



**Bonneville's Public Engagement for Establishing a Policy Direction on  
Potential Day Ahead Market Participation  
Workshop 2  
September 11, 2023**

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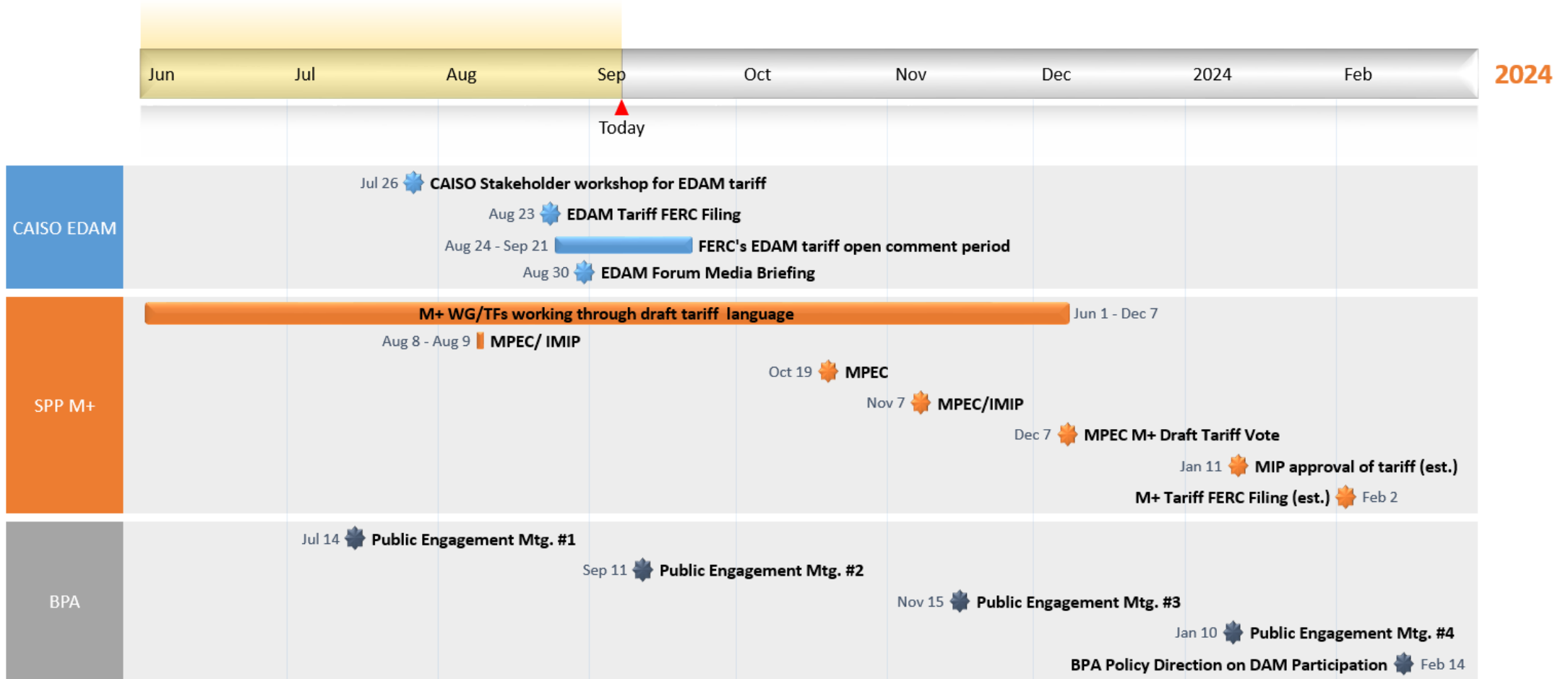


# Agenda

- Update on Day Ahead Market (DAM) development (9am – 9:30am)
- Update on developing GHG accounting in a DAM (9:30am – 10:00am)
- BPA Will Continue to Supply Electric Power to our Customers in a DAM (10am – 10:30am)
- BPA's draft DAM evaluation principles (10:30am – 11:30am)
- Lunch Break (11:30am – 12:30pm)
- Review of comments received after the first workshop (12:30pm – 1:30pm)
- 5b rights/DAM compatibility (1:30pm – 2:30pm)
- Table top scenario work with PPC (2:30pm – 3:30pm)
- Q&A and Closeout (3:30pm – 4pm)

# **Update on Day Ahead Market Development**

# Day Ahead Market Activity



# **Update on Developing GHG Accounting in a DAM**

# Market Design for GHG Accounting

- Attempts to accommodate state carbon pricing programs (e.g. California cap-and-trade, Washington cap-and-invest)
  - Markets have not yet worked on non-pricing programs
- Each state program (or linked programs) creates a GHG area/zone that follow the state boundaries
  - Generation inside the state and imported into the state is subject to the state program
- The cost of compliance is added to in-state generation's energy bid
- Market identifies/deems specific resources being imported into the state
  - Always voluntary for a resource outside the state to agree to be identified as imported into the state
  - Buyer does not have control over what power they receive

# Market Design for GHG Accounting

- Arriving at the right design means navigating several difficult trade-offs
  - Ability to meet state policy goals, minimizing emissions leakage, impacts to market efficiency, costs to ratepayers, equitable resource treatment, adverse impacts to states without GHG programs...
- Solution set is intertwined with the reporting and compliance rules for the state carbon pricing program
- Washington Department of Ecology (Ecology) recently opened a rulemaking on electricity markets to develop cap-and-invest program rules for organized markets.

