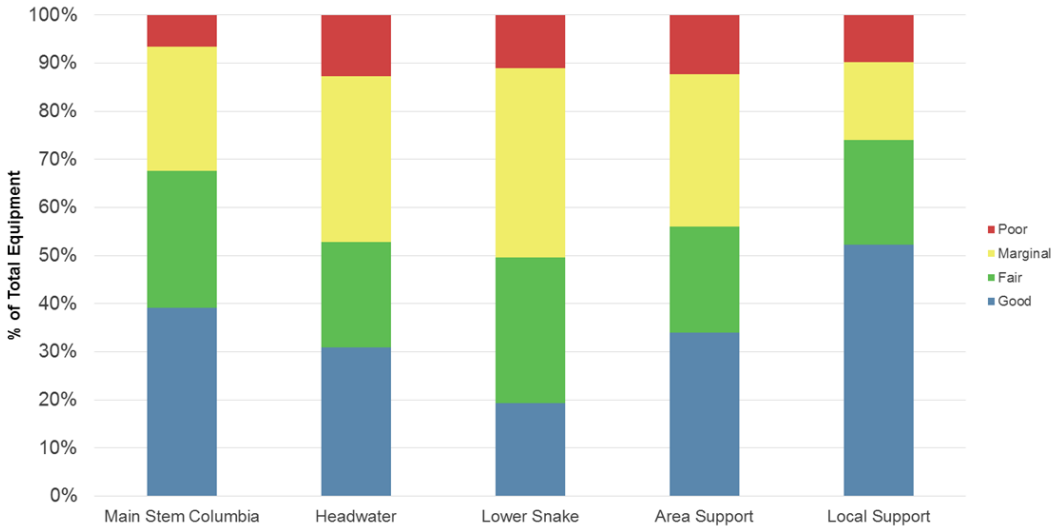


Figure 7 Current Asset Condition by Strategic Class

3.1.1.1 Federal Hydro O&M Expense Program

Historical Program Execution

The Fed Hydro Operations and Maintenance Program for the Corps and Reclamation make up 46 percent of Power's total IPR costs. The O&M program funds all Corps and Reclamation routine hydropower operations and maintenance activities, non-routine maintenance projects, and mitigation-related activities to benefit fish and wildlife and protect cultural resources at FCRPS facilities. Other Corps and Reclamation programs funded with routine O&M dollars include:

- Dam safety.
- Personnel safety.
- Engineering.
- Contracting.
- Physical and cyber security.

- Water management.
- Reliability compliance.

From 2010 to 2014, the expense program grew by an average of 7 percent per year including the ramp-up for the overhaul on units G22-G24 in the Third Power plant at Grand Coulee. In the 2015 to 2018 time period, expense program increases were held just below 3 percent per year on average. Expense budgets were held flat in 2018 and 2019. Then for the 2020-2021 rate period, the Corps and Reclamation took reductions to their expense budgets of 1.4 percent and 6.7 percent, respectively, to support BPA's cost management objectives and mitigate upward pressure on Power rates.

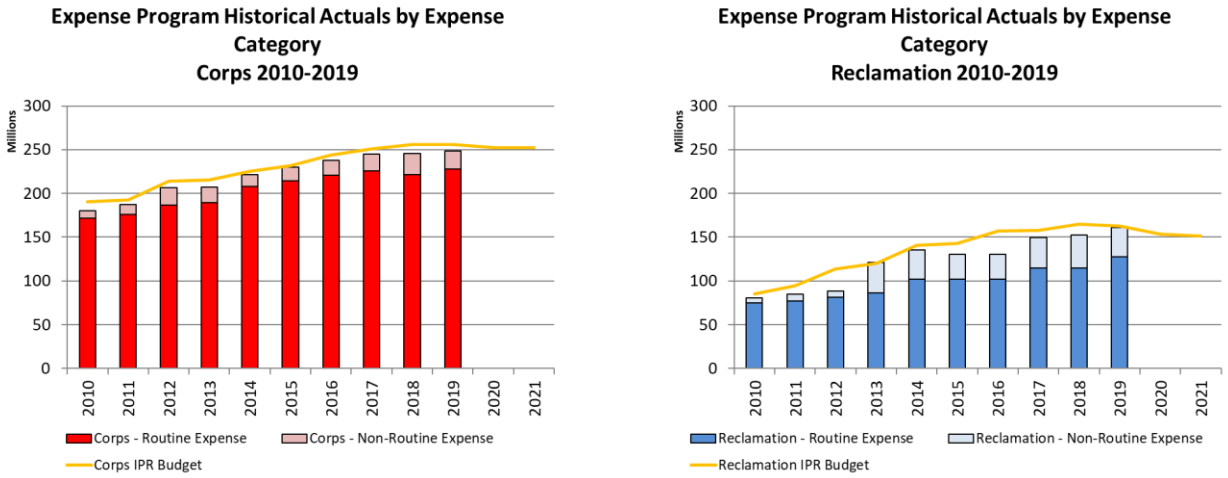


Figure 8 Expense Program Historical Actuals by Expense Category

Past O&M cost increases were driven by mandated increases in wage rates, rising regulatory and mitigation requirements, and the need to support asset management initiatives. Added costs have also come from critical, non-routine maintenance including Reclamation's mechanical overhauls on units G22-24 at Grand Coulee's Third Power plant, and more recently Grid Modernization and the Western Energy Imbalance Market (EIM) initiatives. These cost pressures have not subsided, but the Corps and Reclamation have implemented cost management initiatives, including by deferring work and by reducing their workforces through attrition.

Both the Corps and Reclamation have taken steps over the last four years to reduce overall labor-related costs at all facilities. They have done this by evaluating work schedules, consolidating functions and evaluating new Operations and Maintenance strategies which may prescribe reduced levels of performance based on asset criticality and risk to each agency's respective mission. These actions coincide with ongoing measures to reduce overtime, delay hiring actions and reduce training and travel costs. Budget reductions planned in FY 2020 and FY 2021 will lead to staff reductions at Corps facilities. Non-routine maintenance projects are also being regularly reprioritized, with only the most critical projects moving forward and others being deferred into future rate periods. Non-routine maintenance projects include a wide variety of work including unplanned repairs of failed

equipment, and planned large-scale rehabilitation and acquisition of spare equipment. Any cessation of this work will delay these equipment renewal efforts and have a negative long term effect on the condition of assets. Numerous projects have been deferred in previous rate periods, causing the backlog of needs to grow. Planned non-routine maintenance activities exceed available funding for fiscal years 2020 thru 2023; any emerging work or failed components will require reprioritization and deferral of existing projects after risk-based evaluation of impacts.

Program objectives in 2022 and 2023

In order to hold IPR O&M funding levels flat, the Corps and Reclamation will need to absorb $13 million to $17 million per year due to inflation. Efforts are underway at the Corps and Reclamation to find efficiencies and savings in their O&M programs. The Corps and Reclamation have started analyses to understand and evaluate the value and importance of assets in order to optimize how the assets are operated and maintained. The value and importance of the assets will be determined by assessing the mission-essential purposes of the facility. The current demands to provide water quality, fish passage/attraction, power generation, water delivery for irrigation and municipal water, recreation, and ancillary services at each facility will be evaluated. Once the value of the facilities/assets is established, it will be used to develop optimized operations and maintenance activities in order to align the level of effort of O&M to the value of each facility or asset. This approach is aligned with asset management life-cycle's purpose of ensuring that the benefits or purpose of the assets continue to meet the needs of the organization and that the levels of effort (O&M) are optimized to ensure that those efforts are performed as cost-effectively as possible.

Additional measures to meet flat budgets will likely be needed to reduce labor costs. Maintenance will also be deferred, increasing the maintenance backlog. These efforts come at a time when the hydropower industry is facing rising cost pressures from aging infrastructure, wage increases, implementing key elements of BPA's strategic plan, and increasing regulations including NPDES permits, 401 Certifications, and the Temperature TMDL. Operating within these funding constraints will not be easy – cost management efforts will continue, and resources will be prioritized to support mission-critical efforts while also implementing strategic reductions in other program areas.

Impacts of proposed spending level

The Corps and Reclamation have supported BPA's commitment to disciplined cost management by reducing funding levels from BP-18 to BP-20 by $15 million annually, and holding costs at that reduced level in BP-22. Achieving the proposed funding levels while absorbing wage increases and other inflationary pressure requires rebalancing and reprioritizing projects, as well as implementing efficiencies to identify work that can be foregone or done with less manpower. Significant reductions in the labor force will be required, as 60 percent to 70 percent of expense budgets fund employee salaries and benefits. Non-routine maintenance projects will be prioritized, work will be deferred to future rate periods, and the labor force will be further reduced through attrition.

Holding funding levels flat in the BP-22 IPR, in light of actions already taken in the 2016 and 2018 IPRs, magnifies potential program impacts and decreases flexibility to respond to forced outage events. As projects continue to be deferred or slowed it creates an increased risk of outages that will negatively impact the availability of units and available generation. Historically the forced outage factor for the Corps is 5 percent to 7 percent; it was 4.8 percent as of March 2020. Some facilities are experiencing much higher forced outages, such as McNary at 11.9 percent, Lower Monumental at 8.5 percent, and The Dalles at 11.1 percent. Reclamation's forced outage factor is historically less than 1 percent but is currently at 10 percent due to transformer problems with unit G21 at Grand Coulee. The G21 outage in the first quarter of FY 2020 resulted in roughly $6 million in lost revenue. The continued deferral of non-routine extraordinary maintenance (NREX) appears to be having an impact on operations by contributing to rising outage factors. Holding budgets at the BP-20 level will reduce the ability to pay overtime to workers who respond to forced outages and will likely result in reduced availability of units for generation for longer durations. Incremental additional funding, in the range of a 1 percent increase, would help buy down this risk and provide contingency funding for overtime directed at returning forced out units back to service more quickly. Additional levels of funding would enable work on deferred non-routine maintenance. Examples of such maintenance include main unit breaker maintenance at several projects, Libby powerhouse elevators, and BPA spillway hoists and preferred AC/DC work.

Overall, the majority of the forced outages contributing to the high FCRPS forced outage factor are from the Main Stem Columbia and Lower Snake strategic classes. These strategic classes account for 89 percent of the FCRPS average annual generation. Grand Coulee, McNary, The Dalles, Lower Granite and Lower Monumental all currently have forced outage factors higher than their 10-year averages.

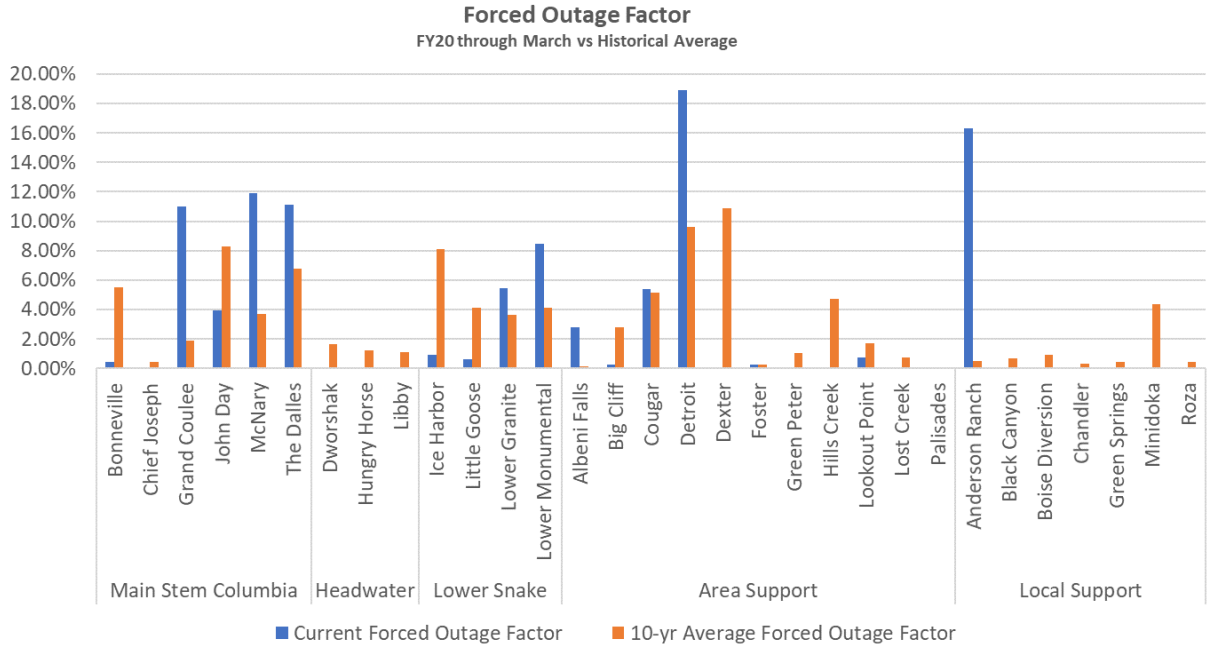


Figure 9 Forced Outage Factor

3.1.1.2 Federal Hydro Capital Investment Program

Historical Program Execution

Annual capital investments have hovered between $150 million and $200 million per year over the last 10 years. Although analyses have supported higher levels of capital investment for many years, the FCRPS has been unable to ramp up to the levels identified in previous IPRs. In response, the agencies are taking proactive steps to achieve higher capital investment levels.

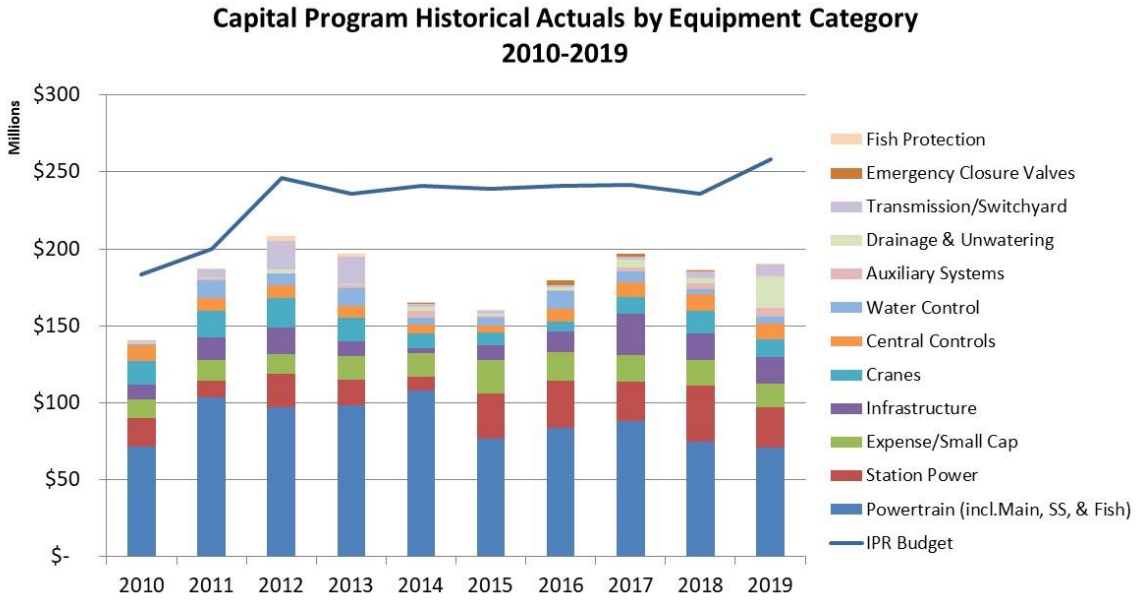


Figure 10 Capital Program Historical Actuals by Equipment Category 2010-2019

The ability to ramp up the program relies on several large powertrain investments moving forward, specifically at Grand Coulee, McNary and Chief Joseph. These investments have taken longer to plan, design and execute than expected but are core to the business case for a higher level of investment. Advancing projects to fill in the gaps caused by delays in large investments is not always possible or a sound business decision. A critical piece of the FCRPS investment strategy is to optimize the timing of investments. Investments are moved forward if analysis shows that it is both an economically and logistically feasible decision. In development of the 2020 asset plan, additional investments in excess of the capital budget have been queued up in the first three years, recognizing that existing investment expenditure forecasts may not go as planned. This provides flexibility to advance investments in the event that others are delayed.

Investment in powertrain components declined in the second half of the decade with more investment devoted to station power and infrastructure. Many of these investments were made in anticipation of major powertrain investments in the 2020s. As powertrain investments reach the execution phase at Grand Coulee, McNary and Chief Joseph in the next 10 years, it is expected that

the share of investment dedicated to powertrain equipment will rise. This trend can already be seen with the turbine replacement project at McNary, the contract for which is already awarded and proceeding.

Capital Program Strategy

Asset condition, criticality and risk drive the capital investment program. A lifecycle cost minimization approach is used to identify the optimal level and timing of investment across the system. As potential investments are identified, the three-agency Asset Planning Team evaluated their timing to maximize the value of investments within budget and logistical constraints.

Arriving at a recommended investment level involves performing sensitivity analyses to understand the cost and risk tradeoffs of different levels of capital investment. In addition to the recommended strategy, capital budget constraints were modeled at 33 percent higher, 33 percent lower and 50 percent lower. In each alternative, the model identifies investments in assets in order to minimize lifecycle cost up to the budget constraint. The model will not identify investments up to the budget constraint if it is not optimal to do so. Safety and environmental risks are tracked qualitatively and the model recommends intervention if an asset crosses into the high-risk threshold due to condition degradation and its respective safety and environmental consequences of failure.

Analysis Results

Compared to a no-investment alternative, all funding levels analyzed produced risk mitigation and efficiency benefits with Net Present Values (NPVs) between $7.2 billion and $7.7 billion. Higher levels of investment over the recommended strategy produce only minor incremental benefits. Lower levels of investment become more costly. A 33 percent reduction in investment would reduce the NPV by $96 million, and a 50 percent reduction in investment would reduce the NPV by $368 million.

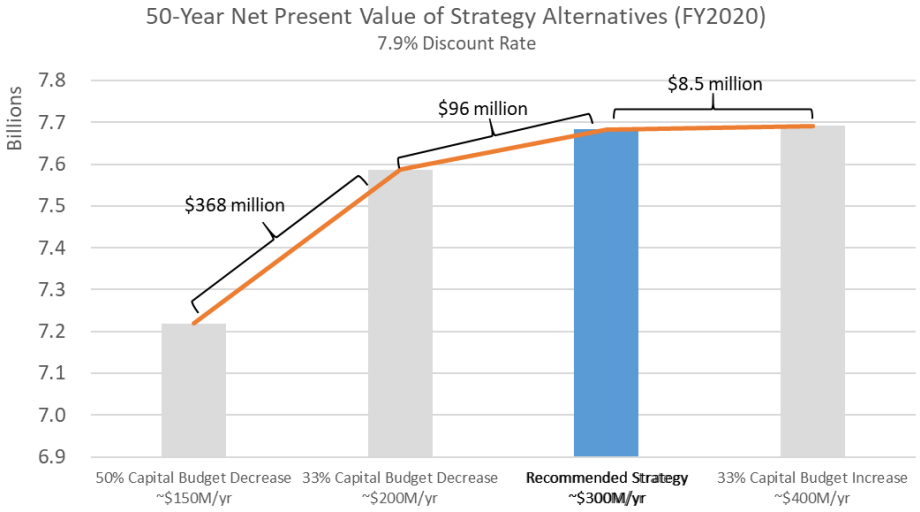


Figure 11 50-Year Net Present Value of Strategy Alternatives (FY 2020)

Capital program value is primarily derived from reductions in the risk of direct costs and lost generation that would otherwise result from equipment failure. The recommended strategy is expected to reduce lost generation risk by 33 percent over the next 20 years as high-risk assets at McNary, Grand Coulee, Chief Joseph and John Day are replaced. Direct cost risk, the risk associated with the incremental cost of replacing assets that have failed, is also expected to be reduced by the same amount relative to today. Further benefits of the recommended strategy include reductions in safety and environmental risk as well as critical replacement of joint assets that support the various missions of the three agencies.

Recommended Strategy

Investment in powertrain components is expected to increase substantially in the next 10 years, as shown below in Figure 9. Several particular powertrain replacement projects are expected to drive the steep increase to $300 million by 2024. Grand Coulee transformer replacements and G19-21 modernization, McNary exciter, governor and turbine runner replacements, and Chief Joseph generator rewinds account for the majority of the increases as the program ramps up. As mentioned earlier, these investments and related work are key to the business case for a higher level of investment but have taken longer to plan, design and award than expected. With the recent award of the turbine replacement project at McNary, which accounts for $60 million per year on its own by 2026, there is greater certainty in execution than in previous IPRs.

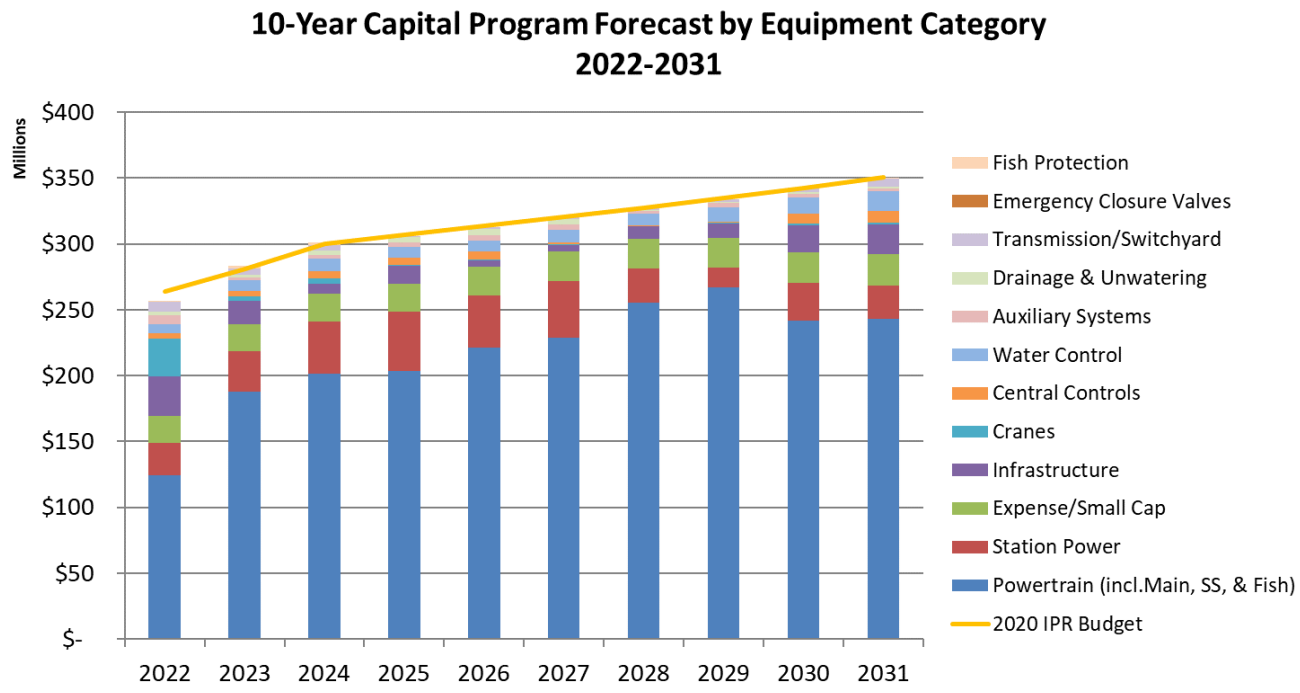


Figure 12 10-Year Capital Program Forecast by Equipment Category 2022-2031

The chart below shows the total capital investment forecast at each plant. Blue bars represent planned projects that are either in design or construction. Orange bars represent forecasts associated with modeled asset replacements based on asset condition and risk for which a project is still in scoping or is yet to be identified. The timing and costs for modeled asset replacements are uncertain and tend to shift as projects are identified.

