TACOMA POWER PROVIDER OF CHOICE PRODUCT ANALYSIS

April 2025

Abstract

Tacoma Power must elect a product for our next power purchase contract with Bonneville Power Administration (BPA) by June 1, 2025. This analysis considers product alternatives and identifies Slice/Block as our preferred product for our next BPA contract.

1 TABLE OF CONTENTS

2 EXECUTIVE SUMMARY

Tacoma Power must elect a product for our next power purchase contract with Bonneville Power Administration (BPA) before June 18, 2025. The new contract will take effect on October 1, 2028 and run through September 30, 2044. To support this important product selection, Tacoma Power has evaluated the proposed BPA products to determine which product that will best meet customer needs at the lowest possible cost. This analysis finds that Slice/Block remains the best product option for Tacoma Power because:

1. It is the least likely to require the purchase of a generating resource in the next 5 to 10 years and may never require one over the course of the contract
2. It is lower than or equivalent to the cost of the next-best alternative (Load Following)
3. It preserves the most flexibility to select any product in the future
4. There is significantly more certainty regarding how it will be implemented for Tacoma Power relative to the next-best alternative (Load Following)

Tacoma Power considered all BPA product options that will be available and closely analyzed the three options most suited to our needs: our current Slice/Block product, a Block with Shaping Capacity product and a Load Following product. Overall, we find that Block with Shaping Capacity is a worse fit for Tacoma Power compared to the other two products, and that Slice/Block and Load Following are both attractive products. Neither Slice/Block nor Load Following is unilaterally superior across all dimensions, and our product choice ultimately comes down to a choice between tradeoffs.

On the one hand, Load Following would ensure our ability to meet our winter short-term and sustained peaking capacity needs even under the most extreme events. That robust winter position comes at the expense of our summer energy position. For Tacoma Power, switching to Load Following would pose significant risk to our summer energy position as climate change progresses and would almost certainly require the acquisition of an additional summer energy resource to fill the gap in the near to medium-term (i.e., over the next 5 to 10 years).

Slice/Block, on the other hand, provides us with more energy in the summer. The primary disadvantage of Slice/Block is that it exposes Tacoma Power to slightly more hydro risk in the winter (i.e. we receive slightly less energy than we would under other products in the worst winters). The magnitude of risk is small and manageable in the near and medium-term (i.e., over the next 10 years). The risks we face with Slice/Block *may* ultimately require the acquisition of an additional supply-side resource later in the life of the contract if we find ourselves heading toward certain future conditions (namely if restoration of Riffe Lake is significantly delayed or electrification accelerates more quickly than anticipated), but we may also continue to find that no supply-side resource is needed throughout the life of the contract.

In terms of product cost, Slice/Block and Load Following are both attractive options for different reasons. Before accounting for any new resource purchases, Slice/Block is, at worst, equivalent in cost to Load Following and is lower cost in many scenarios because Slice/Block places responsibility for managing peak loads and hydro risk on the customer. Tacoma Power is particularly well-suited to take on that risk because of our status as a balancing authority, which requires us to ensure that electric supply matches load within our balancing area and maintain system frequency, and our existing expertise in managing the variability of our own resources. BPA charges Load Following customers for taking on the responsibility of ensuring that peak demand is met. After accounting for the cost of the new energy resource needed under Load Following, Slice/Block is lower cost than Load Following in all scenarios.

Slice/Block also presents some other advantages over Load Following. If Tacoma Power does not elect Slice/Block now, it is very likely that it will no longer be an option in future contracts. Even if it were still a product option, it would be difficult or impossible to rebuild the infrastructure (internal operations and modeling tools, transmission portfolio, etc.) we have developed to manage the product. Under Slice/Block, we also have significantly more certainty around critical implementation details that affect our resource position, our power supply costs and our operations. Implementation details for a Tacoma Power Load Following product would not be finalized until well after we selected the product.

Table 1. Summary of BPA product choice analysis

	Slice/Block	**Block with Shaping Capacity (BWSC)**	**Load Following**
Resource adequacy	Adequate in winter and summer by standard RA metrics Minor capacity risk in most extreme situations, which *may* require an additional supply-side resource in the future	Adequate energy in winter by a comfortable margin, but significant winter peaking capacity risk in extreme event analysis Significant summer energy risk. Summer energy resource highly likely to be needed.	Adequate energy in winter by a very comfortable margin and no peaking capacity risk in extreme event analysis Significant summer energy risk. Summer energy resource highly likely to be needed.
Product cost & risk	\$1.20 to \$1.45 billion over life of contract Slightly higher year-to-year revenue variability than alternatives, with more upside potential than downside risk	\$1.39 to \$1.64 billion over life of contract, including cost of new summer resource Lowest year-to-year revenue variability, though differences are small	\$1.31 to \$1.80 billion over life of contract, including cost of new summer resource
Other considerations	Lowest barrier to switching products in future High level of implementation certainty	Some barriers to switching products in future High level of implementation certainty	Very difficult to switch back to other products in future Significant uncertainty in implementation

3 BACKGROUND

3.1 ABOUT BPA AND TACOMA POWER'S HISTORY WITH BPA

BPA was established in 1937 by the U.S. government to market and distribute electricity generated by the federal dams on the Columbia River. The primary mission of the BPA was to provide low-cost, reliable power to the Pacific Northwest, especially for public power entities such as municipal utilities, rural electric cooperatives, and public agencies.

Tacoma Power has had a long-standing relationship with BPA and has been a BPA customer since 1940. As a public utility in the Pacific Northwest, Tacoma Power is one of BPA's preference customers, benefiting from priority access to federally generated hydropower. Tacoma Power receives more than half of its power supply through its contract with BPA. Under the current 20-year BPA "Regional Dialogue" contract, Tacoma Power purchases the Slice/Block product, which includes both a slice of the federal system, and a block of baseload power shaped to Tacoma Power's monthly energy needs. The Regional Dialogue contract is in effect through September 2028.

Tacoma Power is actively involved in BPA's stakeholder process for the new "Provider of Choice" contract. Many of the Provider of Choice product offerings are similar to those under the Regional Dialogue contracts. However, several important changes and new product offerings are part of the new contract (discussed in the next section).

3.2 ABOUT PROVIDER OF CHOICE PRODUCT OPTIONS

For the most part, BPA will be offering the same basic set of products as those available in the current Regional Dialogue set of offerings, though many product details will change. Tacoma Power narrowed the list of potential products to the following three: Slice/Block, Block with Shaping Capacity and Load Following.

These three products would help us manage peak loads most effectively by either providing us some ability to manage the timing of when we receive power throughout the day (in the case of Slice/Block and Block with Shaping Capacity) or by contributing directly to meeting our peak loads (in the case of Load Following).

3.2.1 SLICE/BLOCK PRODUCT

The Slice/Block product is a power supply offering that allows utilities to purchase electricity with a mix of both fixed and flexible features. This product consists of two components: a "Slice" component and a fixed monthly "Block" of power. The "Slice" component is a share of BPA's total system output, which fluctuates with water conditions. The "Block" portion, on the other hand, represents a fixed amount of energy, providing a more predictable and stable supply for utilities.

The first Slice/Block product was introduced in 2001 under BPA's 10-year Subscription contract. It was a simpler product at that time. The current version of the Slice/Block product was first introduced under BPA's Regional Dialogue contract (2008 - 2028, with delivery spanning 17 years). Today's Slice/Block product requires utilities to manage a virtual version of the federal system that meets all the operational constraints that BPA faces and request quantities of power that are consistent with these realities. Requesting power outside the bounds of BPA's constraints can result in stiff penalties. Managing Slice requires both a sophisticated modeling tool and robust operations to ensure the virtual model of BPA's system is functioning and producing reasonable results that do not trigger penalties.

The Slice/Block product offered in the next contract will generally be like the current Slice/Block product we purchase, with two key changes. First, both the Slice and the Block portions of the product will adjust as our loads go up or down in the Provider of Choice version of Slice/Block. This product design is in contrast to the Regional Dialogue contract in which our "slice" of the system was set as a fixed percentage throughout the contract and the Block component of our product changed over time as our loads changed. Because our loads declined relative to our starting point in the Regional Dialogue contract, our product today is more heavily weighted towards the Slice component than the Block component. The impact of this change to a 50/50 split will generally mean that we will be receiving slightly less Slice and slightly more Block relative to today if we select Slice/Block. Second, the Slice component will change from being flexible on an hourly basis within a day to being flexible only on a day-ahead basis. This means that, rather than adjust our Slice take throughout the day as we see our loads and the market change, we will need to "lock in" our Slice take the day before we need it.

