Public Rate Design Methodology (PRDM)

Workshop #4

Chapter 5, 6 & 8, Tier 1 & 2 Rate Design, Resource Support Services

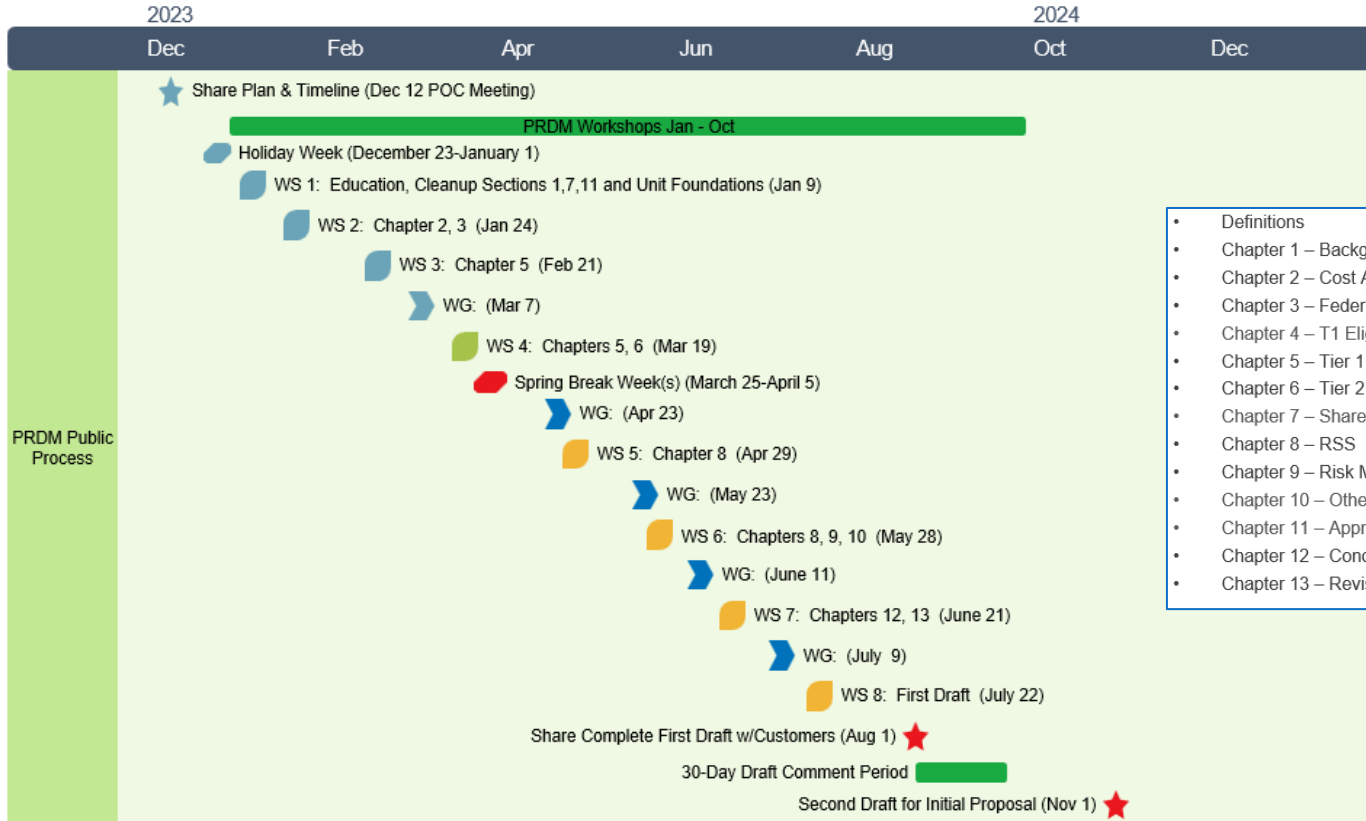**Meeting 11 a.m. – 4 p.m.**

March 19, 2024

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Agenda

Time Start	Time End	Topic	Presenter(s)
9 a.m.	11 a.m.	**BP26 Rate Case Kick Off Workshop (Late Start for PRDM – and feel free to use room)**	
11:00	11:15	Welcome, Introduction, Agenda, and Housekeeping	Scott Reed
11:15	12:00	Workgroup report out and discussion	Scott Reed, Mike Deen and Sean Ford (PPC)
12:00	1:00	**L U N C H B R E A K**	
1:00	2:00	Peak Load Variance Charge education and discussion	Daniel Fisher
2:00	2:10	**B R E A K**	
2:10	3:45	Chapter 6: Tier 2 Rate Design	Garth Beavon
tbd	tbd	Chapter 8: Resource Support Services (on deck if time allows)	Daniel Fisher
3:45	4:00	Conclusion & Next Steps	Scott Reed
		Note: times are approximate	

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Timeline Update

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Update on PRDM Chapter Drafting

- While we had hoped our drafting work could closely follow our workshops – we've learned that approach won't be an efficient use of everyone's time until we've moved the ball further in workshop and workgroup discussions.

- Until we know more about the framework, we are going to pause our attempt to make redline edits in real-time. We now expect draft development / redline review work will start in June.

- Between now and June we'll continue to develop context, designs, and assess impacts, and refine designs – and that work will set us up well for a productive chapter drafting process.

- Chapter drafts will first identify objectives for the chapter and related changes from TRM.

Workgroup Summary

Scott Reed, Mike Deen and Sean Ford (PPC)

Workgroup Report Out

- Summary
  - Attendance
  - Topics
    - Baseline for evaluating design impacts
    - Rate Impact Credit
    - Peak Load Variance
    - Preliminary designs
    - Preview of Chapter 3 redlines

- Summarize Discussion & Feedback

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Baseline:

Purpose: defines measurement point used to assess rate-designs – underlying input to our Rates Impact Model

BPA's Takeaways
- FY22 and 23 Actuals @ BP-22 Rates used to calculate effective non-Slice product rates for each customer. The revenue collected from these years (the status quo) will be used to establish the revenue needed to be collected under the other rate designs we are evaluating.
- Repeat process for FY24 and 25 Forecasts @ BP-24 Rates.
- This dual approach will help us understand the results, how consistent they are across multiple years, as well as across different sources of data (actuals versus forecasts).
- Customers that want to evaluate their impact under a different product selection than they have today will work with BPA to help define the inputs. This will be one part art and one part science given such a request requires us to create a hypothetical case instead of using inputs backed by invoices, contract rules, and/or rate case studies.
- This analysis will be used to understand the different rate designs and their potential impact on different customer profiles.
- The analysis is also intended to inform how the Rate Impact Credit (RIC) might need to be applied to produce palatable results.

Other Takeaways
- Summary and discussion

Rate Impact Credit (RIC):

Purpose: RIC is an important element for the overall rate design to work for a broad range of interests

BPA's Takeaways:
- Purpose of the CDQ and the RIC are twofold: a proxy for un-tiered capacity, and rate-shock mitigation for atypical/idiosyncratic/outlier impacts the PRDM rate design might cause relative to the TRM rate design.
- Said another way, Bonneville does not view the RIC, or the CDQs, as a subsidy. Rather, the CDQs, and now the RIC, allowed Bonneville to send marginal price signals for the increased/decreased use of capacity without having to establish a capacity-HWM the same as it did for energy.
- Looking forward, a potential way in which BPA could size the RIC would be to calibrate it based on the value provided through CDQs.

Other Takeaways:
- Summary and discussion

Peak Load Variance (PLVC):

Purpose: Unbundle the cost of holding capacity to serve load uncertainty above the P50 peak level. Explicitly define costs for planning reserve margin obligations – which Bonneville views as a pooled insurance-like service for LF customers and/or Block customers as eligible and elected.

