DRAFT AGENDA

October 22 and 23, 2018

BPA – CAISO Technical Face-to-Face

October 22 – 2:00 – 5:00pm

I. 2:00p – Process Map
   a. BPA – build off of the "chevron" slide in our Oct 11th stakeholder presentation
   b. ISO – feedback
II. 3:00p – Implementation Agreement Attachment A
   a. ISO – build up BPA-specific example Attachment A
   b. BPA - feedback
III. 4:00p – Governance items
   a. ISO – review of governance/EIM Governing Body
   b. ISO – review of overall process (as requested in October 11th stakeholder mtg) from identifying an issue, to resolution with EIM GB

October 23 – 8:00 – 12:00 noon

I. 8:00a – Settlements – High-level introduction of perspectives
   a. Laura G / Bri A – BPA explains customer's current expectations (includes types of BPA customers, volume of bills, revision rate, dispute window, etc.)
   b. ISO – EIM entity settlements overview
II. 9:30a – Tour of the ISO floor (for the 7 Monday afternoon attendees)
<break as needed – 3 more BPA participants arrive>
III. 10:00a – Generation Aggregation / Late-breaking constraints
   a. Todd K – Validate +/- shift factors
   b. Russ M – Present results of BPA's Table-top scenarios
   c. ISO – Metering approach – what would it look like to develop what you all need given the Table Top that we present (furthering the discussion from Oct 5th)
   d. ISO – Auto-matching approach – what would it look like to develop what you all need given the Table Top that we present (furthering the discussion from Oct 5th)
   e. ISO – Validate ISO tariff options (we believe there are 2 we discussed Oct 5th, confirming the references)
IV. Treatment of Transmission – we think we are good in this area for now based on Oct 5th

October 23 – 1:00 – 5:00pm

I. 1:00p – Market Power Mitigation
   a. ISO – Introduction of BPA staff and ISO MPM principals, including from DMM
   b. ISO – run through how the MPM run could impact the earlier Gen participation discussion
   c. BPA – feedback / questions

II. 2:00p – Settlements
   a. Laura G / Bri A – BPA shares current list of Settlement issues / questions
   b. Don T – settlement examples
   c. BPA / ISO – Build on the scenarios from the Transmission and Late breaking constraints, applying them to settlements examples
   d. Laura G / Bri A – BPA shares draft agenda for December 2018 customer workshop on EIM Settlements

III. 4:00p – Address follow-ups from the Process / Implementation / Gov discussion on Oct 22nd

IV. 4:30p – Next steps / next meeting

AGENDA

December 3 and 4, 2018

BPA – CAISO Technical Face-to-Face

December 3rd – 9:00am – 4:00pm

I. 9:00am – Feedback from last meeting and BPA's Nov 11th stakeholder meeting
   a. BPA – intro its documentation approach for these technical face-to-face meeting
   b. ISO – feedback on Nov 11th meeting (ISO to provide ahead of time so BPA can review)
      i. EIM process
      ii. LMPM (detailed review of latest proposal Tuesday afternoon)

II. 9:30am – Utilicast Gap Analysis
   a. BPA – follow-up from prior meeting, link to Grid Mod and then EIM
   b. ISO – feedback

III. 10:30am – Generation Resource Participation
   a. Aggregated Resource Participation
      i. George – ISO reviews Overlapping Resource Aggregation paper
      ii. BPA – feedback
   b. Third Party Generation Resource Participation [BPA December stakeholder mtg item]
      i. BPA – review materials for Dec 18th stakeholder meeting
      ii. ISO feedback

LUNCH – 11:30am - 12:30pm

I. 12:30pm – Resource Sufficiency
   a. BPA – description of our analytical approach RS and understanding of CAISO RS process
   b. ISO – feedback

II. 2:00pm – Auto-matching
   a. BPA – continuing discussions of late breaking constraints (ie. use cases for Slice, VERS); we understand auto-matching is limited to EIM Entity BAA to external, and we want to expand functionality to EIM BAA to EIM BAA and EIM Entity BAA to internal
   b. ISO – feedback

III. 3:00pm – Principles on EDAM / Emerging Markets (follow-up from previous meeting)
   a. ISO – follow-up from prior meeting
   b. BPA – feedback