# EDAM GHG Market Design

- Resource-specific deeming to load in a state (GHG area) with a carbon pricing program
- Expanded the EIM GHG accounting design to EDAM, with some updates targeted at further minimizing emission leakage.
- Design is currently for California only. CAISO has indicated they will extend the design to Washington if Ecology adopts rules that enable resource-specific deeming to the state.
- CAISO recently began a new [stakeholder process](#) on GHG accounting.
  - Potential topics that may be explored: review of CAISO GHG accounting and market design, state coordination, beyond GHG price-based policies, emissions tracking and accounting.



# Markets+ GHG Market Design

- Both resource-specific + unspecified resource (where cost-effective) identification for load in a state (GHG zone) with a carbon pricing program
- Design specifics, reporting metrics, and tariff language are currently being discussed and developed by a [GHG task force](#). Intended to be broadly applicable to state carbon pricing programs, but Washington's program is front and center.
  - Ecology will still need to adopt rules to enable resource-specific imports from a market.
- There has been discussion of non-pricing programs, but the current work is focused on creating the market design for pricing programs. We expect solutions for non-pricing programs will be further explored at a later point.

# BPA Engagement

- BPA is participating in GHG accounting stakeholder processes for both markets.
- BPA is advocating for a balanced market design that supports customers in Washington in meeting their state compliance requirements, does not unduly impact customers in other states, and values the low-carbon attributes of the FCRPS.
- Actively engaged in Ecology's rulemaking to develop reporting and compliance rules for organized markets

# **BPA Will Continue to Supply Electric Power to our Customers in a DAM**

## Power Sales Contracts and Serving Load

- BPA's long-term public preference power sales contracts will ensure that all available Firm Power from the FCRPS is managed to meet preference customer load on an annual planning basis.
- As we do today, BPA will continue to manage the FCRPS, including market purchases and sales, to meet our load commitments and create economic value that keeps rates low for our preference customers.

## **BPA Will Continue to Supply Electric Power to our Customers in a DAM**

- BPA will ensure the carbon free attributes of the FCRPS are maintained for customers.
- BPA will manage and optimize our hydro system, setting minimum and maximum market constraints that fall within the FCRPS's use for meeting multi-purpose system objectives and environmental stewardship responsibilities.

# **BPA's Draft DAM Evaluation Principles**

# Draft DAM Evaluation Principles

- **Statutes** - Bonneville meets its statutory, regulatory, and contractual obligations
- **Reliability** - Bonneville maintains efficient, economical and reliable delivery of power and transmission service to its customers.
- **Reliability** - Market design includes resource sufficiency and/or resource adequacy frameworks that ensure reliability.
- **Business** - Bonneville's participation is supported by a sound business rationale.
- **Strategy** - Bonneville's participation is consistent with Bonneville's strategic plan.

# Draft DAM Evaluation Principles

- **Governance** – The market has durable, effective, and independent governance structure which provides fair representation to all market participants and stakeholders. Decision-making and stakeholder engagement occurs in a transparent and inclusive manner.
- **Customers** - Bonneville’s evaluation of DAM participation includes transparent consideration of the commercial and operational impacts on its products and services.
- **GHG** - Bonneville will evaluate how participation will impact greenhouse gas emissions attributed to the federal system and customers’ ability to comply with state carbon programs. Participation must maintain the value of the low-carbon nature of the federal system to the extent possible.



