



Slice/Block Product

May 29 and 30, 2024



Agenda for May 29 and 30

1. Discussion of Slice/Block inherent features, incidental uses, and risks.
2. Scope of Slice/Block product design sprint and what is in scope later in process.
3. Load service and surplus – how it works today v. how it works under a day-ahead market.
4. Day-ahead Slice/Block product mechanics.
5. Design concerns around customer proposal.



Day-Ahead Slice Overview

Slice as a Day-Ahead Product (11/14/23)

- A day-ahead Slice product needs to allow BPA to optimize the FCRPS on behalf of **all customers** and fit into a best solution for BPA's market participation.
- Slice customers under a day-ahead product would:
 - Submit a final Slice take ahead of the day-ahead market run. It would not provide an opportunity to submit bid range associated with Slice to the market.
 - No ability to adjust slice take for real-time market, nor bid slice into real-time market. Including a real-time component would increase the uncertainty and complexity of offering the product.

Day-ahead Slice/Block Customer

- Assumes that a Slice/Block customer will be a market participant.
 - Market participant is an entity that is directly participating in the market, usually by virtue of having load and/or generation in the market footprint or by otherwise participating and receiving settlements from the Market Operator in the market (e.g. virtual bidding).
- Slice/Block customers as market participants will determine their own MOO and their resource offer based on their non-federal resources.
 - Bonneville has yet to determine how planned products would be modeled or communicated in a day-ahead market.

DA Slice/Block: Annual Net Requirements

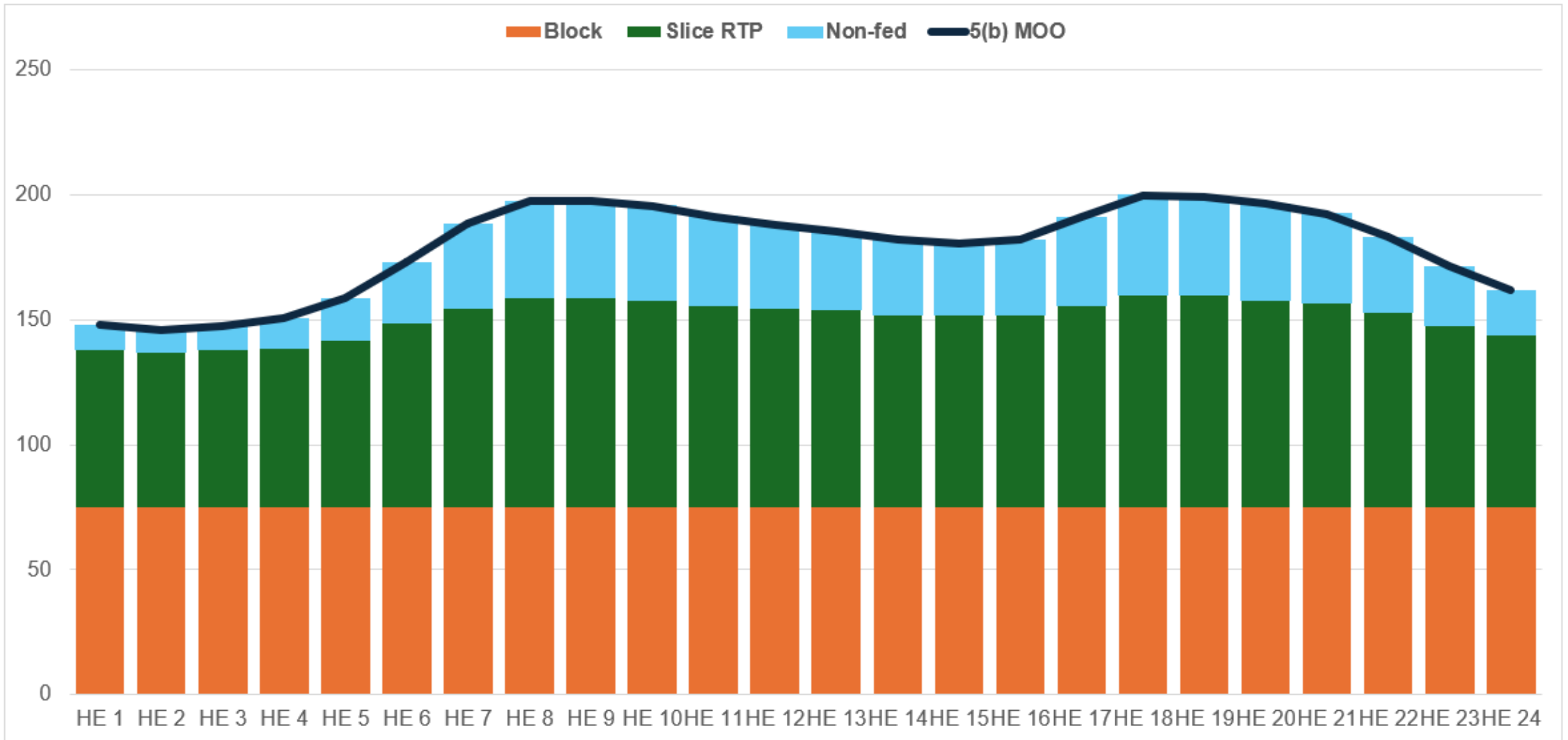
- Bonneville completes annual net requirements transparency process ahead of the upcoming fiscal year (more details coming in June workshop).
- In this example, the process calculates that the customer's net requirements is 150 aMW. The customer's Slice/Block percentage split would be:
 - Block portion = 75 aMW
 - Slice portion* = 75 aMW or 1.05%