3.2.2 BLOCK WITH SHAPING CAPACITY

Block with Shaping Capacity is a less complex product than Slice/Block. It provides customers with a fixed monthly amount of energy but comes with a more desirable profile (i.e., more energy comes in heavy load hours) and provides a certain amount of flexibility for customers to "shape" the energy to their load, both within a day and across the month. The precise amount of flexibility that BPA will allow is not known for certain yet. For the purposes of this analysis, we use the best information we have today and assume we would be able to request up to 10% above or below our fixed monthly energy allowance. As with Slice/Block, Tacoma Power would need to "lock in" our shaped amount of Block the day before we need it.

3.2.3 LOAD FOLLOWING

The current set of BPA contracts prohibits Balancing Authorities like Tacoma Power from selecting the Load Following product. As a result, Tacoma Power's previous product choice analyses have not compared Load Following to Slice/Block. BPA has changed this policy for its Provider of Choice contract, and Tacoma Power is now eligible to receive the Load Following product. Load Following essentially puts the onus on BPA to meet a customer's net load needs after accounting for what the customer's own resources are contributing to meeting that load.

Load Following was not originally designed for utilities like Tacoma Power (a Balancing Authority with significant resources of our own). As a result, BPA would need to figure out many critical implementation details to make the product work for us (how to estimate our resource's contribution to meeting our peaks, whether we would need to overhaul our transmission portfolio, etc.).

For a customer within BPA's Balancing Authority, BPA ensures that their loads are met on an instantaneous basis. For Tacoma Power, on the other hand, Load Following would operate on a day-ahead basis (i.e. they would commit to forecasting the next day's hourly needs and supplying that forecasted amount to us). Any load deviations from the day-ahead forecast would still be the responsibility of Tacoma Power. As a result, so long as Tacoma Power maintains its status as its own Balancing Authority, our Load Following product would look fundamentally different from that of a customer who is not a Balancing Authority.

3.3 REVIEW OF PREVIOUS ANALYSES

Tacoma Power has analyzed the difference between Slice/Block and alternative Block products (including Block with Shaping Capacity) and has consistently found Slice/Block to be the product best suited to Tacoma Power's needs and capabilities. Tacoma Power's 2008 IRP projected Slice/Block would cost approximately $8 million less per year than Block with Shaping Capacity and did not expect any appreciable increase in risk associated with the product. Product options were evaluated again in November 2015, when we were given the opportunity to switch to Block with Shaping Capacity, and we have again been re-analyzing the choice between the two products over the course of more recent IRPs in the lead-up to a final contract decision. We have consistently found Slice/Block to be our preferred option over Block with Shaping Capacity. While Slice/Block does present more hydro risk, we have consistently found that risk to be manageable and worth the value we receive from Slice/Block. Because Tacoma Power had not previously been eligible for Load Following, this is our first formal analysis comparing Slice/Block to Load Following.

4 ANALYSIS METHODS

4.1 CRITERIA FOR EVALUATING PRODUCT OPTIONS

As with any power resource decision we make, our ultimate objective is to put Tacoma Power in the best position to meet customer demand into the future at the lowest possible cost to customers. We use the same modeling tools and the same basic criteria for evaluating products as those used in our 2024 IRP: (1) our resource adequacy position under different products and (2) the expected cost of each product and cost risk associated with each product. We also include some other important quantitative and qualitative considerations.

4.1.1 RESOURCE ADEQUACY

A resource adequacy (RA) standard is used to measure whether a utility has enough power resources to meet loads based on a consistent criterion. Our current resource adequacy standard includes three components to measure different aspects of our system's capabilities: (1) short-term peaking capacity, (2) sustained capacity, and (3) monthly energy.

Short-term peaking capacity

Short-term peaking capacity measures the maximum amount of power that can be generated in a given hour and represents the physical capacity of the system. Reservoir elevation levels affect short-term peaking capacity by increasing or decreasing the head pressure on the generator, thereby impacting physical generating capability. Under low water conditions, short-term peaking capacity is degraded only by these physical limitations. In contrast, sustained capacity (discussed below) is degraded in low water conditions due to operational considerations.

Short-term peaking capacity is evaluated in this IRP in two ways. In the first way, we use an industry-standard metric to measure our sustained capacity position: loss of load hours (LOLH). LOLH measures the number of hours when the load plus the required reserves of the system is less than potential generation, resulting in a capacity shortfall:

$$LOLH\left(\frac{hours}{year}\right) = \frac{\sum_{s=1}^{S}\sum_{h=1}^{H} L_{s,h}}{S}$$

Where:

- S is the number of simulations,
- H is the number of hours in the year, and
- $L_{s,h}$ = 1 for each hour that Capacity – (Required Reserves + Load) < 0 and = 0 otherwise.

We consider a portfolio to be fully adequate from a sustained capacity perspective when LOLH is 1.0 hours/year or lower, marginally adequate when it is between 1.0 hours/year and 2.4 hours/year and inadequate when it is higher than 2.4 hours/year.

We also assess potential worst-case outcomes. For this evaluation, we compare the lowest peaking capacity outcome across all our runs within a scenario to the highest loads across runs within the scenario. This effectively means that we analyze what would happen if we faced the coldest temperatures experienced in 43 years on the tail end of a winter drought. This is not a situation we have seen in our historical records, but it is possible. This analysis is referred to as the Extreme Event analysis. We use the Extreme Event analysis to understand how our short-term peaking capacity risk differs under different scenarios or resource choices we might make. Our 2024 IRP did not establish cutoffs for what constitutes an acceptable level of risk during an extreme event, but for this analysis we provisionally identify a shortfall of no more than 39MW as acceptable, a shortfall of between 40MW and 69MW as marginal, and a shortfall of 70MW or more as a concerning level of risk.

Sustained capacity

Sustained capacity measures the maximum amount of power that can be generated by the Tacoma Power system while also considering water levels (i.e., energy) for subsequent needs. For this calculation, low water conditions will have less sustained capacity compared to high water conditions due to operational considerations. We use the same metric to measure our sustained capacity position. LOLH is calculated with the same formula above but using sustained capacity rather than peaking capacity. The thresholds are also the same (fully adequate when LOLH is 1.0 hours/year or lower, marginally adequate when it is between 1.0 hours/year and 2.4 hours/year, and inadequate when it is higher than 2.4 hours/year).

Monthly energy adequacy

We assess energy resource adequacy based on the 10th percentile of our load-resource balance (LRB), which is total monthly generation minus total monthly load, across our simulations for each month separately. This approach is conceptually similar to BPA's current critical water planning approach. For the seasons of most concern to us (winter and summer), we define an advisory threshold of 0 average megawatts (aMW) (i.e., the monthly 10th percentile LRB must be greater than or equal to zero) as fully adequate, between 0 and -10 aMW as marginally adequate, and lower than -10 aMW as potentially inadequate. While we look at outcomes for each month of the year, the months that drive our findings are February in the winter and August in the summer, as these are the months when our reservoirs will tend to be most depleted in a poor water season.

4.1.2 COST AND RISK

When evaluating the cost of each product decision, we consider:

1. Direct BPA product costs, which include both BPA product charges and the value of the in-kind energy we receive from Slice
2. The cost of any additional supply-side resources needed to mitigate resource adequacy risk
3. The incremental cost of transmission needed to support a given product and any additional supply-side resources needed
4. Annual revenue risk under alternative products

4.1.3 OTHER CONSIDERATIONS

In addition to our quantitative analysis of resource adequacy and cost, we address some other important considerations. These considerations include our compliance position under the Western Resource Adequacy Program (WRAP) and Washington's Clean Energy Transformation Act (CETA), how our product choice today might impacts the set of product options that will be viable for Tacoma Power to consider in future contracts, and the amount of uncertainty we face regarding critical product implementation details.

4.2 SUMMARY OF MODEL RUNS

This analysis runs through a similar set of model runs as those considered in the 2024 IRP. We begin by examining our position under a "baseline" set of conditions. We then conduct several sensitivity analyses around our weather assumptions under climate change, alternative load growth assumptions and Riffe Lake restoration delays.