# **Review of Comments Received After the First Workshop**

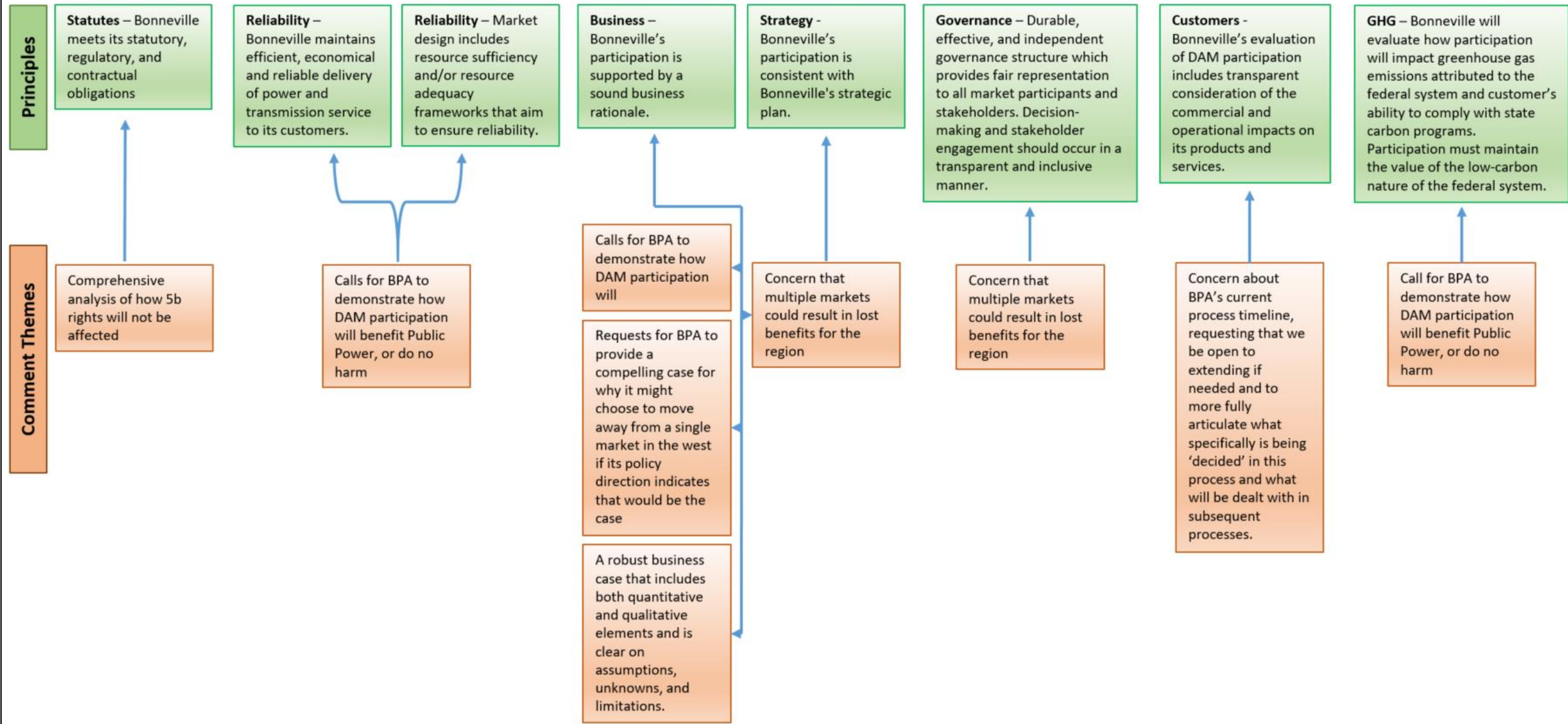
# Themes from Comments Received

- Requests for comprehensive analysis of how 5(b) rights may be affected and calls for BPA to demonstrate how DAM participation will benefit or at least not harm public power customers.
- Concern about BPA's current process timeline, requesting that we be open to extending if needed and to more fully articulate what will be decided in this process and what will be addressed in subsequent processes

# Themes from Comments Received

- Concern that multiple markets could result in lost benefits for the region.
- Requests for BPA to provide a compelling case for why it might choose to move away from a single market in the West.
- Request that BPA provide a robust business case that includes both quantitative and qualitative elements and is clear on assumptions, unknowns, and limitations.

# Cross Walk of Comments and Draft Principles



**Principles**

**Comment Themes**

**Statutes** – Bonneville meets its statutory, regulatory, and contractual obligations

Comprehensive analysis of how 5b rights will not be affected

**Reliability** – Bonneville maintains efficient, economical and reliable delivery of power and transmission service to its customers.

Calls for BPA to demonstrate how DAM participation will benefit Public Power, or do no harm

**Reliability** – Market design includes resource sufficiency and/or resource adequacy frameworks that aim to ensure reliability.

**Business** – Bonneville's participation is supported by a sound business rationale.

Calls for BPA to demonstrate how DAM participation will

Requests for BPA to provide a compelling case for why it might choose to move away from a single market in the west if its policy direction indicates that would be the case

A robust business case that includes both quantitative and qualitative elements and is clear on assumptions, unknowns, and limitations.

**Strategy** - Bonneville's participation is consistent with Bonneville's strategic plan.

Concern that multiple markets could result in lost benefits for the region

**Governance** – Durable, effective, and independent governance structure which provides fair representation to all market participants and stakeholders. Decision-making and stakeholder engagement should occur in a transparent and inclusive manner.

Concern that multiple markets could result in lost benefits for the region

**Customers** - Bonneville's evaluation of DAM participation includes transparent consideration of the commercial and operational impacts on its products and services.

Concern about BPA's current process timeline, requesting that we be open to extending if needed and to more fully articulate what specifically is being 'decided' in this process and what will be dealt with in subsequent processes.

**GHG** – Bonneville will evaluate how participation will impact greenhouse gas emissions attributed to the federal system and customer's ability to comply with state carbon programs. Participation must maintain the value of the low-carbon nature of the federal system.

Call for BPA to demonstrate how DAM participation will benefit Public Power, or do no harm

# 5b Rights/DAM Compatibility

# Preliminary Assessment

- BPA has broad contract authority.
- If BPA decides to join a day ahead market, BPA must satisfy its statutory directives and Northwest Power Act section 5(b) contract obligations.
- If BPA decides to join a day ahead market, power sales contract provisions would be developed to outline participation roles and responsibilities. If participation is post-2028, language would be developed in the Provider of Choice process.