BPA's Takeaways

- The demand charge already captures differentiation in load factors, especially if we retain CSP as the billing determinant, so we're not inclined to further target particular load factor shapes.

- Presentation ahead on our early thinking here, expressed in the Workgroup.

Other Takeaways

- Summary and discussion

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Preliminary Rate Design Alternatives:

BPA's Takeaways:

- Let's not get ahead of ourselves! Rate design should not get ahead of industry-wide pricing (removing HLH/LLH as defined by WSPP). It should, however, be flexible enough to adapt to industry change if that change occurs during the PRDM time period.

- Designs should support more granularity rather than less – so remove monthly-average energy rates from preliminary designs.

- See preliminary designs matrix.

Other Takeaways:

- Summary and Discussion

Preliminary Designs:

*Dependent Variables	Element 1	Element 2	Element 3	Element 4	Element 5	Element 6	Element 7
Status Quo	TOCA	Non-Slice TOCA*	Slice %	Non-Slice HLH/LLH Load Shaping Rates	Rate = Marginal || Revenue Credit to Element 2		
					Load Following Demand = Tier 1 CSP - Tier 1 aHLH - CDQ		
					Block w/ Shaping Capacity Demand = Contract Shaping Amount - CDQ		
Alt. 1			Slice % and/or $/MWh	Non-Slice HLH/LLH Energy*	**Rate = Marginal || Revenue Credit to Element 4**	**Rate = Embedded Capacity Based || Revenue Credit to Element 4**	
					Load Following Demand = Tier 1 CSP - Tier 1 aMonthly	PLV = TRL * PLVrate (removed from Element 4)	Rate Impact Credit
					Shaped Block = Tier 1 CSP - Tier 1 aMonthly	No PLV Option	Rate Impact Credit
					Block w/ Shaping Capacity Demand =Contract Shaping Amount	PLV Option (Same capacity pricing as Load Following + Mkt Energy)	Rate Impact Credit
Alt. 2			Slice % and/or $/MWh	Non-Slice HLH/LLH Energy*	**Rate = Marginal || Revenue Credit to Element 4**	**Rate = Embedded Capacity Based || Revenue Credit to Element 4**	
					Load Following Demand = Tier 1 CSP - Tier 1 aHLH	PLV = TRL * PLVrate (removed from Element 4)	Rate Impact Credit
					Block w/ Shaping Capacity Demand = Contract Shaping Amount	PLV Option (Same capacity pricing as Load Following + Mkt Energy)	Rate Impact Credit
Alt. 3			Slice % and/or $/MWh	63% of Non-Slice Revenue Requirement over HLH/LLH Energy*	**Rate = 37% of Non-Slice Revenue Requirement over capacity at TTSL & Contract Shaping Amount**	**Rate = Embedded Capacity Based || Revenue Credit to Element 4**	
					Load Following and Shaped Block Demand = Load at TTSL	PLV = TRL * PLVrate (removed from Element 4)	Rate Impact Credit
					Block w/Shaping Capacity Demand = Contract Shaping Amount	PLV Option (Same capacity pricing as Load Following + Mkt Energy)	Rate Impact Credit
Alt. 4	Fixed Customer Charge 37% of Revenue Requirement		Slice % and/or $/MWh	Non-Slice HLH/LLH Energy*	**Rate = Marginal || Revenue Credit to Element 4**	**Rate = Embedded Capacity Based || Revenue Credit to Element 4**	
					Load Following Demand = Tier 1 CSP - Tier 1 aMonthly	PLV = TRL * PLVrate (removed from Element 4)	Rate Impact Credit
					Shaped Block = Tier 1 CSP - Tier 1 aMonthly	No PLV Option	Rate Impact Credit
					Block w/ Shaping Capacity Demand =Contract Shaping Amount	PLV Option (Same capacity pricing as Load Following + Mkt Energy)	Rate Impact Credit

Next Steps

- Analysis and discussion
    - Run preliminary designs to generate impacts by customer (tentative report out on 4/29)
    - Will include current LDD and IRD as a starting point (enable on/off for clarity)
    - Discuss results and refine

- Assess and define preliminary Demand Rate

- Assess and define preliminary Rate Impact Credit (RIC)

- Assess and define preliminary Peak Load Variance Charge (PLV)

- Target design by July

Peak Load Variance Charge

Daniel Fisher, Power Rates Manager

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About the potential Peak Load Variance Charge

- Bonneville is considering adding a Peak Load Variance Charge (PLVC) to the core charges described in the PRDM.

- The purpose of the PLVC would be to unbundle the cost of holding capacity to stand ready to serve load when it exceeds long-term expectations (P50 Peak Load).

- Unbundling and separately charging for this capacity became more important as the region focused on a common resource adequacy standard and ways in which to better achieve resource reliability among entities that participate.

- The benefits of unbundling the cost is further emphasized if Bonneville were to provide a Peak Load Variance Service to products other than Load Following. Namely, transparency and comparable pricing across products to support equity.

- Planning for and holding this capacity has always been an intrinsic part of the Load Following product. Only the pricing, i.e., bundled versus unbundled, has varied through time.
  - Bonneville had an unbundled charge in its Subscription contract period, called the Load Variance Charge, that aimed to collect some additional revenue from customers that elected load following products.
  - Through the negotiation of other tradeoffs that resulted in Load Following customers paying more for capacity use in Regional Dialogue as compared to Subscription, the Load Variance Charge was removed from the core charges defined in the Tiered Rates Methodology.

What capacity is the potential Peak Load Variance Charge measuring?

- The cost of the capacity that Bonneville holds to meet its planning standard (P10 Peak Load) that is above its P50 Peak Load obligation.

- Load Following demand billing determinant will be higher when this capacity is used – albeit over time, only the demand billing determinant would average out to the P50 value.

- Energy used during P50 to P10 peak events would flow naturally through the rate design and either be at Tier 1 or marginally priced depending on customer's CHWM and annual load amount.

Load Following Product

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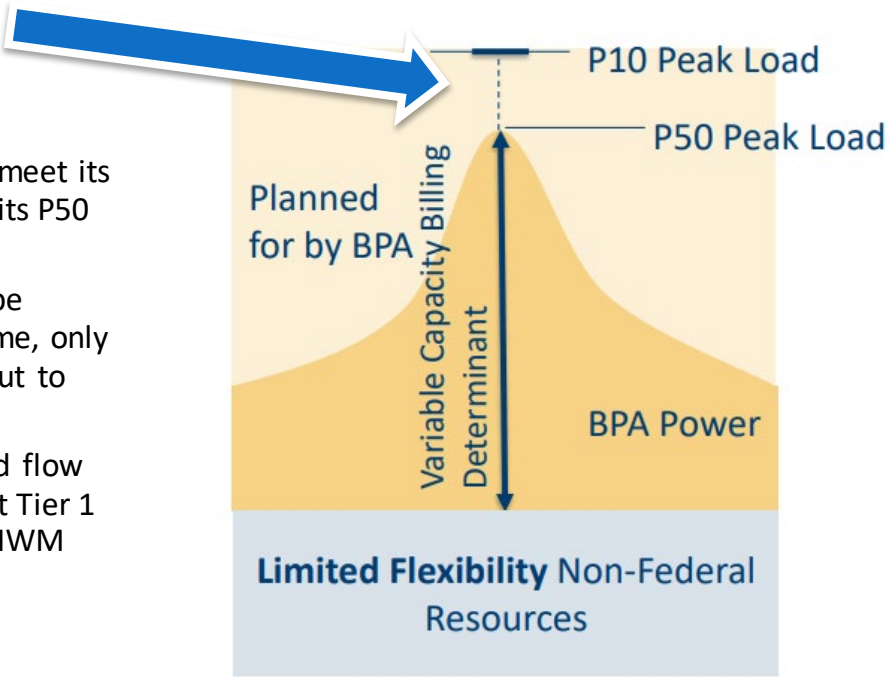
Block with Shaping Capacity Product

Pricing should be comparable to any Block with Shaping Capacity customers that elect the Peak Load Variance Service.