1. **Baseline runs:** We start with a look at our resource position under our "base case" set of assumptions. This scenario uses our most recently completed corporate load forecast[1], which included Anticipated Electrification projections from our 2023 electrification study. The baseline runs use a 43-year historical weather record (1981 through 2023) for both inflows and temperatures and assume that Riffe Lake elevation is restored in 2030.
2. **Impacts of climate change:** In our baseline runs, we use a relatively short historical weather record (1981-2023) to reflect climate conditions representative of what we expect to see today. In our climate change analysis, we perform additional model runs with different weather inputs to analyze how the continuation of climate change trends would impact our position.
3. **Accelerated load growth:** In the accelerated load growth scenario, we replace the Anticipated Electrification projections used in our baseline runs with Expansive Policy projections from our electrification study.
4. **Load decline/slow growth:** In this scenario, we replace Anticipated Electrification projections with Policy Regression projections of electrification.
5. **Riffe Lake restoration delay:** Tacoma Power's intention is to restore Riffe Lake to full pool as soon as possible. However, it is possible that our baseline assumption of restoration by 2030 is too optimistic. We run a simple sensitivity analysis using the alternative assumption that Riffe Lake elevation is not restored over the course of the study period. This sensitivity analysis in no way implies an intention on the part of Tacoma Power to not restore lake levels as quickly as possible.

[1] Tacoma Power is currently in the process of refreshing our corporate load forecast. The next version will be available in June 2025.

5 RESOURCE ADEQUACY RESULTS

5.1 POSITION UNDER BASELINE ASSUMPTIONS

This section compares the resource adequacy position results for the three BPA products (Slice/Block, Block with Shaping Capacity, and Load Following) under the baseline assumptions (Scenario 1). As discussed above, the baseline runs assume the Anticipated Electrification load scenario, historical weather conditions (inflows and temperature from 1981- 2024), and Riffe Lake restoration to full pool in 2030. The alternative BPA products commence in October 2028 at the start of the new Provider of Choice contract.

5.1.1 SHORT-TERM PEAKING CAPACITY POSITION

Table 2 presents summary metrics for short-term peaking capacity position for the three BPA products under consideration. None of the products had loss of load hours for peaking capacity (our standard resource adequacy metric for peaking capacity). However, the extreme event capacity balance suggests considerable differences between products. Our precise position in any given event under a Load Following product depends on implementation details (namely, how much our own resources are required to contribute to meeting our peak loads). These details will only be determined if we select Load Following and only after our product selection decision is made. For the purposes of this analysis, we assume Load Following will just cover us and so assume we would be neither surplus nor deficit in an extreme event. The Slice/ Block product also provides very good peaking capacity because of the ability to shape across hours. While not as robust as Load Following, it leaves us with just enough peaking capacity in an extreme event in 2035 and with a relatively small shortfall of 30 MW possible by 2043. In contrast, Block with Shaping Capacity only has limited ability to shape and therefore contributes the least to peaking capacity. Its peaking capacity was nearly 70 MW worse than Slice/Block.

It is worth noting that, in an extreme event of the severity represented by our analysis, it is likely that BPA itself would also be struggling to meet its peaking obligations to customers. The risk that BPA would not be able to deliver on contracted power would affect all products and is not addressed in this analysis.

Table 2: Short-term peaking capacity RA metrics in 2035 and 2043 under alternative BPA products

	Loss of Load Hours (hours/year)		Extreme Event Capacity Balance (MW)	
Product	2035	2043	2035	2043
Slice/Block	0.0	0.0	1	−30
Block with Shaping Capacity	0.0	0.2	−67	−97
Load Following	0.0	0.0	0	0

Notes

Red = fails adequacy threshold

Yellow = adequacy warning

Green = adequate

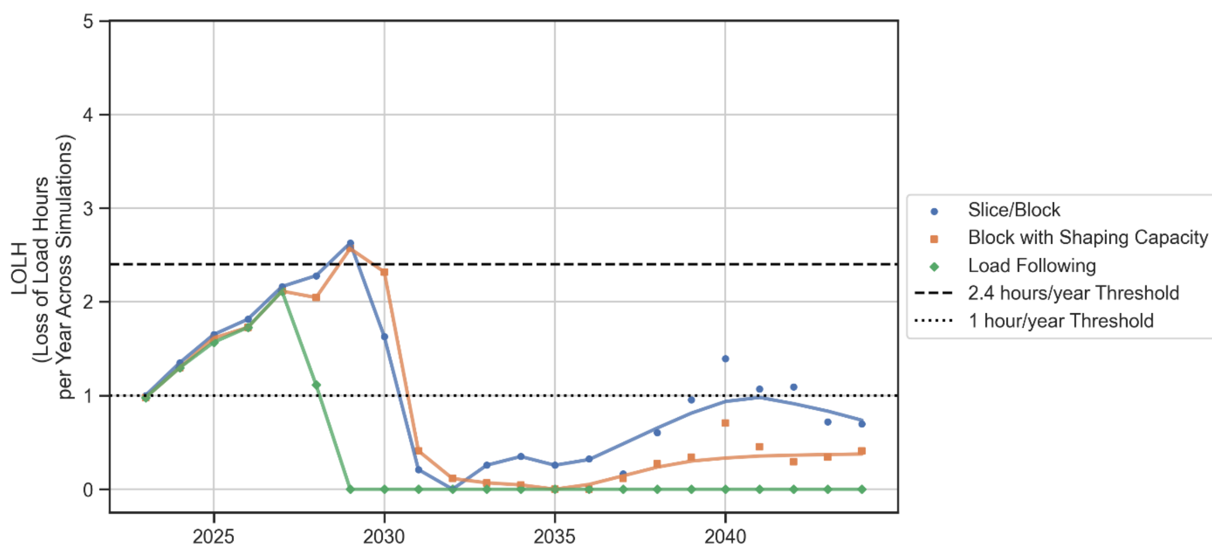
Loss of load hours represents the average annual hours during which the load plus reserves exceed the physical generating capacity. The thresholds for loss of load hours for physical capacity are 1.0 and 2.4 hours/year.

Extreme event capacity balance is the difference between the minimum physical generating capacity and the maximum load plus reserves during the winter across all model runs. A negative value indicates that maximum load plus reserves exceeds the minimum physical generating capacity on model simulations. This measure does not maintain the hour-by-hour linkage in the simulations. The thresholds for extreme event capacity balance are -40 MW and -70 MW.

5.1.2 SUSTAINED CAPACITY POSITION

Figure 1 plots the sustained capacity position for the BPA products. No scenarios exceed the adequacy thresholds after Riffe Lake restoration in 2030.