*Slice portion percentage is an estimate based on FY 2024 Slice/Block.

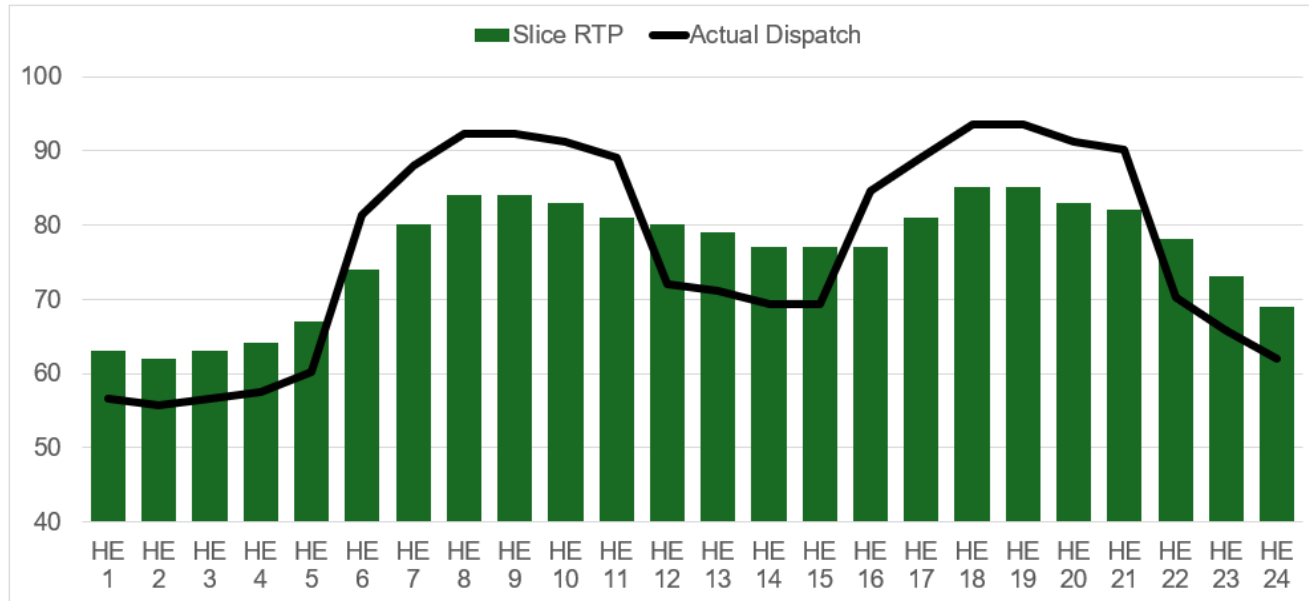
DA Slice/Block: WRAP

- For the **WRAP Forward Showing**, the customer gets to count:
 - **Slice portion**: the customer's Slice percentage determines the percentage of the system QCC they could count towards their own WRAP compliance. The system QCC Slice/Block customers would be able to count would be limited to the resources attributed to serve power at a PF Tier 1 rate.
 - **Block portion**: the customer receives the flat capacity equal to the energy delivery amount. For Slice/Block product, the block portion is shaped to net requirements load in flat monthly amounts.