- Unlike the Load Following product, a block customer with shaping capacity does not have a demand billing determinant that would stretch into the P50 to P10 region.

- Energy used during P50 to P10 peak events would **not** flow naturally through the rate design.

- Current thinking is to separately account for any energy used during a peak load variance event at a market index value and neither impact the amount of energy provided through the block product nor apply an additional block capacity billing determinant.

- Solution needs to be equitable regardless of the amount of non-federal resources a customer has.

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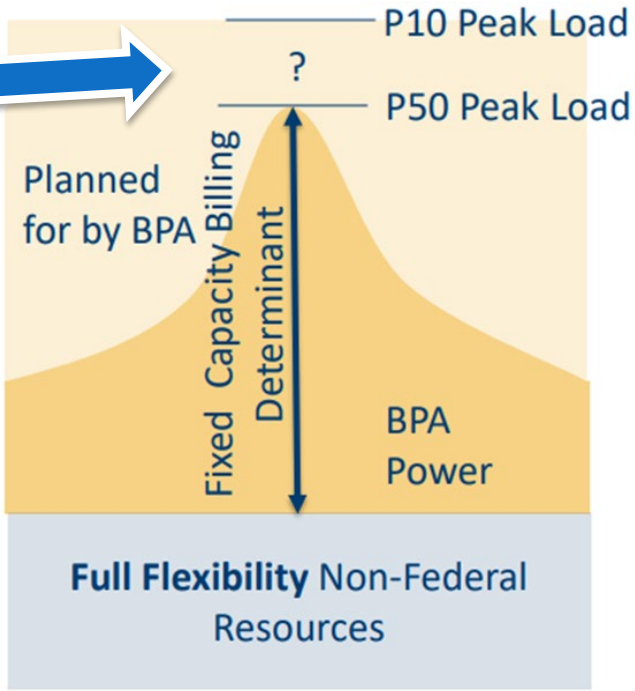
Pricing Considerations

- Bonneville staff currently view the Peak Load Variance Services like an insurance-like service that provides access to a pooled amount of capacity during Peak Load Variance events.

- Similar to other pooled capacity services, specifically Transmission's balancing services, Bonneville would forecast in each rate case how much capacity it needed to support the pool and calculate the aggregated cost of holding that capacity.

- Given the nature of the capacity – relatively long lead times and limited price signal opportunity – Bonneville staff believe the embedded cost of capacity – specifically its supplemental operating reserve capacity (i.e., non-spinning contingency reserves) rate is the correct reference point for the cost of Peak Load Variance Service capacity. *Note: It's not uncommon that a planning reserves margin specifically call out "Contingency Reserves" as a type of qualifying capacity.*

- Bonneville would then establish a billing determinant and rate that would recover those forecast costs from the customers that receive Peak Load Variance Service.

Pricing Considerations Continued

- Bonneville staff currently believe a Total Retail Load-based billing determinant is a reasonable method for allocating these costs given the service's pooled and insurance-like characteristics. The assumption being that the bigger the load the more that load contributes to Bonneville's P50 to P10 Peak Load obligation.

- For various reasons, Bonneville staff is not currently compelled to try to further distill a customer's share of those pooled costs based in each customer's load characteristics. If Bonneville were to go down this path, it would likely have to be a methodology similar to Bonneville's Incremental Standard Deviation (ISD) methodology that it uses to separate and establish cost causation between the shared use of balancing reserves for load, dispatchable energy resources, variable energy wind, and variable energy solar.
  - It would likely have to be even more data intensive as rather than four cost-causation buckets, each customer would have to be evaluated. In addition to being data and computationally intense, it would likely be extraordinarily contentious and would have to be recalculated each rate case. **Trust us, we don't want this.**

- Such an elaborate, computationally intensive, and likely contentious approach feels overkill for this particular situation given our current practice of not unbundling it at all.

- Lastly, a portion of these capacity costs are likely covered through the regular Tier 1 demand billing determinant that may be based on the sum of each customer's non-coincidental peak which is, by definition, bigger than the coincidental peak that will be at the core of any Peak Load Variance Service event.

Preliminary Pricing Example

- **Variable 1:** Bonneville's capacity % it uses to determine how much additional capacity power must hold to cover resource adequacy for its peak loads. Average annual margin = 17.8% (*Note: this may need to be adjusted downward for the portion of the percentage that includes operating reserves which Bonneville recovers through Transmission rates.*)

Requirements Summary					
	Season	**June-2024**	**July-2024**	**August-2024**	**September-2024**
Program Monthly PRM	Summer	16.5%	10.4%	10.3%	17.9%

Requirements Summary					
	Season	**November-2023**	**December-2023**	**January-2024**	**February-2024**	**March-2024**
Program Monthly PRM	Winter	21.6%	17.7%	19.0%	19.9%	26.9%

- **Variable 2:** 17.8% multiplied by the P50 Peak Load covered by Bonneville. 1,012 MW
- **Variable 3:** Embedded cost of supplementing operating reserves. $5.92/kW/mo
- **Variable 4:** Forecast Total Retail Load of customers covered through Peak Load Variance Service. 52,875,569 MWh
- **Calculation cost:** [1,000 MW * $5.92/KW/mo * 12 months * 1000 kW/MW] = $71,910,774
- **Calculate rate:** $71,910,774 divided by 52,875,569 MWh = $1.36/MWh

Chapter 6:

Tier 2 Rate Design

Garth Beavon, Rates Economist

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Tier 2 Under the TRM

If a customer's net requirements load is greater than its RHWM (amount of firm power a customer can purchase at the Tier 1 PF rate), this is called Above-RHWM load. (TRM Para 4.3.)

- Both RHWM and Above-RHWM Load are expressed in average megawatts (aMW).

The customer must elect to serve Above-RHWM load in one of three ways:

- Purchasing non-federal resources.
- Purchasing an amount of firm power at Tier 2 rates from BPA.
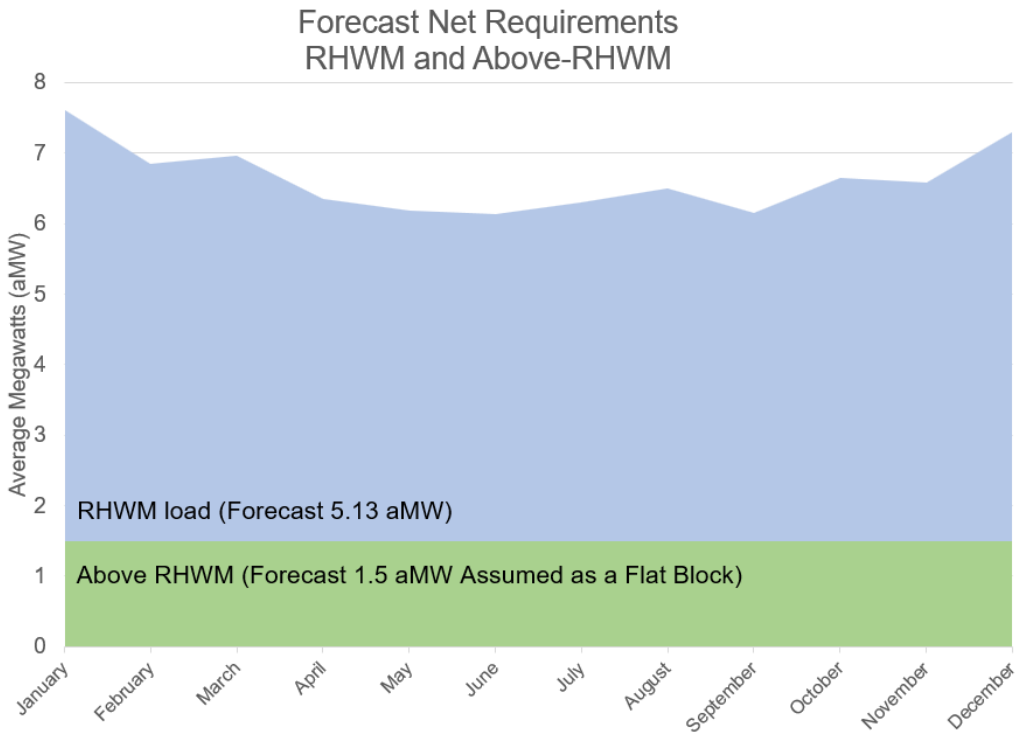- A combination of the two previous options.