Figure 1. Sustained capacity RA metrics under alternative BPA products

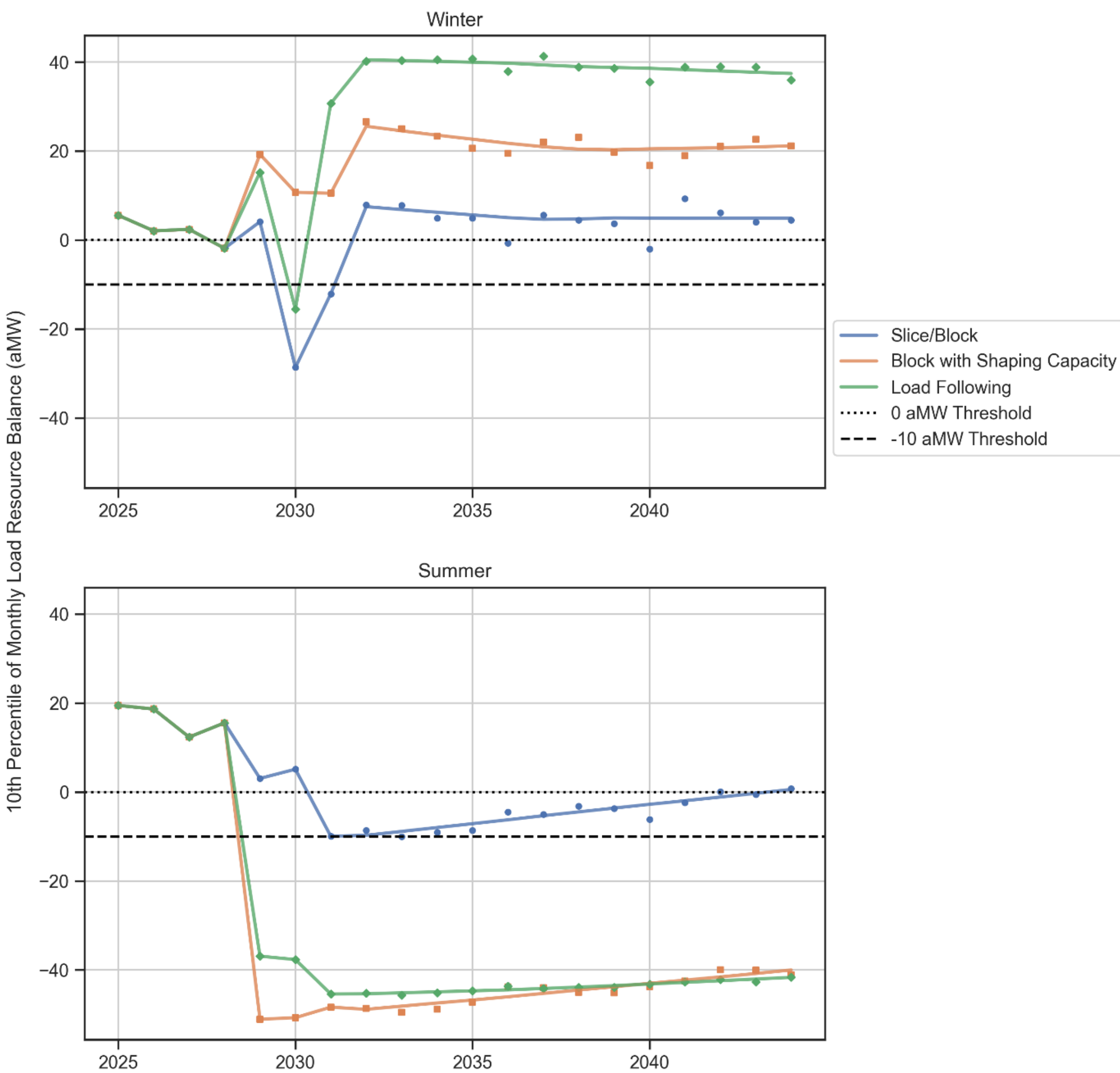


5.1.3 ENERGY POSITION

Figure 2 plots our monthly energy position (total monthly generation minus total monthly load) at the 10th percentile of simulations. Figure 2 generally points to a tradeoff between Slice/Block and the two alternative products.

While Block with Shaping Capacity and Load Following will not typically provide us with more energy in the winter or summer, they do provide more energy in the worst winters relative to Slice/Block. This comfortable winter energy adequacy position comes with a tradeoff. Block with Shaping Capacity and Load Following both leave us short by around 40 aMW in the summer and fail our energy adequacy standard. Although energy from Slice/Block is more variable and provides less winter energy in the worst water conditions relative to Block with Shaping Capacity or Load Following, we still find that we have adequate energy in the winter under Slice/Block.[2]

Figure 2. Winter and summer energy RA metric under alternative BPA products



[2] The temporary downward blip is an artefact of how our model handles the timing of restoring Riffe Lake elevation to full pool in a bad water year and does not reflect a real shortfall in that year.

5.2 RESOURCE ADEQUACY RISK SCENARIOS

Table 3 and Table 4 provide an overview of the resource adequacy results for all three products across all scenarios. The tables present summary data in 2035 and 2043, respectively. The year 2035 was selected because it is several years into the new contract and after the restoration of Riffe Lake to full pool, when the modeled system has adjusted to the new parameters. The year 2043 is the last year in the model run with reliable load projections and represents our position towards the end of the contract. Values in green font are considered adequate, values in yellow font are an adequacy warning, and values that are red font are considered inadequate. The broad results demonstrate the trade-offs between product options. Though not unilaterally superior across all dimensions, Slice/ Block presents the best balance of risks.

Scenario 2 captures the impacts of climate change, which result in wetter winters and drier summers. All product options are still found to provide adequate energy in the winter, though Slice/Block looks more like alternative products in the winter. All products are considered inadequate in the summer, but Slice/Block performs significantly better. Block with Shaping Capacity and Load Following exacerbate summer energy risks in bad water years and even leave us short nearly 50 aMW even in a normal (50th percentile) water year (see Figure 3). These results highlight the need to manage our summer energy position carefully to address the trend toward drier summers under any product option. Our 2024 IRP found that the level of summer energy risk we face under Slice/Block from climate change could be managed most cost-effectively through midday purchases from the wholesale market when solar is plentiful on the grid. Later this year, we plan to further evaluate whether that will be a durable strategy ten or more years from now and what risks might threaten our ability to rely on this strategy in the future. Under alternative product options, it is very likely that we would need to supplement our current resource portfolio with a summer energy position to fill the gap.

Scenarios 3 and 4 address the potential for higher or lower load growth from electrification (the Expansive Policy scenario and the Policy Regression scenario from Tacoma Power's 2023 Electrification Study). Our energy position and our sustained capacity position (which is closely tied to our winter energy position) are similar across these risk scenarios because the total amount of energy we receive from BPA will increase or decrease as loads change.[3] Electrification does, however, have a large potential impact on our capacity position. Many of the new electric loads (EVs, electric end uses in homes, etc.) are expected to turn on at around the same time and at a time when our system is typically already experiencing peaks. As a result, peak demand growth is expected to outpace total energy consumption growth. We continue to find that we pass our peaking capacity standard all scenarios and products. However, the extreme event capacity balance shows a degradation of about -10 MW in 2035 and about -50 MW in 2043 under our higher electrification scenario compared to the baseline analysis. Under Slice/Block, we *may* determine that a capacity resource is needed to shore up extreme event capacity risk in the 2040's if the pace of electrification quickens. In this scenario, it is much more likely that we would need a supplemental capacity resource if we were to select Block with Shaping Capacity and unlikely that we would not need one if we were to select Load Following.[4] Under the slower electrification growth scenario, Slice/Block provides enough capacity even under our extreme event analysis.

The risk scenario where Slice/Block *may* present unacceptable risk is if Riffe Lake elevation cannot be restored to full pool (Scenario 5). In that case, the combination of lower winter energy and less winter peaking capacity in the worst water conditions results causes us to fail our sustained capacity adequacy standard by a significant margin by 2043. Our peaking capacity position would likely be approaching an unacceptable level of risk towards the end of the 2030's in this

[3] In all cases we expect to be just at or below our BPA Contract High Water Mark, which sets the maximum amount of energy we can receive from BPA. Our energy position would diverge more across scenarios if this were not the case.
[4]As discussed further in the next section, we would be paying more to BPA for the additional capacity they would be providing us in that case.

scenario. Switching to Block with Shaping Capacity would marginally improve our sustained capacity metric by providing more winter energy, but it would increase our extreme event capacity risk considerably. Load Following, on the other hand, would fully mitigate these risks (though still at the cost of our summer energy position). We intend to restore Riffe Lake elevation to full pool. If we find that it will be impossible to do so, we may find it necessary to either supplement our portfolio with a capacity resource or request a switch to the Load Following product to shore up these risks.

Table 3. Summary of resource position analysis under alternative BPA products in 2035

	Peaking Capacity		Sustained Capacity	Energy	
	LOLH (hours/ year)	Extreme Event Capacity Balance (MW)	LOLH (hours/ year)	Summer LRB (aMW)	Winter LRB (aMW)
Scenario 1 - Baseline					
a - Slice/Block	0.0	1	0.4	−9	5
b - Block w/ Shaping Capacity	0.0	−67	0.0	−47	21
c - Load Following	0.0	0	0.0	−45	41
Scenario 2 - Climate Change Adjusted					
a - Slice/Block	0.0	−12	0.3	−31	37
b - Block w/ Shaping Capacity	0.0	−82	0.4	−67	38
c - Load Following	0.0	0	0.0	−55	41
Scenario 3 - Expansive Policy Electrification					
a - Slice/Block	0.0	−9	0.7	−2	0
b - Block w/ Shaping Capacity	0.0	−74	0.4	−46	19
c - Load Following	0.0	0	0.0	−44	36
Scenario 4 - Policy Regression Electrification					
a - Slice/Block	0.0	17	0.1	−9	12
b - Block w/ Shaping Capacity	0.0	−39	0.0	−43	21
c - Load Following	0.0	0	0.0	−43	37
Scenario 5 - No Riffe Lake Restoration					
a - Slice/Block	0.0	−53	4.3	6	4
b - Block w/ Shaping Capacity	0.3	−124	3.2	−40	20
c - Load Following	0.0	0	0.0	−37	13

Notes

Red = fails adequacy threshold

Yellow = adequacy warning

Green = adequate

- **Peaking Capacity.** The loss of load hours (LOLH) are calculated similar to sustained capacity but without adjusting for operational considerations. The thresholds for peaking capacity LOLH are 1.0 hours/ year and 2.4 hours/ year. The extreme event capacity balance is the difference between the maximum load plus reserves minus the minimum peaking capacity across all model simulations and winter hours. This measure does not maintain the hour-by-hour linkage in the simulations. The thresholds for extreme event capacity are -40 MW and -70 MW.
- **Sustained Capacity.** The loss of load hours (LOLH) are calculated based on the number of hours that load plus reserves exceed sustained generating capacity. Sustained generating capacity is calculated based on the physical capacity of the Tacoma Power system with adjustments made for operational considerations such as low water conditions. The thresholds for sustained capacity are 1.0 hours/ year and 2.4 hours/ year.
- **Energy.** The seasonal load resource balance (LRB) is based on the following: the load resource balance (average generation minus average load) is calculated for each month and each model simulation; then, the 10th percentile is calculated across model simulations for each month; finally, the seasonal LRB is the minimum of those monthly percentiles. The thresholds for seasonal LRB are 0 aMW and -10 aMW for both summer and winter.