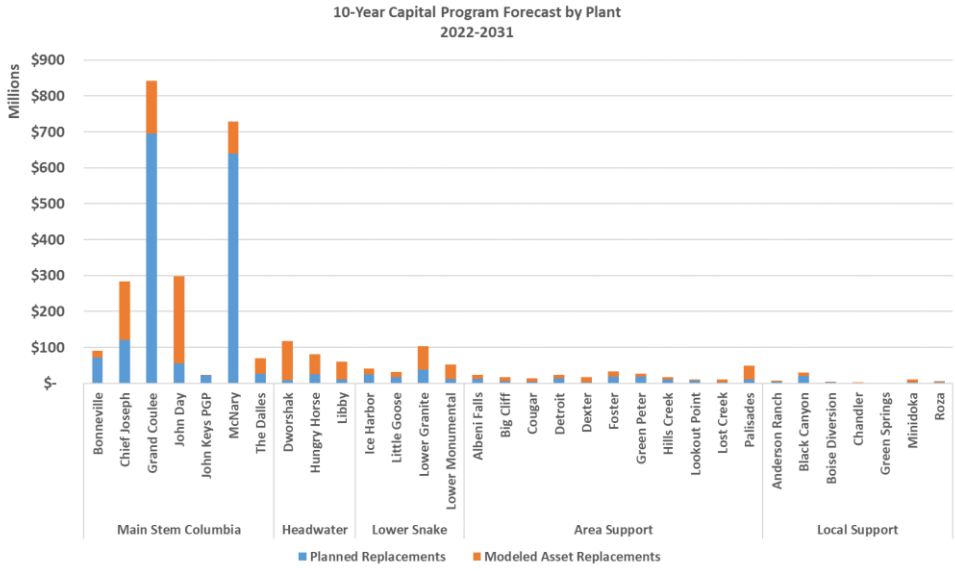


Figure 13 10-Year Capital Program Forecast by Plant 2022-2031

The level of investment in each facility is highly correlated with the amount of risk it poses to the system. Over the next 10 years, the aforementioned investments at Grand Coulee, McNary, Chief Joseph and John Day will mitigate the high levels of lost generation risk currently observed based on existing asset condition and consequence of failure.

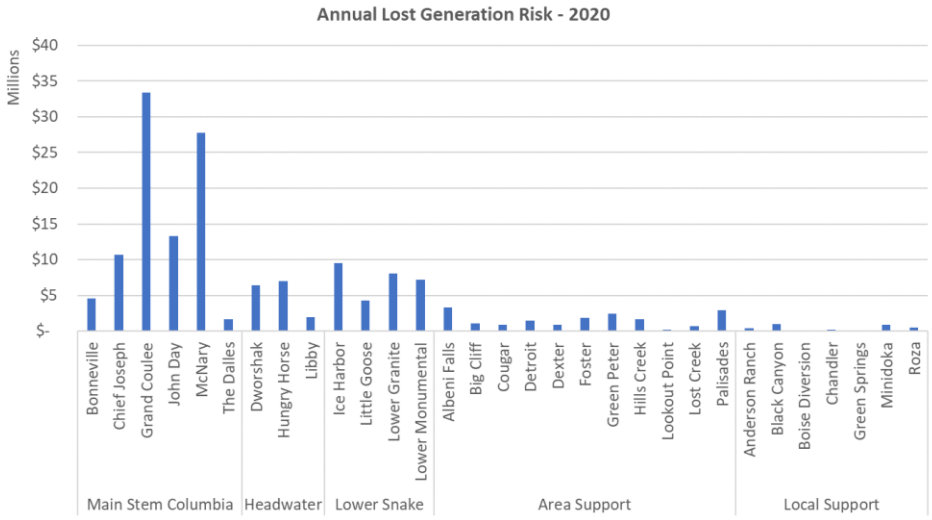


Figure 14 Annual Lost Generation Risk – 2020

3.1.1.3 Federal Hydro Program Summary

The level of capital and expense spending forecast over the next fifty years is closely tied to the amount of generation produced by each strategic class. It should be recognized that generation is just one of the various missions that FCRPS facilities support, so exact alignment is not expected.

More than 60 percent of the capital and expense programs are forecast for the Main Stem Columbia, which represents 77 percent of average annual FCRPS generation. The Main Stem is also the most cost effective of the strategic classes with a 50-year Cost of Generation (direct capital and expense) of $7.54/MWh and a 50-year Fully-Loaded Cost (all Corps/Reclamation/BPA costs attributable to the hydro system) of $19.04/MWh. As a system, the capital and expense programs presented in this IPR have a 50-year Cost of Generation of $9.56/MWh and a 50-year Fully-Loaded Cost of $22.00/MWh.

Table 11 Long Term Capital and Expense Program Summary

Strategic Class	% of FCRPS Average Annual Generation	% of 50-Year Capital Forecast	% of 50-Year Expense Forecast	50-Year Cost of Generation ($/MWh)	50-Year Fully Loaded Cost ($/MWh)
Main Stem Columbia	77%	61%	64%	$7.54	$19.04
Lower Snake	12%	15%	14%	$12.13	$29.80
Headwater	6%	8%	8%	$11.76	$23.56
Area Support	4%	11%	10%	$30.07	$45.52
Local Support	1%	5%	4%	$42.48	$56.06
FCRPS	100%	100%	100%	$9.56	$22.00

3.1.2 Columbia Generating Station

Description

The Columbia Generating Station (Columbia) is a 1,207 (gross) megawatt boiling water nuclear reactor located on the Department of Energy (DOE) Hanford Site in Richland, Washington. Columbia began operating in 1984 and is licensed through 2043. It is owned and operated by Energy Northwest, a joint action agency under Washington law. Output from Columbia, along with FCRPS power, is used to supply and meet the Administrator's long-term firm power sales contract obligations.

Columbia's operating costs are included in Power Services' rates and cover the operations and maintenance of the nuclear plant. BPA acquires 100 percent of Columbia's generation and funds 100 percent of its costs. BPA also directly funds Columbia's Decommissioning Trust Fund and Nuclear Electric Insurance Limited (NEIL) insurance premiums.

Energy Northwest continues to work toward achieving technical and cost performance measures with the goal of providing competitively priced power. Energy Northwest has implemented its Cost-

effective Operation Project and other industry-supported initiatives to reduce Columbia's production cost of power by increasing the efficiency of overall operations. Energy Northwest continues to hold Columbia's cost increases to levels at or below inflation.

At the same time, Columbia's power generation has increased. During 2018, for example, Columbia produced 9.7 million megawatt-hours. This is more than any other year in its 34-year history. Columbia's previous generation record was set in 2016 with 9.6 million megawatt-hours. Columbia has set generation records in five out of the last seven years and has also recently set nine monthly generation records. In 2019, Columbia produced 8.9 million megawatt-hours of electricity, setting a new generation record for a refueling outage year. Also in 2019, Energy Northwest and BPA worked jointly to revise the existing load shaping protocol to better support the region's needs during times of high spring run-off. These efforts support BPA's strategic goals to sustain financial strength and provide competitive power products and services, as established in the BPA 2018-2023 Strategic Plan.

Program objectives in 2022 and 2023

Proposed spending levels for FY 2022-2023 will support continued operation and maintenance of Columbia and are consistent with the spending forecast provided by Energy Northwest. Costs will be higher in FY 2023 as Columbia will have a refueling and maintenance outage.

Proposed O&M costs are based on Energy Northwest's Columbia Long Range Plan. The LRP is established through a rigorous internal process that looks at challenges and constraints that need to be overcome to meet Columbia's mission and support continued operation. O&M and capital projects are reviewed and ranked prior to inclusion in the LRP. Highest priority projects are included in the proposed funding levels, whereas lower priority projects may be deferred to future years or dropped from the list. The LRP is systematically monitored and updated annually to account for the needs of the plant based on defined life-cycle management requirements.

Energy Northwest identifies, funds and completes projects each year. One example of a major expense project anticipated for fiscal years 2020 through 2023 is the in-service inspection and non-destructive examination project, which is required by the Nuclear Regulatory Commission (NRC). Others include the inspection, repair and refurbishment of valves in the plant, vessel services during the outage, and main turbine inspections. Noteworthy capital projects include:

- Reactor Water Cleanup Heat Exchanger.
- Ongoing commitments from the 2012 Plant License Renewal.
- Low Pressure Turbine Refurbishment.
- High Pressure Turbine Replacement.
- Moisture Separator Reheater Internal Replacement.
- Reactor Recirculating Pump and Motor Replacement.
- Independent Spent Fuel Storage Installation Cask Pad Expansion – Phase 3 Completion.

As described below, Energy Northwest also continues to implement strategies to decrease costs and increase generation. In 2012, the NRC approved the extension of Columbia's operating license to 2043. This extension of the licensing period to a total of 60 years has allowed BPA to reduce annual contributions to the Columbia Decommissioning Trust Fund, as the contributions will be made over a longer period of time.

In May 2012, the Department of Energy, Tennessee Valley Authority, the U.S. Enrichment Corporation and Energy Northwest signed agreements to pursue a depleted uranium program to provide nuclear fuel for Columbia, a program similar to the one conducted in 2005. Under the program, DOE provides depleted uranium hexafluoride (DUF6) that can be cost-effectively enriched to provide enough uranium fuel for Columbia operations through at least 2028. This agreement generated savings of approximately $20 million per year from FY 2014 through 2019 and is projected to continue to achieve savings through 2028. Columbia's significant uranium inventory and the long-term enrichment contracts in place continue to minimize the impact of volatility in the market price of nuclear fuel.

During Columbia's refueling outage in the spring of 2017, the NRC granted Energy Northwest permission to proceed with a measurement uncertainty recapture power uprate. This allowed Columbia to increase its licensed output from 3,486 megawatts thermal to 3,544 megawatts thermal. The reactor power uprate also resulted in additional electrical output of approximately 19 MWe for the station.

Impacts of proposed spending level

The proposed spending levels for Columbia are achievable, support reliable operation of the nuclear facility, and are aligned with Energy Northwest's Cost-effective Operation initiatives. Columbia's operational ability to absorb inflation at levels equivalent to the BP-20 Rate Case will be achieved through staff reductions attained through attrition, additional absorption of escalation, and additional reduction in non-labor O&M costs. Additionally, a larger portion of O&M costs will be allocated to capital as a result of an increase in total capital projects over the same period. Financial exposure will be reduced based on Columbia's demonstrated predictable performance.

There are potential factors that may influence Columbia's ability to operate within the proposed spending level. These include:

- Any emergent equipment reliability issues.
- Any additional days needed for the refueling and maintenance outage.
- Any change in regulatory fees.
- Any forced outages if the plant needs to be taken offline for repairs.
- Unexpected changes by the State of Washington that would affect retirement costs.
- Any unexpected increases in employee benefits.
- Undefined and/or unknown regulatory mandates from the Nuclear Regulatory Commission.

As part of its adaptive management process, Columbia looks for opportunities to maintain flexibility to address emergent challenges.

3.1.3 Fish and Wildlife

Description

BPA's Fish and Wildlife Program, sometimes called "the direct program," provides funding directly to local, state, tribal, and federal entities to implement hundreds of mitigation projects. These projects are mostly considered "enhancement" actions under the Northwest Power Act; that is, off-site protection and mitigation actions that typically address impacts to fish and wildlife not caused directly by the FCRPS. These actions help improve the overall conditions for fish and wildlife adversely affected by the development and operation of the FCRPS. For example, Fish and Wildlife Program funding improves habitat in the mainstream as well as tributaries and the estuary, builds hatcheries and boosts hatchery fish production, evaluates the success of these efforts, and improves scientific knowledge through research. This work is implemented through annual contracts, many of which are associated with multi-year agreements like the Columbia River Basin Fish Accords. BPA fulfills many of its Endangered Species Act (ESA) compliance commitments through the direct program as well. Because these ESA actions also help fulfill Northwest Power Act mitigation responsibilities, BPA tallies them together as expenditures from the direct program.

In its role under the Northwest Power Act, the Northwest Power and Conservation Council develops a program of measures to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River and its tributaries. Each year Bonneville funds projects consistent with the Council's program to fulfill its Northwest Power Act fish and wildlife responsibilities and to implement offsite mitigation actions listed in various Biological Opinions for ESA-listed species.

In addition to the hatchery operations that are funded through the Fish and Wildlife Program, BPA directly funds the U. S. Fish and Wildlife Service (USFWS) for annual operations and maintenance of the Lower Snake River Compensation Plan (LSRCP) fish hatcheries and facilities. The LSRCP hatcheries and satellite facilities produce and release more than 19 million salmon, steelhead, and resident rainbow trout as part of the program's mitigation responsibility. The LSRCP hatcheries and satellite facilities are operated by Idaho Fish and Game (IDFG), Washington Department of Fish and Wildlife (WDFW), Oregon Department of Fish and Wildlife (ODFW), USFWS, the Nez Perce Tribe (NPT), Confederated Tribes of the Umatilla River (CTUIR), and Shoshone-Bannock Tribes (SBT).

Program objectives in 2022 and 2023

BPA remains committed to its obligations to mitigate for the operation of the federal hydropower system and to comply with all applicable environmental laws.

The Fish and Wildlife Program objectives are informed by biological opinions (BiOps), court orders, and Northwest Power and Conservation Council recommendations. Many uncertainties impact the implementation of the Fish and Wildlife Program. The Program focuses on the flexibility of multi-year planning and shaping of available budgets on an annual basis to support high-priority work that is most likely to be ready to implement. This program provides a strong base of biological accomplishment that should be maintained, refined, and built on, rather than reinvented. BPA will manage project funding and priorities based on biological investment portfolios, emphasizing cost-effective funding of biologically effective projects.

The Environmental Capital program is managed with a relatively level budget and systematic approach. There are no new programs planned for BP-22.

Impacts of proposed spending level

For the Fish and Wildlife Program, BPA expects that it will be able to meet critical legal compliance obligations under applicable laws, various BiOps, agreements and the Council Program at proposed funding levels. Concurrently, the program is committed to supporting BPA's strategic plan and financial health objectives, and will maintain budgets flat in relation to the BP-20 average.

The proposed funding reflects environmental compliance commitments under various laws and formal agreements. Consequently, these are considered firm rather than flexible elements of BPA's cost structure. The proposed funding also reflects a balance between listed species under the ESA and species that are not listed, between anadromous fish and resident fish and wildlife, and between wild and hatchery fish. With the exception of capital funding for hatchery construction and certain land acquisitions and stewardship funds, the BPA Fish and Wildlife Program budget is funded through expense budgets.

Capital Execution

Fish and Wildlife capital spending is represented by 3 asset categories: (1) hatcheries, (2) fish screens and passage improvements, and (3) conservation lands/easements.

Hatcheries: Capital expenditures on hatcheries increased in the last 2 years as a result of new hatchery construction agreements and funding of the non-recurring maintenance needs. Hatchery related expenditures have historically made up approximately 55% of Fish and Wildlife capital spending.

Screens/Passage: Fish screen operating entities perform condition assessments of the assets, prioritize the immediate and longer term maintenance needs, and share assessments with BPA and the FSOC in order to obtain funding.

Conservation Lands: Land acquisitions that permanently extinguish a portion of BPA's mitigation obligations are funded through BPA's capital program, and these include land acquisitions to mitigate for impacts to wildlife and acquisitions to mitigate for impacts to resident fish species in Montana. Other acquisitions are expensed, and land related expense costs for fiscal years 2015 through 2019 showed a slight increase in absolute terms while capital costs declined over the same period. The overall spending remained relatively flat as a percentage of the total program expenditures. Capital costs have been declining steadily since 2011 due to achievement of certain wildlife settlements. Land-related expenditures have made up approximately 39 percent of Fish and Wildlife capital spending.

For Environmental Planning and Analysis (EC), work includes continuing to identify the appropriate NEPA strategies and provide quality, timely and cost-effective environmental and cultural planning and analysis services to deliver key program milestones in partnership with Transmission, Power and Fish and Wildlife.

3.2 Operations

7% of Power IPR program costs

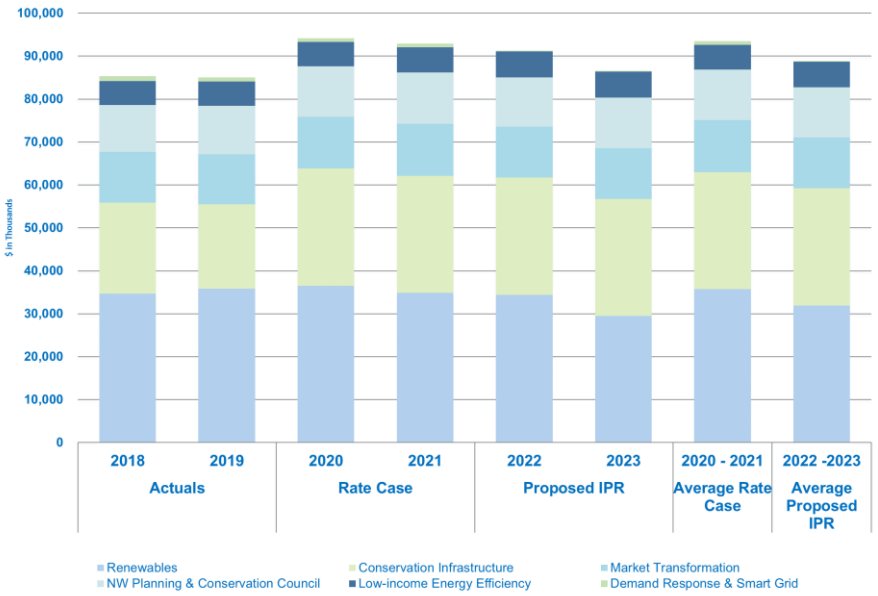


Figure 15 Power Operations, Expense Overview

Program cost details

Table 12 Power Operations Program, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Renewables	34,692	35,865	36,523	34,869	34,418	29,467	35,696	31,943
Conservation Infrastructure	21,148	19,608	27,296	27,296	27,300	27,300	27,296	27,300
Market Transformation	11,824	11,658	12,050	12,050	11,800	11,800	12,050	11,800
Low-Income and Tribal Weatherization	5,523	5,727	5,739	5,853	6,005	6,005	5,796	6,005
Distributed Energy Resources	1,193	907	855	855	215	215	855	215
NW Power & Conservation Council	10,969	11,275	11,725	11,956	11,545	11,797	11,840	11,671
Total	**85,349**	**85,040**	**94,188**	**92,879**	**91,283**	**86,584**	**93,533**	**88,934**

The Operations Program Plan is the largest of the three Power program plans in scope of work and second to the Asset Management Program in overall expense. The Operations program focuses on key activities that reliably supply BPA's firm power products and balancing services. It also includes the infrastructural and operational enablers behind BPA's conservation investments and oversight of BPA's renewable power purchases. The internal costs associated with this program are included in Section 3.4.

3.2.1 Renewables

Description

The Renewables program covers renewable resources acquired by the Administrator to meet firm power contract obligations. The program seeks opportunities to reduce costs and maintain existing program functions. BPA purchases energy from four wind projects currently under contract; two contracts expire in 2022. Funds also support maintaining the solar monitoring networks and management costs of Tier 1 Renewable Energy Certificates.

The Renewables program is expected to meet BPA's strategic goal to sustain financial strength by being at or below the rate of inflation through 2028. As contracts expire over the next seven years, the cost of the program will steadily decrease.

The Renewables program budget is 99.99 percent long-term power purchase contracts costs and 0.01 percent program support costs. The power purchase contracts' costs cover existing obligations at an annual average cost of approximately $32 million for the rate period.

Impacts of proposed spending level

Expenses for the wind project contracts are forecast using the updated contract costs and conservative wind energy output forecasts. There is a risk that the energy output will be greater than forecast. In the event of a year that is windier than forecast, the agency will seek cost reductions in other programs.

3.2.1 NW Power and Conservation Council

Description

Under the Northwest Power Act, BPA funds the Northwest Power and Conservation Council according to a funding formula based on BPA's forecasted annual firm power sales. Such forecasted sales are coordinated and reflected within BPA's rate cases. After each rate case, BPA updates the funding range for the Council, which then runs an annual public budgeting process to determine its funding needs in a particular year. Monthly requests for funds from the Council are coordinated through Intergovernmental Affairs, so the Council's forecasted budget needs for 2022 and 2023 are summarized in the table above. It should also be noted that the Council operates on a two-year budget timeline. The forecast in the IPR for 2023 is a preliminary estimate; the Council has not fully developed its proposed budget for 2023. Typically the Council underspends its budget, and its expenditures consistently remain below the level of inflation.

3.2.2 Energy Efficiency

The portion of Energy Efficiency costs included in the Operations Program Plan are listed below. Conservation Purchases are included in the Commercial Activities Program Plan.

Table 13 Power Operations: Energy Efficiency, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Conservation Infrastructure	21,148	19,608	27,296	27,296	27,300	27,300	27,296	27,300
Market Transformation	11,824	11,658	12,050	12,050	11,800	11,800	12,050	11,800
Low-Income and Tribal Weatherization	5,523	5,727	5,739	5,853	6,005	6,005	5,796	6,005
Distribured Energy Resources	1,193	907	855	855	215	215	855	215
Total	**39,688**	**37,900**	**45,940**	**46,054**	**45,320**	**45,320**	**45,997**	**45,320**

Description

Through its Energy Efficiency (conservation) program, BPA meets its obligation to acquire and encourage the development of energy savings to maximize the value of the FCRPS and lessen BPA's need to acquire other resources to supply firm power to its customers.

Proposed spending for Energy Efficiency within the Operations program includes funding for:

- Regional program delivery infrastructure, which includes program implementation, emerging technology, market research, and market support services.
- A grant to the Northwest Energy Efficiency Alliance for market transformation and regional infrastructure support.
- Distributed energy resources.
- Low-income weatherization grants to states and tribes.

Proposed spending levels support program implementation for 2022 and 2023, which is a period outside of the 7th Power Plan's Action Planning window and beyond BPA's current Energy Efficiency Action Plan. BPA will develop a new Action Plan, inclusive of 2022 and 2023, factoring in the Council's new power plan, which is expected to be published in 2021. Planning assumptions may be adjusted to more accurately reflect the scale and type of efficiency measures to help meet BPA's resource needs and goals consistent with BPA's resource program and the Council's power plan.

Program objectives in 2022 and 2023

BPA's energy efficiency program objectives are to focus on developing cost-effective energy savings. Evolving customer needs drive BPA to develop new programs and evaluate the scale, scope and

composition of the existing program portfolio to obtain energy savings. Once measures are implemented, BPA will evaluate projects and programs to ensure reliable resources are acquired.

BPA is holding its overall conservation infrastructure and major program spending (see section 3.3 below) flat relative to BP-20 Rate Case levels which may impact energy efficiency savings achievements. The FY 2022 and FY 2023 proposed energy efficiency funding levels under the Operations program supports:

Conservation Infrastructure

BPA's conservation infrastructure funding supports:

- BPA's regional programmatic infrastructure.
- Momentum savings research.
- Emerging technology and measure maintenance research.
- Program evaluation.
- Regional End Use Load Research project.
- Contract staffing.

A portion of this funding level will be dedicated to achieving heating, ventilation and air conditioning (HVAC) and weatherization savings in support of acquiring savings during BPA's times of highest energy needs. BPA will shift funds from other areas, such as the sunsetting Simple Steps program, to advance HVAC work. Proposed funding levels put at risk BPA's ability to take part in new regionally funded research initiatives (e.g. stock assessments, field studies), limits market research and evaluation of programs, and reduces the ability to provide data and conduct analysis for BPA's Resource Program.

Distributed Energy Resources

This budget category includes funding of service contracts for analyzing Distributed Energy Resource market trends, feasibility, availability and cost data, as it applies to resource planning and other power requirements. BPA will evaluate the development of products that can be physically located close to loads and review opportunities to acquire them when supply needs arise and it is cost effective to do so. This approach is consistent with the BPA 2018-2023 Strategic Plan and supports the agency's goals for cost competitive power services and efficient and responsive transmission services.