Tier 2 rates are based on the forecast price to acquire the additional power.

- In this way, there is no subsidy of Tier 2 options from Tier 1 revenues, or between Tier 2 options.
- BPA is neutral on whether a customer selects BPA or an alternative supplier to serve needs.
- BPA separates costs between the Tier 1 Cost Pool and Tier 2 Cost Pools through the rates and relevant contract provisions.

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Tier 2 Under the TRM

- BPA provides the following Tier 2 alternatives:
  - a Load Growth Rate
  - a Short-Term Rate; and
  - as customer needs and interests warrant, a Vintage rate or set of Vintage rates

- BPA Tier 2 rate alternatives are based on a flat annual block of power. Rate design is very simple: A $/MWh rate, with no Demand Charge, and no Customer Charge.

- The actual price of BPA Tier 2 service is established in each applicable 7(i) process (rate case).

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Tier 2 Under the TRM

Forecast Net Requirements RHWM and Above-RHWM

RHWM load (Forecast 5.13 aMW)

Above RHWM (Forecast 1.5 aMW Assumed as a Flat Block)

Each rate period, a customer is assigned a RHWM amount and, if eligible load is more than that amount, an Above-RHWM amount. The RHWM amount represents the amount of power that is purchased at Tier 1 rates. The Above-RHWM amount is the amount of power that is served by non-federal resources or at Tier 2 rates, based on customer election.

Even if actual load differs from the forecast, the above-RHWM amounts do not change. Where the load actuals deviate from load forecast, the differences are measured as the billing determinants of the Tier 1 Load Shaping Charge.

In effect, the Tier 1 Load Shaping Charge acts like a true-up for Above-RHWM load forecast error. This true-up is calculated at the Load Shaping Rate (which is a forecast marginal market price).

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Tier 2 Under the TRM (cont.)

Tier 2 Alternative (Customer commitment*)	Allocated Costs (Resource types)	RECs Provided?
Short-Term (3-5 yrs)	Short-term market purchases (5 years or less in duration). Purchases driven by lowest cost market opportunities.	Yes, if purchase came with RECs.
Load Growth (14 or 17 yrs)	A mix of short- and long-term purchases (examples would include renewables, CCCT, waste energy gen, market purchases). Resource selection primarily driven by lowest lifecycle cost.	Yes, if purchase came with RECs.
Vintage (up to 17 yrs)	Based on customer interest. (Wind, geothermal, solar, waste energy generation, CCCT). Resource selection driven by targeted resource and lowest lifecycle cost.	Yes, if purchase came with RECs.

* Customer commitment period is based on the applicable purchase periods as established in the CHWM Contract. These periods and their notice deadlines are also shown in a table in TRM Para. 4.3.1.

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Tier 2 Under the TRM (cont.)

BP-24 Priority Firm Rate:

2.2.2   Short-Term Charge

The Short-Term Charge is applicable to customers that have elected to purchase power at the Tier 2 Short-Term Rate, as specified in the customers' CHWM Contracts, Exhibit C, Section 2.5.

2.2.2.1   Short-Term Rate

Fiscal Year	Rate in mills/kWh
2024	63.83
2025	60.25

2.2.2.2   Short-Term Billing Determinant

The Short-Term Billing Determinant is the annual amount of power specified in the customer's CHWM Contract. For the relevant billing month, the contract amount will be converted from average megawatts to kilowatthours assuming a Flat Annual Shape.

Tiered Rate Methodology:

16   Rate Alternative will pay the rate associated with that rate alternative. Each Tier 2 Rate will be
17   established to recover all the costs allocated to the associated Tier 2 Cost Pool. BPA will
18   establish Tier 2 Rates based on the cost of providing a flat annual block of power. Service at the
19   Tier 2 Short-Term, Load Growth, and Vintage rates will include the transferred Renewable

Customer Contract:

Annual Amounts Priced at Tier 2 Rates (aMW)								
Fiscal Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
Tier 2 Short–Term Rate	2.967	6.921	0.000	1.650	0.000	0.839	6.023	9.738	2.843
Remarketed Amounts									
Fiscal Year	2021	2022	2023	2024	2025	2026	2027	2028	
Tier 2 Short–Term Rate	5.504	19.742	22.432						
Remarketed Amounts									

Tier 2 Under the TRM (cont.)

- Applicable cost components that are included in Tier 2 rates:

    - Resource acquisition and power purchase costs

    - BPA overhead costs – overhead costs associated with power provided at Tier 2 Rates

    - Resource Support Services (RSS) – for the cost of RSS products needed to financially deliver a flat block of energy

    - Other costs, including risk-related costs. These would include such costs as transmission costs, balancing authority costs for within-hour balancing, fuel adjustment adders, etc.

Tier 2 Under the TRM (cont.)

This is a payment for block energy that BPA uses to serve planned Above-RHWM Load. The quantity of service that BPA provides priced at each Tier 2 Rate is established in each customer contract. This service is in fixed, annual amounts on a take-or-pay basis for each fiscal year of a rate period.

Rate	"63.83 mills / kWh." (In BP-24 FY 2024.) The rate is based on a forecast cost of purchasing a block power from the market.
Billing Determinant	Customer's Tier 2 Power needs as specified in the customer's contract, measured in kilowatt hours.
Monthly Rate Difference?	No. The rate is calculated based on an annual flat block of power. Each hour of the year is apportioned the same number of kilowatts (regardless of diurnal period). Each hour has the same rate.
Cost Pool	There is a separate cost pool for each Tier 2 Rate alternative.
Applicable Customers	All customers can elect Tier 2 service. Load Following, Block, Block/Slice.
Example	Customer contract specifies that 2.130 aMW will be billed at Tier 2 short-term rate in FY 2024. There are 744 hours in January of 2024. The year 2024 has a rate of 63.83 mills / kWh. The charge is 2.130 * 744 * 63.83 = $101,153 for the month of January.

PRDM Changes to Above-CHWM and Tier 2

Quantities and Attributes:

- For most customers, access to power purchased at Tier 1 rates would be fixed for the term of the contact, but each rate period there will be a different Above-CHWM amount because the customer will have a new load forecast for each rate period. (CHWM will remain the same, but the customer's forecast overage will be different. Each fiscal year will have a different load forecast.)

- For operational and contractual convenience, BPA may extend to Load Following customers an option to have up to 0.999 aMW of Flexible Path Above-CHWM Load served through the Tier 1 rate design. This rounding option would be similar in purpose to the "round down" option under Regional Dialogue, permitting contract choices which would apply to full MW units.