December 4th – 8:30am – 11:30am

I. 8:30am – Settlements Workshop [BPA December stakeholder mtg item]
   a. Laura G / Bri A – BPA explains approach for Dec 18th stakeholder meeting
   b. Bri A / Russ M – Discuss progress and solicit feedback on scenarios under development
   c. Laura G / Bri A / Todd K – list of questions
   d. James Lynn – ISO reviews its deliverable from our October 22/23rd meeting
   e. ISO feedback / response questions throughout

LUNCH – 11:30 – 12:30pm

December 4th – 12:30 – 4:00pm

I. 12:30pm – LMPM Stakeholder Initiative Discussion
   a. Eric F / Kelii H – questions on latest proposal and conference call
   b. ISO – feedback / response questions
II. 1:30pm – Metering Workshop
   a. Kelly G / Todd K / Rian Sackett / Mark S – Introductions and Description of BPA's Metering Approach
   b. Kelly G et al – List of questions
   c. ISO – feedback / response questions
III. 3:30pm – Next steps / next meeting
   a. Mark S
   b. Angela G
IV. 4:00pm – Adjourn

AGENDA (v2)

January 8 and 9, 2019

BPA – CAISO Technical Face-to-Face

January 8th – 1:00pm to 4:00pm

I. 1:00pm – **Resource Sufficiency** [BPA January stakeholder mtg item]
   a. BPA – review of slides for stakeholder meeting
   b. ISO – feedback
   c. Self-supplying LSE in BAA example

II. 2:30pm – **Emerging Markets** [BPA January stakeholder mtg item]
   a. BPA – review of slides for stakeholder meeting
      i. EDAM
      ii. DAME Phase 1
      iii. DAME Phase 2
      iv. As yet unpublished T-30 initiative
      v. Any others?
   b. ISO – feedback and update on EDAM principles

January 9th – 8:30am –11:30am

I. 8:30am – **Transmission/Settlement,** specifically, interchange mechanics
   a. ISO: George's paper on Intertie Base Schedules
   b. BPA (Todd): Review interaction between losses, load base schedules, actuals, and settlements (UIE, UFE, RTIEO)
   c. BPA (Todd): Misc. Settlement Questions

II. 10:00am – **Generation aggregation**, follow-up from Dec meeting
   a. BPA / CAISO: GDF sets dialogue
   b. ISO: further documentation on APR proposal from Dec meeting

LUNCH – 11:30am to 12:30pm

I. 12:30am – **Auto-matching / Late breaking constraints**, ISO needs to provide paper on this subject before reviewing

II. 1:30pm – **Ramp protection:**
   a. ISO: review written proposal
   b. BPA: feedback

III. 2:30pm – **LMPM**, review CAISO's revised stakeholder proposal

IV. 3:30pm – Next steps / next meeting
   a. Mark S

b. Angela G
c. **Training,** we have access to the 26 CBTs, we want to provide a quick status update
d. **Gap analysis**, only if there is follow-up from the ISO, we are not currently aware of any questions
e. **Settlements**, feedback from Dec 18th meeting, only if there is an ask from the Settlements team – currently, we are working follow-up items through the sub-team
f. Other?

II. 4:00pm – Adjourn

CONSOLIDATED FOLLOW-UP ITEMS

December 3 and 4, 2018

BPA – CAISO Technical Face-to-Face

Section	Name	Item	Status
Metering	Priyanka	Review and provide feedback on BPA's SQMD templates	1/31/2019: BPA looking to talk with Priyanka in mid-March; assemble and send example in late February
Metering	Priyanka	ISO EMS staff will tell us how they manage interchange meter corrections/estimates	1/31/2019: sent request for CAISO staff contact
Metering	CAISO Legal – John Anders	Is this statement sufficient to identify the existing business process of grandfathered for metering. Meter guide (STD-DC-5): This guide applies to both new and revised metering installations.	1/31/2019: sent BPA's intended resolution to the CAISO
Overall	Agnes	Share Grid Mod Roadmap with ISO	12/18/18: Complete Grid Mod roadmap is on BPA's website
Overall	Mark	Post Utilicast Gap Assessment documents on Accellion (the map and the executive summary documents)	12/18/18: Complete Mark sent to Angela
Aggregation	Todd K	Write a best practices document for Intertie Base Schedule	12/18/18: in process Todd and George are corresponding 1/9/2019: Complete presented revised document at face-to-face (see January for updates)
Aggregation	George	Provide the document with all of the graphs about Intertie Base Scheduling	12/18/18: in process Todd and George are corresponding