Low Income and Tribal Weatherization

BPA provides grants to the four Northwest states and recognized tribes within the region to improve efficiency levels for qualified low-income residences. Grants to states are allocated on a proportional basis using the most current census data for households with incomes below federal poverty guidelines. Grants to tribes for low-income services are made on an application basis and take a variety of factors into consideration including geographic dispersion, prior participation and local needs. BPA is providing a modest increase for these grants, which is offset by funding reductions in other areas.

Market Transformation

BPA is one of 15 regional funding members of the Northwest Energy Efficiency Alliance. BPA's funding, based on load share, helps enable transformations of targeted markets to more efficient products. Market transformation is a well-established channel for low-cost, long-term savings and is highly effective in markets that are challenging for traditional utility programs to reach. Verified savings from NEEA's intervention strategies and activities are counted toward BPA's annual savings accomplishments. NEEA's approach identifies opportunities and impediments, removes barriers, and accelerates market adoption.

Impacts of proposed spending level

The primary risk BPA faces at the proposed funding level is variance from forecast energy efficiency savings achievements. This may occur if implementation conditions in 2022 and 2023 vary from planning assumptions, including factors such as higher than expected costs of energy efficiency acquisition or the need to add or enhance program support services. Additionally, proposed funding levels would not mitigate for smaller volume or lagging pace of market adoption or slow energy efficiency measure development.

3.3 Commercial Activities

5% of Power IPR program costs

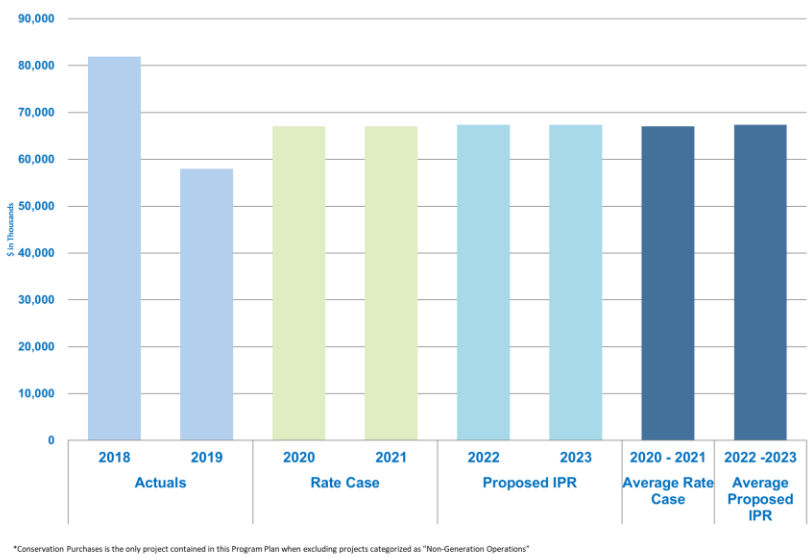


Figure 16 Power Commercial Activities, Expense Overview

Program cost details

Table 14 Power Commercial Activities: Energy Efficiency, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Conservation Purchases	81,923	57,959	67,000	67,000	67,357	67,357	67,000	67,357
Total	**81,923**	**57,959**	**67,000**	**67,000**	**67,357**	**67,357**	**67,000**	**67,357**

The Commercial Activities Program includes all resource acquisitions and sales of power, including bulk trading activities, long-term requirements power sales, and energy efficiency acquisitions. The internal costs associated with this program are included in Section 3.4.

Description

When acquiring resources to meet its firm power load obligations, such as the Regional Dialogue power sales contract, the Northwest Power Act requires BPA's Administrator to first consider and acquire all cost-effective energy efficiency, consistent with the Northwest Power and Conservation Council's Power Plan. BPA's 2020 Resource Program identified the need for BPA to acquire 111 aMW of cost effective conservation over the 2022 and 2023 time frame in its least-cost portfolio.

The conservation purchases' budget includes the cost of Energy Efficiency Incentives (EEI) and Energy Smart Reserved Power (ESRP). BPA customers locally develop a broad array of energy saving measures and programs to serve their needs and those of their consumers. Under the Energy Conservation Agreements BPA acquires energy savings from customers through EEI payments based on utility-reported energy conservation. A small increase to the EEI budget, offset by other reductions, is proposed to hold overall funding levels consistent with the prior rate period (see section 3.2.2). Changes in portfolio composition (e.g. the loss of inexpensive lighting measures) and a need to acquire a larger proportion of higher cost savings (e.g. HVAC and weatherization) create some risk in BPA's ability to achieve forecasted energy efficiency savings.

BPA's ESRP program provides funds for energy efficiency resource development through efficiency projects at federal agency facilities, such as fish hatcheries, transmission substations, or Bureau of Reclamation irrigation projects that draw power directly from the federal dams. By improving efficiencies at federal facilities, BPA increases the amount of power available to supply to its utility customers. Funding has been reduced compared to the prior rate period to better reflect program potential and to support augmentation of EEI funding.

BPA will work collaboratively with its customers to administer its existing Energy Conservation Agreements as well as continue to obtain input from the public and the Council regarding BPA's energy efficiency needs.

3.4 Non-Generation Operations

7% of Power IPR program costs

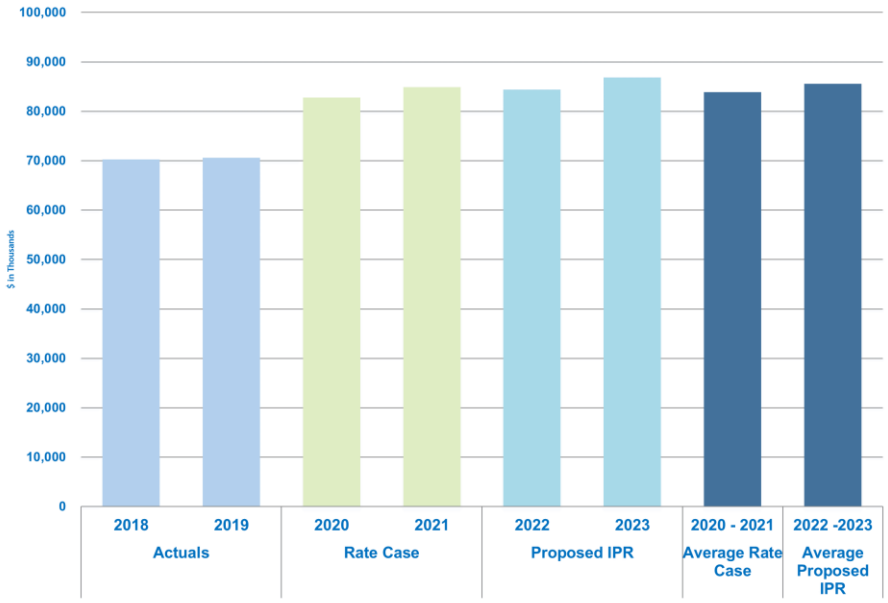


Figure 17 Power Non-Generation Operations, Expense Overview

Program cost details

Table 15 Power Non-Generation Operations, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Asset Management	3,723	3,412	5,426	5,546	4,038	4,129	5,486	4,083
Commercial Activities	15,388	15,397	23,748	24,277	14,768	15,342	24,012	15,055
Operations	27,744	27,819	23,539	24,401	38,859	40,337	23,970	39,598
Non-Generation Operations (Power Internal)	**46,856**	**46,629**	**52,714**	**54,224**	**57,665**	**59,808**	**53,469**	**58,736**
Asset Management	4,643	6,072	7,347	7,434	4,124	4,111	7,390	4,117
Commercial Activities	8,893	7,803	16,103	16,613	12,720	12,854	16,358	12,787
Operations	9,830	10,099	6,652	6,652	9,842	10,084	6,652	9,963
Non-Generation Operations (Enterprise Services)	**23,366**	**23,974**	**30,102**	**30,699**	**26,686**	**27,048**	**30,400**	**26,867**
Grand Total	**70,222**	**70,602**	**82,816**	**84,922**	**84,350**	**86,856**	**83,869**	**85,603**

Note: The program plan framework was implemented beginning in FY 2019, and the financial reporting structure was updated in FY 2020. Due to this change, the proposed IPR is comparable to rate case overall while the program break-out is only relevant for the proposed IPR.

Description

Delivering on Power's mission requires support from power and agency services staff. Non-Generation Operations (Power internal) includes the salaries and benefits for approximately 300 Power Services employees responsible for all aspects of the business activities and processes performed by Power Services. This includes Power Services' costs for professional services, supplemental labor, travel, training and awards. Power internal support funds essential staffing and training required to fulfill BPA's commitment to provide competitive products and services along with modernizing assets and system operations as outlined in the strategic plan.

Non-Gen Operations (Enterprise Services) includes direct support received from Enterprise Services, such as Information Technology and Legal that were previously allocated 100 percent to Power but are now direct charged.

As described earlier, IPR costs fall into three main categories that cover a full range of work performed in Power Services: Asset Management, Commercial Activities and Operations.

Impacts of proposed spending level

- Managing Power Internal support costs requires reprioritization of workload given constrained funding for all aspects of this program, including staffing levels, service contracts, and supplemental labor. Power staffing levels remain near all-time lows and will remain near current levels through FY 2021 in support of cost management efforts. Proposed spending levels for FY 2022 and 2023 support a small net increase in staff for Grid Modernization and consistent with BPA's workforce strategy.
- Management continues to actively monitor staffing needs while seeking operational efficiencies for immediate implementation, to mitigate business risk such as delays in prioritized work, quality control and/or slower customer service. Power continues to constrain non-labor costs following a 30 percent reduction from BP-18 levels through decreases in supplemental labor, training, subscriptions, service contracts, sponsorships, and memberships for Power Services.
- As established in the agency strategic plan, Power will focus on initiatives and work that support BPA's efforts to provide competitive products and services. Power will also focus on modernization of its assets and system operations, as articulated in the strategic plan. Work will continue on the modification of the Columbia River Treaty, implementation of the CRSO EIS, marketing of surplus capacity and other products, and the constant pursuit of efficiencies and operational excellence in programs and processes.

3.5 Enterprise Services G&A

6% of Power IPR program costs

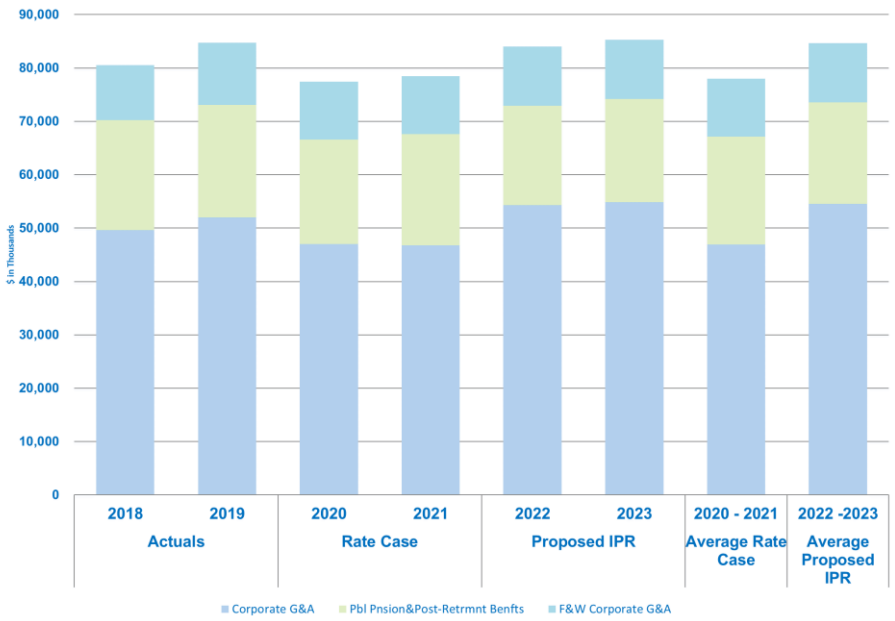


Figure 18 Power Enterprise Services G&A, Expense Overview

Program cost details

Table 16 Power Enterprise Services G&A, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Enterprise Services' G&A Allocations	59,965	63,600	57,859	57,644	65,330	65,966	57,752	65,648
Post-retirement benefits	20,601	21,088	19,577	20,831	18,666	19,354	20,204	19,010
Total	**80,567**	**84,689**	**77,436**	**78,475**	**83,996**	**85,320**	**77,955**	**84,658**

Description

Enterprise Services G&A, referred to as internal support in the 2018 IPR, consists of two components: additional post-retirement benefits contributions and Power's share of G&A. Enterprise Services is included in both the power and transmission revenue requirements. Since the program is the same for each business unit, the full narrative is captured here in the Power Services section and only a brief summary and corresponding table are included in the Transmission Services section.

The Enterprise Services' allocations include the portion of Enterprise Services' costs that are not direct charged to a power or transmission specific program, and are allocated to Power and Transmission Services. For details, refer to section 5.2. The Enterprise Services' funding levels are

determined by the level of service required to support the business lines. The work expected is outlined in each of the individual executive summaries within the Enterprise Services' section.

The additional post-retirement benefits is an operational expense as part of the power and transmission rates, and are a result of changes in the cost factors developed by the Office of Personnel Management (OPM). Federal agencies use these factors to calculate their imputed costs relating to the "pensions" (the Civil Service Retirement and Federal Employees' Retirement Systems), the Federal Employees Health Benefits Program and the Federal Employees Group Life Insurance Program. OPM sponsors the retirement programs, and the cost factors are based on actuarial data and forecasts of future healthcare and pension costs. Beginning in 1998, the Administrator elected to include an additional post-retirement contribution to offset underfunding for the before-mentioned program. BPA does this by voluntarily remitting to the U.S. Treasury each year in the year-end payment. The contribution includes component amounts that represent both BPA retirees and the retirees related to the power producing operations of the Corps and Reclamation.

4 Transmission Services

Transmission Services is responsible for planning, designing, constructing, marketing, operating and maintaining over 15,000 circuit miles of transmission assets in the Pacific Northwest. The proposed Transmission Services spending for FY 2022 – 2023 supports the BPA 2018-2023 Strategic Plan and builds on BPA's legacy of transmission system reliability. A strategic goal for BPA is to strengthen its financial health, which the agency will advance by cost-effectively modernizing, managing and maintaining its assets. Transmission builds on a foundation of safety, regulatory and statutory compliance to meet Transmission customer needs efficiently and responsively, in support of BPA's other strategic goals.

The average age of BPA's transmission's assets is approaching 50 years and many are well past the end of their expected economic life. Transmission exists in an increasingly dynamic, uncertain and quickly changing environment. Transmission is facing capital and expense pressures while the transmission system is aging and becoming more constrained. These conditions demand a responsive and modern approach to the way BPA positions itself commercially and how the Transmission organization aligns to deliver and capture value. BPA is adopting a more flexible, scalable, economical and operationally efficient approach to managing its transmission system in order to remain a competitive transmission provider. This work will ensure Transmission maintains financial strength while continuing to meet multiple statutory responsibilities and delivering the public benefits that are so valuable to the region.

Vision for managing transmission assets:

Transmission Services will manage its assets to achieve safety, reliability, and availability and adequacy standards and maximize economic value for the region. It will use efficient and transparent practices that are effective in managing risks and delivering results.

Transmission Services creates value by operating a high-performance grid, enabling economic growth in the region, and providing access to federal and nonfederal resources and markets. As a dependable and responsive business partner for BPA's customers, Transmission meets compliance requirements, while ensuring the continuing safe, reliable and economic operation of the transmission grid consistent with sound business principles. Enabling economic growth and providing grid access means that Transmission provides flexible products and services to meet evolving demand forecasts, impacts to energy markets, generation choices, and policies.

Transmission Services applied three main principles from the agency's strategy to prioritize spending in the FY 2022-2023 rate period: sustain financial strength; modernize assets and operations; and meet Transmission customer needs efficiently and responsively. The agency's strategy is realized through the Transmission Operating Plan and three program plans: Asset Management, Operations, and Commercial Activities. The Transmission Operating and program plans allocate funding levels and align resources to business outcomes that achieve objectives supporting BPA's strategy. Financial health is supported by balancing upward cost pressures against efficiencies and trade-offs. Upward pressures include price and wage inflation, and additional workload to increase customer responsiveness, maintain our asset base and modernize systems. Balancing factors include carefully evaluating and prioritizing hires, projects, and consolidating support workload.

Careful stewardship of Transmission's expense funds results in limiting the growth of proposed program spending to the rate of inflation. The proposed spending levels support safety, compliance, and reliability and market transformation activities. Improvements to Transmission's asset management practices will continue. Transmission will start optimizing maintenance intervals as well as its spare parts inventory with the use of a decision-support tool that allows it to perform a probabilistic risk assessment. Transmission will accomplish compliance-driven and contractually-obligated maintenance responsibilities efficiently and cost-effectively, ensuring the reliability of the grid through management of maintenance resources. Commercial Activities will develop strategy, policies and implementation plans to enable customer and BPA participation in the Western EIM and other emerging markets that involve the use of BPA's transmission system.

Finally, the Transmission capital funding proposal reflects the transition from a period of large system expansion to one dominated by smaller, sustain projects. Proposed capital execution for this rate period is approximately $300 million direct spend per year. There is a growing volume of projects funded by customers in advance (PFIA) reflecting developer and utility demand on project resources, which can compete with other capital work.

Potential impacts to the Revenue Requirement

As discussed in the Power section, BPA recognizes that its rates are more than the sum of their IPR costs. As shown in Figure 19, IPR costs are expected to represent less than half of Transmission's revenue requirement.

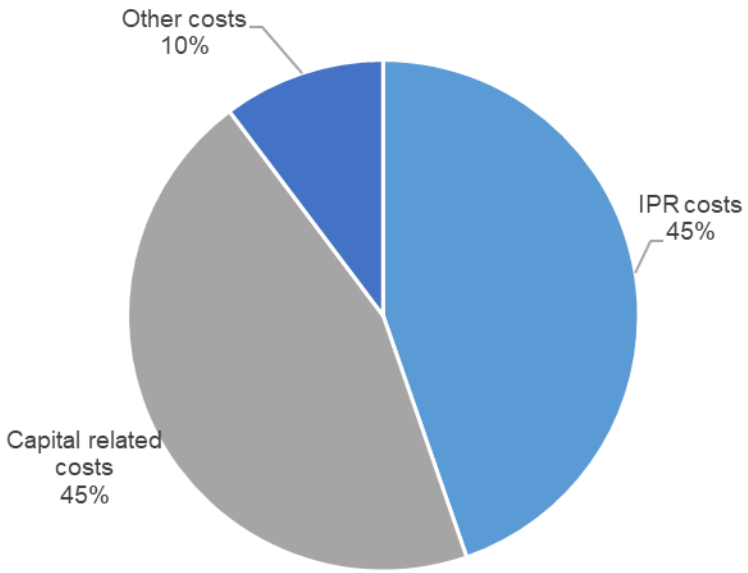


Figure 19 Transmission Potential Revenue Requirement BP-22 average initial IPR

Table 17 summarizes the averages of IPR costs, other costs not detailed in IPR, and capital related costs for the BP-20 rate period and BP-22 initial proposal. The percent change in total costs column reflects the change in the total revenue requirement over the two year period. The annualized percent change in the cost column reflects the annual percent change in the revenue requirement. These percent changes approximate the potential impact on transmission rates, but do not account for changes in the other factors such as ancillary services.

IPR Costs are based on the initial proposed spending levels.

Other costs are costs that are not fixed during the IPR process. Instead, they are determined by contracts, formulas, or are modeled in the rate case, such as between-business line ancillary services, or are not included in rates such as reimbursables. Forecasts of these costs are included in the IPR Publication in order to provide an initial view of these costs and their impact on the total revenue requirement.

Capital related costs reflect how the cost of debt impacts the revenue requirement. This occurs through depreciation, amortization, net interest expense, and minimum-required-net revenue (MRNR).

MRNR increases the revenue requirement when debt service and other cash expenses exceed accrued expenses, and occurs when cash repayment needs exceed depreciation and amortization.

Table 17 Draft Revenue Requirement Transmission Services

($thousands)	Average BP-20 Rate Case	Average BP-22 Initial IPR	$ Increase (Decrease)	% change in total costs	Annualized % change in Cost
IPR Costs	489,822	514,500	24,678	2.3%	1.1%
Other costs	119,920	118,089	(1,831)	-0.2%	-0.1%
Use of reserves	(55,413)	-	$55,413	5.1%	2.5%
Capital related costs					
Depreciation and amortization	338,837	353,476	14,639	1.3%	0.7%
Net interest	171,397	164,945	(6,452)	-0.6%	-0.3%
MRNR *	26,442	-	(26,442)	-2.4%	-1.2%
Total revenue requirement	1,091,005	1,151,010	60,005	5.5%	2.7%

**MRNR does not include additional debt payments due to the leverage policy.*

Figure 20 shows each program within Transmission, and their percent of the total average

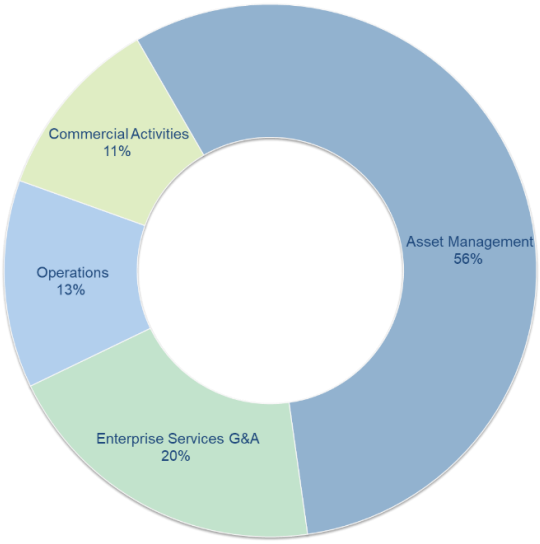


Figure 20 Transmission Services expense summary by program

Table 18 shows the IPR costs by major program, capital costs, and other costs estimated in IPR but not described in detail. The table reflects the actuals for FY 2018 and FY 2019, the final spending levels for the BP-20 rate period, and the proposed spending levels for the BP-22 rate period.

Table 18 Transmission Services Summary

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020-2021	2022-2023
Asset Management	256,165	267,334	262,974	268,795	286,951	290,281	265,884	288,616
Commercial Activities	63,451	54,872	62,078	57,136	58,537	59,620	59,607	59,078
Operations	58,786	62,926	71,098	71,150	64,284	65,598	71,124	64,941
Enterprise Services G&A	91,752	101,622	92,528	93,884	101,128	102,602	93,206	101,865
Costs Described in IPR Total	**470,154**	**486,754**	**488,678**	**490,965**	**510,899**	**518,101**	**489,822**	**514,500**
Transmission Asset Category	231,277	224,169	297,068	304,530	312,000	327,000	300,799	319,500
Other Asset Categories Within Transmission	30,823	38,350	50,838	44,942	105,780	118,990	47,890	112,385
Transmission Indirects	50,907	51,046	54,747	55,569	53,390	54,072	55,158	53,731
Corporate Indirects	49,851	46,888	46,873	47,041	46,765	47,052	46,957	46,908
PFIA	32,907	57,201	65,457	50,061	45,000	50,000	57,759	47,500
AFUDC	14,741	13,931	13,007	13,432	13,738	15,159	13,220	14,448
Capital Total	**410,506**	**431,585**	**527,990**	**515,574**	**576,672**	**612,272**	**521,782**	**594,472**
Between Business Line Acquisitions and Ancillary Services	120,534	103,546	118,089	121,751	118,089	118,089	119,920	118,089
Other Costs Total	**120,534**	**103,546**	**118,089**	**121,751**	**118,089**	**118,089**	**119,920**	**118,089**
Grand Total	**1,001,194**	**1,021,885**	**1,134,758**	**1,128,290**	**1,205,661**	**1,248,462**	**1,131,524**	**1,227,061**

Table 19 shows the capital spending for 2024 through 2031.