- BPA will convey the environmental attributes, including carbon content and RECs, to public power customers that are served with firm requirements power at a specific Tier 2 rate.

PRDM Changes to Above-CHWM and Tier 2

Rates and Costs:

- Rate design will be the same: For each Tier 2 alternative, there will be a $/MWh charge for power service in fixed, annual amounts on a take-or-pay basis. The rate will be determined in each rate period. Each fiscal year will have a different rate.

- Under certain conditions, BPA proposes to provide power to the Long-Term Tier 2 rate at the cost of Tier 1. In all other conditions, BPA would set the Tier 2 rates on the acquisition cost or the forecast market cost of that power.

- BPA intends to include provisions in the PRDM that explain what happens if BPA has Long-Term Tier 2 costs and no load being served at the Long-Term Tier 2 rate. The provision would also address situations where a subset of customers that elected service at the Long-Term Tier 2 rate are determined to be bearing an inequitable amount of the Long-Term Tier 2 costs.

PRDM Changes to Tier 2 (cont.)

"Flexible Above-CHWM Path" means that a customer will be able to make, <u>in each rate period</u>, a different choice for service of that amount (e.g., choice between federal service or non-federal service).

"Long-Term Tier 2 Path" means that a customer has made a commitment, <u>for the term of the contract</u>, to the choice of federal service for their Above-RHWM Load.

Each customer will be provided a one-time option to elect one of these four options:

Option	Description
All Long-Term	All of a customer's Above-CHWM Load will be served at BPA's Long-Term Tier 2 rate.
Fixed Long-Term, remainder Flexible	A fixed aMW amount of a customer's load will be served at BPA's Long-Term Tier 2 rate with any remaining Above-CHWM load served through the Flexible Above-CHWM Path.
Fixed Flexible, remainder Long-Term	A fixed aMW amount of a customer's load will be served through the Flexible Above-CHWM Path with any remaining Above-CHWM load served at BPA's Long-Term Tier 2 rate.
All Flexible	All of a customer's Above-CHWM Load will be served through the Flexible Above-CHWM Path.

PRDM Changes to Tier 2 (cont.)

Setting aside potential offramps, a customer will make a one-time election to determine what portion of its Above-CHWM load will be served through the Long-Term Tier 2 Path and what portion will be served through the Flexible Above-CHWM Path.

Tier 2 Alternative	Allocated Costs (Resource types)	Environmental Attributes?
Long-Term Tier 2 Federal Service Option	Cost-effective resource acquisitions. (Workshop discussion clarified that BPA resource acquisitions may not be limited to specific terms.) If sufficient firm inventory is available, BPA will set the Long-Term T2 rate with an allocation of the costs of BPA's firm inventory.	BPA will convey the environmental attributes, including carbon content and RECs.
Short-Term Tier 2 Federal Service Option*	Cost-effective resource acquisitions.	Same as Long-Term
Vintage Tier 2 Federal Service Option*	An acquisition-based purchase of power at the cost of acquiring the output of that resource.	Same as Long-Term

* Customers with Flexible Path will make an election about short-term federal Service at least three months before each rate case.

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PRDM Changes to Tier 2 (cont.)

Served Net Requirements
CHWM and Above-CHWM
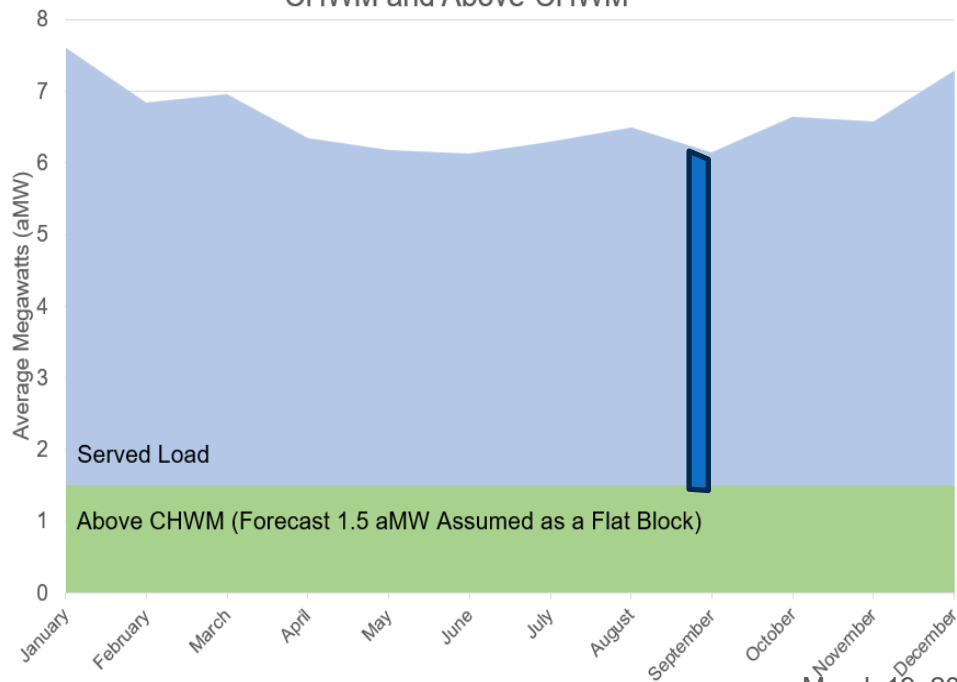
Treatment of Above-CHWM Load Forecast Error

Under a MWh rate construct, a customer would not be limited to their TOCA amount of power (which could be less then their CHWM amount). Rather, a customer would either:

1) Be provided a running total of their CHWM megawatt hours that would be charged at Tier 1 power rates. If that amount ran out, a marginal rate would apply for the remainder of the year.

2) Be billed for all power use in the year at Tier 1 rates with no limitations. At the end of the year, BPA would determine whether any of that power should have been billed at a marginal rate and if so, apply a true-up for those MWhs.

Whether the True-Up is a charge or a credit would depend on the relative prices.

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Chapter 8:

Resource Support Services

Daniel Fisher, Power Rates Manager

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What are Resource Support Services? – (Background Education)

- Under Section 5(b) of the Northwest Power Act, BPA's firm power supply obligation is determined by netting customer loads against their non-federal resources.

- Because BPA's obligation is "net" of a customer's non-federal resources, it must define, through the contract, the customer's non-federal generation obligations.

- Often, these non-federal resources require additional energy and capacity services to shape the energy output to the customer's contractually required obligation amounts – i.e., Resource Support Service (RSS).

- Resource support services are not new to Regional Dialogue, albeit they were renamed and made more robust to better support tiered rates and customers using non-federal resources to meet Above-RHWM load obligations.

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What are Resource Support Services? – (Background Education cont.)

- At a simplistic level, Resource Support Services (RSS) is the suite of services that allows a customer to apply the actual, variable output of a resource to its load without making other BPA customers better or worse off and without having to guarantee a specific scheduled shape of resource.

- RSS is important because customers are expected to develop a variety of resources during the term of the Regional Dialogue contracts. Some of these resources will have characteristics that reduce the amount of load BPA would otherwise serve in higher value times (e.g., winter HLH), while others may reduce the amount of load BPA must serve in lower value times (e.g., spring LLH).

What are Resource Support Services? – (Background Education cont.)

- Under Regional Dialogue, Resource Support Service includes several separate services used to support and financially quantify the impact of non-federal resources being applied to a customer's load.
    - Forced Outage Reserve Service (existed in Subscription and Regional Dialogue).
    - Secondary Crediting Service (existed in Subscription and Regional Dialogue).
    - Grandfathered Generation Management Service (existed in Subscription and Regional Dialogue).
    - Transmission Scheduling Service (new in Regional Dialogue).
    - Transmission Curtailment Management Service Charge (new in Regional Dialogue).
    - Resource Remarketing Service Credits (new in Regional Dialogue).
    - Diurnal Flattening Service (new in Regional Dialogue).
        - Resource Shaping Charge and Resource Shaping Charge Adjustment are not technically Resource Support Services, but are required components of the Diurnal Flattening Service.