DA Slice/Block: Load Example



DA Slice/Block: Day-ahead Submittal



1. Slice/Block customer submit their Slice RTP amounts for all 24 hours in advance of the market run. Working assumption is that like a contract resource (but to be determined), Bonneville would assume the Slice RTP amounts as part of its MOO and a customer's MOO would be reduced by that amount, as facilitated by the Market Operator.
2. Bonneville would reflect the Slice RTP in its resource offer.
3. The market operator determines the most economic dispatch. The dispatch for Bonneville's whole system may be more or less than Slice RTP.
4. The outstanding question is whether there is a financial value that needs to be resolved in the Slice/Block product design or if that value can be captured in a customer's non-federal resource offer.

DA Slice/Block: Real-time

- Customer-elected Slice RTP in the day-ahead remains the hourly value going into the real-time market.
- If Bonneville resources' capability shifts significantly into real-time, Bonneville will adjust DA bid curves and the market will solve for changes in real-time.
- If Slice/Block (or standalone Block) customer load or resources change in real time relative to their DA RTP submission, the customer can adjust their non-federal resource participation, or the market will adjust other factors to address changes.



Slice/Block Product Load Service and Surplus Value

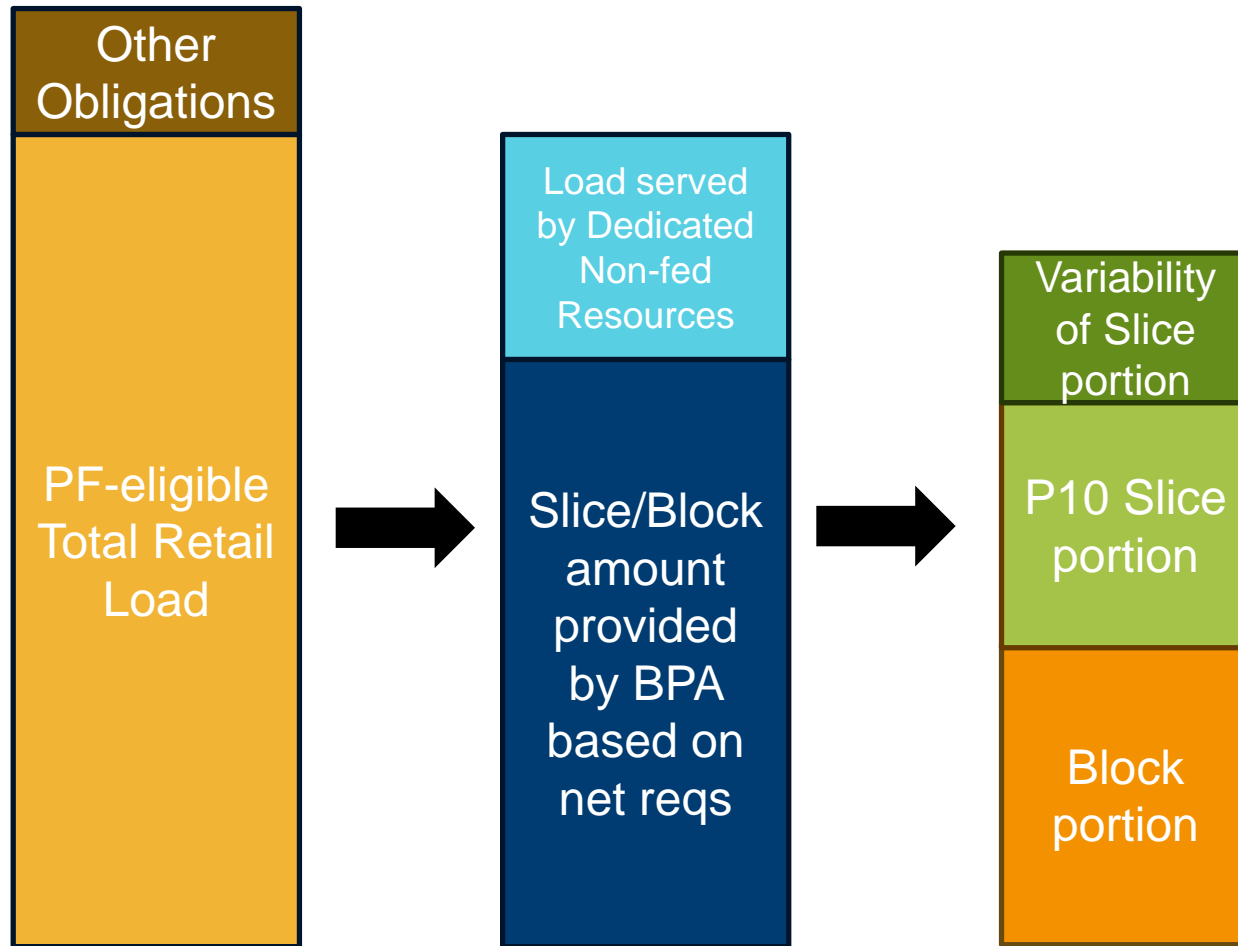
Slice/Block Surplus Value in the Future

Outstanding question from day-ahead Slice/Block product design:

- What is more important to customers in the future – accessing the actual power from surplus or the financial value?

Assumption to date has been customers would prefer to retain ability to set MW amounts.

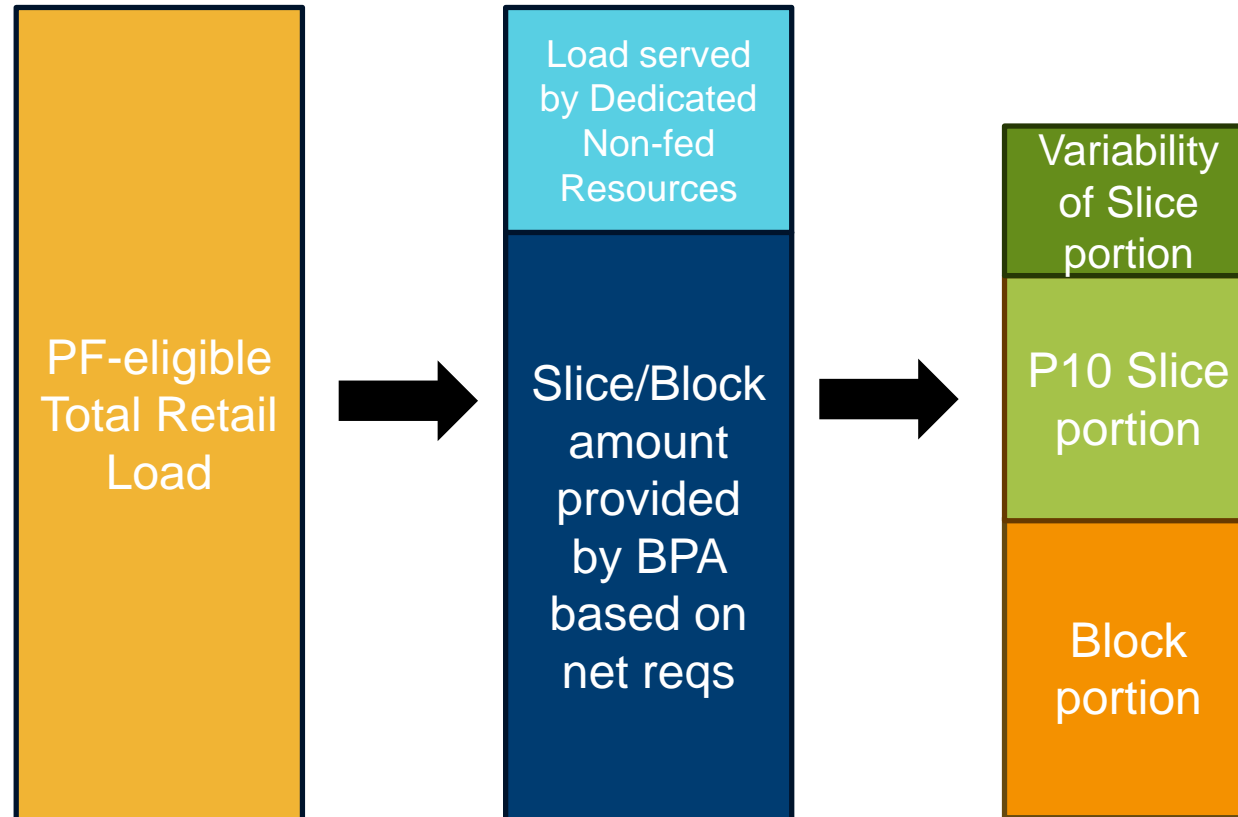
Slice/Block Load Service Today



Planning Horizon:

- BPA and customer agree upon a customer's monthly PF-eligible total retail load (TRL) forecast for the year on an annual basis. Other obligations could include Above-CHWM load, an NLSL, or another load the customer has contracted to serve. On an annual basis determine net requirements.
- The Slice/Block product provides a block portion and a slice portion. The slice portion is made up of firm power and variable power dependent on the water year.

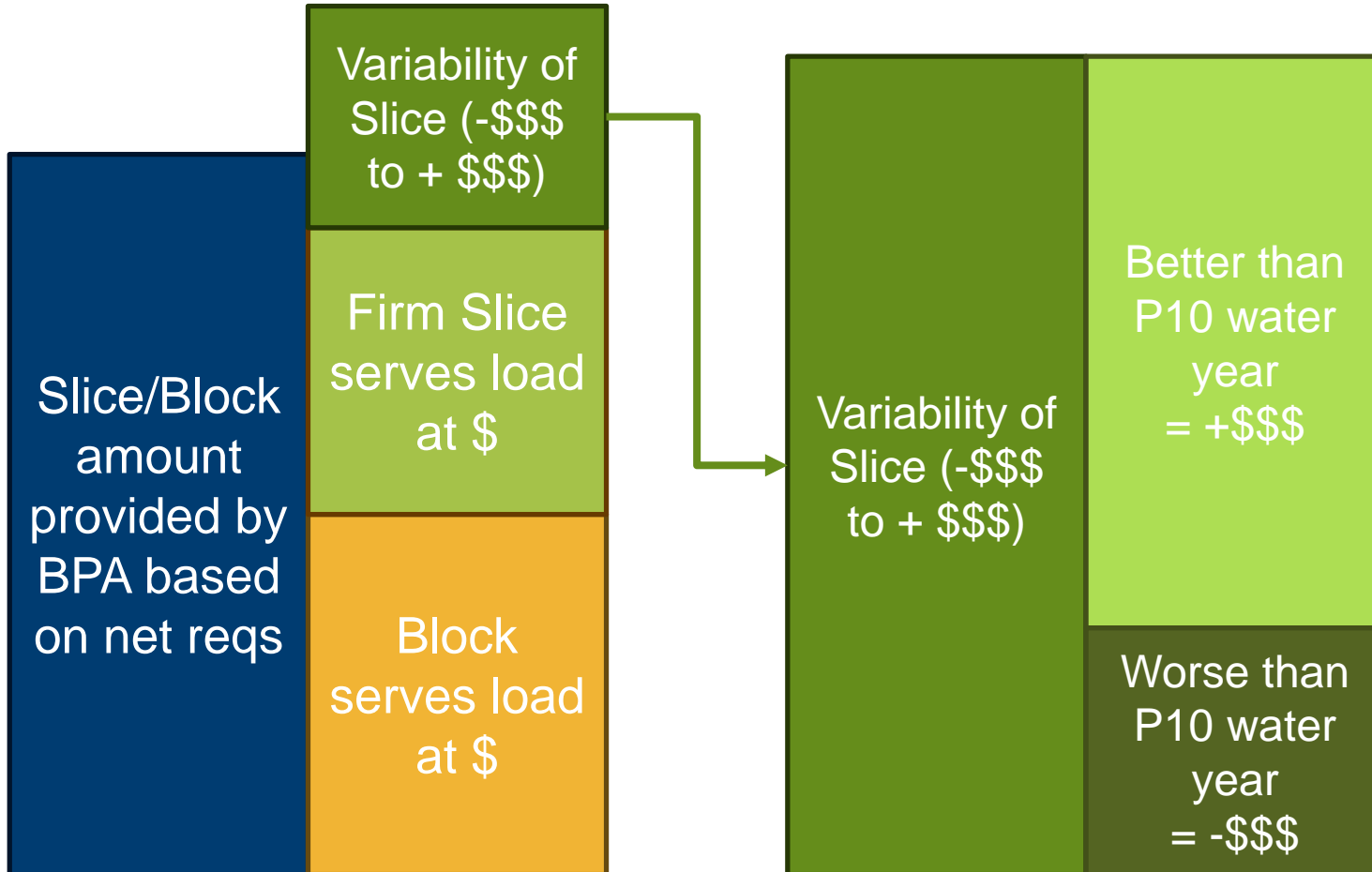
Slice/Block Load Service Today (cont.)