Table 19 Transmission Services Capital Outyear Summary

($thousands)	Capital Outyears							
	2024	2025	2026	2027	2028	2029	2030	2031
Transmission Asset Category	385,000	534,600	498,000	392,000	314,000	314,000	321,067	328,130
Other Asset Categories Within Transmission	110,000	36,410	54,920	53,630	57,540	58,250	60,660	53,170
Transmission Indirects	54,755	55,437	56,119	56,801	57,484	58,166	58,848	59,531
Corporate Indirects	48,187	49,316	50,428	51,572	52,737	53,861	54,958	56,039
PFIA	40,000	30,000	30,000	30,000	30,000	30,000	30,675	31,350
AFUDC	17,594	21,942	27,373	31,307	32,140	31,469	30,447	28,988
Capital Total	**655,536**	**727,705**	**716,840**	**615,310**	**543,901**	**545,746**	**556,655**	**557,207**

4.1 Asset Management

56% of Transmission IPR program costs

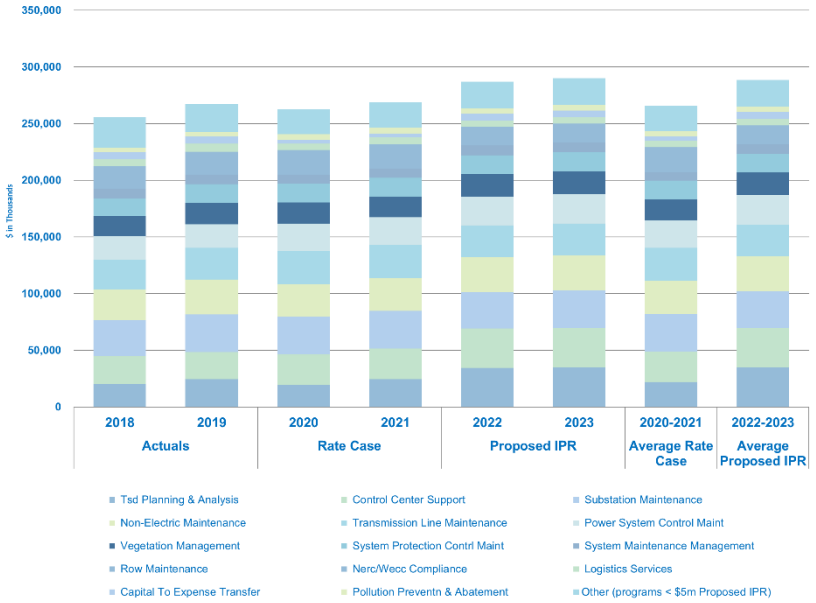


Figure 21 Transmission Asset Management, Expense Overview

Program cost details

Table 20 Transmission Asset Management, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Tsd Planning & Analysis	20,651	24,518	19,418	24,726	34,694	35,022	22,072	34,858
Control Center Support	24,147	24,144	26,877	26,877	34,588	34,882	26,877	34,735
Substation Maintenance	32,051	33,038	33,201	33,201	32,355	32,926	33,201	32,640
Non-Electric Maintenance	26,636	30,892	28,968	29,053	30,708	30,880	29,010	30,794
Transmission Line Maintenance	26,565	27,987	29,249	29,249	27,868	28,279	29,249	28,074
Power System Control Maint	20,662	20,836	24,290	24,290	25,696	26,076	24,290	25,886
Vegetation Management	18,112	18,709	18,499	18,499	19,796	19,846	18,499	19,821
System Protection Contrl Maint	15,239	16,485	16,477	16,477	16,548	16,916	16,477	16,732
System Maintenance Management	8,480	8,604	7,713	7,713	8,641	8,760	7,713	8,700
Row Maintenance	8,073	8,421	7,052	7,052	8,208	8,275	7,052	8,241
Nerc/Wecc Compliance	11,859	11,495	14,973	14,973	8,096	8,140	14,973	8,118
Logistics Services	6,188	7,165	5,671	5,843	5,847	5,902	5,757	5,874
Capital To Expense Transfer	6,179	6,599	3,328	3,328	5,846	5,846	3,328	5,846
Pollution Preventn & Abatement	4,290	3,778	4,957	5,081	4,779	4,896	5,019	4,838
Information Technology	11,663	12,307	10,881	10,963	3,972	4,037	10,922	4,004
Asset Mgmt Exec & Admin Svcs	0	0	0	0	3,454	3,482	0	3,468
Security Enhancements Expense	727	640	711	711	3,031	3,031	711	3,031

Table 20 Transmission Asset Management, Expense Detail, Continued								
($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Technical Training	2,897	2,637	2,669	2,669	2,915	2,960	2,669	2,938
Environmental Policy/Planning	1,228	1,234	1,639	1,668	2,838	2,935	1,654	2,887
Research & Development	5,099	3,274	2,838	2,857	2,752	2,794	2,847	2,773
Eng Line Rating	2,887	2,601	1,931	1,931	2,343	2,356	1,931	2,350
Aircraft Services	1,437	849	1,634	1,634	948	962	1,634	955
Asset Mgmt Enterprise Svcs	0	0	0	0	910	958	0	934
KSI Asset Management expense	740	272	0	0	71	72	0	71
Joint Cost Maintenance	301	263	1	1	46	47	1	47
Heavy Mobile Equipment Maint	55	588	0	0	0	0	0	0
Total	**256,165**	**267,334**	**262,974**	**268,795**	**286,951**	**290,281**	**265,884**	**288,616**

Table 21 Transmission Asset Management, Capital Detail

($thousands)	Proposed IPR		Capital Outyears							
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Transmission Asset Category	312,000	327,000	385,000	534,600	498,000	392,000	314,000	314,000	321,067	328,130
Other Asset Categories Within Transmission	105,780	118,990	110,000	36,410	54,920	53,630	57,540	58,250	60,660	53,170
Transmission Indirects	53,390	54,072	54,755	55,437	56,119	56,801	57,484	58,166	58,848	59,531
Corporate Indirects	46,765	47,052	48,187	49,316	50,428	51,572	52,737	53,861	54,958	56,039
PFIA	45,000	50,000	40,000	30,000	30,000	30,000	30,000	30,000	30,675	31,350
AFUDC	13,738	15,159	17,594	21,942	27,373	31,307	32,140	31,469	30,447	28,988
Capital Total	**576,673**	**612,273**	**655,536**	**727,705**	**716,840**	**615,310**	**543,901**	**545,746**	**556,655**	**557,208**

4.1.1 Capital

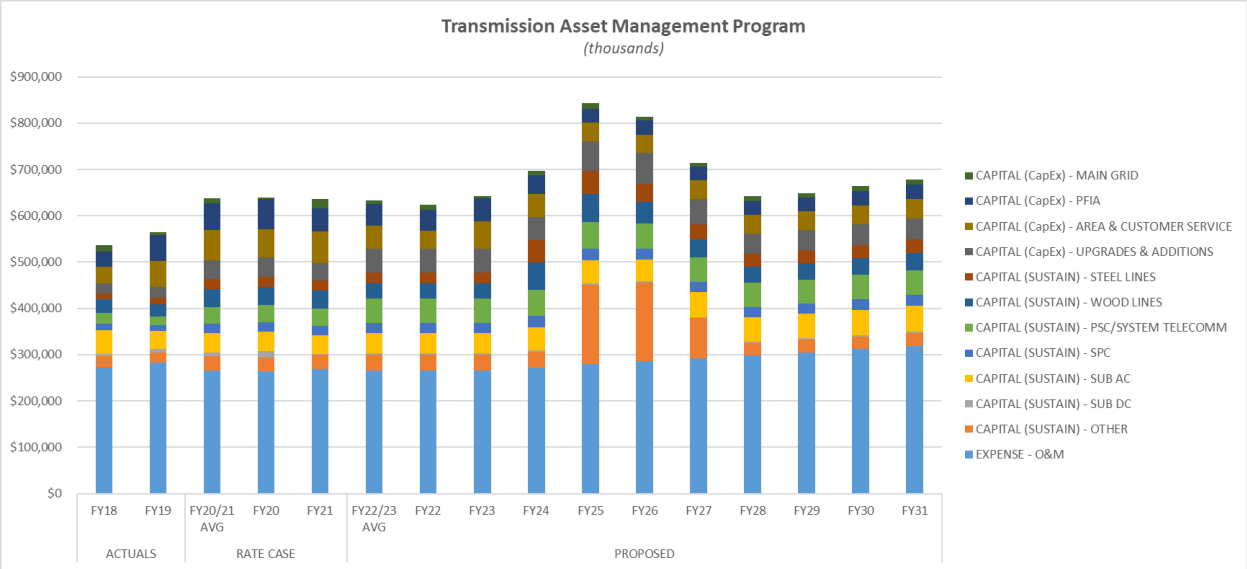


Figure 22 Transmission Asset Management Program

Program Cost Details

Table 22 Transmission Capital Detail

Program	Proposed IPR		Future Fiscal Years							
Capital Expand (CapEx)	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Main Grid	$10,000	$5,000	$10,000	$12,000	$8,000	$7,000	$10,000	$10,000	$10,225	$10,450
PFIA	$45,000	$50,000	$40,000	$30,000	$30,000	$30,000	$30,000	$30,000	$30,675	$31,350
Area and Customer service	$40,000	$60,000	$50,000	$40,000	$40,000	$40,000	$40,000	$40,000	$40,900	$41,800
Upgrades & Additions	$50,000	$50,000	$50,000	$64,000	$66,000	$55,000	$44,000	$44,000	$44,990	$45,980
Total Capital Expand	*$145,000*	*$165,000*	*$150,000*	*$146,000*	*$144,000*	*$132,000*	*$124,000*	*$124,000*	*$126,790*	*$129,580*
Capital Sustain										
Steel Lines	$24,000	$24,000	$49,000	$51,000	$39,000	$32,000	$28,000	$28,000	$28,630	$29,260
Wood Lines	$33,000	$33,000	$58,000	$60,000	$47,000	$39,000	$35,000	$35,000	$35,788	$36,575
PSC/System Telcomm	$53,000	$53,000	$57,000	$57,000	$54,000	$53,000	$52,000	$52,000	$53,170	$54,340
SPC	$21,000	$21,000	$25,000	$26,000	$24,000	$22,000	$22,000	$22,000	$22,495	$22,990
SUBS AC	$44,000	$44,000	$49,000	$49,000	$47,000	$54,000	$53,000	$53,000	$54,193	$55,385
SUBS DC	$3,000	$3,000	$3,000	$3,000	$2,000	$3,000	$3,000	$3,000	$3,068	$3,135
Other*	$34,000	$34,000	$34,000	$172,600	$171,000	$87,000	$27,000	$27,000	$27,608	$28,215
Total Capital Sustain	*$212,000*	*$212,000*	*$275,000*	*$418,600*	*$384,000*	*$290,000*	*$220,000*	*$220,000*	*$224,952*	*$229,900*
Total Capital	**$357,000**	**$377,000**	**$425,000**	**$564,600**	**$528,000**	**$422,000**	**$344,000**	**$344,000**	**$351,742**	**$359,480**

** Other: Access Roads, CC System Infrastructure, Land Rights, TEAP Tools, Line Ratings, Misc. Replacement Projects*

Description

Transmission Services manages nearly $5 billion in net book value of assets for substation, transmission line, and communication and control center infrastructure that is critical to the Northwest economy. This remarkable engine of the Northwest economy spans approximately 300,000 square miles and includes more than 15,000 circuit miles of transmission lines, 3,500 miles of fiber, approximately 300 substations, 732 telecommunication facilities, and two control centers.

These assets deliver electric power, directly or indirectly, to a population of more than 12 million through four main product categories: Ancillary Services, Generator Interconnection/Integration (GI), Network Transmission (NT), and Point-to-Point (PTP).

BPA's Transmission business will focus on integrated replacement and maintenance decision-making with explicit consideration of risk and criticality in order to achieve objectives on asset performance, cost and risk over the next 10 years. Specific asset replacement decisions will be informed by asset health and criticality information that was not readily available in the past. Additional consideration will be given to asset life extension, run-to-failure (when applicable) and maintenance strategy options to reduce costs where practicable. Maintenance practices will advance to free up resources to complete more replacement and expansion work as needed.

Transmission system expansion due to compliance needs and customer-driven interconnections that serve renewable generation and large load requests (e.g. data centers) are on the horizon and anticipated to require system reinforcement needs. When feasible, Transmission partners with local utilities to implement non-wires solutions to mitigate these demands through technology alternatives such as power flow control devices, capacitor banks, and other tools.

Transmission will continue to refine its 10-year capital forecast by maturing asset management capabilities and streamlining how decision-making can improve across the asset life-cycle to bring efficiencies and opportunities for greater savings. Transmission will provide transparency to the capital investment plans and methodologies throughout the IPR process.

Program objectives in 2022 and 2023

Long-Term Objectives

Objective 1: Risk based Planning & Prioritization

Under BPA strategic plan objective 2a (Administer an industry-leading asset management program) Transmission will continue to follow its Strategic Asset Management Plan (SAMP), which implies that understanding asset criticality, health and risk (CHR) is the widely accepted best practice for planning and prioritizing investments including maintenance and capital. Standing up CHR as a cross-functional output for decision-making tangibly improves all areas of the current state asset management maturity model. CHR allows incorporation of risk-based planning, which goes beyond prioritizing investments - it also addresses the risk mitigation alternatives that deliver the best risk-spend efficiency.

Objective 2: Financial Effectiveness

Transmission is applying best-practice industry standards to manage the life-cycle costs of Transmission assets. This is central to maintaining the long-term reliability, safety, and value of the power and transmission systems. Understanding how existing standards, processes and policies influence the cost of delivering transmission service and the corresponding asset-life-cycle costs, brings opportunities for savings.

Asset Management Program Plan/SAMP Alignment

Transmission Business Model - Focus	Strategic Asset Management Plan - Goals	Agency Strategic Plan
➢ **Infrastructure** ➢ **Advanced Situational Awareness** ➢ **Right-sized Investments** ➢ **Value and Risk-Based Asset Management**	➢ Develop asset strategies and plans that are informed by asset condition, criticality and risk. ➢ Manage life-cycle costs to inform investment decisions based on best value and perform alternatives analyses that also consider total life-cycle costs coupled with CHR and economic analysis. ➢ Partner with agency enterprise architect to align related processes and systems.	**Objective 1a**: Improve cost-management discipline **Objective 1b:** Build financial resiliency **Objective 2a:** Administer an industry leading asset management program that takes into consideration **Objective 2b:** Modernize federal power and transmission system operations and supporting technology **Objective 4a:** Address load service requests by using flexible, scalable and efficient solutions
Long-Term Viability ➢ **Integrated & Efficient Processes** ➢ **Data-Driven Decision Making** ➢ **Innovation & Continuous Improvement**	➢ Develop and implement criticality, health, and risk criteria to inform how much maintenance should be done on a given asset, when investment decision should be taken, prioritizing highest value assets for an investment decision that considers all risk dimensions. ➢ Develop agency performance metrics that understands asset investments and impacts to agency objectives; including net-carbon as an example	**Objective 1a**: Improve cost-management discipline **Objective 1b:** Build financial resiliency **Objective 2a:** Administer an industry leading asset management program **Objective 2b:** Modernize federal power and transmission system operations and supporting technology **Objective 4a:** Address load service requests by using flexible, scalable and efficient solutions **Objective 4b:** Develop and implement policies, pricing and procedures for regional planning that incentivize grid optimization

Benefits of Proposed Spending Level

The table under the Program Cost Details section (Table 21) is a summary of Transmission's capital proposed IPR spending levels. O&M expense costs will reflect modest, prudent investments in FY 2022 and FY 2023. While the Vancouver Control Center (VCC) project is not yet approved, capital budget estimates are included in the Upgrades & Additions line item for expand and in other line items for sustain. BPA has included VCC costs in our proposed capital spending levels because significant investment in our control center infrastructure is the most likely outcome. The VCC costs are approximately $2.5 million in FY 2020 and $15 million in FY 2021. If the project is approved, expected reprioritization in other programs due to human resource limitations will likely enable Transmission to fund the first two years (FY 2020-2021) of VCC development without requesting additional capital authorization. The capital funding for the Transmission Asset Category included in this IPR for VCC is $148.6 million in FY 2025, $144 million in FY 2026, and $70 million in FY 2027.

The Dittmer Control Center in Vancouver, Washington was constructed in 1974. At the time, it offered state-of-the-art capabilities for BPA and the utility industry. In the forty-five years since construction, BPA has made substantial investments to ensure the operational viability of the control center. However, the current control center configuration is constrained by three major factors: Life Safety Deficiencies, Physical/Information Security Control Deficiencies, and Strategic/Operational Limitations. The VCC project will implement a modern control center for BPA with the necessary continuity, security and technology capabilities to support its critical functions through an all hazards event, with flexibility for future growth and market opportunities. This project will address both the Grid Modernization requirements and the current physical infrastructure obsolescence issues of the existing control center. The primary model under evaluation is construction of a new, 149,000 sq. ft., purpose-built, seismically resilient, and, furnished Control Center on the 331,000 sq. ft. footprint of two other Ross Complex buildings currently due for replacement. This investment replaces and optimizes the critical business functions and operations currently conducted in the Dittmer Control Center. BPA is evaluating potential alternatives to proceed with the best value for the Region, including status quo or retaining the Dittmer Control Center location and refurbishing it to meet as many project goals as possible, minimizing risk to collocated operations and given the physical limitations of the building. The investment will be required to insure the reliability and resilience of the BPA Transmission system for the near and distant future.

Scoping and design dollars are included in the FY 2020 and FY 2021 numbers for upgrading the Ross Complex electrical station service in order to sufficiently serve the proposed new VCC. The construction dollars associated with the station service project are included in FY 2022 and FY 2023 as placeholders. BPA's financial participation in Midway-Ashe is included, assuming $8 million spend in each of the following fiscal years: FY 2020, FY 2021 and FY 2022. The proposed Grand Coulee 230-kV switchyard modernization effort is included starting in FY 2021's budget but significant investment beyond the 230-kV current-limiting reactor is not expected to occur until FY 2022 or later. Transmission's share of investment in Grid Modernization projects such as the federal generation high-side metering additions are also included.

At this time BPA's financial participation in the proposed Boardman to Hemingway (B2H) transmission line is not included. Although studies and negotiations continue, BPA has not committed to funding its portion of the costs involved in building the nearly 300-mile long 500-kV transmission line; nor has BPA agreed to asset or capacity exchanges with other transmission owners and providers.

If Transmission must adjust budgets to accommodate B2H or any other large project, other program budgets and execution rates would be affected and updates and tradeoffs would be reflected in future investment planning. Irrespective of budgets, if the VCC project is approved, Transmission will substantially defer other projects and programs as required to focus limited human resources on VCC.

Modestly increased funding will maintain BPA's capacity to perform maintenance in its five core asset management-related service areas: substation maintenance, transmission line maintenance, system protection control maintenance, power system control maintenance, and substation operations.

4.1.2 Expense

Description

A robust asset management strategy and a system maintenance plan are essential for BPA to meet its responsibility to serve the majority of the Northwest region's high-voltage needs. BPA's strategy covers the primary asset programs including:

- Alternating current substations.
- Direct current substations.
- Control centers.
- Power system control.
- System telecommunications.
- System protections control.
- Rights-of-way.
- Wood poles.
- Steel lines.

The assets within these programs deliver electric power to more than 12 million people through Transmission service, regional utilities, generation and line and load interconnections, interregional transfers of capacity and energy, and ancillary services such as regulation and load following services.

Control Center Support provides full life-cycle support of control-center assets used for the secure and reliable operation and control of the interconnected transmission system. Support activities include:

- Program and project management.
- Planning.
- Architecture and engineering.

- Design and build.
- Operations and maintenance of control center assets, including software applications, systems and associated infrastructure.

This subprogram provides necessary control-center implementation, support, and regulatory compliance with cyber security and reliability standards.

Non-electric facilities maintenance is responsible for maintaining buildings, sites and systems that support the functionality of BPA's transmission system. Power system control maintenance maintains crucial transmission system fiber optic and telecommunications assets, remedial action schemes, supervisory control and data acquisition and telemetering equipment. Power system control responsibilities include more than 11,000 pieces of equipment at 732 sites. Transmission line maintenance maintains and repairs BPA's network of overhead transmission lines and transmission line structures and fixtures including steel and aluminum lattice tower, wood poles and associated structures, insulators, insulator assemblies, overhead conductors and devices, fiber optic cable assemblies, obstruction warning devices, and roads and trails.

Transmission system development planning and analysis provides technical support and asset planning for the transmission infrastructure consistent with objective 2a, Administer an industry-leading asset management program as identified in BPA's strategic plan.

Program objectives in 2022 and 2023

Transmission Services' asset management maintenance programs continue to prioritize safety and occupational health to empower employees and contractors to recognize and address safety issues. Emergency maintenance maintains overall system reliability requirements and ensures public safety. Preventative maintenance on the BPA transmission system will provide reliable and sustainable assets that meet current and future agency needs, ensuring that performance condition standards comply with applicable regulations while minimizing life-cycle costs.

Impacts of proposed spending level

Transmission Services' asset management program proposed spending levels will avoid significant risks. The asset management program aligns with BPA's strategic plan, with proposed spending levels focused on sustaining optimal asset performance and right-sizing program funding levels to ensure reliability and to meet customer needs. Improvements in Transmission's asset-management capabilities will allow for the optimizing of maintenance intervals and inform best value decision-making across the asset life-cycle based upon a designed level of reliability and asset value. Integration of best-value decisions between capital and maintenance continues to be developed for financial effectiveness by allowing for new ways of looking at BPA investments and how best to mitigate risk(s) across the system.

Modest increases in Transmission asset management expense funding above BP-20 levels are expected to minimize significant funding gaps that would have reduced BPA's capacity to perform preventative maintenance and process improvements.

The Transmission asset maintenance program was able to absorb the expense funding levels set in the 2018 IPR by implementing the Asset Management and Cost Management strategies that have now seen two years of maturity. These initiatives are showing signs of success and additional significant reductions may place their long-term success at risk, and endanger our ability to resource core work. Without making modest funding increases, other core programs such as vegetation management and access-road maintenance, would be significantly underfunded.

The criticality, health and risk (CHR) initiative and maturation of the Institute of Asset Management competencies, including reliability engineering, will continue to inform the spending levels and allocation of resources. Reliability engineering consists of systematic application of engineering principles and techniques throughout the asset lifecycle to ensure that a system or device has the ability to perform a required function under given conditions for a given time interval.

The CHR initiative provides a disciplined systematic risk assessment for all Transmission assets. Transmission continues to add assets to the pool for CHR analysis to aid in refined investment decision-making but is currently not limited to those that are in a single system, an example being control center assets. Asset health is a direct function of asset condition, and the failure modes/failure recording and survival analysis allows for measuring asset performance across a hierarchy of scales between a specific location and a portfolio of assets. These health scores are coupled with the asset's criticality – measured across five risk dimensions – safety, financial, compliance, environmental and reliability – and allows investment decisions from strategic to operational to be data driven and risk informed. These decisions include prioritization of maintenance and capital as well as the investment and alternatives required to mitigate risks. This allows for right sized investments to marry with aging infrastructure that is optimized to the individual location level.

Significant new demands are being placed on the asset management program to deliver on the agency strategic plan, including modernization of assets and system operations within BPA's two control centers, as well as inflationary pressures of ongoing maintenance and operations. Several critical improvement program areas include Grid Modernization, Mission Critical Information Technology, Telecommunications Strategy, and Cyber Security and Compliance. Funding at less than the proposed levels would:

- Reduce capacity to perform critical maintenance in the control centers and the field.
- Create CHR implications.
- Result in needed cyber security improvements.
- Delay capital projects with expense components.
- Defer modernization efforts intended to reduce technical gaps.
- Increase overall system risk.

The proposed spending level is expected to provide sufficient resources to perform core maintenance, workplace safety and strategy-driven process improvements.

The continuity of BPA's core asset maintenance areas are funded, including:

- Substation maintenance.
- Transmission line maintenance.
- System protection control maintenance.
- Power system control maintenance.
- Substation operations and vegetation management.