Services Overview – (Background Education)

- **Forced Outage Reserves Service (FORS)** – a service that provides an agreed-to-amount of capacity and energy to load during forced outages of a qualifying resource.

- **Secondary Crediting Service (SCS)** – a service that provides a monetary credit for the secondary output from an Existing Resource that has a firm critical energy component and a secondary energy component.

- **Grandfathered Generation Management Service (GMS)** – a service that allows a Load Following customer that dedicated the entire output of an Existing Resource that received GMS during Subscription to run that resource against load and offset its Tier 1 load.

- **Transmission Curtailment Management Service (TCMS)** – a service that is now proposed to be included as a feature of the Transmission Scheduling Service (TSS) provided under the Load Following contract. BPA will provide replacement power for a qualifying resource when a transmission curtailment occurs between such resource and the customer's load.

- **Resource Remarketing Service** – a service offered through the Firm Power Products and Services (FPS) rate schedule and will be considered and negotiated on a case-by-case basis. The Resource Remarketing Service is designed to help customers manage the "lumpiness" of acquiring resources that are larger than their Above-RHWM load. Customers will receive a credit for the excess power until their load growth catches up to the size of the resource purchased.

Services Overview – (Background Education cont.)

- **Diurnal Flattening Service (DFS)** – a service that makes a resource that is variable or intermittent, or that portion of such resource that is variable or intermittent, equivalent to a resource that is flat within each monthly/diurnal period.
  - For example, the DFS can convert the output of a resource, like wind, with output that is highly variable and unpredictable and which provides little dependable capacity, into a firm block by firming and reshaping the energy and adding firm capacity. This is evermore important in a time when BPA or the customer may have new capacity requirements – such as WRAP.

- **The Resource Shaping Charge** is not a service, but rather a credit or charge that adjusts for the difference in value between a resource shape that is flat within each monthly/diurnal period (but not necessarily flat when comparing one monthly/diurnal period to another) and an equivalently sized flat annual block (flat for all hours of the fiscal year). This is calculated before the rate period and fixed.

- **The Resource Shaping Charge Adjustment** is a very simple end-of-month energy adjustment that ensures neutrality between the forecast and actual generation. The Resource Shaping Charge Adjustment is not a penalty rate and is calculated using the exact same rates used for calculating the Resource Shaping Charge. This will only be applied to resources receiving the DFS.

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TRM and Potential PRDM Changes

- TRM:
    - **Most important sentence.** The capacity component of each RSS service will be priced at the Demand Rate, and the energy component will be priced at the market price of energy for the appropriate time period for the particular RSS service.
    - **Second most important sentence.** BPA will offer comparable pricing methodology, terms, and conditions for each of these services for qualifying resources, whether the purchaser is a Load Following, Block, or Slice/Block customer.
    - **The TRM did not establish the RSS pricing methodology.** BPA will develop or modify the design and pricing governing these products in each 7(i) process.
    - **A framework that was not comprehensive nor restrictive.** The TRM did not confine BPA to only offering certain support services and allowed BPA the ability to refine or adopt new services as negotiated through contract with rates set in each 7(i) process.
    - **Financial cost/benefit of resource shape.** TRM made clear that the financial benefit, or cost, of a resource's energy shape would be measured and billed separately from the load.
- PRDM:
    - **Limit to pricing philosophy only.** The same as the TRM, the PRDM should include a sentence on the pricing philosophy to be applied in each 7(i) process – e.g., comparable treatment across products, marginal, and market-based. No mention of specific treatment for capturing energy value.
    - **RSS thresholds.** We may want to consider including RSS pricing thresholds in the PRDM – e.g., the size and circumstance of a resource when RSS-based charges would apply.
        - Important note. Just because RSS isn't applied, doesn't mean the cost went away. Rather, high/low capacity contributions and high/low energy shape value would be captured through BPA's net load billing determinants and rates. This could result in MORE being paid and would also be less transparent.

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Further PRDM Considerations

- With little to no exception, BPA rates staff believes capacity should be measured and billed separately from the load.
- BPA rate staff is open to the idea of bundling the energy impact of a resource's output into the load but is somewhat concerned about the tradeoffs:
  - If a resource had a banner energy generation year, the resource output could effectively displacing BPAs Tier 1 power rather than a market-based value.
    - In high-market-value times, the customer would receive **less** credit than had BPA tracked the resource generation separately from the load. All else equal, this would **increase** BPA's financial reserves.
    - In low-market-value times, the customer would receive **more** credit than had BPA tracked the resource generation separately from the load. All else equal, this would **decrease** BPA's financial reserves.
    - BPA has a long history of separating firm generation from surplus generation to avoid these outcomes. For example, BPA's Secondary Crediting Service that existed prior to Regional Dialogue.
  - Bundling could inadvertently foreclose entirely better designs. New day-ahead markets might lend themselves better to an entirely different approach altogether. Rather than having the energy impacts flow through BPA's posted load or resource energy rates, certain market implementations may be the best way to capture a resource's energy value.
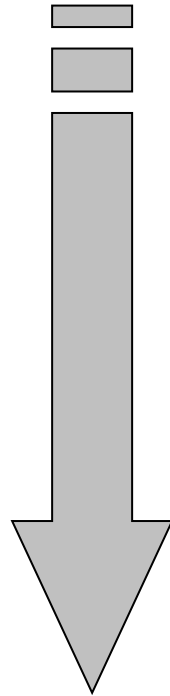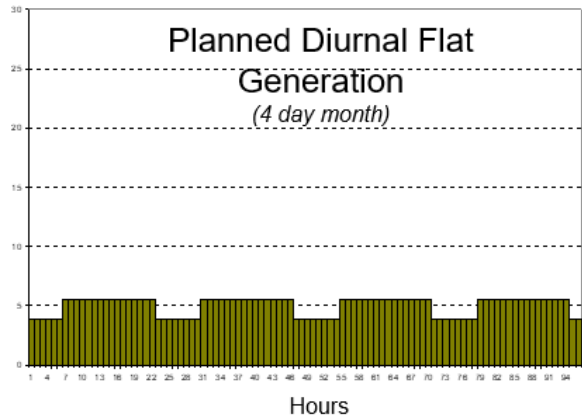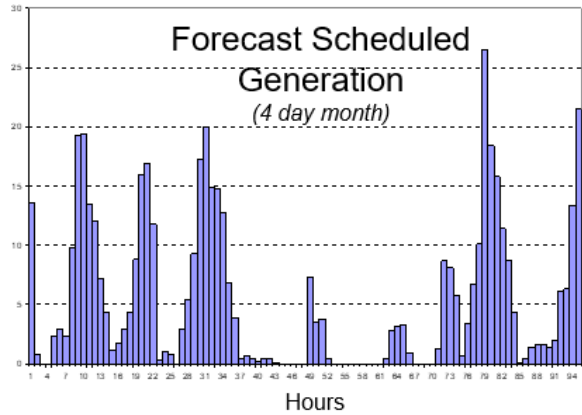
## Diurnal Flattening Service Pricing (Background Education)

- **Reminder:** This is not established in the TRM but rather each 7(i) process.

- The **capacity charge** attempts to capture the capacity shortfall of a variable/intermittent resource when compared to a flat annual block of power. A capacity rate is then applied to the amount of capacity the resource is short of a flat annual block. This is expected to be paid as a fixed $/month charge.