In operational time horizon:

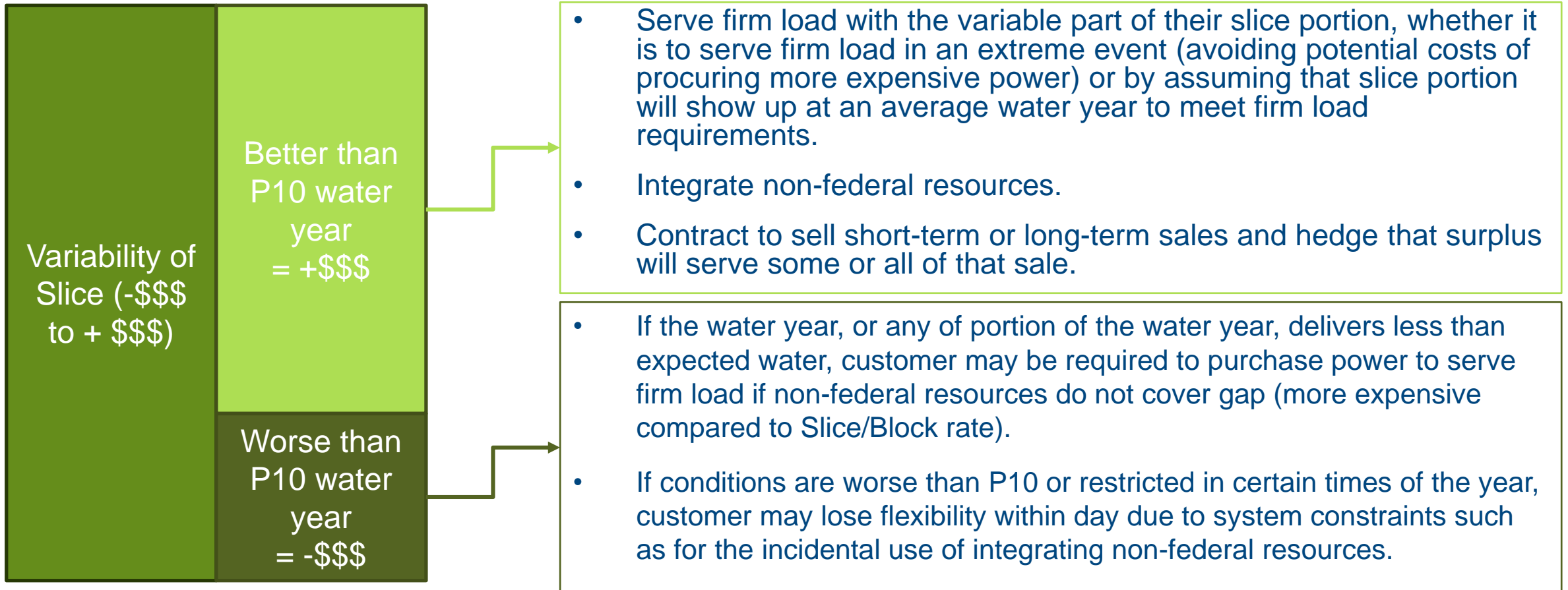
- Actual loads may vary to be more or less than planned in any given hour, day, or month. The customer takes on the obligation to meet that variability.
- Non-federal generation may also appear differently than planned.
- The slice portion of the load is based on P10 water conditions. But actual conditions may be below P10 for the year or any given period within the year.