WECC standards and safety are primary components of the maintenance program. Avoidance of backlogging lower-priority work is also funded, whereby the future costs of maintaining the transmission grid are assessed in accordance with CHR.

While inflationary pressures for staff will absorb the majority of the increase in the proposed funding levels, greater efficiency is expected from each maintenance dollar spent as a result of the asset management and cost management strategies that have now seen two years of maturity.

4.2 Commercial Activities

11% of Transmission IPR program costs

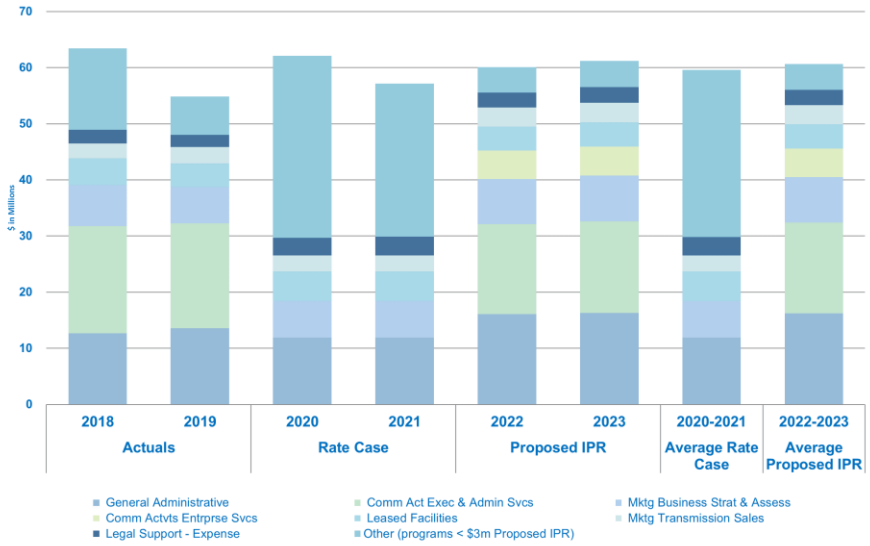


Figure 23 Transmission Commercial Activites, Expense Overview

Program cost details

Table 23 Transmission Commercial Activities, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
General Administrative	12,658	13,540	11,913	11,913	16,069	16,314	11,913	16,192
Comm Act Exec & Admin Svcs	19,128	18,743	19,452	14,180	14,521	14,774	16,816	14,648
Business Strategy and Assessment	7,321	6,473	6,541	6,565	8,018	8,150	6,553	8,084
Comm Actvts Entrprse Svcs	0	0	0	0	5,045	5,171	0	5,108
Leased Facilities	4,715	4,188	5,220	5,220	4,296	4,296	5,220	4,296
Transmission Sales	2,677	2,875	2,864	2,864	3,402	3,483	2,864	3,443
Legal support	2,411	2,205	3,166	3,294	2,638	2,783	3,230	2,711
Contract Management	3,766	3,244	3,711	3,793	2,139	2,182	3,752	2,161
Sched-Reservations	1,029	813	1,253	1,253	934	954	1,253	944
Transmission Billing	2,036	2,362	2,719	2,816	907	939	2,767	923
Reliability Demand Response/Redispatch	4,519	207	5,156	5,156	298	305	5,156	301
Non-Between Business Line Ancillary Services	227	191	81	81	268	268	81	268
Settlement Agreements	2,965	31	3	3	1	1	3	1
Total	**63,451**	**54,872**	**62,078**	**57,136**	**58,537**	**59,620**	**59,607**	**59,078**

Description

The Transmission Commercial Program Plan (CommPP) provides direction to standardize and streamline products, rules and strategies to satisfy BPA's commercial objectives and customer needs. The CommPP strives to optimize current and future opportunities and efficiencies to support more than 300 customers, resulting in average annual revenues of $1.1 billion.

The CommPP has four objectives, described below, that outline a broad set of activities and targets that encompass all aspects of the commercial function. These objectives cover three types of work:

- Core work, such as contract administration, billing, rate and tariff development.
- Efficiency work, such as initiatives to improve the quality or speed of transactions.
- Strategy work, which includes work to support Grid Modernazation and potential participation in the Western Energy Imbalance Market.

The Commercial Activities Program also funds a broad range of administrative activities that support the internal operations of the Transmission business line such as:

- The Student Training Program.
- Hourly Firm, Short Term Availability Transfer Capability, General and Administrative costs.
- Chief of Staff staffing.
- Non-between business line ancillary costs that support the balancing reserves purchased through a third party.

Included in this program is a reduction target to offset Transmission's portion of the IT increase as explained in the Enterprise Services Program Plan. Decisions for achieving this reduction are tracked in the Commercial Program Plan.

The CommPP's first objective, entitled "Design and Offer High Quality Services," focuses on using market analysis and customer input to develop, define and deploy improvements to our product and service offering. This program considers opportunities across both long-term and short-term transmission service as well as interconnection service, including line and load requests.

The second objective, entitled "Align Service Performance Expectations," focuses on the performance of BPA's commercial processes and systems. Not only should the commercial processes and systems be clear and transparent to customers, but they must also align with BPA's open access tariff, its rate schedule and any other regulatory guidance, such as that from NAESB, NERC, WECC and CAISO.

The third objective, entitled "Capture Revenue and Mitigate Commercial Risk," focuses on a few different areas that tie together. Improvements to short-term and long-term market inventory calculations as well as improved forecasting of existing long-term rights will inform the development of updated revenue targets which will then be captured through accurate billing. Transmission's current average annual revenues are around $1.1 billion, with monthly billing of just over $700 million. In the previous fiscal year, BPA issued on average 516 bills a month, utilizing more than 550 billing determinants. BPA Transmission also manages more than 2,744 transmission service contracts that enable more than 30,000 transmission service requests and more than 200,000 tags processed each month through our commercial systems. In addition, on average, there are about 800 new contracts per year for non-transmission services, such as reimbursables, generator interconnection, etc. BPA recognizes the importance of effective contract administration, robust commercial systems to support market transactions, and accurate and efficient

billing to support customer business models and maximize efficiencies within BPA. This objective also includes consistently delivering on our commitments in the Network Integration Transmission Service (NT) Dialogue process.

The fourth and final objective, entitled "Manage the Business Interfaces with Customers," focuses on managing business relationships with our customers. This includes our account executives as well as the digital interface for customers to conduct their day-to-day business with BPA. From accessing bills to study results to contracts, customers will be able to access their information consistently and closer to real time. Leveraging the agency enterprise portal initiative, Transmission will have an opportunity to better organize information used by customers to evaluate and analyze their business with BPA.

Program objectives in 2022 and 2023

The major projects of this CommPP, as well as the core work for the organizations supporting the CommPP, align with BPA's strategic goals to meet transmission customer needs and sustain financial strength. In addition to aligning with the agency's strategic goals, the CommPP has taken into consideration how it will interface, influence or be influenced by major agency initiatives such as the Western Energy Imbalance Market decision process and other Grid Modernization projects. For example, BPA commenced its BP-22 pre-rate case workshops earlier than usual to better engage and prepare customers ahead of the next series of EIM, rate, and tariff decisions.

BPA is evaluating how its commercial services and products are supported across the agency. This action will identify opportunities for efficiencies and ensure that those services and products are delivered with the highest level of customer service and quality control. As part of the TC-20 settlement, BPA collaborated with customers to provide commercial activity solutions that align with BPA's needs and customers' business strategies. This allows for a collaborative, phased approach toward a product that is based on business model data.

A key effort in fiscal year 2020 is to evaluate various customer transactions and analyze for efficiencies in both BPA labor as well as time that customers can expect response or resolution. For example, we determined that to support a new interconnection request for generation, there are at least 28 distinct touch points between BPA staff and the customer that take at least 14 organizations from across the agency to support. This analysis does not include the number of shared support staff office exchanges required to support the process and offers insight into the complexities and challenges of just this one type of transaction.

Such examples demonstrate why the CommPP will continue to rely on successful coordination across Transmission, to meet evolving customer expectations.

Impacts of proposed spending level

The current work in the commercial activities program is intended to improve business processes and efficiencies. BPA is proposing spending levels that will ensure that BPA staff, systems and processes can continue to identify and effect efficiencies as a result of the suite of Grid Modernization and Agency Enterprise Portal (website) deliverables as well as ensure that it is fully prepared to assist the region into the Western EIM should BPA make that decision. BPA feels that the modest investments under these initial spending levels will create both short-term and long-term benefits through policy clarity, system and process efficiencies, and maximizing revenues.

The proposed spending levels support the new long-term available transmission capacity and study process initiatives. Such initiatives will provide customers with a timely response to transmission

requests, develop service plans tailored to a customer's specific needs and align BPA practices with the pro forma tariff and industry standards. These initiatives will also support optimization of use of the existing system through risk-informed study assumptions, improved management of conditional firm and identifying non-wires solutions as a means to provide a more flexible, scalable and cost-effective result in response to customer needs.

There are a number of risks and trade-offs to be aware of if BPA were not to make these investments. While these risks may not all be directly tied to a specific commercial activity, they have been identified as potentially having an indirect impact on commercial activities and operations. The recent work with customers on the hourly firm market as a result of the TC-20 settlement has created greater awareness and transparency as to how different non-commercial functions across Transmission can impact commercial markets.

The ability to run the commercial markets optimally relies on many factors outside of the typically defined commercial function. Impacts to functions such as outage management, our field offices ensuring equipment is properly maintained, and back office capabilities to stand up new functions to support future market participation, can create unforeseen impacts to the commercial function and resultant revenues and customer service levels.

To provide greater clarity on the risks of lower spending levels than proposed, BPA has identified the following areas that, without investment, could impact commercial capabilities.

Engineering and Technical Services

- Any impacts to the sustain program could impact customer satisfaction as related to outage management, associated improvements to 3rd party facility ratings and dynamics through regional offices and possible impact to schedules.
- If the sustain program is associated with improvements to sub-grid constraints, that may impact potential revenues associated with capacity requests.

Field Services

- High risk associated with supplemental labor could potentially impact reimbursable projects and other wrench-turning hours that support customer-related projects, outage management. Increase in maintenance backlog and asset reliability may degrade operational capacity of short-term/real-time markets which may impact customer satisfaction.
- Increases in unplanned outages due to cutbacks in vegetation management could have a varying degree of impacts to commercial markets. Customer awareness around outages, both planned and unplanned and resultant impacts to commercial markets have increased over the last year with the implementation of the managed hourly firm market as a result of the TC-20 settlement.

System Operations

- Inability to expand this function poses risk to execution of Grid Modernization. Grid Modernization functionality is essential if BPA decides to join the Western EIM. Without the proposed levels of investment in Grid Modernization functionality, improvements and efficiencies to everyday operations may not be realized.
- Reduction in supplemental labor creates risk to administrative requirements associated with business conditions, particularly notable given the potential transition to the Western EIM.

- Reduction in study capability creates risk to maximizing revenues. While studies require a degree of investment, the resultant revenue opportunities typically return more than that investment.

Planning

- Inability to appropriately staff could have a significant impact to future customer service capabilities related to heat maps and other tools that allow customers to assess long-term business.
- Inability to respond timely to technical issues impacting Line and Load and Generation Interconnection requests.
- Inability to appropriately staff could have a significant impact to facility ratings and any associated compliance issues could result in unplanned direct and indirect costs.
- Reduction to supplemental labor risks ability to maximize Fiber and Wireless programs which will continue to develop as a revenue stream.
- Any slowdown to the Commercial Activities plan and Asset Management could impact customer satisfaction and jeopardize long-term revenues.

Tariff, Revenue, Sales and Marketing

- Many staff positions are already filled as "single point of failure." Examples include:
    - Fifteen account executives (fourteen active) that service over 300 customers covering a six state territory.
    - Eleven account specialists that process over 2,700 contract actions a year.
    - One product manager each to manage Network and Point-to-Point products, including process improvements and customer-requested workshops and engagements.
    - One staff to manage the Business Practice process and implementation.
    - One staff with senior level understanding of EIM charge codes.
- Positions vacated through retirements and voluntary attrition could be repurposed to meet new duties (e.g. EIM settlements function) but would mean reducing quality control and increasing transaction time in the areas of attrition.
    - Workload would need to be prioritized to core work with limited ability to engage further on efficiency, strategic initiatives or other customer-requested engagements.
- BPA could reduce travel and training, with the risk that this will reduce BPA's preparation for a potential EIM execution; impact BPA's leadership role at national standards organizations, including NAESB, and limit the ability of Account Executives and other customer-facing staff to work with customers in person.

Technology Services

- Reduction in supplemental labor poses a risk to the ability to implement Grid Modernization.
- Potential impacts to cyber security and reliability/compliance could create unforeseen risks to the broader grid and impact commercial markets.

In summary, funding levels lower than proposed in the commercial activities program would limit the degree of benefits for both customers and BPA. The proposed spending levels are in line with inflation and allows customers to be given the data to make choices of services and placement of generation, and

other data driven transparency that was not afforded before. These proposed spending levels also allow BPA to be prepared to enter the Western EIM. Without this investment, BPA risks not being ready to implement the Western EIM's settlements function and other system needs. Funding levels less than proposed would also limit the ability to implement any changes in Open Access Technology International or the customer portal, and would result in CFTE and BFTE reductions that support customer functions and customer engagement. These proposed initial spending levels will allow the commercial activities to support changes to the commercial systems, the customer portal, and will provide continued support of the customer engagement processes.

4.3 Operations

13% of Transmission IPR program costs

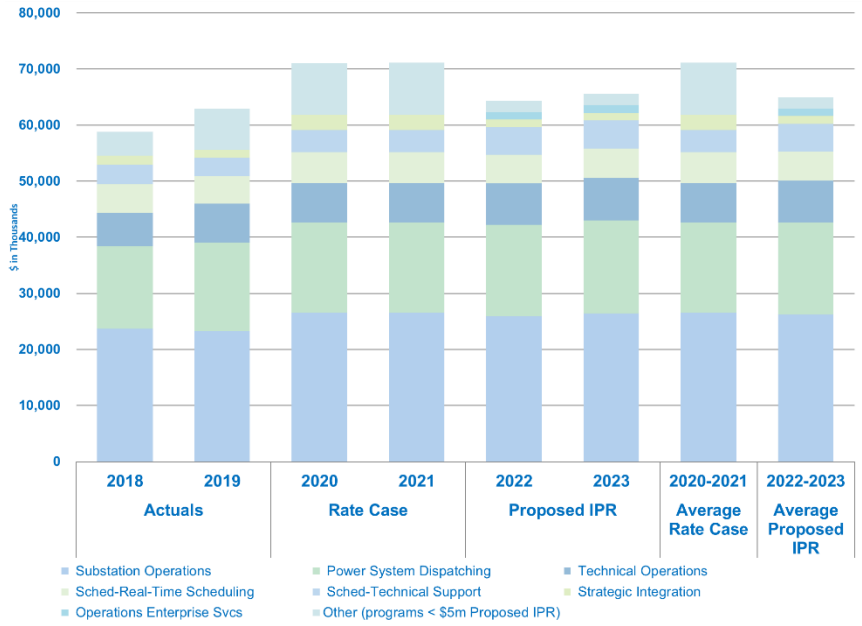


Figure 24 Transmission Operations, Expense Overview

Program cost details

Table 24 Transmission Operations, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Substation Operations	23,673	23,309	26,521	26,521	25,917	26,445	26,521	26,181
Power System Dispatching	14,705	15,775	16,130	16,130	16,273	16,590	16,130	16,431
Technical Operations	5,984	6,930	7,032	7,032	7,401	7,547	7,032	7,474
Real-time scheduling	5,062	4,906	5,536	5,536	5,161	5,274	5,536	5,217
Technical support	3,452	3,281	3,899	3,899	4,899	5,004	3,899	4,952
Strategic Integration	1,694	1,389	2,735	2,786	1,340	1,352	2,760	1,346
Operations Enterprise Svcs	0	0	0	0	1,319	1,368	0	1,343
Grid Modernization	3,577	7,010	8,374	8,375	1,261	1,290	8,375	1,277
Transmission System Operator	347	136	402	402	261	265	402	263
Operations Exec & Admin Svcs	0	0	0	0	170	175	0	172
Scheduling after-the-fact	158	136	202	202	144	147	202	146
Pre-scheduling	134	54	267	267	138	141	267	139
Total	**58,786**	**62,926**	**71,098**	**71,150**	**64,284**	**65,598**	**71,124**	**64,941**

Description

The Operations program is comprised of 11 subprograms: executive and administrative services, power system dispatching, pre-scheduling, real-time scheduling, scheduling after-the-fact, strategy integration, substation operations, technical operations, technical support, grid modernization and the transmission system operator program. These programs fully support the core components of the BPA 2018–2023 Strategic Plan by enhancing the safe and reliable delivery of power to BPA's customers.

Power system dispatching provides for the operation and management of two regional control centers providing dispatch and control services. As the balancing authority and transmission operator, this program monitors and manages the integrated power system to ensure safe, reliable and compliant operations, including the direction of real-time actions during normal, planned and emergency conditions. This program also provides outage coordination for internal BPA and external stakeholders and provides training programs to maintain NERC-certified dispatch staff.

Technical Operations develops and manages all near-term system operating limits and total transfer capabilities to support the safe, reliable and open-access operation of the transmission system. Technical Operations also provides operating and mitigation plans for all system conditions to support real-time operation of the interconnected system. The subprogram provides technical support for planned outages, remedial action schemes, automatic generation control, balancing authority operations, renewable resource integration, and disturbance and event monitoring and reporting.

Substation Operations supports the continuity of operations through work standards; control of energized access, including physical, and cyber-security requirements impacting system reliability and safety.

Program objectives in 2022 and 2023

Power System Dispatch will continue to reliably dispatch the power system by providing service to BPA's customers, providing interregional interconnections, improving substation operations continuity and maintaining electrical reliability. Technical Operations program funding will ensure that the Operations Program performs the studies to verify the system can be operated reliably for overall visibility of the bulk electric system and maintain public safety. The program objectives include regulatory requirements and training to implement current and emerging NERC and federal cyber-security requirements, along with required training. Operations will support Grid Modernization projects in the rate period, proceeding according to the Grid Modernization Roadmap, and will include work such as the Real-Time Operations Modernization, Automated Operations Planning and Reliability Assessments, Outage Management System, Short-Term Available Transfer Capability, Network Model, AGC Modernization and Energy Imbalance Market-supporting projects.

Impacts of proposed spending level

The proposed spending levels mitigate a number of risks. Without this level of funding, BPA would absorb wage and other sources of inflation through several mitigation efforts that would increase Transmission's risks. These mitigation efforts in the Transmission Operations program would include delayed hiring, leaving positions vacant to balance wage inflation. It would also result in risk to Grid Modernization projects schedule delivery.

Contractor support positions would be much reduced, hampering engineering knowledge transfer, administrative support and business analytics. These functions would shift onto other personnel, reducing their applied hours of expertise in their field. Finally, contracted engineering studies by technical operations would be reduced to the lowest possible level, limiting the system states that could be studied through the technical operations staff. Cutting studies could result in increased conservatism or built-in margins of error, reducing transmission flexibility.

The proposed spending levels would avoid these risks, as well as sustain existing efforts in the Operations program that increase efficiency by prioritizing work, planning demand, and flattening management structure to help absorb upward cost pressures.

4.4 Enterprise Services G&A

20% of Transmission IPR program costs

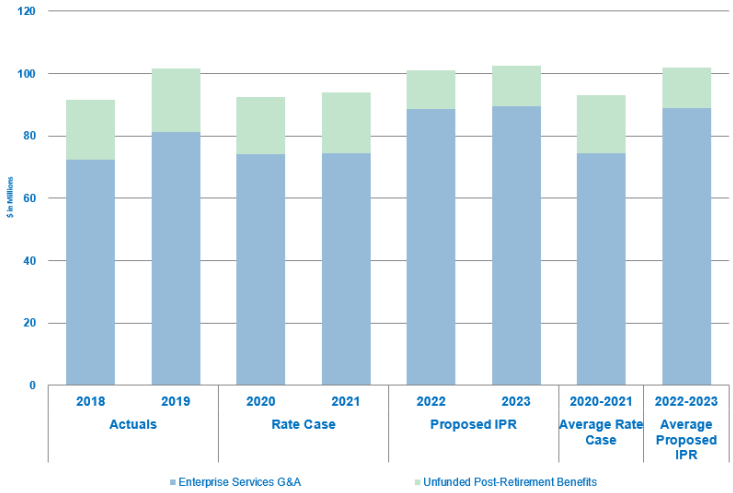


Figure 25 Transmission Enterprise Services G&A Overview

Table 25 Transmission Enterprise Services G&A

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Enterprise Services' G&A Allocations	72,384	81,413	74,090	74,591	88,521	89,651	74,341	89,086
Post-retirement benefits	19,368	20,210	18,438	19,293	12,607	12,952	18,866	12,779
Total	**91,752**	**101,622**	**92,528**	**93,884**	**101,128**	**102,602**	**93,206**	**101,865**

Description

Enterprise Services G&A, referred to as internal support in the 2018 IPR, consists of two components: additional post-retirement benefits contributions and Transmission's share of G&A. Enterprise Services is included in both the power and transmission revenue requirements. Since the program is the same for each business unit, the full narrative is captured in Power Services, section 3.5.

5 Enterprise Services

Enterprise Services is a program plan within BPA's business management infrastructure framework and consists of the departments located within Corporate and the Chief Administrative Office. All of the Enterprise Services' costs are reflected in Power and Transmission collectively, either as an allocation or direct charge. The cross-departmental view provided by the program plans empowers Enterprise Services to better understand, anticipate, prepare for, and respond to programmatic demands.

The mission of Enterprise Services is to enable BPA to meet its objectives and initiatives by delivering high quality essential services through the following core functions:

- Administer a safety program that provides a safe workplace for all BPA employees.
- Maintain comprehensive regulatory compliance that reasonably assures compliance with laws and regulations.
- Provide legal expertise and representation.
- Provide leadership and services to meet commitments in the financial plan.
- Fostering support, knowledge, and awareness of BPA's activities, achievement, and value to the Pacific Northwest.
- Develop, engage and empower a talented and diverse workforce to meet BPA's regional commitments.
- Provide strategic direction so that BPA can modernize its systems and processes in order to remain competitive.
- Provide the equipment and materials for BPA staff to complete their work.
- Provide customer support services.

The figure below shows each function within Enterprise Services, and their percent of the total average proposed spending levels.

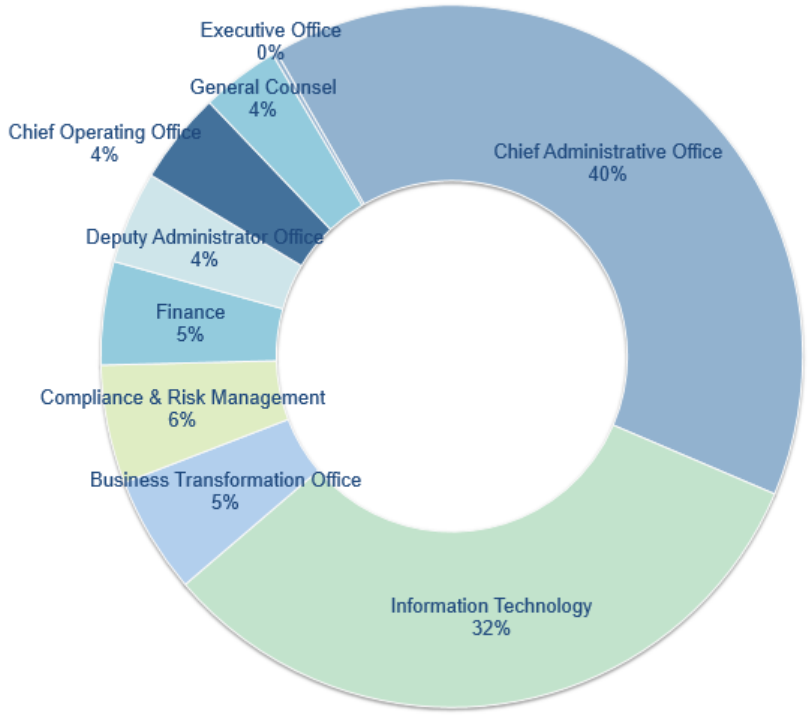


Figure 26 Enterprise Services Expense Summary by Department

The table below shows the Enterpriese Services expenses, and reflects the actuals for FY 2018 and FY 2019, the final spending levels for the BP-20 rate period, and the proposed spending levels for the BP-22 rate period.