- The **energy charge** attempts to capture the cost of smoothing the variable/intermittent energy generation into flat monthly/diurnal blocks. This is expected to be paid as a $/MWh rate based on actual generation.

Actual Generation (1 day) — Hours

Scheduled Generation (1 day) — Hours
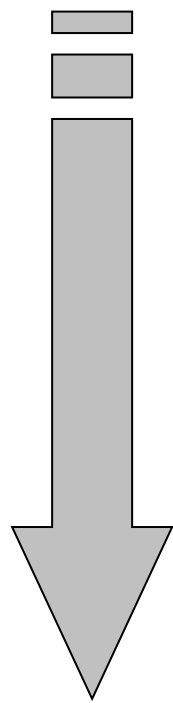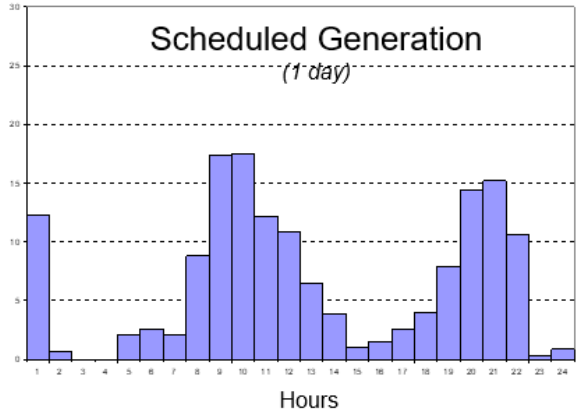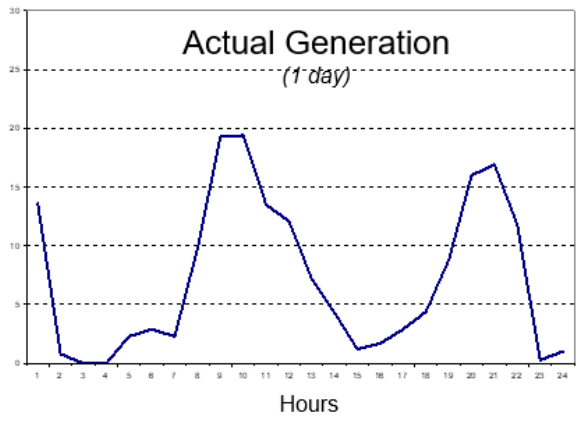
The Diurnal Flattening Service provides hour-to-hour support and **not within-hour support**. Either the customer self-provides these services or the balancing authority where the resource is located provides the within-hour flattening through integration charges and generation imbalance charges.

The **Diurnal Flattening Service** provided by Power Services will financially flatten the resource in the 24 HLH and LLH periods of the year.

Planned Diurnal Flat Generation *(3 month year)*

Planned annual Flat Generation *(3 month year)*
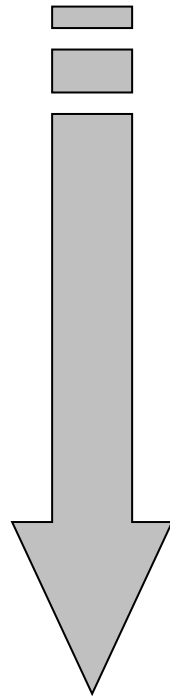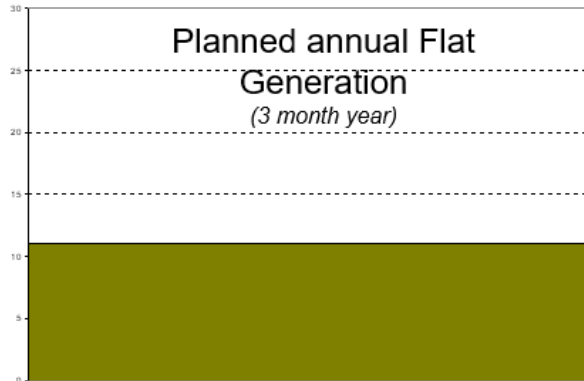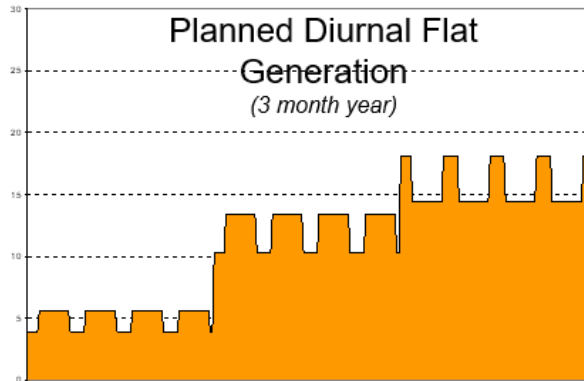
The **Resource Shaping Charge** calculated off planned generation will financially flatten a resource that is flat within the 24 HLH and LLH periods of the year to a resource that is annually flat.

Planned Diurnal Flat Generation (3 month year)

Actual Diurnal Flat Generation (3 month year)
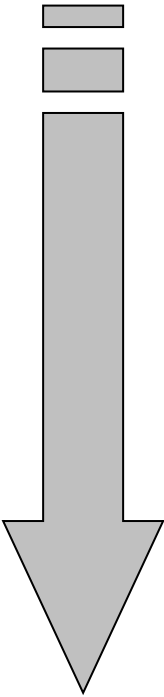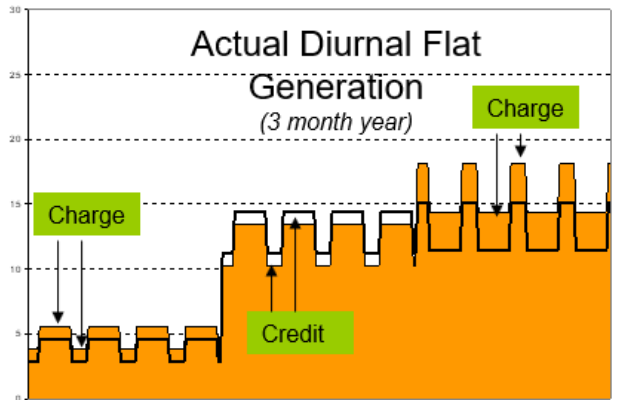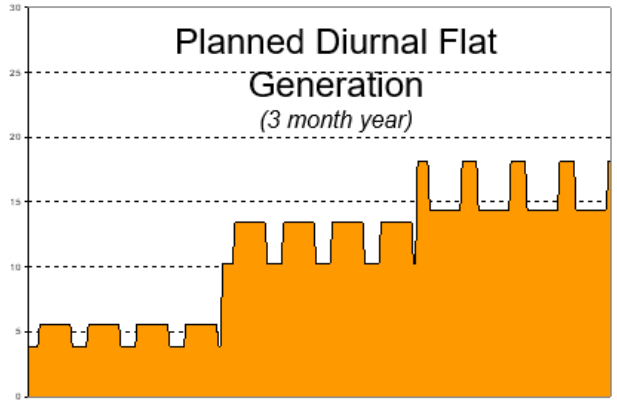
The **Resource Shaping Charge Adjustment** will compare the planned diurnal flat generation to the actual diurnal average generation of the resource. Generation above will be credited and generation below will be charged.
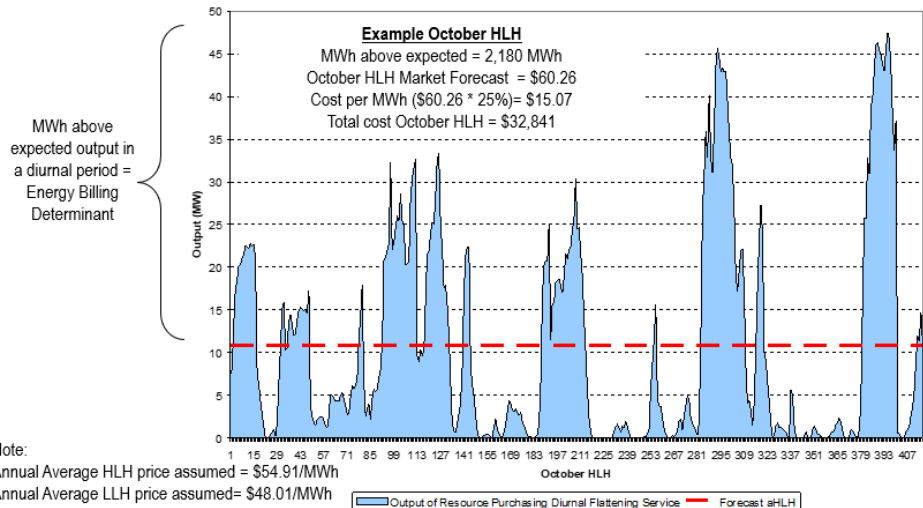
Diurnal Flattening Service Capacity Charge