# Power Sales

- All firm power sales are subject to the preference and priority provisions in sections 4 and 5 of the Bonneville Project Act. BPA's resource acquisition authority ensures an adequate supply of power, avoiding allocation of federal power and competing/conflicting requests between preference and non-preference purchasers requesting firm power.
- Therefore, BPA's resource acquisition authority assures an adequate supply of power and avoids triggering preference for requirements power sales under section 5(b).
- Preference continues to apply to sales of surplus power.

# Power Planning and Delivery

- Northwest Power Act section 5(b) provides eligible purchasers with a right to request a sale of “electric power” from BPA. Today, BPA meets its firm power sales obligations by delivering electric power from federal resources and non-federal resources, including market purchases.
- In a day ahead market, BPA would continue to plan and deliver power from its resource portfolio as it does today to satisfy its load obligations.
- BPA will work with transfer providers to ensure that customers receive quality service.



# Rates and Contracts

- BPA would determine cost allocation and cost recovery in rate case workshops and Northwest Power Act section 7(i) rate proceedings.
- BPA would update transmission service terms and conditions in tariff proceedings.
- BPA would discuss potential power sales contract provisions with customers to align with expectations for DAM optimization, among other things. Potential contract discussions will occur in power sales contract processes concurrent with the market evaluation process.

# GHG Accounting

- Bonneville will evaluate how participation will impact greenhouse gas emissions attributed to the federal system and customers' ability to comply with state carbon programs. BPA will ensure that participation maintains the value of the low-carbon nature of the federal system to the extent possible.
- BPA invites comment on policies and procedures that may be necessary for hydro resource participation and greenhouse gas accounting in a day ahead market.

# Table Top Scenario Work with PPC

# Background

- BPA and PPC have been meeting regularly since July to map out a series of load service scenarios to better understand 5b rights/DAM compatibility
- These load service scenarios cover both how BPA interacts with the BES today and how it is likely to in a DAM for serving its load obligations (including public power load)
- The goal of this exercise is to ensure we are all approaching the 5b compatibility discussion from a common understanding of how load is served today and how it will likely be served in a DAM.

# Scenario Overview

- Today's scenarios present a very simplistic overview of how BPA sets up to serve load and meet its obligations and how that operates in bilateral and organized markets
- The scenarios are focused on BPA's Power Services obligations, resources, and purchases
  - Balancing Authority Area (BAA) representations are meant to convey Net Scheduled Interchange (NSI) and basic wholesale marketing with neighbors
- Today's scenarios are meant to describe the basic mechanics of how BPA meets its obligations today and how we could do so in a DAM
  - The DAM mechanics in these scenarios are very generic, and not unique to either EDAM or M+

# Scenario Overview Continued

- The scenarios generally describe two different conditions:
  - The FCRPS has ample energy and capacity to meet BPA's demand obligations and to sell surplus into the market, which is reflected by a large bid range and economic bids
  - The FCRPS has sufficient capability to meet its own demand obligations, but its energy and capacity is much more limited, which is reflected by a smaller bid range and less competitive economic bids
- The scenarios show, at a high level, how these conditions manifest in the status quo and how they would in a DAM

# Scenario Overview Continued

- Generation and loads are simplified but generally represent how BPA identify capability and obligations
  - Generators represent our Overlapping Resource Aggregates (“ORA”) in the EIM, which typically have the most flexibility, as well as the balance of the system (“BOS”), which runs flatter
  - Loads and other demand obligations derive from multiple Regional Dialogue products as well as bi-lateral transactions
    - Though the loads are determined by different methods (e.g. Load Following vs. Block) BPA ultimately has a net load position for which it must secure sufficient generation

# Scenario Description

- 1a: “Base Economic” – BPA self-schedules FCRPS and uses bilateral markets pre-EIM and is then economically dispatched by the EIM to serve load and market intra-hour. The FCRPS bids into the EIM are economic all the way up to their max bid range
- 1b: “Base w/Purchase” – BPA self-schedules FCRPS and uses bilateral markets pre-EIM and is then economically dispatched by the EIM to serve load and market intra-hour. The FCRPS prices compared to the bilateral market and bids into the EIM are only economic for the first “tranche”. BPA purchases from the bilateral market prior to EIM and then is not dispatched in the EIM



# Scenario Descriptions Continued

- 2a: “DAM Economic”: BPA sets up the FCRPS and uses bilateral markets prior to the DAM. Then the FCRPS is economically committed and dispatched in the DAM/RTM for load service and surplus marketing. There is a “must run” component of the FCRPS that is a self-scheduled price taker. The FCRPS bids into the DAM/RTM are economic all the way up to their max bid range
- 2b: “DAM w/Purchase”: BPA sets up the FCRPS and uses bilateral markets prior to the DAM. Then the FCRPS is economically committed and dispatched in the DAM/RTM for load service and surplus marketing. There is a “must run” component of the FCRPS that is a self-scheduled price taker. The FCRPS bids into the DAM/RTM are only economic up to the first “tranche”. The DAM commits economic deliveries external to the BAA to serve the balance of our demand obligations. No further dispatch in the RTM.