Table 4: Summary of resource position analysis under alternative BPA products in 2043

	Peaking Capacity		Sustained Capacity	Energy	
	LOLH (hours/ year)	Extreme Event Capacity Balance (MW)	LOLH (hours/ year)	Summer LRB (aMW)	Winter LRB (aMW)
Scenario 1 - Baseline					
a - Slice/Block	0.0	-30	0.9	-1	4
b - Block w/ Shaping Capacity	0.2	-97	0.3	-40	23
c - Load Following	0.0	0	0.0	-43	39
Scenario 2 - Climate Change Adjusted					
a - Slice/Block	0.0	-54	0.8	-28	38
b - Block w/ Shaping Capacity	0.1	-112	0.6	-65	40
c - Load Following	0.0	0	0.0	-55	43
Scenario 3 - Expansive Policy Electrification					
a - Slice/Block	0.0	-62	3.6	6	-10
b - Block w/ Shaping Capacity	0.5	-134	1.8	-34	8
c - Load Following	0.0	0	0.0	-40	32
Scenario 4 - Policy Regression Electrification					
a - Slice/Block	0.0	-5	0.0	-3	12
b - Block w/ Shaping Capacity	0.0	-54	0.0	-36	28
c - Load Following	0.0	0	0.0	-40	37
Scenario 5 - No Riffe Lake Restoration					
a - Slice/Block	0.1	-88	8.5	13	-2
b - Block w/ Shaping Capacity	0.7	-154	5.3	-42	20
c - Load Following	0.0	0	0.0	-37	19

Notes

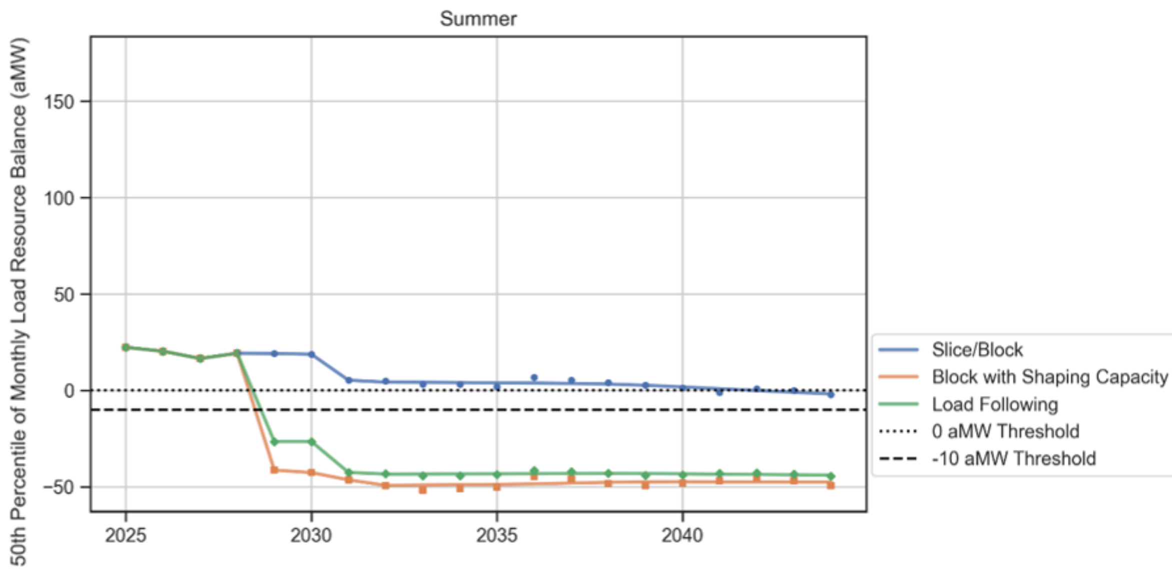
Red = fails adequacy threshold

Yellow = adequacy warning

Green = adequate

- **Peaking Capacity.** The loss of load hours (LOLH) are calculated similar to sustained capacity but without adjusting for operational considerations. The thresholds for peaking capacity LOLH are 1.0 hours/ year and 2.4 hours/ year. The extreme event capacity balance is the difference between the maximum load plus reserves minus the minimum peaking capacity across all model simulations and winter hours. This measure does not maintain the hour-by-hour linkage in the simulations. The thresholds for extreme event capacity are -40 MW and -70 MW.
- **Sustained Capacity.** The loss of load hours (LOLH) are calculated based on the number of hours that load plus reserves exceed sustained generating capacity. Sustained generating capacity is calculated based on the physical capacity of the Tacoma Power system with adjustments made for operational considerations such as low water conditions. The thresholds for sustained capacity are 1.0 hours/ year and 2.4 hours/ year.
- **Energy.** The seasonal load resource balance (LRB) is based on the following: the load resource balance (average generation minus average load) is calculated for each month and each model simulation; then, the 10th percentile is calculated across model simulations for each month; finally, the seasonal LRB is the minimum of those monthly percentiles. The thresholds for seasonal LRB are 0 aMW and -10 aMW for both summer and winter.

Figure 3. Summer energy positions under alternative BPA products under p50 water conditions with climate change



6 PRODUCT COST ANALYSIS

When evaluating the cost of each product decision, we consider:

1. Direct BPA product costs, which includes both BPA product charges and the value of the in-kind energy we receive from Slice
2. The cost of any additional supply-side resources needed to mitigate resource adequacy risk
3. The incremental cost of transmission needed to support a given product and any additional supply-side resources needed
4. Annual revenue risk under alternative products

6.1 COMPARISON OF PRODUCT CHARGES

BPA is a self-financed federal agency and, Like Tacoma Power, sets rates so that it will be able to recover its total costs. BPA allocates costs (and their corresponding charges) based on a methodology set at the beginning of the contract. Product charges are estimated based on BPA's current proposal for its Public Rate Design Methodology[5], which will replace the rate methodology used under our current contract. Table 5 summarizes key cost elements associated with each BPA product option considered for a single year (2035) given base case load assumptions. Each cost component is described in more detail below the table.