Table 26 Enterprise Services Expense Summary

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020-2021	2022-2023
Information Technology	88,377	96,415	83,220	84,251	100,746	101,241	83,736	100,994
Workplace Services	47,173	52,225	52,038	52,223	51,155	51,354	52,130	51,254
Supply Chain Services	34,850	34,648	37,706	38,490	38,098	38,098	38,098	38,098
Human Resources Service Center	14,175	14,691	16,647	16,955	16,378	16,699	16,801	16,539
Security & Continuity Of Ops	10,706	11,536	10,399	10,490	11,996	12,119	10,445	12,058
Safety	7,157	5,818	6,712	6,836	6,329	6,475	6,774	6,402
Program Management Office	2,800	3,152	4,617	2,094	3,214	3,292	3,356	3,253
Undistributed Reduction	0	0	0	0	-3,400	-3,400	0	-3,400
Chief Administrative Office Subtotal	**205,238**	**218,485**	**211,339**	**211,339**	**224,516**	**225,878**	**211,340**	**225,198**
Business Transformation Office	9,010	11,864	17,065	17,168	16,835	16,938	17,117	16,887
Compliance & Risk Management	15,992	16,562	17,464	17,976	16,804	17,316	17,720	17,060
Finance	15,496	14,921	15,451	15,975	14,833	14,833	15,713	14,833
Deputy Administrator Office	18,629	14,267	13,558	13,880	13,178	13,479	13,719	13,329
Chief Operating Office	11,237	11,464	13,633	14,067	13,033	13,467	13,850	13,250
General Counsel	10,593	10,409	11,570	11,998	11,274	11,274	11,784	11,274
Administrator	761	576	944	968	607	619	956	613
Enterprise Services' Total	**286,958**	**298,548**	**301,025**	**303,372**	**311,081**	**313,804**	**302,199**	**312,442**

Table 27 Enterprise Services Capital Summary

($thousands)	Proposed IPR		Capital Outyears							
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Facilities	74,200	88,200	78,300	4,300	22,500	23,000	25,700	25,600	27,800	21,100
IT	19,928	19,828	19,028	18,428	16,728	20,474	20,938	21,417	21,899	22,381
Fleet	10,000	12,000	14,000	14,200	14,200	14,400	14,400	14,200	14,200	14,200
Security	8,000	8,200	8,500	8,700	9,000	7,000	8,200	9,200	9,400	8,600
AFUDC	513	513	521	519	515	516	520	522	525	528
Capital Total	**112,641**	**128,741**	**120,349**	**46,147**	**62,943**	**65,390**	**69,758**	**70,939**	**73,824**	**66,809**

5.1 General Allocation of Enterprise Services Costs

Enterprise Services comprises the costs necessary to operate the agency and includes the core functions located within the Chief Administrative Office and Corporate. Enterprise Services' costs are reflected within the Power and Transmission revenue requirements that are used for setting rates. These costs are directly charged to a program within the business line if there is a direct connection, and the remaining costs are allocated using cost allocation pools. In FY 2020, an effort was led to enable the direct charge concept to be more widely applied, where before only some costs were direct charged and the remainder allocated. One of the goals is to achieve increased transparency to better enable cross-functional collaboration and planning with contributing Enterprise Services organizations in support of program plans. As the agency matures in this effort, allocated costs may decrease while direct charges increase.

5.1.1 Enterprise Services General Allocation Methodology

The cost allocation pools are collections of project costs from the Enterprise Services organizations, and are comprised of projects with similar cost allocation drivers. The drivers are used to determine the allocation rates. The makeup of the cost pools and project costs are reviewed biannually to accurately reflect cost causation and assess the continued relevance of the allocation rates. Organizations may charge into one or more cost pools, including the Power and Transmission Program Plans. The description of products and services provided by these organizations can be found in the individual organizations' summaries.

Allocation rates are set with the goal of making methodologies:

- Equitable and fair.
- Defensible in a rate-setting environment.
- Defensible with internal and external auditors.
- Cost-effective and practical to implement.
- Direct and simple, facilitating understanding and transparency.
- Used to develop rates that will be implemented and unchanged on an annual basis.

Costs can be allocated either evenly to Power and Transmission Services or based on specific cost drivers, such as level of effort and labor hours.

- Even allocations – traditional general and administrative (G&A) costs: Cost pools that serve the general purpose of BPA support functions and are split 50-50 to Power and Transmission.
    - No consistent, measurable method of assigning support costs directly to the benefactor.
    - Functions are general in nature and are not directly affected by changes in traditional cost drivers (e.g. federal employee and supplemental labor levels, budget levels, etc.).
    - Collection of costs or measurement of driver is cost prohibitive – it is uneconomical to

attempt more precise allocations.
    - Lack of causal relationship to benefactors prevents a clear distinction for assigning those costs.

- Directed allocation pools: Cost pools that can be distributed with more precision, based on specific cost drivers and are not split 50-50 to Power and Transmission.
    - Activities are managed and budgeted centrally, but methods exist to assign costs to benefactors.
    - Functions can be linked to cost drivers and can change based on those drivers. Direction of effort studies or other means can be used to allocate in a cost-effective manner.

Upon completion of the cost pool review, potential changes to allocations are presented to the Accounting Officer, the Chief Financial Officer and other relevant executives for review and approval. The approved allocations are then implemented in the IPR, used for the upcoming year's budgets and allocation of actual costs.

Power's Revenue Requirement includes the portion of Enterprise Services costs for Power and Fish & Wildlife within their IPR costs. Transmission's Revenue Requirement includes a portion of Enterprise Services costs within IPR program-costs, and a portion within IPR capital for the Enterprise Services capital overhead indirect allocation rate.

These Enterprise Services capital overhead and Transmission indirect allocation rates are also reviewed and evaluated for implementation in the IPR. However, BPA is planning to continue this review for implementation through the final close-out of the BP-22 IPR. BPA will reevaluate the model to ensure it aligns with industry best practices and ensure that it results in an equitable allocation of these costs.

Enterprise Services G&A allocation rates for the BP-22 Initial IPR are reflected in the summary table below. The capital overhead rates have not yet been determined and are subject to change.

Table 28 G&A Allocation Summary Information for BP-22

Cost Pool	Cost Pool	Costs included in the pool	Power	F&W	Transmission expense	Transmission capital
A – Equal Effort Cost Pool	Corporate Executive, Planning & Gov.	Regulatory affairs, executive, CAO management, strategic planning and internal audit.	40.5%	9.5%	27.5%	22.5%
	Finance	Accounting, budgeting, forecasting, accounts payable, payroll, financial reporting, treasury, rates support, capital management, financial liaisons	40.5%	9.5%	27.5%	22.5%
	Legal	General counsel	40.5%	9.5%	27.5%	22.5%
	IT Cross Agency Applications	Customer billing systems, enterprise performance management (EPM), reporting services, data integration	50.0%	0.0%	50.0%	0.0%
	Public Affairs	Internal and external communications, national relations, regional relations, tribal relations	40.5%	9.5%	50.0%	0.0%
	Risk Management	Enterprise risk, transaction risk and credit risk management	40.5%	9.5%	27.5%	22.5%
	Technology Innovation	Technology innovation administration and project management costs	50.0%	0.0%	50.0%	0.0%
	Metering & Billing	Power and Transmission Services customer billing and metering services	50.0%	0.0%	50.0%	0.0%
	Forecasting & Contract Management	Contract management and support, load forecasting and analysis	50.0%	0.0%	50.0%	0.0%
	BTO Portfolio Management	BTO administration and project management costs	50.0%	0.0%	50.0%	0.0%
B - Extra Effort Cost Pool	IT Corp Application Assets	IT maintenance of BES/Financials, HRMIS and a number of other IT business systems applications such as SharePoint, customer contracting and DOE hiring.	28.3%	6.7%	65.0%	0.0%
	Supply Chain Management & Admin	Management and administrative costs for agency purchasing & Transmission contracting and logistics	28.3%	6.7%	65.0%	0.0%
	Supply Chain Agency Purchasing	Purchasing services for environment, Energy Efficiency, Power, IT and Corporate	28.3%	6.7%	35.8%	29.3%
C - Labor Hour Cost Pool - BFTE & Supplemental Labor	BPA Safety	Field safety, construction safety, medical surveillance, corporate safety	16.2%	3.8%	44.0%	36.0%
	BPA Security	Physical, personnel and information security, continuity of operations	16.2%	3.8%	44.0%	36.0%
	IT Infrastructure Assets	Data center storage, Linux, Wintel, security, Desk top/end user computing, LAN, WAN, help desk, and phone services	16.2%	3.8%	44.0%	36.0%
C - Labor Hour Cost Pool - BFTE only	Human Resources	HR policy, talent acquisition, employee development, labor relations, staffing and classification, EEO	17.0%	4.0%	43.5%	35.6%
	Agency Service Awards	Corporate awards	17.0%	4.0%	79.0%	0.0%
E - Blended IT Cost Pool	IT Admin & System Policy	IT leadership & planning, admin, quality control, project management, IT training	28.3%	6.7%	35.8%	29.3%
F - Workplace Services Cost Pool	Workplace Services	HQ and field leases, utilities, janitorial, maintenance, space management including moves and furniture, office equipment & supplies, mail/courier, media services, motor pool, transit and parking	34.0%	8.0%	31.9%	26.1%
G - Grid Modernization	Grid Modernization	Grid modernization project management	35.0%	0.0%	65.0%	0.0%

5.2 Business Transformation Office

Program cost details

Table 29 Business Transformation Office, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 - 2023
Enterprise Services G&A Allocations	7,037	9,610	4,565	4,668	14,704	14,727	4,617	14,716
Transmission Direct Support	1,558	868	8,375	8,375	1,066	1,106	8,375	1,086
Power Direct Support	415	1,386	4,125	4,125	1,066	1,106	4,125	1,086
Total	**9,010**	**11,864**	**17,065**	**17,168**	**16,836**	**16,938**	**17,117**	**16,887**

Description

The Business Transformation Office (BTO) is responsible for the successful development and execution of cross-agency initiatives designed to ensure BPA achieves the goals outlined in the agency strategic plan. The BTO provides resources, structure and standardization in the areas of program and project management, change management, business analysis and enterprise architecture.

The BTO spending levels are broken out into two main elements: key strategic initiative (KSI) and non-KSI. The KSI element funds the incremental costs for the agency's KSI and the non-KSI element funds the BTO existing staff and capabilities. Currently, the BTO's primary focus is on the Grid Modernization KSI.

Objectives in 2022 and 2023

BPA's strategic plan identified modernizing federal power and transmission system operations and supporting technology as a strategic objective. The strategic plan describes the actions BPA should take over the next several years to become more competitive and responsive to customer needs and to leverage and enable industry change through modernized assets and system operations. The importance of this objective was emphasized in FY 2019 when BPA made the Grid Modernization Key Strategic Initiative its only KSI.

Grid modernization work is driven by the grid modernization roadmap for the federal power and transmission system. Grid modernization projects will enhance system operations in three major ways – automation, increased accuracy and operational visibility. Automating processes will minimize the potential for human error, improve operational effectiveness, and support quicker responses to certain system conditions. By incorporating more real-time data and analysis into power and transmission operations, BPA will be able to more efficiently determine system limitations and inventory available to meet BPA's obligations. BPA will also be better equipped to monitor operating conditions that impact system capability. Increasing the visibility of system

conditions, including market flows, forecasts, stability concerns and post-contingent concerns, will help preserve reliability, optimize reserve levels and operate the transmission system closer to its physical limits. Ongoing grid modernization projects, such as those related to network modeling, outage management and inventory management, will better position BPA to make more informed choices about reliability coordination, day-ahead market enhancements, tariff strategy and potential market participation. Programmatic investments will support a more reliable, flexible and efficient system, help to reduce future costs and create new market opportunities for BPA and other regional resource owners. These changes will better position BPA to improve its capability for reliable operations, increase opportunities to participate in new wholesale electricity markets, leverage opportunities to monetize the valuable clean hydropower capacity, better utilize the flexibility of the federal transmission system, and return value to the region from the federal power system and transmission grid.

One example of this is BPA's potential entrance into the Western Energy Imbalance Market operated by the California Independent System Operator in March 2022. Five grid modernization projects will specifically enable BPA's ability to participate in that market, and many others lay the foundation which could allow BPA to further optimize its operations in the EIM.

While the bulk of the project work will occur in FY 2020 and 2021, continued investments in grid modernization through FY 2022 and 2023 are necessary to finalize all projects on the roadmap.

5.3 Chief Administrative Office

The Chief Administrative Office (CAO) proposes an increase in its BP-22 Initial IPR spending levels compared to the BP-20 rate case, related to Information Technology.

- The CAO held relatively flat within its other departments to minimize the rising costs of IT.
- The CAO reduced costs and was able to absorb inflation by managing levels of supplemental labor and federal labor through attrition.

The CAO provides policy and strategic guidance concerning key BPA internal operations and provides executive-level leadership for strategic direction and policy.

The business units that report directly to the CAO and that provide support to Corporate and both Power Services and Transmission Services are:

- Program Management Office.
- Diversity & Inclusion.
- Information Technology.
- Human Resources.
- Safety.
- Security and Continuity of Operations.
- Supply Chain.
- Workplace Services.

Impacts of proposed spending level

The CAO is proposing BP-22 IPR spending levels consistent with the BP-20 Rate Case, with the exception of Information Technology which has an average proposed increase of $17.2 million per year when compared to the BP-20 Rate Case.

The increased spending levels in IT primarily relate to:

- Increases in software licensing fees, which range from 10 percent to 30 percent depending on the vendor and products.
- New requirements for cyber security compliance.
- IT projects initially forecast as capital that have since been classified as expense because of solutions chosen and Office of Management and Budget guidance changes.
- Maintenance costs for new implementation, and increased costs for maintaining the current enterprise system, and implementation of Grid Modernization projects and the related operations and maintenance.

Since FY 2016, and including the BP-22 IPR proposed spending levels, the CAO organizations have reduced costs to stay at or below the rate of inflation, including the proposed spending increase for IT in FY 2022-2023. The CAO has successfully bent the cost curve through setting, and meeting, internal cost reduction targets each fiscal year through diligent cost management and elimination of discretionary spending. As labor costs continue to rise, the CAO intends to implement cost savings where possible, while maintaining programs critical to the success of the enterprise.

Work expected in 2022 and 2023

The CAO will continue major cost-management initiatives to find sustainable, long-term efficiency and cost savings, including initiatives in Supply Chain and IT. The CAO will support grid modernization strategic initiatives in Supply Chain and IT through efforts focused on:

- Improving the IT technical infrastructure and how it is supported.
- Ensuring continuity of operations and the security of the grid.
- Creating and supporting a safe, positive and inclusive work environment, where people are valued and enabled to deliver results.
- Developing a workforce strategy that provides an agile and adaptive response to grid modernization personnel requirements.

The figure below shows each of the major functions within the CAO, and their percent of the total average proposed spending levels.

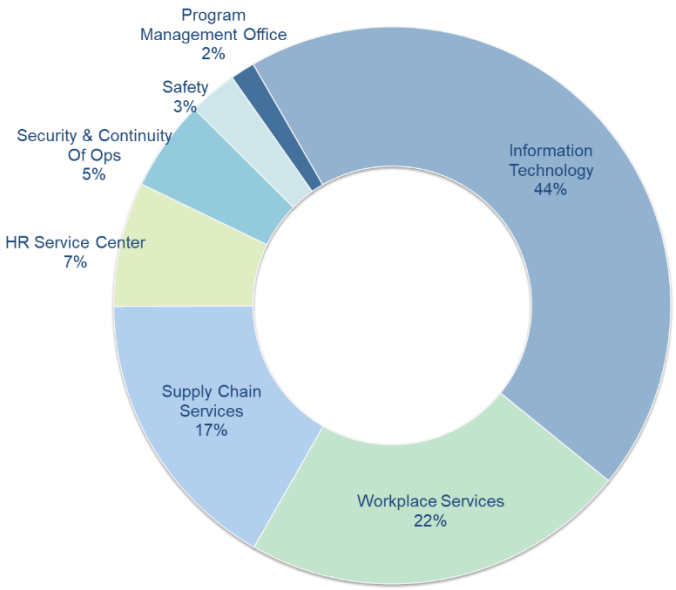


Figure 27 Chief Administrative, Expense Overview

The table below shows the IPR costs by major function. The table reflects the actuals for FY 2018 and FY 2019, the final spending levels for the BP-20 rate period, and the proposed spending levels for the BP-22 rate period.

Table 30 Chief Administrative Office Expense Summary

	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
($thousands)	2018	2019	2020	2021	2022	2023	2020 -2021	2022 -2023
Information Technology	88,377	96,415	83,220	84,251	100,746	101,241	83,736	100,994
Workplace Services	47,173	52,225	52,038	52,223	51,155	51,354	52,130	51,254
Supply Chain Services	34,850	34,648	37,706	38,490	38,098	38,098	38,098	38,098
Human Resources Service Center	14,175	14,691	16,647	16,955	16,378	16,699	16,801	16,539
Security & Continuity Of Ops	10,706	11,536	10,399	10,490	11,996	12,119	10,445	12,058
Safety	7,157	5,818	6,712	6,836	6,329	6,475	6,774	6,402
Program Management Office	2,800	3,152	4,617	2,094	3,214	3,292	3,356	3,253
Undistributed Reduction	0	0	0	0	-3,400	-3,400	0	-3,400
Total	**205,239**	**218,485**	**211,339**	**211,339**	**224,517**	**225,877**	**211,339**	**225,198**

5.3.1 Information Technology

Program Cost Details

Table 31 Information Technology, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Enterprise Services' G&A Allocations	88,377	96,414	83,220	84,251	88,928	89,427	83,736	89,177
Power Direct Support	0	0	0	0	6,288	6,147	0	6,217
Transmission Direct Support	0	1	0	0	5,531	5,667	0	5,599
Total	**88,377**	**96,415**	**83,220**	**84,251**	**100,746**	**101,241**	**83,736**	**100,994**

Table 32 Information Technology, Capital Detail

($thousands)	Proposed IPR		Capital Outyears							
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Information Technology	19,928	19,828	19,028	18,428	16,728	20,474	20,938	21,417	21,899	22,381
AFUDC	513	513	521	519	515	516	520	522	525	528
Capital Total	**20,441**	**20,341**	**19,549**	**18,947**	**17,243**	**20,990**	**21,458**	**21,939**	**22,424**	**22,909**

Mission

Information Technology has overall responsibility and accountability for BPA's information technology-related programs (excluding those related to grid operations), develops and supports agency-wide business automation, and provides governance, planning and standards for the agency's information technology activities. IT related programs include maintenance of assets covering telecommunications components, network circuits, servers, storage devices, desktop systems, printers, copiers, faxes, phone systems and software, including applications provided as Software-as-a-Service (SaaS). Software assets are further categorized as critical business systems, enterprise business systems and task systems. Critical business systems must operate around the clock to enable power marketing and transmission scheduling functions; enterprise business systems allow BPA to manage its staff, finances, facilities, supply chain, transmission assets, and services such as managing circuits and work planning services; and task systems are small web-based applications which enable BPA staff to perform work more efficiently.

IT's Executive Vice President of Information Technology and Chief Information Officer led and delivered a comprehensive Enterprise Technology Assessment in March 2018 which identified 10 Breakthrough

Report strategies that aligned with BPA's goals of strengthening financial health and modernizing assets. When fully implemented, these breakthrough strategies were to achieve cost reduction goals, improve service delivery, and enable IT to be a more effective strategic business partner. Combined capital and expense savings identified through April of 2020 amount to approximately $26 million from such activities as software rationalization, work prioritization, and reductions in personnel. An interesting accomplishment produced from a combination of the ETA's breakthrough strategies is the adoption of private cloud services within BPA's data centers that allow for consolidation of resources to enable additional Continuous Operations/Disaster Recovery capabilities within existing physical space at BPA's alternate data center. This implementation enabled BPA to nearly instantaneously switch almost all of its Federal and Contractor workforce to remote telework status in the face of the COVID-19 pandemic.

While the ETA has been successful in creating savings based on its initial point-in-time financial estimates, upward cost pressures for inflation, net new operations and maintenance costs, additional compliance requirements, and Grid Modernization projects have flattened the anticipated reductions in future IPR funding projections. It is also now evident that the reductions in IT personnel are not sustainable.

Asset Condition and Trends

Up until FY 2019, new system requests were generally afforded higher priority over core-sustain efforts in order to meet emerging business line requirements for automation to improve efficiency and effectiveness. After several years of operating with these priorities, IT services began to deteriorate due to inadequate operational support, and the growing backlog of needed age-based asset updates. Outages began to increase in basic systems. The direst of these situations are currently being mitigated, but the backlog is still significant and must be addressed. Moving forward, IT plans to place a higher premium on core-sustain efforts for systems already in place.

Several application upgrades supporting Grid Modernization and core business functions are underway, but more sustain work is needed in the coming years to maintain BPA's ability to continue to find efficiencies in internal processes and serve the region effectively.

IT services have a profound impact on the effectiveness and efficiency of BPA's processes and people. An Information Technology Strategic Asset Management Plan (IT SAMP) was developed to ensure IT resources and investments are aligned with BPA's vision and strategy to maximize business value and to achieve efficiencies where possible. In support of BPA's 2018-2023 Strategic Plan, IT's objectives are centered on sustaining financial strength and modernizing assets and IT is able to support these goals through the management of lifecycle costs and asset value.

The IT SAMP aligns investments to reduce asset performance risks to acceptable levels. Planning and investments are needed to reduce risk in delivering viable disaster recovery services for BPA's Enterprise Business Systems. The major outcomes of the IT SAMP are as follows:

- Evolving IT Infrastructure to meet emerging cyber security threats and providing reliable services while lowering operations and investment costs required to meet business needs.
- Meeting strategic and evolving business needs by providing business solutions that deliver

demonstrable positive net value and benefits to BPA and the Pacific Northwest.

Between FY 2008 and FY 2019, IT capital investments delivered new business systems into production at the rate of about six new systems per year. These new systems expand IT's assets resulting in an average net new operation and maintenance cost of 8.2 percent of the investment cost, primarily for new software maintenance contracts and new support labor costs. At the same time, the IT expense funding levels have not increased to cover the net new O&M costs from these systems or increased at the rate of inflation. Rather, IT has decreased its spending levels in real terms resulting in:

- Additional pressure on maintaining personal computing devices beyond prescribed refresh rates.
- Increased backlog on business-requested enhancements to existing business systems and technical debt.
- Increased backlog on business capital investments
- Reduced FY 2020 projects to Grid Modernization and core sustain efforts only.

Impacts of proposed spending level

IT is proposing an increase for the BP-22 IPR when compared to the BP-20 Rate Case to adequately fund core operations, primarily related to:

- Increases in labor costs due to inflation.
- Material increases of 10 percent to 30 percent for licensing fees.
- New requirements for cyber security compliance.
- IT projects planned for capital that also require expense solutions.
- Maintenance for new technology implementations that expanded business capabilities.
- Unexpected emerging business needs.

To help offset these increases, through the end of FY 2020**,** the Enterprise Technology Assessment program is forecast to meet its targeted savings based on the snapshot of IT spending in FY 2018. Nine of the 10 ETA cost reduction strategies are approved for implementation, including a combination of cost avoidance and long-term savings including:

- Review, consolidation and reduction of software licenses and contracts.
- Reduction in staffing levels.
- Implementation of private clouds.
- Hyper-consolidation to avoid new building construction for business continuity.