# Scenario 1a: Base Economic Setup

- This scenario assumes perfect forecasting of load and generation as well as market depth
- BPA has a net demand of 5000MW. This is comprised of multiple contracts and products
- BPA has 8000MW of potential generation at multiple prices
  - 5000MW of “self-scheduled” generation (min gen) priced at \$0
  - 1500MW incremental MW we are willing to generate at \$15
  - 1500MW incremental MW we are willing to generate at \$35
- Bi-lateral purchases/sales are clearing at \$35, with sufficient depth to take all of our incremental capability
- BAA2 is a neighboring BAA in the same RTM, neither BAAs are in a DAM
- BPA can make purchases and sales to other BAAs as well (i.e., 250MW sale)

**Example 1a: Base Economic Status Quo**

Generator Supply	Offer	MW	\$
ORA1	Min	3250	\$0
	Max	5000	\$35
	Bid	3251-4000	\$15
	Bid	4001-5000	\$35
ORA2	Min	500	\$0
	Max	1000	\$35
	Bid	501-750	\$15
	Bid	751-1000	\$35
ORA3	Min	250	\$0
	Max	1000	\$35
	Bid	251-750	\$15
	Bid	751-1000	\$35
BOS		1000	\$0
Bilateral Mkt Price			\$35

**BPA Load and Demand Obligations**

- Sum: 5000MW (4250MW internal to BA)
  - Load Following plus losses: 2000MW
  - Slice/Block: 2250MW
  - Transfer loads: 500MW
  - Contracted forward sales: 250MW

**Pre-Day Ahead/Pre EIM**

**ORA1:**

- Pre-DA: 5000MW

**ORA2:**

- Pre-DA: 1000MW

**ORA3:**

- Pre-DA: 1000MW

**BOS**

- Pre-DA: 1000 MW

**Sum**

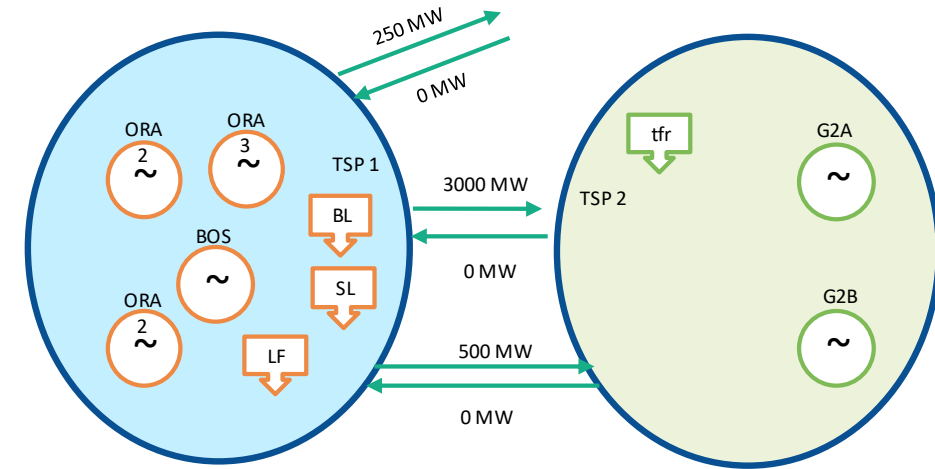
- Base Schedule: 8000MW

**Totals Purchases and Sales**

- \$105,000
  - 3000MW sales at \$35

**Net Scheduled Inter**

- BA1: NSI = +3750
- BA2: NSI = -3500



# 1a Outcomes

- BPA commits the FCRPS for its 5000MW of load
- BPA makes an additional 3000MW of bilateral sales at \$35 of \$105,000
- These sales become Base Schedules in the EIM
- Absent any load or generation changes (assumed to not occur in this example) there are no additional transactions

# Scenario 1b: Base w/Purchase Setup

- This scenario assumes perfect forecasting of load and generation as well as market depth
- BPA has a net demand of 5000MW. This is comprised of multiple contracts and products
- BPA has 6000MW of potential generation at multiple prices
  - 3500MW of “self-scheduled” generation (min gen) priced at \$0
  - 1000MW incremental MW we are willing to generate at \$15
  - 1500MW incremental MW we are willing to generate at \$35
- Bi-lateral purchases/sales are clearing at \$35, with sufficient depth to take all of our incremental capability BAA2 is a neighboring BAA that is in the same RTM, neither BAAs are in a DAM
- BPA can make purchases and sales to other BAAs as well (i.e., 250MW sale)

Example 1b: Base w/Purchase Status Quo

Generator Supply	Offer	MW	\$
ORA1	Min	2000	\$0
	Max	3000	\$45
	Bid	2001-2500	\$15
	Bid	2501-3000	\$45
ORA2	Min	300	\$0
	Max	1000	\$45
	Bid	301-500	\$15
	Bid	501-1000	\$45
ORA3	Min	200	\$0
	Max	1000	\$45
	Bid	201-500	\$15
	Bid	501-1000	\$45
BOS		1000	\$0
Bilateral Mkt Price			\$35

**BPA Load and Demand Obligations**

- Sum: 5000MW (4250MW internal to BA)
  - Load Following plus losses: 2000MW
  - Slice/Block: 2250MW
  - Transfer loads: 500MW
  - Contracted forward sales: 250MW

**Pre-Day Ahead/Pre EIM**

ORA1:

- Pre-DA: 2500MW

ORA2:

- Pre-DA: 500MW

ORA3:

- Pre-DA: 500MW

BOS

- Pre-DA: 1000 MW

Sum

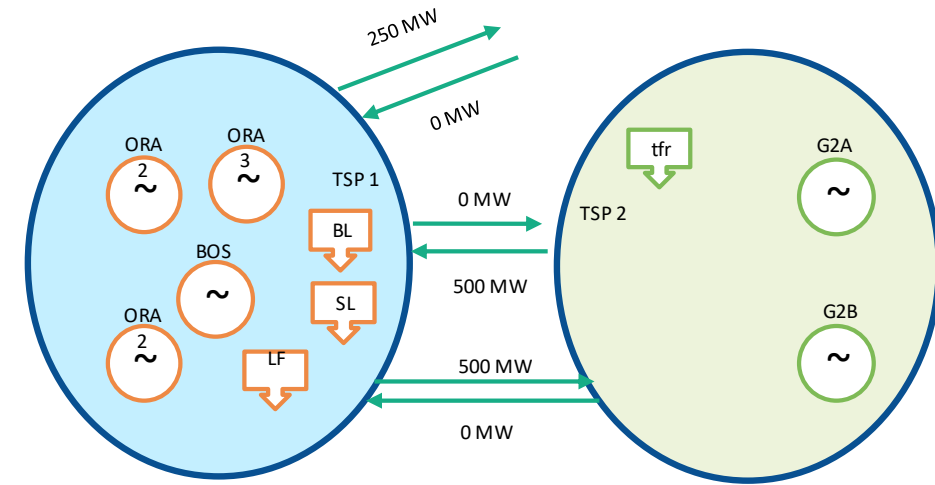
- Base Schedule: 4500MW
- Bi-lateral purchase: 500MW

**Totals Purchase**

- -\$17,500
  - 500 at \$35
  - Avoided cost \$5,000

**Net Scheduled Inter**

- BA1: NSI = +250
- BA2: NSI = 0



# 1b Outcomes

- BPA commits the FCRPS for its 4500MW of load
  - BPA has sufficient FCRPS capability to serve load, but 2500MW would have used water as fuel at a price that was uneconomic
- BPA makes a bilateral purchase of 1500MW at \$35 for \$52,500
  - If BPA had used the FCRPS for the entirety of load service it would have incurred an incremental cost of \$15,000
- These self-commitments and purchases become Base Schedules in the EIM
- Absent any load or generation changes (assumed to not occur in this example) there are no additional transactions

# Scenario 2a DAM Economic Setup

- BPA has the same load and generation position as in scenario 1a
- Instead of utilizing the bilateral market in the day-ahead timeframe BPA makes its generation available to the DAM
  - BPA has the same min/max gen and bids as well
- BAA2 is a neighboring BAA that is in the same DAM/RTM
- BPA can make purchases and sales to other BAAs as well (i.e., 250MW sale)



**Example 2A: DA & RT FCRPS Economic**

Generator Supply	Offer	MW	\$
ORA1	Min	3250	\$0
	Max	5000	\$35
	Bid	3251-4000	\$15
	Bid	4001-5000	\$35
ORA2	Min	500	\$0
	Max	1000	\$35
	Bid	501-750	\$15
	Bid	751-1000	\$35
ORA3	Min	250	\$0
	Max	1000	\$35
	Bid	251-750	\$15
	Bid	751-1000	\$35
BOS		1000	\$0
Market Clearing Price			\$35
Total	\$15	1500	\$15
Total	\$35	1500	\$35

**Load Obligations MP1**

- **Sum: 5000MW (4250MW internal to BA)**
  - LF plus losses – 2000MW
  - Slice/Block – 2250MW
  - Transfer loads – 500MW
  - Contracted forward sales – 250MW

**Pre-Day Ahead/Pre M+**

ORA1:

- Pre-DA: 3250MW Self-Schedule
- Bid Range: 3251-5000MW

ORA2:

- Pre-DA: 500 MW
- Bid Range: 501-1000MW

ORA3:

- Pre-DA: 250 MW
- Bid Range: 251-1000MW

BOS

- Pre-DA: 1000 MW

Sum

- Self Schedule: 5000MW
- Add'l Bid id in Capacity: 3000MW
- Total: 8000MW

**Net Scheduled Inter**

- BA1: NSI = +750
- BA2: NSI = -500

**Day Ahead Awards**

ORA1:

- 5000 MW

ORA2:

- 1000 MW

ORA3:

- 1000 MW

BOS

- 1000 MW

Load bids:

- MP1 - L1: 5000MW @ \$1000

- BA1 NSI = +3750

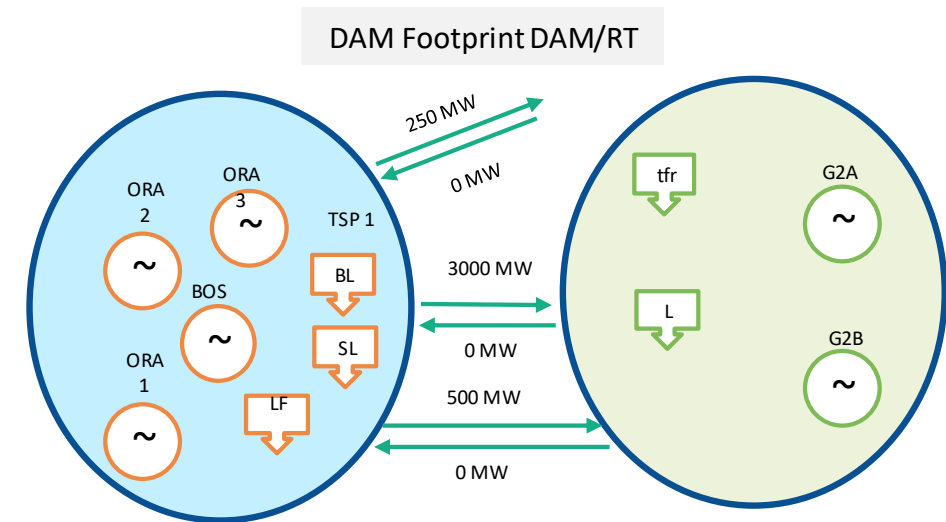
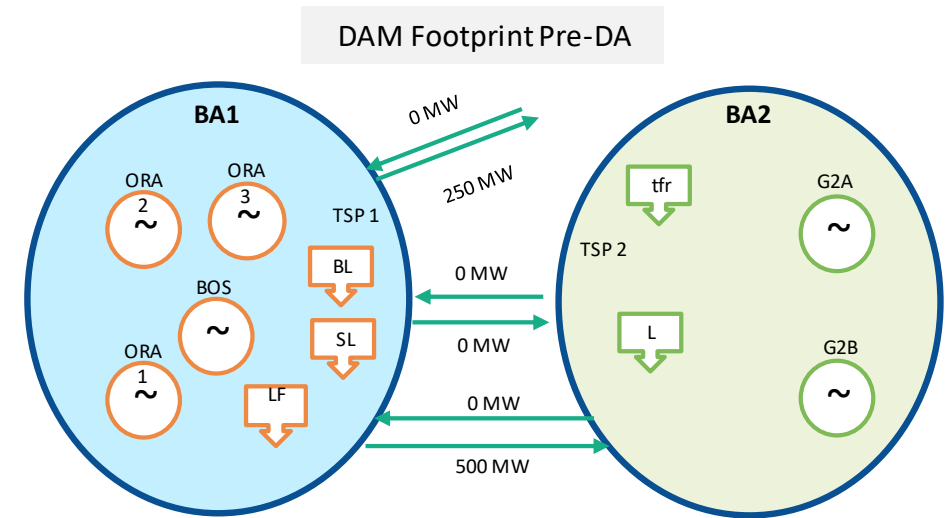
- BA2 NSI = -3500

- LMP = \$35

- MP1 Cost: -\$175,000

- MP1 Revenue: +\$280,000

- MP1 Net: \$105,000



## 2a Outcomes

- BPA commits the FCRPS for its 5000MW of load
- BPA makes an additional 3000MW of generation available, all of which is priced at \$35 or lower
- BPA Power Services nets \$105,000
  - BPA's load purchases 5000MW of power at \$35 for a total cost of \$175,000
  - BPA generation clears 8000MW of sales at \$35 for a total of \$280,000
- Absent any load or generation changes (assumed to not occur in this example) there are no additional transactions

# Scenario 2b DAM w/Purchase Setup

- BPA has the same load and generation position as in scenario 1b
- Instead of utilizing the bilateral market in the day-ahead timeframe BPA makes its generation available to the DAM
  - BPA has the same min/max gen and bids as well
- BAA2 is a neighboring BAA that is in the same DAM/RTM
- BPA can make purchases and sales to other BAAs as well (i.e., 250MW sale)

**Example 2b: DA & RT Purchase**

Generator Supply	Offer	MW	\$
ORA1	Min	2000	\$0
	Max	3000	\$45
	Bid	2001-2500	\$15
ORA2	Bid	2501-3000	\$45
	Min	300	\$0
ORA2	Max	1000	\$45
	Bid	301-500	\$15
	Bid	501-1000	\$45
ORA3	Min	200	\$0
	Max	1000	\$45
	Bid	201-500	\$15
ORA3	Bid	501-1000	\$45
	BOS	1000	\$0
Market Clearing Price			\$35
Total	\$15	1000	\$15
Total	\$45	1500	\$45

**Load Obligations MP1**

- Sum: 5000MW (4250MW internal to BA)
- LF plus losses – 2000MW
- Slice/Block – 2250MW
- Transfer loads – 500MW
- Contracted forward sales – 250MW

**Pre-Day Ahead/Pre M+**

ORA1:

- Pre-DA: 2000MW Self-Schedule
- Bid Range: 2001-3000MW

ORA2:

- Pre-DA: 300 MW
- Bid Range: 301-1000MW

ORA3:

- Pre-DA: 200 MW
- Bid Range: 201-1000MW

BOS

- Pre-DA: 1000 MW

Sum

- Self Schedule: 3500MW
- Add'l Bid id in Capacity: 2500MW
- Total: 6000MW

**Net Scheduled Inter**

- BA1: NSI = +750
- BA2: NSI = -500

**Day Ahead Awards**

ORA1:

- 2500 MW

ORA2:

- 500 MW

ORA3:

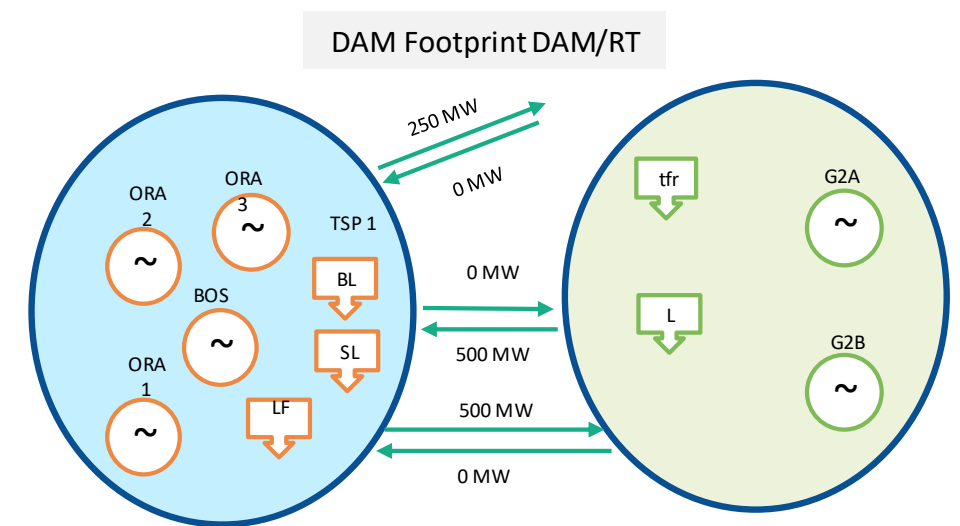
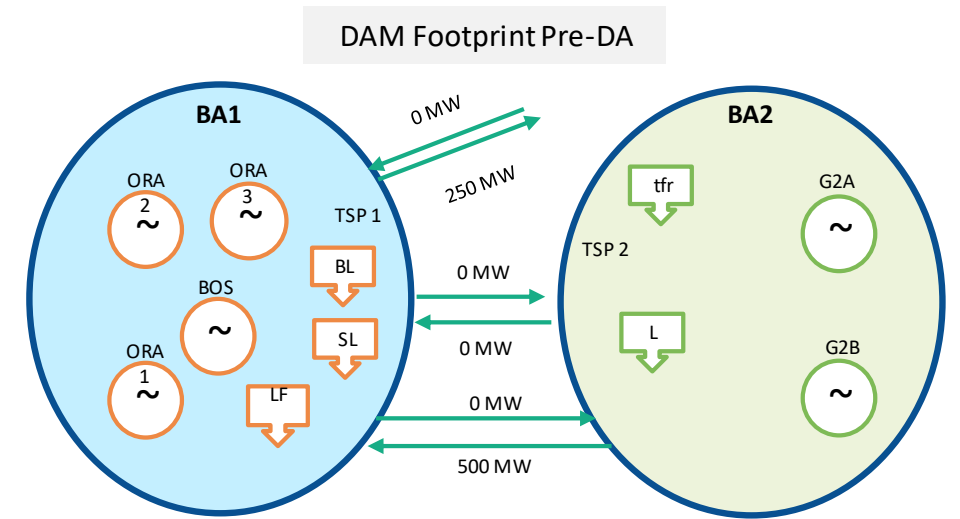
- 500 MW

BOS

- 1000 MW

Load bids:

- MP1 - L1: 5000MW @ \$1000
- BA1 NSI = +250
- BA2 NSI = 0
- LMP = \$35
- MP1 Cost: -\$175,000
- MP1 Revenue: +\$157,500
- MP1 Net: -\$17,500
  - Avoided Cost \$5000



# Outcomes

- BPA commits the FCRPS for its 3500MW of load
  - An additional 1000MW is economic
  - An additional 1500MW is uneconomic
- BPA generation clears 4500MW of sales at \$35 for a total \$157,500
- BPA Power Services nets -\$17,500
  - BPA's load purchases 5000MW of power at \$35 for a total cost of \$175,000
  - BPA generation clears 1500MW of sales at \$35 for a total of \$157,500
  - BPA also *avoided* -\$5000 by purchasing 500MW of economic power to serve load (i.e. FCRPS at \$45)
- These self-commitments and purchases become Base Schedules in the EIM
- Absent any load or generation changes (assumed to not occur in this example) there are no additional transactions

# Q&A and Closeout

# Wrap up

- Public feedback period on BPA's DAM participation following this workshop
  - 9/12 – 10/15
- Next DAM Evaluation Public Workshops
  - BPA will hold an additional workshop on October 23<sup>rd</sup> to discuss work on its day ahead market business case
  - Next originally scheduled workshop will be November 15<sup>th</sup>
- Please send any feedback regarding this process to [techforum@bpa.gov](mailto:techforum@bpa.gov) (please put "DAM Participation Evaluation" in the subject heading)
  - All formal feedback received will be posted to the BPA.gov page for BPA's DAM Participation Evaluation

# Appendix: Day Ahead Market Activity (posted again for reference in close out discussion)