[5] https://www.bpa.gov/energy-and-services/rate-and-tariff-proceedings/public-rate-design-methodology-2029

Table 5. Comparison of estimated cost of BPA product alternatives in 2035 (Base Case)

	Slice/Block	Block with Shaping Capacity	Load Following
Composite charge	$ 119,814,793	$ 119,814,793	$ 119,814,793
BPA demand-related charges net of offsetting credits	$ -	$ 2,339,089	$ 19,276,382
BPA load shaping charge	$ 224,431	$ 670,011	$ 1,172,084
Credit for surplus energy marketed by BPA	$ (8,369,562)	$ (16,739,124)	$ (16,739,124)
Rate Impact Credit, Mitigation	$ -	$ 206,430	$ -
Credit for TPWR peaking contribution (higher contribution)	$ -	$ -	$ (20,390,294)
Credit for TPWR peaking contribution (lower contribution)	$ -	$ -	$ (5,078,431)
Total BPA product cost (higher TPWR peaking contribution) **Total BPA product cost (lower TPWR peaking contribution)**	**$ 111,669,662**	**$ 106,291,200**	**$ 103,133,841** **$ 118,445,705**
Average power marketing surplus*	$ (7,741,845)	$ -	$ -
Incremental transmission cost	$ -	$ -	$ 2,000,000
Incremental administrative cost	$ 700,000	$ -	$ -
Net BPA product cost (higher TPWR peaking contribution) **Net BPA product cost (lower TPWR peaking contribution)**	**$ 104,627,817**	**$ 106,291,200**	**$ 105,133,841** **$ 120,445,705**
Cost of additional resources needed**		$ 17,229,374	$ 15,075,702
Total resource cost (higher TPWR peaking contribution) **Total resource cost (lower TPWR peaking contribution)**	**$ 104,627,817**	**$ 123,520,574**	**$ 120,209,543** **$ 135,521,407**

*In the case of Slice, costs associated with enhanced transmission needed to market Slice are deducted

**New resource cost includes firming cost estimates but assumes current rights can be redirected (in the case of BWSC) or NITS service will provide the necessary transmission (in the case of Load Following)

Composite charge: The composite charge is the largest component of the BPA product costs and is the same across all products. It is calculated based on our net requirement (the difference between our expected load and our resources' energy capabilities under critical water conditions). As our loads increase, we receive more power from BPA and pay for a larger share of system costs.[6]

Demand-related charges and offsetting credits: Because BPA is taking on responsibility for providing for customer demand to differing extents under Block with Shaping Capacity and Load Following, both products include a demand charge. The demand charge is billed on a $/kW-month basis and is calculated based on how much a utility is expected to use from BPA during a normal (1 in 2) peak event above and beyond the flat amount of hourly energy it uses. Demand is charged at BPA's marginal demand rate, but customers using these products receive a corresponding credit to bring the charge back to BPA's embedded demand rate in the first year of the contract. As a customer's peak demand grows over time, the credit remains flat and incremental demand growth is charged the marginal demand rate.

Load shaping charges: Utilities get credited or charged for differences between their load shape and the shape of energy coming out of the federal system. Generally speaking, this charge ensures that utilities are charged more when they take more than their allocated share of system energy during heavy load hours and credited if they take less.

Credit for surplus energy sales: The BPA contract works in such a way that BPA customers are treated like "owners" of the federal system, with rights to its output. Under the Slice component of the Slice/Block product, we take a share of output from the federal system in-kind and market any surplus energy ourselves. Under the Block and Load Following products, BPA markets power on our behalf and credits us with the value of wholesale marketing activities. We thus assume that the additional credit we receive from BPA under Block with Shaping Capacity and Load Following is equivalent to the pre-tax revenues we would generate from marketing Slice ourselves.

[6] Note that the amount of energy utilities can receive from BPA is capped by a utility-specific Contract High Water Mark (CHWM), which is based on utilities' 2023 loads and is set at the beginning of the contract.

Rate impact mitigation credit (RICm): The objective of this charge is to avoid dramatic increases in a customer's bill due to changes in rate design (and associated cost allocation) methodology across contracts. The RICm essentially spreads the increase over multiple years, and the charge gradually phases out over time. BPA's updated rate design methodology has very little impact on the cost of Slice/Block, and the charge phases out by the end of the second year of the contract. BPA's new rate design methodology has a larger impact on Block with Shaping Capacity, and the charge phases out from approximately $3 million in the first year of the contract to around in the last year before it phases out (2035). The new methodology would produce a more favorable outcome for us as a load following customer relative to the previous methodology and, as a result, there is no rate impact to mitigate.

Offsetting credit for peaking capabilities: In the case of Load Following, Tacoma Power would be credited for the capacity our resources are able to contribute to meeting our peak load. Our peaking contribution would be credited at BPA's embedded demand rate. The exact value of that credit depends on peaking capabilities that BPA and Tacoma Power would need to establish as part of a load following contract. What those values will be is a significant source of cost uncertainty with Load Following. This analysis considers some likely bookends.

Power marketing surplus: We receive energy in-kind from BPA whenever our share of Slice is surplus to our Critical Water needs, and Tacoma Power markets that power. As explained above, we assume that the value of the credit we would receive from BPA under other products is equivalent to the value of the in-kind energy. However, we deduct the City of Tacoma's 7.5% Gross Earnings Tax (GET) on revenues that we pay when we market the power under Slice. We also must pay the transmission costs associated with marketing surplus energy. However, we assume this cost is also a wash, since BPA also deducts transmission costs from the credit it would give us for marketing surplus power.

Incremental transmission cost: We account for the estimated incremental cost of having to convert from our current point to point transmission portfolio to BPA's network integration transmission service (NITS) if we were to select the Load Following product. We are not certain that BPA would require us to change our transmission service, but it is likely they would. This analysis assumes an incremental cost of $2 million per year based on previous analyses Tacoma Power has conducted on the cost of switching to network integration transmission service. The exact cost is highly uncertain and could range from zero to several million dollars more than our estimate of $2 million.

Incremental administrative cost: The Slice product is complex and requires a considerable investment of staff time to manage it. We estimate that the FTE cost of managing Slice is approximately $700,000.

Cost of additional resources: We estimate that it would cost us an additional $17 million or $15 million per year for the purchase of the summer resource needed to shore up our summer energy position if we were to elect Block with Shaping Capacity or Load Following, respectively. This estimate reflects the approximate cost of a solar resource including a cost to firm up some of its variability. We do not include an additional cost of transmission for the new resource. In the case of BWSC, we assume that existing point to point transmission we currently use for marketing Slice could be redirected and would not result in an incremental transmission cost. In the case of Load Following, we already assume a switch to NITS service, which has an incremental cost. Because NITS service charges are based on a customer's demand, we would not need to reserve additional rights or incur additional costs for a new generating resource if we were already making the switch to NITS. In the case of Block with Shaping capacity, we assume that no additional transmission costs would be incurred because we would either re-direct some of our existing transmission rights or sell use of some of these rights to offset this cost.

6.2 REVENUES UNDER DIFFERENT PRODUCT OPTIONS

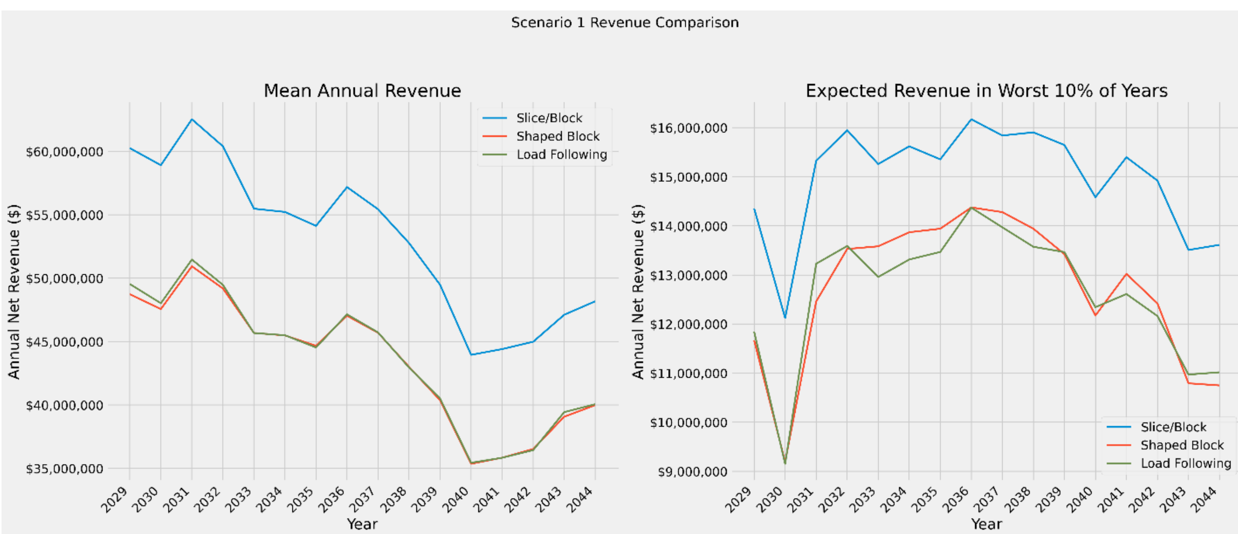
Slice/Block offers significantly higher net-present revenue than either other product under consideration over the entire 20-year timespan, which is worth approximately $130 Million more in present-value terms than either Block with Shaping or Load Following, though the precise value of that revenue will fluctuate from year to year. This revenue value comes partially from the fact that the Slice portion of the product provides us with surplus system energy in-kind from BPA that we market ourselves rather than relying on BPA to do so on our behalf. Beyond the value of the in-kind energy we receive from the product, Slice also offers us the most flexibility to optimize our own system.