Slice Surplus Value Today

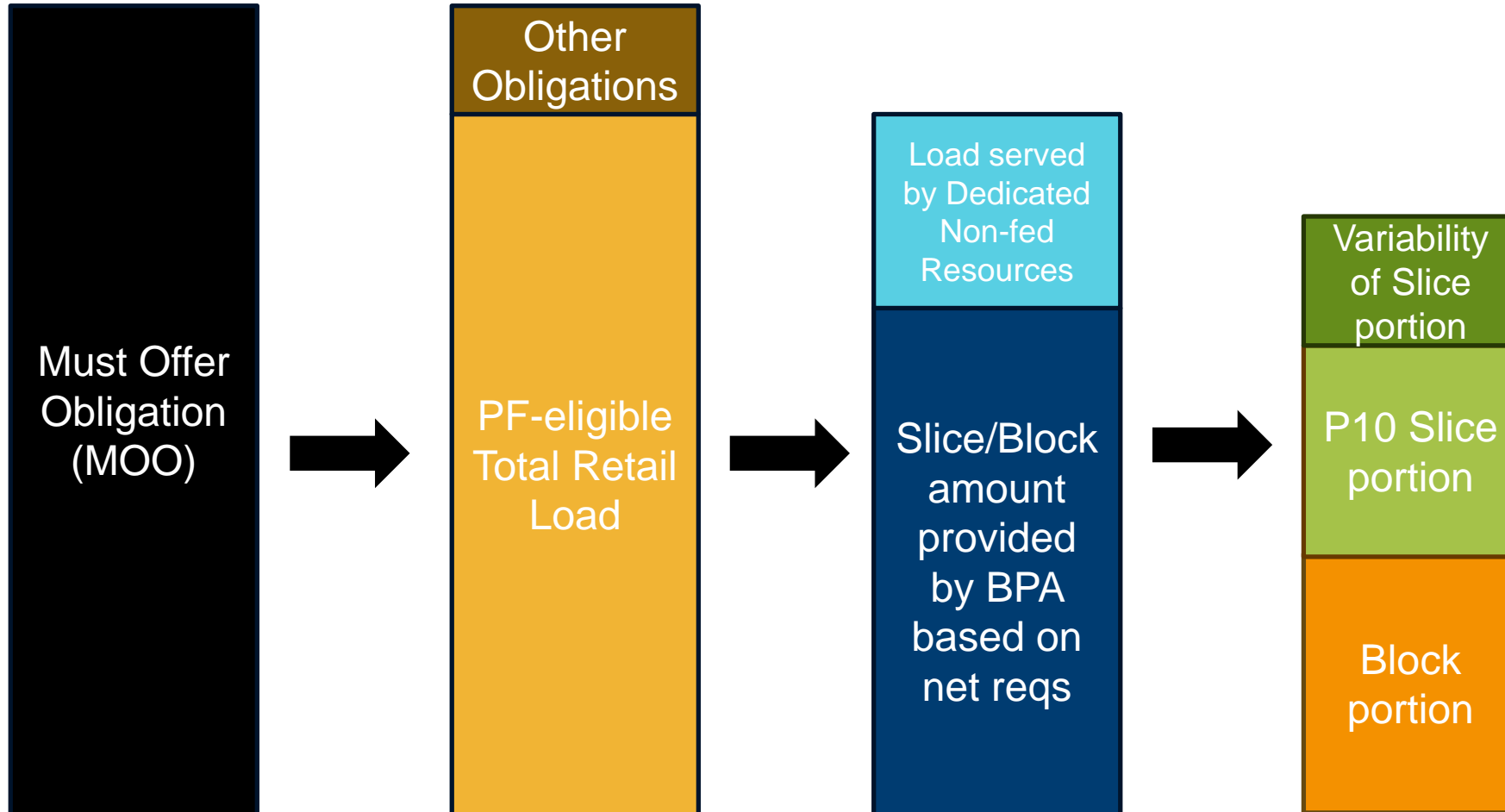


- Slice/Block customers pay a set rate for their Bonneville supplied power and then get firm power as well as an advanced sale of surplus.
- The variability in the slice portion of the product provides value to customers but also includes risk inherent to uncertainty around water conditions at any point in the year.
- Customers make their own planning and risk assumptions on how much generation may be available in the variability of the slice portion.

Slice Surplus Value Today (cont.)