- Capacity cost based on the fixed capital costs of the rate case defined capacity resource – same that is used for the Tier 1 demand rate.

- Billing determinant will be the resource's expected annual generation minus the amount of capacity provided by the resource (as reflected in the "operating minimums" agreed to in the DFS section of the contract).

Forecast scheduled quantity of output

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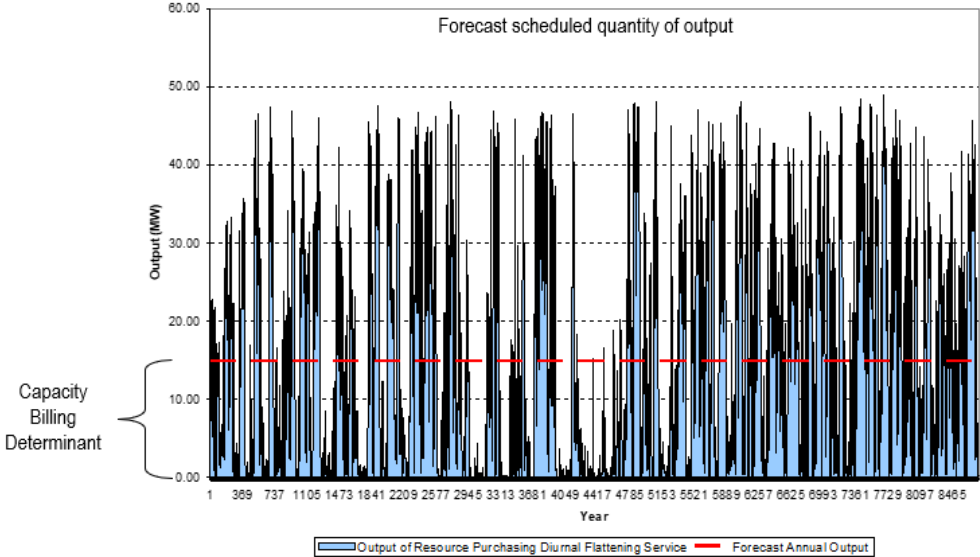
Diurnal Flattening Service Energy Charge

- Based on generation above the supported resources expected output in each monthly diurnal period of the year (24 each year).

- Billing Determinant will be the sum of MWhs that are generated above the resource's expected monthly diurnal generation (forecast October aHLH in the graph at right).

Example October HLH
MWh above expected = 2,180 MWh
October HLH Market Forecast = $60.26
Cost per MWh ($60.26 * 25%)= $15.07
Total cost October HLH = $32,841

MWh above expected output in a diurnal period = Energy Billing Determinant

Note:
Annual Average HLH price assumed = $54.91/MWh
Annual Average LLH price assumed= $48.01/MWh

Output of Resource Purchasing Diurnal Flattening Service — Forecast aHLH

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Why is measuring and charging for capacity separately so important?
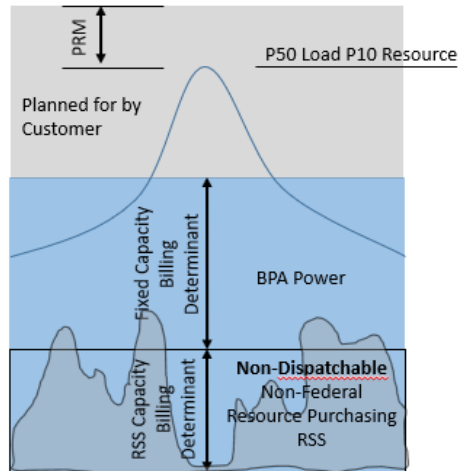

Load Following Product & RSS
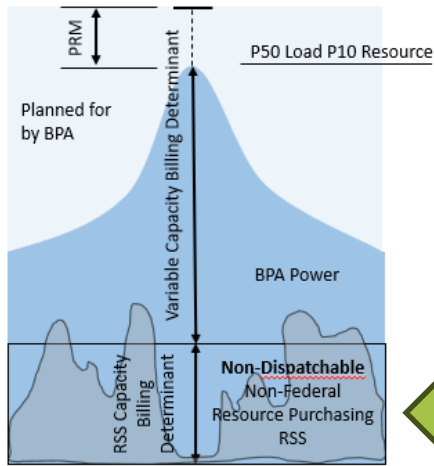
Capacity purchased through Resource Support Services (RSS) would be available to meet Qualified Capacity Contribution.

Because:

1) Capacity is not being proposed to be tiered like energy (CHWM), and

2) Capacity must be planned well in advance of the operational timeframe and many power industry requirements are beginning to reflect that fact – e.g., WRAP and Resource Sufficiency Requirements.

Block Product & RSS

Capacity purchased through Resource Support Services (RSS) would be available to meet Qualified Capacity Contribution.

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Conclusion & Next Steps

April and May Schedule

Spring Break 3/25 - 4/5

Workgroup #2 4/23

April 29, Workshop #5
- Chapter 8 (cont.): Resource Support Services

Workgroup #3 5/23

May 28, Workshop #6
- Chapter 9: Risk Mitigation
- Chapter 10: Other Rate Design

2029 PRDM
- Definitions
- Chapter 1 – Background & Purpose
- Chapter 2 – Cost Allocation
- Chapter 3 – Federal System
- Chapter 4 – T1 Eligibility (CHWM) Move to POC
- Chapter 5 – Tier 1 Rate Design
- Chapter 6 – Tier 2 Rate Design
- Chapter 7 – Shared Rate Plan – Delete
- Chapter 8 – RSS
- Chapter 9 – Risk Mitigation
- Chapter 10 – Other Rate Design
- Chapter 11 – Approval and Duration – Delete/Move
- Chapter 12 – Conditions for Revision
- Chapter 13 – Revision Processes

Parking Lot

Issue	Action	Note
Environmental Attributes T1, T2	New section in Chapter 2	
WRAP and PRM-Related Services	Contract negotiations and Chapter 5 through Peak Load Variance Charge	
Battery Treatment	Contract negotiations, maybe PRDM, likely future 7(i) process	
Risk framework (e.g., RDC & Secondary energy credits)	Chapter 2, Chapter 9, or potential future 7(i) process	
Designated System Obligations	Chapter 3	
Vintage Tier 2 not flat block	Contract negotiations and potential PRDM	
Resource Acquisition Strategy and Execution	Resource Program and Operations	
New Resources Rate Design	Contract negotiations and applicable 7(i) process	

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Thank you

For feedback, questions, comments please email: **prdm@bpa.gov**

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