In general, net revenues fall over time in our simulation due to changing wholesale price projections used in this analysis. Annually, Slice/Block returns consistently more revenue than the other two products, but the net revenue gap between them is reduced. The general finding that revenues are higher under Slice/Block will hold regardless of the specific price projections used.

Slice/Block comes with more revenue variability than other BPA products because the output of Slice is variable and because it provides less energy in the winter when our own system output is more variable. While expected revenues are still positive under the worst 10% of years and are still higher than under alternative product options, the gap between products is much smaller in the bad years.

Slice/Block has a different seasonal risk profile relative to other products. Slice/Block exposes us to the most revenue risk in late winter under high load and low water events and the least revenue risk in the summer. Load Following does a better job than Block with Shaping Capacity of protecting us against high-priced purchases under difficult winter conditions without increasing summer revenue risk as much.

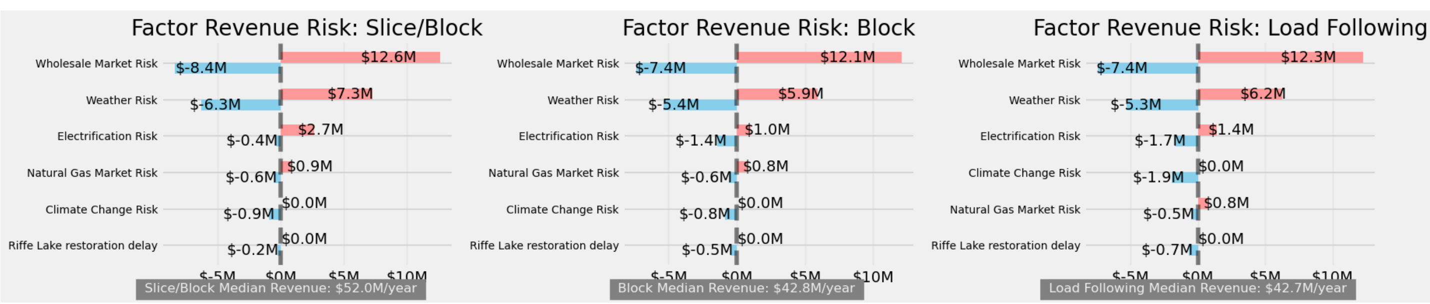
Figure 4: Expected revenue and revenue risk across products



We next evaluate expected revenue risks under each of the three products and evaluate key factors that influence revenue risk. Figure 5 summarizes the various risk factors across products.

1. **Wholesale market risk:** This dimension represents risk from changes to the variability in wholesale power prices from large-scale buildouts of new generation and storage, persistent changes in weather patterns, and long-term changes in the profile of regional demand. Market-level risk is the largest contributor to revenue uncertainty in general regardless of product choice. Potential annual impacts range from approximately -$8 million to over $12 million across scenarios, all other factors held equal.
2. **Local weather risk:** This dimension represents risk from fluctuating local weather patterns, including temperature and inflows, which affect Tacoma Power's resource capacity and load burden. Local weather is the second largest source of revenue variability, with impacts between -$5.3 million and +$7.3 million in annual revenue impacts.
3. **Climate change risk:** Whereas the previous dimension captures risk from year-to-year weather variability, this dimension represents revenue risk coming from changes to the long-term trend in temperatures and inflows, which change the profile of Tacoma Power's load and resource capacity. Climate change is a small component of risk, holding other market dynamics and year-to-year variability in local weather fixed.
4. **Natural gas market ris**k: Though Tacoma Power doesn't operate any natural gas facilities, power market prices are often influenced by natural gas generation and, as a result, the market for natural gas. This dimension captures revenue variability due to natural gas price volatility.
5. **Electrification risk:** This dimension captures potential changes to our revenue risk profile from changes to our load driven by electrification. While electrification is expected to matter for our ability to meet customer' energy and peak demand needs, it is not a major source of revenue variability.
6. **Riffe Lake restoration delays:** This dimension captures revenue risks associated with potential long-term challenges in securing permission to restore Riffe Lake to full pool. While this risk scenario has important resource adequacy implications, it is not expected to meaningfully impact revenue variability, holding other market dynamics and year-to-year variability in local weather fixed.

Figure 5: Revenue risk factors across products



Revenue risks are generally similar across products because much of the revenue risk Tacoma Power faces is driven by the risk we inherently face with our own hydro resources. However, different products do present different revenue risk profiles. Slice/Block is the most exposed to the downside of wholesale price fluctuations and weather risk. Across each of these two dimensions, Slice/Block leaves us exposed to approximately $1 million more downside revenue risk than either Block with Shaping Capacity or Load Following. Both alternatives to Slice/Block offer similar downside risk and upside potential, though Block with Shaping Capacity has less upside potential than Load Following. The Load Following product captures some but not all the upside potential of Slice/Block but mitigates downside risk to the level of Block with Shaping Capacity.

While we face the most year-to-year variability from market fluctuations under Slice/Block, it is important to note that long-term changes to market dynamics will also impact BPA's power marketing activities and, in turn, the value of the credit non-Slice customers receive when BPA markets surplus power on their behalf. As a result, the long-term market revenue risk from Slice would be partially offset by long-term changes to alternative products.

There are more notable differences in the risk profiles across products related to weather, climate, and electrification. Slice/Block is the most exposed to local weather risk but benefits from good water years when BPA's system is more productive. Variable local weather conditions expose us to nearly $1 million more in downside revenue risk under Slice/Block relative to alternative products but also present just over $1 million more in upside potential. Block with Shaping Capacity reduces some of the downside weather risk of Slice/Block but at the cost of more upside potential. Because Load Following increases the amount of energy we receive from BPA when local load is high, it outperforms Block with Shaping Capacity in both upside and downside risk.

The climate change risk scenario sees lower winter energy needs because of milder winters, and higher summer demand due to rising temperatures. Across all products, the impacts of climate change generally present $1 to $2 million in downside risk without any offsetting upside potential. Load Following presents approximately $1 million more in downside risk than the other two products. Load Following provides much of its power and advantage during the winter months and presents more summer risk for us. Climate change reduces the value of Load Following's winter risk mitigation and exacerbates its summer revenue risk.

Slice/Block also exposes us to less revenue risk driven by uncertainty in our projections of the future of electrification. With Slice/Block, uncertainty in our electrification projections is unilaterally superior to alternative products, with approximately $1 million less downside revenues risk and just over $1 million more upside risk. The reason for this is due to how the *low* electrification scenario affects when our system receives power from BPA. Load following closely tracks peaks, at the cost of less flexibility in timing. Block with Shaping Capacity and Slice/Block track energy over time, but we retain some control over when and how that power is dispatched. Our peaks, in this case, shrink over the contract period but our Exhibit-J does not, which means we receive relatively less power from Load Following than we would under expected electrification and thus the magnitude of annual revenue shrinks relatively more here than either Block with Shaping Capacity or Slice/Block given the same scenario.

6.3 COMPARISON OF NET PRESENT VALUES

Figure 6 compares annual present value product costs over time under our three different load scenarios. Results are presented with and without accounting for the value of the in-kind energy we receive under the Slice product.

Because the composite charge is both the most substantial component of our BPA bill and the same across products, direct costs between the products are generally close. Once we account for the value of the in-kind energy we receive through Slice, the direct product costs of Slice/Block and Load Following are very close at the beginning of the contract. Block with Shaping Capacity is generally more expensive for Tacoma Power than either of the other two options at the beginning of the contract period. The relative cost of different product options changes over time depending primarily on how our peak demand grows. As peak demand rises, we incur a higher demand charge under Load Following both because we are putting more demand on the system and because demand growth above and beyond what we had at the start of the contract is charged at BPA's marginal demand rate. This analysis assumes that BPA's marginal demand charge is constant in real terms over time. It may go up if grid capacity becomes scarcer or more expensive in the future or it may go down if capacity becomes cheaper and more plentiful. Under our Anticipated Electrification scenario, the cost of Load Following quickly outpaces the cost of Slice/Block. Under our more aggressive Expansive Policy scenario, the cost of Load Following surpasses both Slice/Block and Block with Shaping Capacity. Under the Policy Regression scenario, Load Following could be similar in cost to Slice/Block if the cost of Load Following is on the low end. This is also the scenario under which Load Following is least needed to shore up extreme event peaking capacity risk.