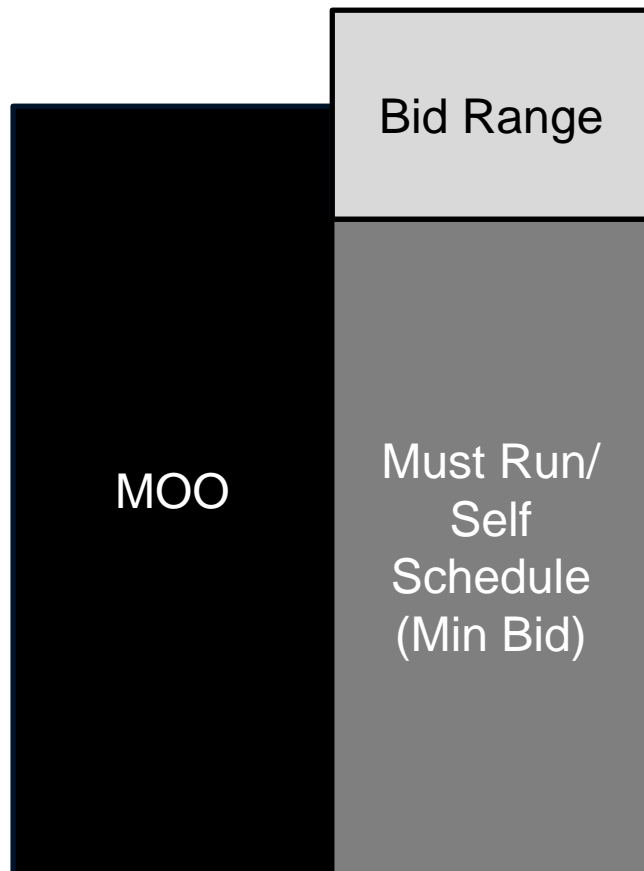


Slice/Block Load Service Day-Ahead Market



- In a day-ahead market, each market participant will be responsible for determining their MOO in each hour.
- A market participant's MOO will be inclusive of all load obligations it has taken on.
- Slice/Block product design must figure out how Slice/Block product fits into a customer meeting their MOO as a market participant.

Surplus Value in DAM for Market Participant



- **What stays the same?**
 - Revenue from market sales for generation that is surplus to load obligation.
 - Forward purchases when generation expected to be below firm obligations.
- **What's changing?**
 - Bi-lateral market liquidity will likely change but uncertain to what extent. Potential to see lower physical forward sales activity due to future WRAP Forward Showing obligations.
- **What's new?**
 - Market engine will economically dispatch participating resources and interchange bids across the entire market footprint ensure most economic resources are dispatched to serve load in any given hour.



DISCUSSION AND DESIGN

What is more important to customers in the future – accessing the actual power from surplus or the financial value?

What about financial settlements is important to Slice/Block product design? Is this specific to product or about broader day-ahead market participation?



“True Slice” Proposal Concerns

Concerns with “True Slice” proposal

Bonneville has identified five areas of the customer proposal that it does not believe can be resolved.

1. Tie to load service.
2. Compatibility across market futures.
3. Concept simplicity does not translate to design/implementation simplicity.
4. Operational concerns.
5. Technical feasibility.

1. Tie to Load Service

- Slice/Block product must be grounded in 5(b) load service.
- Unclear how a percentage of federal system converts to meeting a portion of a customer's MOO (assuming planned product customers will be market participants).

2. Compatibility Across Markets

- Proposal relies on functionalities that allow Bonneville to convey resource attributes through day-ahead market mechanisms.
- Unclear how to provide similar access or construct to customers in another market or if Bonneville was not in a market.

3. Concept simplicity does not translate to design/implementation simplicity

- The proposal is based on a fixed percentage share and is a shift away from what customers currently access through the Slice RTP in the Slice Computer Application (SCA).
- After determining the Combined Interest Resource mechanism is not viable, the simplicity of the original concept becomes more complicated to maintain true percentage.

4. Operation Concerns

- Creating a product tied to the feasible min/max of resources are not representative of the maximum generation Bonneville would bid into the market.
- The federal system is used for multiple purposes and the “True Slice” proposal could create adverse impacts by expanding what Slice/Block customers would claim as RTP.

5. Technical feasibility

- The ability to update the SCA to create the resource allocations requested by customers or create a true feasible min/max is beyond what Bonneville believes it can handle in an SCA upgrade in time for Provider of Choice contract power deliveries and accurately reflect what is occurring in operations.
- In addition to the feasibility of completing the upgrade in time, the proposal could create additional maintenance around calculating the percentage to accurately reflect the balance of system (BOS).
- SCA meant to be a simplified representation of the system to calculate Slice RTP as needed for Regional Dialogue; proposal introduces fundamental shift in what would need to be modeled.