IT automation provides the agency the means to meet evolving business needs and compliance requirements and to achieve efficiencies and cost savings. The IT spending proposal represents shaped capital and expense dollars that meet known requirements, maintain asset refresh rates and represent a significant cost reduction from IPR 2016 levels. Reducing the proposed spending levels

will impact IT's ability to meet emerging business requirements and to fund software upgrades and infrastructure refreshes.

Baseline expense funding in IT is primarily driven by operations and maintenance of existing IT systems, and the cost of implementing new IT automation systems in support of emerging business needs identified by IT customers. Increases in IT expense spending are driven by inflation and additional operations costs of new systems. As a rule of thumb, IT requires 20 percent of the total capital investment in expense to develop the business case, perform requirement gathering and analysis, perform the analysis of alternatives, and to plan the project. Once the new system is delivered into production, the net new annual operations and maintenance costs associated with the investment is 8 percent of the investment.

The proposed capital levels are based on anticipated new systems and system replacements to meet business objectives. While IT has been anticipating a shift from capital to expense due to increasing adoption of cloud-based IT solutions, this trend has slowed somewhat across the federal government over the last two years.

Reductions below the proposed levels would result in IT's inability to maintain scheduled refresh rates for IT assets and to meet new business requirements or changes in current business processes. These conditions generally will lead to IT assets that hinder and/or frustrate business consumers, and to unfavorable cyber security events. Making sure that all sustain activities adhere to the prescribed life-cycle refreshes will maintain all IT assets, all business function applications and all infrastructure, in a healthy status, delivering reliable, safe, and valuable assets that meet business needs.

Work expected in 2022 and 2023

IT's goal is the efficient deployment of information technology to promote the economically efficient use of technology to meet BPA's business requirements. To accomplish this, IT will collaborate with clients to estimate and measure the value of IT products and services. In order to increase the level of engagement of business clients in the management of IT assets, BPA deployed IT Strategic Business Partners to each of the business lines at BPA: Power, Transmission and Enterprise Services. The IT Strategic Business Partners develop collaborative relationships with IT's business lines to improve or achieve the following:

- Assist the business information owners and sponsors to determine and subsequently measure the business value of expansion IT projects, to promote effective and efficient use of technology.
- Develop and/or support existing bodies within the business lines to collect and prioritize IT projects with a view to longer range planning.
- Establish an IT Intake Process for initial scoping validation, followed by a review by the Agency Priority Steering Committee for cross-agency prioritization and tracking.

In conjunction with this effort, the System Life-cycle processes used for IT projects is adding a stronger emphasis on ensuring that future expense budgets support additional applications once they have been installed. The process and method for prioritizing expansion projects is not expected to change: sustain

before expand, Mission Critical Systems before Enterprise systems, Reliability and Compliance before Discretionary.

A primary key to customers' understanding of IT costs is a comprehensive Service Catalog that provides the costs of providing IT goods and services. A high-level catalog has been constructed; however, it will evolve to greater levels of detail to make it more useable in future years.

IT is committed to BPA's Strategic Goal #2 Modernizing Assets, and as such will support the automation efforts required to enable BPA to enter the Energy Imbalance Market, as well as accomplish other Grid Modernization endeavors. Currently, identified automation efforts are expected to increase annual IT expense requirements for operations and maintenance by at least $3 million by FY 2022, with more projects likely to be proposed. IT is also ready to commit portions of its IPR capital forecasts to implementation of Grid Modernization projects in the out years.

The Department of Homeland Security, through the Department of Energy, has identified the addition of specific cyber security capabilities that BPA must implement and support. The capability is known as Continuous Diagnostics and Mitigation, and this compliance effort will increase IT's operations and maintenance requirements by approximately $3.4 million per year beginning in FY 2022.

In early 2020, IT facilitated a customer synchronous workshop focused on IT's newly articulated strategy, "IT as a Customer Service Organization." The workshop resulted in a shared understanding of the priorities and service levels required by customers, and the related metrics tracking needed to assure successful delivery. BPA's Human Capital Management also recently conducted a Workforce Study that identified deficiencies in the number of positions required to efficiently operate the IT organization to meet BPA's business automation needs. Both of these efforts will contribute to a small increase in IT personnel over the next two years to increase reliability and service delivery to acceptable levels.

5.3.2 Workplace Services

Program cost details

Table 33 Workplace Services, Expense Detail

	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
($thousands)	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Enterprise Services' G&A Allocations	28,068	29,447	30,010	30,109	26,207	26,293	30,059	26,250
Transmission Direct Support	19,105	22,778	22,012	22,097	24,948	25,061	22,055	25,005
Power Direct Support	0	0	16	16	0	0	16	0
Total	**47,173**	**52,225**	**52,038**	**52,223**	**51,155**	**51,354**	**52,130**	**51,254**

Table 34 Workplace Services, Capital Detail

($thousands)	Proposed IPR		Capital Outyears							
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Capital total	**74,200**	**88,200**	**78,300**	**4,300**	**22,500**	**23,000**	**25,700**	**25,600**	**27,800**	**21,100**

Description

Workplace Services, also referred to as Facilities, manages $1.3 billion of assets comprised of control centers, control houses, radio stations, warehouses and administrative offices. While most facilities directly support Transmission Services, many also enable other facets of BPA business, including Power Services and the full range of corporate and administrative services, including Environment, Fish and Wildlife, Compliance and Finance. The Facilities Strategic Asset Management Plan (SAMP) supports BPA operations by providing quality support services and full lifecycle management of assets in accordance with BPA strategic goals.

Facilities will focus on sustainment and recapitalization efforts to minimize safety and operational risks over the next ten years. Currently, 70 percent of the facilities portfolio is in need of elevated levels of maintenance, repair, or replacement; which represents an increased risk to safety and operations. The strategies and initiatives outlined in the Facilities SAMP seek to manage these risks through three asset management objectives:

- Provide safe, healthy and professional workspaces for BPA personnel.
- Enable reliable, efficient and flexible operations of all BPA organizations.
- Maximize the value of BPA facilities while minimizing risk.

The Facilities program will measure progress against these objectives with the tracking of portfolio Facility Condition Index scores for assets. Investment and maintenance will prioritize actions to maintain personnel safety and essential business while minimizing the degradation of essential facilities assets. Sustainment activities will focus on providing preventative maintenance and repair, while recapitalization activities will include the restoration, modernization, or replacement of facilities. With safety and operational reliability as guiding tenets, Facilities will judiciously manage risks while delivering prudent and cost-effective solutions that maximize value.

5.3.3 Supply Chain

Program cost details

Table 35 Supply Chain, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 -2021	2022 -2023
Enterprise Services' G&A Allocations	6,814	6,090	6,746	6,953	8,391	8,761	6,850	8,576
Transmission Direct Support	28,036	28,558	30,959	31,537	29,707	29,337	31,248	29,522
Total	**34,850**	**34,648**	**37,706**	**38,490**	**38,098**	**38,098**	**38,098**	**38,098**

Table 36 Supply Chain, Capital Detail

($thousands)	Proposed IPR		Capital Outyears							
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Fleet program total	**10,000**	**12,000**	**14,000**	**14,200**	**14,200**	**14,400**	**14,400**	**14,200**	**14,200**	**14,200**

Mission

Supply Chain is the enterprise provider of procurement, materials management, logistics services and fleet. The group develops and executes strategies to provide internal business partners managed solutions to secure equipment, materials and services. Supply Chain also ensures processes meet policy, ethics, risk and compliance requirements, and monitors and manages all supply chain functions across BPA.

Specialized services offered by Supply Chain include:

- Contracting for services.
- Warehousing of inventory.
- Inventory management and order fulfillment.
- Transportation and fleet management.
- Asset utilization and investment recovery.
- Personal property management.
- P-Card administration.
- Processing and disposal of hazardous materials.
- Managing supplemental labor.
- Information systems management as it applies to supply chain, including management of material and equipment.

Fleet Management manages BPA owned and leased mobile equipment, including a diverse range of assets from passenger vehicles to railcars and stationary generators. The assets consist of 1,400 owned mobile equipment and specialty vehicles, 865 leased vehicles, 150 generators, and 700 components of equipment. The age of assets range from 1 to 66 years with a non-depreciated value of $213 million.

Fleet's mission is to provide effective and efficient services to internal customers by:

- Moving to a 20-year replacement cycle.
- Right-sizing the fleet through a systematic analysis while reducing fossil fuel consumption.
- Establishing policy regarding owned, leased, or rented equipment.
- Focusing on preventive and predictive maintenance.
- Fostering business driven decisions using analytics and metrics that are measured against risks and other operational improvement initiatives.

Objectives in 2022 and 2023 and impacts of proposed spending level

Supply Chain costs will remain flat from BP-20 to BP-22. Supply Chain will continue to deliver on the core business of procurement, materials management, logistics services and fleet management while implementing cost savings opportunities and working with internal customers to improve processes and procedures across BPA.

Fleet's mission is to provide the correct equipment at a reasonable cost through a 20-year procurement cycle. Fleet coordinates with customers to optimize the size and capacity of the assets through multiple strategies, including lease, rental and procurement options. As assets are replaced more frequently, BPA will experience a reduction of expenses through fewer technician hours and fewer services required for operations and maintenance.

Fleet Management's goals include providing an 85 percent in-service rate (availability), and by 2025, converting 70 percent of motor pool vehicles to all-electric vehicles and lowering the cost per mile by 10 percent.

5.3.4 Human Resources Service Center

Program cost details

Table 37 Human Resources Service Center, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 -2021	2022 - 2023
Enterprise Services' G&A Allocations	11,822	12,355	13,447	13,755	13,178	13,499	13,601	13,339
Transmission Direct Support	2,353	2,335	3,200	3,200	3,200	3,200	3,200	3,200
Total	**14,175**	**14,691**	**16,647**	**16,955**	**16,378**	**16,699**	**16,801**	**16,539**

Mission

BPA's Human Resources Service Center (HRSC) plans, directs and manages a comprehensive federal human capital management program positioned to meet BPA's mission and objectives. Delivery of business and HR objectives is accomplished through seven major program areas:

- Workforce Planning and Advisory Office.
- Staffing and Placement.
- Classification and Position Management.
- Learning and Workforce Development.
- Employee and Labor Relations.
- Benefits and Processing.
- HR Systems and Automation.

BPA's HRSC is responsible for developing, communicating and coordinating HR strategies, policies and initiatives with the business units in accordance with the BPA strategic plan.

Objectives in 2022 and 2023 and impacts of proposed spending level

HR's proposed FY 2022- 2023 spending levels are based on a strategy of operating at FY 2020 actual spend program and service delivery levels. This strategy did not result in any major program reduction or cuts, rather, it eliminated previously planned increases in HR's spending over time. Further, spending levels reflect an overall reduction in the Federal workforce costs through attrition and reductions in supplemental labor costs.

The elimination of planned cost increases will result in foregoing strategy efforts to enhance the culture and workforce capabilities, including cessation of advancement in workforce development efforts.

HR established several objectives to ensure that the workforce is the right size and composition, possesses the right skills and competencies and works in a positive environment.

The Workforce Modernization efforts for the agency, as further refined through the 2019 Workforce Study, will continue and align with the strategy outlined in BPA's strategic plan. Specifically, the agency will be shifting reliance on contracted labor and right-sizing the federal workforce based on workload requirements determining through the Workforce Study. Simultaneously, work will be needed to realign internal resources to focus on major initiatives such as Grid Modernization. The internal movement of employees to needed functions will be essential to executing the strategy. Similarly, HR will continue to focus on establishing and maintaining updated workforce plans for the agency.

5.3.5 Security & Continuity of Operations

Program cost details

Table 38 Security & Continuity of Operations, Expense Detail

	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
($thousands)	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 -2023
Enterprise Services' G&A Allocations	10,119	10,933	9,834	9,925	9,571	9,694	9,880	9,633
Transmission Direct Support	587	603	565	565	2,425	2,425	565	2,425
Total	**10,706**	**11,536**	**10,399**	**10,490**	**11,996**	**12,119**	**10,445**	**12,058**

Table 39 Security & Continuity of Operations, Capital Detail

	Proposed IPR		Capital Outyears							
($thousands)	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Capital total	**8,000**	**8,200**	**8,500**	**8,700**	**9,000**	**7,000**	**8,200**	**9,200**	**9,400**	**8,600**

Description

Security and Continuity of Operations comprises three program offices: Continuity and Emergency Management, Physical Security, and Personnel and Information Security. The objective is to protect BPA's people and assets by executing the following program areas:

- Continuity and Emergency Management.
- Physical Protection and Control.
- Personnel Identify Verification.
- Employee Onboarding.
- Employee Badging and Card Key Access Control.
- Foreign National Visits and Assignments.

- Insider Threat Workgroup.
- Information Protection.
- Operations Security.

These program areas support the operational and compliance mandates of several authorities including NERC CIP standards, DOE policy, OPM requirements, Homeland Security, and Counterintelligence.

FY 2022 and 2023 Security capital funds provide investment for the execution of the Security Asset Management Plan for the protection of BPA's critical assets in accordance with regulatory compliance. The multi-year plan ensures financial investments in physical protection measures and electronic systems to protect BPA's people and critical infrastructure used to deliver power to rate payers in the Pacific Northwest. This supports BPA's strategic goals of modernizing the grid and meeting transmission customer needs.

FY 2022 and 2023 Security expense funds provide the personnel, contracts, and materials necessary to ensure BPA's workforce is properly vetted, physical security operations are funded, continuity and disaster planning is achieved, and BPA's sensitive information is protected. These activities underpin BPA's core value of safety while supporting the strategic goals of providing competitive power services and meeting transmission customer needs.

Objectives in 2022 and 2023 and impacts of proposed spending level

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FY 2022 and 2023 Security capital objectives include executing on the multi-year capital portfolio investment plan spanning FY 2015 to FY 2032 to bring all critical field sites into compliance with CIP 006 and 014 standards. Investments include fencing, physical barriers and electronic systems. Failing to invest according to the asset management plan and CIP 006 and 014 requirements creates the potential for significant compliance violations and erodes the overall posture of BPA's security protection plan, which could potentially compromise BPA's ability to deliver power.

The investment also includes funds for the wholesale replacement of failing and/or obsolete systems which have reached the end of their functional lifecycle, including systems installed 12 or more years ago. Replacement systems provide enhanced monitoring capabilities, improved design elements, reduce many manual processes, and decrease occurrences of human error. Failure to programmatically re-invest in these systems will create increasingly frequent device failures causing security system outages, loss of monitoring, potential work stoppage, compliance violations, and an increase in expense costs over time.

FY 2022 and 2023 Security expense objectives include:

- Maintaining current levels of Security operations.
- Maintaining the current level of protection while planning for an increase in contractual labor costs.
- Planning for an increase in system maintenance costs to keep up with occurrences of device failures while capital reinvestments get underway.

- Planning for expected increases in OPM costs for background investigations to keep the BPA workforce vetted in accordance with law and policy.
- Planning for the expected rollout of a government-wide program for protecting Controlled Unclassified Information.
- Planning for resources to support the Business Impact Analysis findings and mitigation strategies for Continuity Resilience initiatives.

Failure to plan for adequate cost allocations for these initiatives may result in an eroded security posture, noncompliance with statutes, and inability to meet BPA's strategic objectives.

5.3.6 Safety

Program cost details

Table 40 Safety, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 - 2023
Enterprise Services' G&A Allocations	7,151	5,808	6,712	6,836	6,329	6,475	6,774	6,402
Transmission Direct Support	6	10	0	0	0	0	0	0
Total	**7,157**	**5,818**	**6,712**	**6,836**	**6,329**	**6,475**	**6,774**	**6,402**

Mission

BPA's Safety program supports the agency's mission and safety core value to provide a workplace that is free from all recognizable safety and health hazards through advice, information and support to the BPA workforce. The program engages with executives, agency leaders and BPA workforce members to build a strong safety culture across BPA. Additionally, it implements a robust safety and health system by collecting industrial exposure data and monitoring industry improvements in the safety discipline. The program ensures compliance with the Department of Energy Federal Employee Occupational Safety and Health (FEOSH) Program by reviewing and updating programs and procedures. Safety also conducts inspections, investigations and appraisals, and recommends safe work practices and procedures. The Safety organization reviews contractors site-specific safety plans and performs worksite audits in compliance with host utility responsibilities.

The Safety program collaborates with executive management and the workforce to effectively implement a robust safety and health program to ensure that accident and injury prevention remain a priority. These issues and strategies are managed through several BPA-wide safety committees, including the Executive Safety Committee, Office Occupational Safety & Health Committee, Central Safety and Health Committee, Contractor Safety Committee and Safety Proctor Team.

Safety also seeks continuous improvement by benchmarking with industry peers, conducting workload studies and engaging in independent third-party program reviews.

Objectives in 2022 and 2023 and impacts of proposed spending level

For the BP-22 IPR, the Safety Organization will focus on executing our strategic plan while maintaining a downward cost trajectory. Any increased program costs will be offset by the completion of a separate program or by efficiencies gained through the continued improvements in process and procedures identified in collaboration with our internal partners and third-party observers. Strategic focus points for this rate period include:

- Integration of safety as a core value throughout the employee lifecycle from recruitment to retirement.
- System-wide implementation of industrial ergonomics.
- Maturation of our occupational health information system to include a revamp of our safety dashboards and additional metrics to drive safe behaviors.
- Implementing the new ANSI Z10 Safety Management System.
- Updating the Safety and Occupational Health Manual.
- Implementation of a full scale job hazard analysis program.

Continued efforts will focus on safety by design and the use of technology to gain efficiencies and improve the end users ability to access information at the jobsite.

5.4 Compliance & Risk Management

Program cost details

Table 41 Compliance & Risk Management, Expense Detail

	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
($thousands)	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 - 2023
Enterprise Services' G&A Allocations	9,733	10,383	11,858	12,246	11,068	11,452	12,052	11,260
Transmission Direct Support	3,429	3,436	3,454	3,482	3,584	3,616	3,468	3,600
Power Direct Support	2,830	2,743	2,152	2,249	2,152	2,249	2,200	2,200
Total	**15,992**	**16,562**	**17,464**	**17,976**	**16,804**	**17,316**	**17,720**	**17,060**

Description

The Compliance, Audit and Risk Management Organization is comprised of four organizations headed by the Executive Vice President of Compliance, Audit and Risk Management:

Agency Compliance and Governance oversees a broad array of compliance and governance functions at BPA including:

- Agency level FERC compliance.
- Policy management.
- OMB Circular A-123 compliance.
- Information governance.
- Purchasing policy governance.
- Management of BPA's Workplace Concerns Program and the BPA Hotline.

Audit provides independent, objective assurance and consulting services designed to evaluate and assist BPA by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of its internal control, risk management and agency governance processes. The overall objective is to provide reasonable assurance that BPA is: compliant with laws and regulations, has efficient and effective operations, and has reliable financial reporting.

Risk Management is comprised of the Enterprise Risk Management and Transacting, Credit and Insurance Risk Management functions. Risk Management provides independent assurance that agency business operations and planning, and decision making are risk informed and aligned with the agency's risk tolerance, improving the likelihood that the agency achieves its business objectives. The group provides consulting, facilitation and training for risk assessments, business cases, root cause analyses, and application of the Agency Decision Framework.

Civil Rights and EEO is responsible for Equal Employment Opportunity (EEO) Title VI and VII compliance and resolution programs.

5.5 Finance

Program cost details

Table 42 Finance, Expense Detail

	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
($thousands)	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 - 2023
Enterprise Services' G&A Allocations	15,496	14,921	15,451	15,975	12,993	12,929	15,713	12,961
Transmission Direct Support	0	0	0	0	1,122	1,160	0	1,141
Power Direct Support	0	0	0	0	718	743	0	731
Total	**15,496**	**14,921**	**15,451**	**15,975**	**14,833**	**14,833**	**15,713**	**14,833**

Mission

Finance provides leadership and services in financial planning and analysis, accounting and financial reporting, and financial strategy and operations for the FCRPS and BPA. This organization offers analytical insights and support for rate case and regulatory proceedings as well as public engagement processes. It oversees capital and expense budget development in alignment with strategic objectives, cash and debt management operations, including meeting the annual U.S. Treasury payment, and it proactively addresses accounting matters to achieve a clean audit opinion.

Finance has primary responsibility for strategic and long-term financial initiatives. It develops relationships with federal and non-federal banking communities, rating agencies, investors and others in the financial community. In addition, Finance provides leadership in developing proposals and policies on strategic issues that affect the agency's long-term financial integrity and competitiveness or that have an impact on customers, constituents and other stakeholders.

Objectives in 2022 and 2023 and Impacts of proposed spending level

Finance's proposed spending levels absorb the cost of inflation in order to support BPA's strategic plan goal of strengthening its financial health. Finance has reprioritized work and implemented cost efficiencies in order to the meet this goal. This overall cost-management effort did not result in any major program reductions to Finance as many of the reductions are due to anticipated efficiencies, system investments and expected reductions in federal workforce costs due to attrition. Finance will take on additional risk as a result of these reductions if the expected efficiencies and system investments are not achieved. These risks include unmitigated staffing "single points of failure" for key processes, many of which exist outside our enterprise systems environment. The key processes at risk could directly impact Finance's ability to support the Energy Imbalance Market, Data Analytics, the Asset Investment Excellence Initiative, Power Competitive Analysis, and other initiatives of the Power and Transmission program plans. Risk to baseload Finance work includes an increase in reporting errors and the inability to accomplish work within the designated timeframe.

In fiscal years 2022 and 2023, Finance will continue to lead the effort to meet the strategic goal of sustaining BPA's financial strength. This includes:

- Leading cost-management initiatives and budget development to keep program costs at or below the rate of inflation.
- Providing leadership to increase financial resiliency with targets for how BPA uses debt, secures low cost debt, and manages and maintains liquidity.
- Maintain high credit ratings.

5.6 Deputy Administrators Office

Program cost details

Table 43 Deputy Administrator, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 -2021	2022 -2023
Technology Innovation	8,991	5,147	4,933	4,972	4,933	4,972	4,952	4,952
Communications	5,019	4,740	4,598	4,771	4,598	4,771	4,684	4,684
Intergovernmental Affairs	3,885	4,044	3,349	3,437	3,529	3,596	3,393	3,562
Deputy Administrator	735	336	678	701	118	141	690	130
Total	**18,629**	**14,267**	**13,558**	**13,880**	**13,178**	**13,479**	**13,719**	**13,329**

Description

The Deputy Administrator Office includes Technology Innovation, Communications, and Intergovernmental Affairs. Each of these areas support the agency in different ways, and are detailed in the below sections.

5.6.1 Technology Innovation

Program cost details

Table 44 Technolgy Innovation, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020-2021	2022-2023
Enterprise Services' G&A Allocations	3,642	2,460	2,527	2,527	2,527	2,527	2,527	2,527
Power Direct Support	1,977	943	1,406	1,445	1,406	1,445	1,426	1,426
Transmission Direct Support	3,373	1,744	1,000	1,000	1,000	1,000	1,000	1,000
Total	**8,991**	**5,147**	**4,933**	**4,972**	**4,933**	**4,972**	**4,952**	**4,952**

BPA's mission includes the efficient and effective operations of the FCRPS. The Technology Innovation program establishes programmatic requirements for BPA's research, development and demonstration (RD&D) projects to support continued improvement in the efficient and effective operation of the FCRPS as opportunities become available through new technology.

BPA's federated approach to RD&D requires the organizations responsible for the efficient and effective operation of the FCRPS to identify their R&D projects. A centralized reporting and program management function exists to provide a single, consistent view of BPA's RD&D efforts.

BPA's Technology Innovation Office has been established to perform the centralized report and program management function for all BPA RD&D activities. It serves as a hub of innovation and a centralized point for RD&D program management. It facilitates the development and implementation of technology-based solutions to business challenges by managing a RD&D program to maximize the benefits of internal expertise and external collaborations.