We find in Section 5 that switching to either Block with Shaping Capacity or Load Following would leave us short energy in the summer and would almost certainly require us to acquire an accompanying summer energy resource to fill the gap. The second set of graphs in Figure 6 accounts for this additional resource acquisition cost. The approximate cost of an appropriately sized solar resource to fill the gap (an approximately 40 aMW gap in the case of Block with Shaping Capacity and a 35 aMW gap in the case of Load Following[7]). Once we account for the cost of a summer resource acquisition, Slice/Block is lower cost than other product options even before accounting for the value of in-kind energy from Slice. The difference ranges from around $15 to $30 million annually, depending on the year, scenario and alternative product in question. Note that this ignores the revenues earned by the solar resource by marketing its power outside of the summer shortfalls. These revenues could be positive if energy is tight in a summer when we have enough to meet our own needs without the solar resource, but it is as likely that the incremental revenues from a solar resource will be close to zero or even negative in many years. As the grid continues to build more solar, our own solar resource would be producing at the exact times of day when energy is abundant and sometimes exceeds the grid's needs.

[7] These energy gaps translate a solar resource with a nameplate capacity of 118MW and 103MW in the case of Block with Shaping Capacity and Load Following, respectively.

Figure 6: Alternative BPA product costs over time (2029-2044)

Table 6 compares the total 16-year net present value of alternative product options under our three load scenarios. The first set of columns compare product cost categories presented in Figure 6 above. The next column accounts for differences in total revenues resulting from our ability to better optimize our own system under the Slice/Block product. The final columns estimate the total net present value of each product without and with the additional summer resource purchase needed if we were to stop purchasing Slice/Block. Including that cost, we expect Slice/Block to cost around $190 million less than Block with Shaping Capacity and between $100 and $350 million less than Load Following across the 16 years of the contract.[8]

[8] Note that this estimate includes the additional summer resource costs associated with Block with Shaping Capacity and Load Following. Without that cost, Block with Shaping Capacity is still more expensive than Slice/Block across all scenarios.

Table 6. Comparison of NPV & financial risk metric for BPA products

Scenario	Product	Costs			Market Cost of Switching	Product Cost NPV	
		Product, Net Credits	Supplemental Solar Resource	Added Transmission	Slice/Block NPV - Option NPV	Product + Resource Cost	Product + Market Cost
Anticipated Electrification	Block With Shaping Capacity	1,357,251,862	216,374,631	0	97,277,749	1,573,626,493	1,454,529,611
	Load Following: Low Cost	1,315,988,180	189,327,799	25,116,946	53,920,340	1,505,315,979	1,395,025,466
	Load Following: High Cost	1,507,394,321	189,327,799	25,116,946	53,920,340	1,696,722,120	1,586,431,607
	Slice/Block	1,384,793,631	0	0	0	1,384,793,631	1,384,793,631
Expansive Policy	Block With Shaping Capacity	1,421,896,481	216,374,631	0	101,097,416	1,638,271,112	1,522,993,897
	Load Following: Low Cost	1,420,413,247	189,327,799	25,116,946	93,982,728	1,609,741,047	1,539,512,922
	Load Following: High Cost	1,612,333,853	189,327,799	25,116,946	93,982,728	1,801,661,652	1,731,433,528
	Slice/Block	1,451,617,185	0	0	0	1,451,617,185	1,451,617,185
Policy Regression	Block With Shaping Capacity	1,177,754,417	216,374,631	0	83,541,485	1,394,129,048	1,261,295,902
	Load Following: Low Cost	1,115,878,457	189,327,799	25,116,946	20,650,543	1,305,206,256	1,161,645,946
	Load Following: High Cost	1,307,092,477	189,327,799	25,116,946	20,650,543	1,496,420,276	1,352,859,967
	Slice/Block	1,204,291,600	0	0	0	1,204,291,600	1,204,291,600

7 OTHER CONSIDERATIONS

In addition to the core quantitative tradeoffs between resource adequacy and cost, there are additional qualitative considerations related to our future product choice that are less easily quantified.

CETA compliance position

All products leave us well-positioned to meet CETA's 80% carbon-neutrality standard in 2030 and present similar challenges for meeting CETA's 100% carbon-free standard in 2045 until the State of Washington determines how to address BPA's system power mix (which is very low carbon but not zero-carbon) in the standard. As a result, CETA compliance is not a major driver in our product decision.

WRAP forward-showing position

Due to market sensitivities around WRAP forward showing positions, utilities typically do not publicize their projected positions. We analyzed our projected WRAP position and find results that are directionally similar to those for our short-term peaking capacity more generally. We expect to be able to meet our WRAP forward showing obligation under Slice/Block in both winter and summer but with increasingly tighter margins. We would essentially be guaranteed to meet our forward showing obligation under Load Following and would be at greater risk of failing in some years under Block with Shaping Capacity.

Long-term product optionality

Because it is a share of the federal system and requires customers to manage all the constraints on the federal system, Slice is a complex product to manage. Tacoma Power currently has the IT infrastructure, internal expertise and transmission portfolio needed to manage Slice. If we were to switch to a Load Following product, our internal capabilities would degrade and be costly and difficult to re-establish. Perhaps even more critically, we would need to overhaul our current transmission portfolio and give up significant point to point transmission rights in favor of BPA's network transmission service. Given the current and expected future scarcity of transmission on the grid, it would be difficult or impossible for us to re-establish the transmission portfolio needed to market the in-kind energy we receive from Slice. On the other hand, the contract we sign with BPA will preserve the option to request a one-time product switch during the 20-year contract. If we later find Load Following to be a more attractive or necessary option, we would likely be able to make a switch mid-contract[9] and certainly could elect to switch products at the end of the 20-year contract.

Implementation certainty

We have a long history of successfully working with the Slice product and have a good sense of how the product will change in the next contract. With Load Following, on the other hand, many implementation details are unknown. Load Following was not designed for utilities like Tacoma Power (a Balancing Authority with significant resources of our own). As a result, BPA would need to figure out many implementation details. For example, we would need to establish the expected contribution of our resources for meeting peak loads. Establishing appropriate contributions for Tacoma Power is not straightforward, as our system's peaking capabilities depend on the frequency and duration with which we are expected to maintain a given level of output.

BPA has also indicated that our current transmission portfolio, which relies 100% on point-to-point transmission[10] may be incompatible with a Load Following product and that a switch to Load Following may also necessitate a switch to BPA's network integration transmission service[11] (NITS). At the same time, it is also not clear whether BPA would be able to accommodate Tacoma Power's switch to NITS service due to forecasts of insufficient capacity on their existing transmission system or whether Tacoma Power might be required to pay for a large incremental cost of upgrading transmission to accommodate the switch. Assuming BPA would be able to accommodate the switch, the full implications of having to switch to NITS are not certain. While BPA's Open Access Transmission Tariff ("OATT") requires that the network load be in BPA's balancing authority, it is conceivable that BPA would waive this requirement for Tacoma Power and allow us to maintain our BA responsibilities and control over our generation resources. However, there are no guarantees of an indefinite waiver.

These are critical details that significantly impact our resource position, our power supply costs, and our ability to operate in organized markets but would not be figured out until well after we make this product selection decision. As a result, Slice/Block is more attractive from the perspective of implementation certainty.

8 PRODUCT SELECTION

We find that Slice/Block remains the best product option for Tacoma Power because:

1. It is the least likely to require the purchase of a generating resource in the next 5 to 10 years and may never require one over the course of the contract
2. It is lower than or equivalent to the cost of the next-best alternative (Load Following)
3. It preserves the most flexibility to select any product in the future
4. There is significantly more certainty regarding how it will be implemented for Tacoma Power relative to the next-best alternative (Load Following)

[9] If Tacoma Power's switch to Load Following caused BPA to need to procure additional resources to meet that incremental demand, BPA could deny our request or require more time before granting the switch to allow for that procurement.
[10] Point-to-point transmission service is for the receipt of capacity and energy at designated point(s) of receipt on BPA's system and the transfer of such capacity and energy to designated point(s) of delivery on BPA's system.
[11] Network integration service (NITS) allows the transmission customer to efficiently and economically utilize Network Resources (including BPA purchases) to serve its Network Load. All or part of a utility's resources and loads can be designated as part of the Network. Non-Network loads and resources must be served with point-to-point service.