Aggregation	George	Provide e-mail used for aggregation discussion	12/3/18: Complete Mark has e-mail from George 12/3/2018 at 11:28am
Aggregation	Petar	Wants to talk about Ramp Protection	12/18/18: Potential Jan 8/9 agenda item if there is a write-up to talk from 1/9/2019: Complete CAISO reviewed ramp protection presentation at January meeting
Resource Sufficiency	George	RS software guidelines (this includes their methodology for cleaning data)	12/18/18: in process Mark and Mariano corresponding with George
Resource Sufficiency	George	Is there a minimum number of weekdays and/or weekend days in the 40-day histogram?	TBD
Resource Sufficiency	Mark R	Perform calculation – BPA needs to provide VER and load, ISO can calculate raw RS req'mt which includes the FRU and FRD req'mt as well as the uncertainty values for all intervals in each hourly test	12/18/18: In process BPA and ISO aligning on data elements needed (call 12/19/18) 1/18/2019: BPA provided data elements to ISO
Resource Sufficiency	George	Determine if the OASIS information is the "original" or the "adjusted"? (ie. do OASIS postings include or not include the diversity benefit?)	12/18/18: in process Mark and Mariano corresponding with George
Resource Sufficiency	George	Which is accurate – the formula in the BPM or the one presented on the slide (ie. there was a question about the sign convention)?	12/18/18: in process Mark and Mariano corresponding with George
Resource Sufficiency	George	One of the plots shows the FRD and the downward credit – it shows that as the Flex down credit becomes more positive, the flex ramp down becomes more negative.	12/18/18: in process Mark and Mariano corresponding with George

		Is this the right relationship? Is it graphed incorrectly or is there another explanation?	
Resource Sufficiency	BPA	Provide e-mail with plots that we reviewed in the meeting	12/18/18: Complete BPA sent to George and Angela
Auto-matching	Petar / George	Write-up the t-30 rolling window	TBD
Auto-matching	Russ	Develop use cases	TBD
Auto-matching	Mark R / Petar	Is 15-minute bidding slated to come in 2020?	TBD
Principles of EDAM	Petar	Is there anything more than the 2019 stakeholder plan, slide 6?	1/9/2019: Complete EDAM was reviewed again and slightly updated 12/17 board presentation was provided
Settlements	BPA	Consider submitting a comment in DAME Phase 1 in order to retain option for manual dispatch of regulation and converting UIE to IIE like SMUD, rest of EIM is becoming optimal dispatch minus actual	TBD
Settlements	James	Will help with slide 57	12/18/18: Complete ISO reviewed the entire deck and BPA incorporated feedback
Settlements	Todd K	Provide presentation that we reviewed in last meeting	12/18/18: Complete BPA sent to George and Angela
Settlements	??	We need to submit our hourly load meter?	TBD
Settlements	James	Provide spreadsheet for the calculation of the RT offsets	1/14/2019: TK sent e-mail with specific request 1/23/2019: Symonds followed up
Settlements	Bri	Provide ISO with list of questions that we went through in last meeting	12/18/18: in process We provided the list of questions and BPA captured the answers we thought we heard
Settlements	BPA	Tell James exactly what we	12/17/18: Complete

		are looking for on our two objectives: (1) carrying cost; (2) distribution of charge codes	BPA provided and reviewed written explanation 1/23/2019: Scheduled a conference call on Feb 5th at 3pm
Settlements	James	Verify 21 business days before they have to go to FERC?	TBD