5.6.2 Intergovernmental Affairs

Program cost details

Table 45 Intergovernmental Affairs, Expense Detail

	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
($thousands)	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 - 2023
Enterprise Services' G&A Allocations	3,885	4,044	3,349	3,437	3,232	3,290	3,393	3,261
Transmission Direct Support	0	0	0	0	180	185	0	183
Power Direct Support	0	0	0	0	117	120	0	119
Total	**3,885**	**4,044**	**3,349**	**3,437**	**3,529**	**3,596**	**3,393**	**3,562**

Mission

Intergovernmental Affairs is responsible for developing and managing BPA's outreach and coordination with federal, state, local and tribal government entities, and elected officials. Intergovernmental Affairs also supports engagement with public interest organizations on BPA decisions and coordinates BPA's relationship with the Northwest Power and Conservation Council. This function fosters support, knowledge and effective involvement in, and awareness of, BPA's activities, including meeting BPA's regional engagement purpose under the Northwest Power Act.

Intergovernmental Affairs anticipates the interests and concerns of regional elected officials, government agencies, tribes and public interest organizations, as BPA contemplates and evaluates perspectives related to current and future programs and policies. These interactions are essential to fulfilling BPA's statutory obligations and objectives for commercial viability and meeting public obligations.

Objectives in 2022 and 2023 and Impacts of proposed spending level

The current and near-term demands for support from the Intergovernmental Affairs are many. Intergovernmental Affairs supports congressional delegation, tribal, state and constituent engagement for

BPA's environmental obligations, market design and grid modernization, state and federal legislation affecting BPA customers, and BPA's infrastructure maintenance and expansion. The Intergovernmental Affairs organization must manage effective BPA engagements during overlapping and occasionally conflicting process timelines. This organization also supports preparation and regional engagement for fish and wildlife issues that arise under the Northwest Power Act, the Endangered Species Act, and the National Environmental Policy Act, including the extensive constituent and tribal contributions. The future of the Columbia River Treaty will also require extensive regional engagement during FY 2022 and 2023.

Intergovernmental Affairs supports BPA's long-term financial stability and its ability to meet its statutory obligations at sustainable rates. It supports key BPA strategic initiatives such as Grid Modernization, to ensure successful engagement in evolving Western electricity markets, and engagement with elected officials and interested constituent groups. Intergovernmental Affairs continues to monitor federal and state policies related to carbon reduction, renewable energy development, electric system reliability, and other energy and environmental policies.

5.6.3 Communications

Program cost details

Table 46 Communications, Expense Detail

	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
($thousands)	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 - 2023
Enterprise Services' G&A Allocations	5,019	4,739	4,598	4,771	4,477	4,645	4,684	4,561
Power Direct Support	0	0	0	0	120	125	0	123
Transmission Direct Support	0	1	0	0	0	0	0	0
Total	**5,019**	**4,740**	**4,598**	**4,771**	**4,598**	**4,771**	**4,684**	**4,684**

Mission

BPA's Communications organization is responsible for developing strategic and effective communications and public outreach strategies that foster greater awareness, understanding and support of BPA's mission, strategies and activities, and demonstrate how BPA supports the broad range of needs and interests of the Northwest. Communications develops content for internal and external audiences, which include its power and transmission customers, Northwest retail electric consumers, Northwest tribes, the BPA workforce, regional partners and groups and other stakeholders, and the general public.

Communications staff partner with agency leadership and subject-matter experts in developing clear and effective communications on complex and sensitive policy or program issues, initiatives and topics, and in ensuring the agency is communicating with one voice. Communications is also responsible for ensuring public input in BPA's decision-making processes by promoting public

engagement, education and awareness through public meetings, comment processes, community events and the distribution of information.

Communications also manages the agency's external presence with visual branding guidelines and standards, which help ensure professionalism and consistency across the business. BPA's Library and Visitor Center, which falls under the Communications organization, provides public information regarding programs and policies and distributes documents, materials and products to requestors.

Communications will continue to inform and educate customers, the general public and other stakeholders on how BPA is prudently managing costs, executing its strategic goals, supporting the region's clean energy future and long-term economic success, and transforming its business and operations so it remains the region's provider of choice for low-cost, reliable and responsible carbon-free power for decades to come.

Objectives in 2022 and 2023

Communications executes the agency's responsibility of providing fact-based information about the FCRPS and its impact on fish and wildlife. A number of projects will require significant support from Communications. These include the Columbia River Treaty, the agency's Grid Modernization and Asset Management initiatives, the Western Energy Imbalance Market initiative, resource adequacy and the strategies BPA is deploying to prepare for the development of new long term power sales contracts for the post-2028 period, and BPA's fish and wildlife efforts. Communications also supports BPA's financial and ratemaking processes, including presentations of Quarterly Business Reviews and BPA's Integrated Program Review, by providing comprehensive official information to the public, as well as coordinating and preparing content for meetings and forums. The financial processes and other efforts Communications supports are key to BPA becoming more competitive and responsive to customers, and will help in the drive to modernize BPA's assets and operations, leverage and enable industry change, and deliver on its public responsibilities.

Impacts of Proposed Spending Level

Looking forward, any significant budget cut that results in a staff level reduction would negatively impact Communications' ability to perform its function. Internally to BPA, staff reductions could reduce Communications' ability to keep the BPA workforce informed, which could result in less internal alignment on important issues and initiatives, reduce employee engagement, and ultimately impact the organizational culture and diminish the agency's ability to retain its most skilled and highest-performing employees.

Furthermore, as seen through BPA's response to the coronavirus pandemic, the Communications organization plays a significant role during an emergency or crisis situation. Communications develops, coordinates and distributes critical information so BPA can efficiently and effectively inform its workforce, customers, stakeholders and the public in general about the actions it is taking or any impacts to its operations in a crisis or business continuity event. Failing to communicate in an effective and timely way in an emergency or crisis situation could put the safety, health and well-being of the BPA workforce and even the public at risk. Significant budget or staff level reductions could impair Communications' ability to effectively execute crisis communications while supporting the routine communication needs of the agency. Plus, if BPA is responding to a crisis for an extended period or multiple crises at once, Communications would be even more limited in the support it can provide for lower priority activities.

5.7 Customer Support Services

Program cost details

Table 47 Customer Support Services, Expense Detail

	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
($thousands)	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 - 2023
Enterprise Services' G&A Allocations	8,292	7,737	9,073	9,417	2,635	2,726	9,245	2,680
Transmission Direct Support	0	1	0	0	2,973	3,076	0	3,024
Power Direct Support	0	0	0	0	3,347	3,450	0	3,398
Total	**8,292**	**7,738**	**9,073**	**9,417**	**8,954**	**9,252**	**9,245**	**9,103**

Mission

Customer Support Services (CSS) provides all load forecasts, produces all customer bills and oversees revenue metering services and contract support services for the agency. CSS provides these core business services central to the customer experience while meeting back office governance requirements. The group works closely with Power and Transmission front office business organizations. The Agency Enterprise portal, one of the IT systems CSS uses, is being developed to provide a single source location for

customers' digital touchpoint with BPA. Using this portal, customers will be able to access data related to metering, billing, contracts and forecasting as well as other agency and customer specific information.

Objectives in 2022 and 2023 and impacts of proposed spending level

CSS spending levels are more than 98 percent personnel related. CSS supports BPA's strategic plan through the validation of meter data and production of load forecasts and customer bills for both Power and Transmission. Personnel costs will be stable for the rate period and the CSS staff will be vital for supporting key CSS initiatives. These initiatives include the development of new systems for metering and billing as well as a new portal system for improved customer service. In addition, the CSS staff will be supporting the development of a new system for EIM Settlements that support BPA potentially joining the Western EIM. All of these systems are necessary to keep pace with the changing needs of the agency and the industry.

5.8 General Counsel

Program cost details

Table 48 General Counsel, Expense Detail

	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
($thousands)	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 - 2023
Enterprise Services' G&A Allocations	4,290	4,379	5,239	5,410	5,314	4,987	5,325	5,150
Transmission Direct Support	2,993	2,922	3,166	3,294	2,931	3,092	3,230	3,012
Power Direct Support	3,310	3,108	3,166	3,294	3,029	3,195	3,230	3,112
Total	**10,593**	**10,409**	**11,570**	**11,998**	**11,274**	**11,274**	**11,784**	**11,274**

Mission

The Office of General Counsel (OGC) provides legal advice and representation in connection with all BPA activities. It charges directly to Power and Transmission when supporting projects exclusively for the business units. It also has costs in support of general agency initiatives which are allocated to the business units. Support includes legal advice and representation of the agency in all areas of claims, and administrative or judicial litigation. Areas covered include:

- The Columbia River Treaty.
- Corporate authority, governance and delegations.
- Financial management.
- Tribal issues.
- Fish and wildlife program support.
- Procurement of goods and services.
- Tort claims.

- Freedom of Information Act and Privacy Act.
- Employee claims.
- Ethics, including conflicts of interests and financial disclosure.
- Human capital issues, including labor issues, disciplinary actions, reasonable accommodations requests, and EEO claims.
- Security processes and procedures.

Objectives in 2022 and 2023 and Impacts of proposed spending level

OGC's spending levels are almost entirely personnel driven; it has no programs beyond legal services. While personnel costs remain flat, legal staff has decreased due to a combination of retirements and a number of unexpected departures. To address these unexpected departures and retain our experienced workforce, OGC intends to hold personnel funding flat and apply the differential to our reduced staff through retention incentives, including student loan repayments, attorney promotions to the GS-15 master level, and other incentives as available and appropriate. Retaining senior attorneys is crucial for meeting legal services needs such as program plan advice and counsel, prioritizing litigation and other legal work, and meeting client expectations.

Insufficient funding of legal services would compromise BPA's ability to complete market transactions, including bond work and third party financing, as well as transactions in support of power and transmission sales along with other customer contract needs. It would jeopardize BPA's ability to participate in litigation, ranging from support of Department of Justice actions to actual representation, whether in federal circuit and district courts, the Court of Federal Claims, or in forums such as FERC, NERC and MSPB. Significant delays to agency initiatives would likely be felt by customers and agency staff if legal resources were prioritized due to a lack of experienced attorneys.

OGC's goals and priorities in fiscal years covered by BP-22 rate period are to continue to provide advice related to, and defend actions associated with, the widely varying functional areas identified above. All issues are important, but more activity is expected with the treaty negotiations; changing energy market environments (EIM/EDAM/RA); litigation and activities associated with the Biological Opinion, CRSO, other environmental and tribal processes; and the transmission tariff. Significant additional work is expected around COVID-19 related issues, such as customer payments, BPA obligations, contract disputes, Treasury interactions, and other legal matters.

6 Environment, Fish & Wildlife

Mission

The Environment, Fish and Wildlife (EFW) division manages programs that mitigate for the effects of constructing and operating the Federal Columbia River Power System, as well as ensuring compliance with applicable environmental laws and regulations.

EFW provides support and compliance for the Power and Transmission business lines through three programs: Fish and Wildlife, Environmental Planning and Analysis, and Pollution, Prevention and Abatement.

BPA's Fish and Wildlife Program, sometimes called "the direct program," provides funding directly to local, state, tribal, and federal entities to implement hundreds of mitigation projects. These projects are mostly considered "enhancement" actions under the Northwest Power Act; that is, off-site protection and mitigation actions that typically address impacts to fish and wildlife not caused directly by the FCRPS. These actions help improve the overall conditions for fish and wildlife adversely affected by the development and operation of the FCRPS. For example, Fish and Wildlife Program funding improves habitat in the mainstream as well as tributaries and the estuary, builds hatcheries and boosts hatchery fish production, evaluates the success of these efforts, and improves scientific knowledge through research. This work is implemented through annual contracts, many of which are associated with multi-year agreements like the Columbia River Basin Fish Accords. BPA fulfills many of its Endangered Species Act (ESA) compliance commitments through the direct program as well. Because these ESA actions also help fulfill Northwest Power Act mitigation responsibilities, BPA tallies them together as expenditures from the direct program.

In addition to the hatchery operations that are funded through the Fish and Wildlife Program, BPA directly funds the U. S. Fish and Wildlife Service (USFWS) for annual operations and maintenance of the Lower Snake River Compensation Plan (LSRCP) fish hatcheries and facilities. The LSRCP hatcheries and satellite facilities produce and release more than 19 million salmon, steelhead, and resident rainbow trout part of the program's mitigation responsibility. The LSRCP hatcheries and satellite facilities are operated by Idaho Fish and Game (IDFG), Washington Department of Fish and Wildlife (WDFW), Oregon Department of Fish and Wildlife (ODFW), USFWS, the Nez Perce Tribe (NPT), Confederated Tribes of the Umatilla River (CTUIR), and Shoshone-Bannock Tribes (SBT).

Table 49 Environment, Fish & Wildlife, Expense Detail

($thousands)	Actuals		Rate Case		Proposed IPR		Avg Rate Case	Avg Proposed IPR
	2018	2019	2020	2021	2022	2023	2020 - 2021	2022 - 2023
Enterprise Services' G&A Allocations	128	97	0	0	0	0	0	0
Transmission Direct Support	5,556	5,013	6,499	6,652	7,417	7,630	6,575	7,524
Power Direct Support	284,945	261,753	285,532	285,992	284,920	284,707	285,762	284,814
Total	**290,630**	**266,863**	**292,030**	**292,644**	**292,337**	**292,337**	**292,337**	**292,337**

Table 50 Environment, Fish and Wildlife, Capital Detail

($thousands)	Proposed IPR		Capital Outyears							
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Fish & Wildlife	43,000	43,000	30,000	25,000	15,000	15,000	15,000	15,000	15,000	15,000
Environment	5,580	5,590	5,600	5,610	5,620	5,630	5,640	5,650	5,660	5,670
Capital Total	**48,580**	**48,590**	**35,600**	**30,610**	**20,620**	**20,630**	**20,640**	**20,650**	**20,660**	**20,670**

Program objectives in 2022 and 2023

BPA remains committed to its obligations to mitigate for the operation of the federal hydropower system and to comply with all applicable environmental laws.

The Fish and Wildlife Program objectives are informed by biological opinions (BiOps), court orders, and Northwest Power and Conservation Council recommendations. Many uncertainties impact the implementation of the Fish and Wildlife Program. The Program focuses on the flexibility of multi-year planning and shaping of available budgets on an annual basis to support high-priority work that is most likely to be ready to implement. This program provides a strong base of biological accomplishment that should be maintained, refined, and built on, rather than re-invented. BPA will manage project funding and priorities based on biological investment portfolios, emphasizing cost-effective funding of biologically effective projects.

During BP-22, BPA expects it will meet legal F&W compliance obligations under applicable laws, BiOps, agreements, and the Council program.

Additional expenses related to actions required to implement the preferred alternative within the Columbia River System Operations environmental impact statement will be reviewed once the Record of Decision (ROD) is issued in September 2020.

The LSRCP long-term strategy builds on its short-term goals with continuing improvements in rearing technology that allow for increased fish production using available water; expanding hatchery reforms to further advance best management practices; implementing cost-effective energy

conservation initiatives for pumping and heating/cooling water; and developing and implementing preventative maintenance as well as addressing deferred maintenance.

For Environmental Planning and Analysis, work includes the following. In Partnership with Transmission, continue to identify the appropriate NEPA strategies and provide quality, timely and cost effective environmental and cultural planning and analysis services to deliver key program milestones for BPA's transmission program. In partnership with Power Services and Corporate Strategy, identify the appropriate NEPA strategy and provide quality, timely, and cost-effective environmental planning and analysis to deliver on key project milestones focusing on projects identified as needing environmental compliance. In partnership with EW, identify the appropriate NEPA strategy and provide quality, timely, and cost-effective environmental and cultural resources planning and analysis to deliver on key project milestones for BPA's Fish and Wildlife Program implementation. The lead Federal Agencies will implement cultural resource mitigation projects within the FCRPS.

Pollution Prevention and Abatement plans to achieve the following goals: significantly reduce Polychlorinated Biphenyls (PCBs), a primary Persistent Bioaccumulactive Toxic chemical on BPA's transmission system; ensure BPA's transmission facilities (i.e. substations and maintenance complexes) storm water discharges meet all Federal and State standards established under the Clean Water Act; provide certainty that BPA's oil storage facilities meet all Federal and State standards established under the Clean Water Act and Hazardous Materials Regulations.

The Environmental Capital program is managed with a relatively level budget and systematic approach. There are no new programs planned for BP-22.

Impacts of proposed spending level

For the Fish and Wildlife Program, BPA expects that it will be able to meet critical legal compliance obligations under applicable laws, various BiOps, agreements and the Council Program at proposed funding levels. Concurrently, the program is committed to supporting BPA's strategic plan and financial health objectives, and will maintain budgets flat in relation to the BP-20 average.

In order to achieve this, and account for increased operating costs, the Fish and Wildlife program will identify projects and programs that can sustain reductions and/or extended timeframes for implementation, while still maintaining compliance, progress toward program objectives and regional commitments. These reductions will be achieved through collaboration with stakeholders and an emphasis on projects that directly benefit fish and wildlife in a cost-effective manner.

Two classes of LSRCP activities will not be funded at the proposed budget levels: deferred maintenance (including energy conservation and preventative maintenance) and activities to meet best management practices as recommended by the Hatchery Science Review Group and Hatchery Review Team. The consequences of reduced preventative maintenance or continued deferrals of maintenance are typically higher future operating and capital costs. There is also increased risk of catastrophic failure of equipment that could require emergency equipment replacements (typically

at higher cost) or loss of fish. Reducing the use of best management practices could cause risk to ESA-listed stocks.

The Fish and Wildlife Program also faces the following challenges and constraints that would be exacerbated if funding levels were reduced from proposed levels. Legal challenges to the FCRPS BiOp, the Willamette BiOp, and ongoing litigation create uncertainty for many aspects of the Program. The potential exists for additional funding requirements and additional ESA listings. Larger land acquisitions pose challenges to spending allocations. These large land acquisitions are difficult to plan as numerous uncertainties surround them (availability and permitting, for example); nevertheless, BPA must absorb these opportunities into available spending levels. The costs of implementing BiOps have risen over time. To date, the Fish and Wildlife Program has absorbed these increasing costs into existing funding amounts through aggressive project management and spending efficiencies. The success of the Fish and Wildlife Program is heavily dependent upon funding and services from the following BPA organizations: Environmental Planning and Analysis (EC); Power Generation and Supply (PG): Supply Chain (NS); Office of General Counsel (L); Realty Services (TER).

The proposed funding reflects environmental compliance commitments under various laws and formal agreements. Consequently, these are considered firm rather than flexible elements of BPA's cost structure. The proposed funding also reflects a balance between listed species under the ESA and species that are not listed, between anadromous fish and resident fish and wildlife, and between wild and hatchery fish. With the exception of capital funding for hatchery construction and certain land acquisitions and stewardship funds, the BPA Fish and Wildlife Program budget is expense-funded.

The continual search for efficiencies is part of cost management in a Program with fixed budgets, ongoing commitments, and emerging issues. We will base proposed spending levels and contracting decisions on the biological priority and cost effectiveness of a project in regards to the ESA, Power Act and other binding obligations – a biological investment portfolio approach. These assessments and drive for efficiency will be even more essential under the proposed spending level. One such example is the use of one time stewardship agreements, rather than annual spending streams, to provide operation and maintenance costs associated with wildlife and fish acquisitions purchased for mitigation.

For the Pollution, Prevention and Abatement Program, managing to flat expense budgets without inclusion of inflation will cause delays in compliance work that has a lower priority. Additionally, the flat expense budgets would greatly limit the organization's ability to respond to unforeseeable environmental emergencies, such as transformer failures.

Capital Execution

Fish and Wildlife capital spending is represented by 3 asset categories: (1) hatcheries, (2) fish screens and passage improvements, and (3) conservation lands/easements.

Hatcheries: Capital expenditures on hatcheries increased in the last 2 years as a result of new hatchery construction agreements and funding of the non-recurring maintenance needs. Hatchery related expenditures have historically made up approximately 55 percent of Fish and Wildlife capital spending.

In 2016 HDR, an engineering firm hired by BPA and the Council, performed condition assessments on 14 Fish and Wildlife Program Hatcheries. A condition assessment report for each hatchery can be found on the Council's artificial production programs website. These assessments were then used to develop an estimate of costs to address outstanding mission critical elements from FY 2017 and essential non-recurring maintenance needs and improvements for FY 2018, 2019, 2020 for 9 of the 14 hatcheries. The assessments for these 14 hatcheries will be updated every 5 years to incorporate needs and inform prioritization and planning associated with the facilities, program, and Outyear budgets.

Fish and Wildlife is proactively partnering with NPCC to implement regular condition assessments every 5 years that are used to develop an estimate of costs to address outstanding mission critical elements and essential non-recurring maintenance needs and improvements to prioritize and address critical components to operating existing hatchery programs. The next assessment will be performed in 2021. We are leveraging lessons learned from past projects. For example, the Fish and Wildlife contracting process includes a project team approach to early project planning and development.

Screens/Passage: Starting in fiscal year 2016, the Fish and Wildlife program began eliminating capital funds for fish screens. Any new fish screen funding has been covered by the expense budget as an identified priority for ongoing operation and maintenance. The expense budget for the Fish Screen program was increased starting in the same year to accommodate for these costs. Capital funding was made available, however, for qualifying passage improvement projects beginning in FY20; these projects typically involve the removal or reconstruction of dikes and water control structures to improve side channel habitat for anadromous fish.

Fish screen operating entities perform condition assessments of the assets, prioritize the immediate and longer term maintenance needs, and share assessments with BPA and the FSOC in order to obtain funding.

Conservation Lands: Land acquisitions that permanently extinguish a portion of BPA's mitigation obligations are funded through BPA's capital program, and these include land acquisitions to mitigate for impacts to wildlife and acquisitions to mitigate for impacts to resident fish species in Montana. Other acquisitions are expensed, and land related expense costs for fiscal years 2015 through 2019 showed a slight increase in absolute terms while capital costs declined over the same period. The overall spending remained relatively flat as a percentage of the total program expenditures. Capital costs have been

declining steadily since 2011 due to achievement of certain wildlife settlements. Land-related expenditures have made up approximately 39 percent of Fish and Wildlife capital spending.

Fish and Wildlife will continue to fund the implementation of the lands program to ensure that properties are meeting mitigation objectives, such as mitigation for lost habitat and reduced population sizes and to assist in the conservation of endangered and threatened salmon and steelhead populations. Through improved monitoring of acquired lands and better data management and sharing, BPA can continually improve the lands program and its benefit to fish and wildlife.

Where feasible, BPA is pursuing settlement agreements with stakeholders. The settlements are intended to permanently extinguish further obligation by BPA to acquire lands for fish and wildlife mitigation, within defined geographic areas, or pertaining to specific dams, in exchange for upfront distribution of funding to accountable entities. Such funds provide the entities with the resources to maintain the original mitigation value of the acquired lands.

For Environmental Planning and Analysis (EC), work includes continuing to identify the appropriate NEPA strategies and provide quality, timely and cost-effective environmental and cultural planning and analysis services to deliver key program milestones in partnership with Transmission, Power and Fish and Wildlife.

Environmental Capital: Pollution, Prevention and Abatement (EP) plans to replace 30 or more pieces of high-voltage equipment annually that are regulated for PCB content under the Toxic Substances Control Act; install or upgrade drainage treatment and containment systems at environmentally sensitive transmission facilities to maintain water resources protection and to prevent regulatory non-compliance; and install or upgrade oil storage at key transmission facilities to meet environmental regulatory standards and requirements.

Impacts of proposed capital investment levels & associated O&M tails

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The strategy for the EF&W capital asset management categories is to maintain current planning and implementation practices, therefore there is expected to be little impact to performance or risk of the asset over in the near-term. However, it may become necessary for the program to develop a strategy for addressing climate change impacts that could affect performance of active water transactions that are critical to mitigation obligations. This could raise risk levels for reliability, financial, environment, and compliance of the asset management program in future years.

7 Appendix

7.1 Index of Figures

7.2 Index of Tables

The information in this document was made publicly available on June 12, 2020, and contains information sourced directly and not directly from BPA financial statements.