Next steps with ISO from October 22, 23rd meeting

1) Follow-up conference call to be scheduled for week of Nov 5th seeking to cover the following:
    a. Reviews for BPA's Nov 14th stakeholder meeting:
        i. EIM process plan / updates, including any needed review / questions regarding the documents provided by Janet Morris
        ii. Market Power Mitigation content for BPA's NOV stakeholder meeting
    b. Optional items time permitting
        i. Review Petar's principles on EDAM including relationship with RC
        ii. Review James' Settlement deliverable on magnitude of charges by charge code for a synthetically constructed EIM Entity BAA he thinks could be similar to BPA (we should have his latest by then – he expects to complete it this Friday, but it is subject to ISO legal review). This will help with preparations for BPA's December stakeholder meeting.
        iii. Review George's paper on Overlapping Resources Aggregation
2) Next in series of Face-to-Face meeting targeting first week of December or last week of November
    a. Reviews for BPA's DEC 18th stakeholder meeting:
        i. Settlements content for BPA's DEC stakeholder meeting
        ii. OMP content for BPA's DEC stakeholder meeting
    b. Next topics
        i. Metering Strategy Workshop (we are attempting to schedule this to coincide with the face-to-face but we may not succeed)
        ii. Review Utilicast Gap Analysis
        iii. Progress on Scenarios (Russ)
            1. Impacts on Policy
            2. Impacts on FCRPS Gen Aggregation APR / ANPR configuration
            3. EIM Entity Settlement implications
        iv. Review BPA's OMP write-up
        v. Are there are further Settlements topics beyond those included in Russ' scenarios or the DEC stakeholder deck?
    c. Later topics coming in January (do we need to discuss any of them sooner?)
        i. Resource Sufficiency
        ii. Non-Fed Gen Participation

Status of Promised ISO deliverables from October 22 and 23

Name	Item	Status
Janet and Khaled	Gap analysis on impact assessment	TBD
Janet	Two overview documents: a) On Agreements b) DMM one	Delivered to BPA, but not on Accellion
Janet and Jon	EIM Entity Agreements checklist	TBD
Janet	EIM Resource Data Template	TBD
Jon	Letter from one of Municipals on exemption to Market Based Rate Authority	TBD
Janet	Settlements Configuration Guides	TBD
Don	EIM Entity's EIM GB graphic that he presented in the meeting	TBD
James	Settlements configuration timeline and impacts of EIM configuration changes	TBD
James	Settlements Magnitude by Charge Code	He expects to complete it by Friday but then it needs review by ISO legal
George	Send Overlapping Resource Aggregation	Delivered to BPA, but not on Accellion
Khaled	Send write-up on calculation of competitive LMP	TBD
Angela	Provide updated ISO outage card practices (because ISO said they have recently been limited)	TBD

The Table below is an example only. The list of

ernatives vs. Status Quo and, Finally, to Select the Preferred Alternative

Step When Defined	Common Decision Criteria in ADFs	Example Units	Alternative A Utilize NGR	Alternative B Do Not Utilize NGR
4	Maximum flexibility of the FCRPS offered into the market	(Low = 1, Hi=10)		
4	Systems and processes that are necessary to participate are simplest as possible to implement	(Low = 1, Hi=10)		
4	Market dispatch instructions are hydraulically feasible	(Low = 1, Hi=10)		
4	Market dispatch instructions do not violate any non-power objectives	(Low = 1, Hi=10)		
4	Settlements are easy to implement	(Low = 1, Hi=10)		
	Time to complete			
4	"Expected" Value	Months		
4	"Worst Case" Value	Months		
4	**Useful/Effective Life – "Expected" Value**	Years		
4	**Vendor financial strength**	BB - AAA		
4	**Vendor reputation**	(Low = 1, Hi=10)		
	Stakeholder risks	(Low = 1, Hi=10)		
5,7	Internal Stakeholder Risk 1 (Financial)	(Low = 1, Hi=10)		
5,7	External Stakeholder Risk 2 (Audit, Fine)	(Low = 1, Hi=10)		
	Technology risks			
5,7	Technology (Hardware) Risk 1	(Low = 1, Hi=10)		
5,7	Technology (Software) Risk 2	(Low = 1, Hi=10)		
	Regulatory Compliance risks			
5,7	NERC CIP	(Low = 1, Hi=10)		
	Other Risks			
5	Cyber Security	(Low = 1, Hi=10)		
5	Safety	(Low = 1, Hi=10)		
5	BPA Reputation	(Low = 1, Hi=10)		
7	**Scenario1 ranking (Best Fit=1, Worst Fit =**	10-Jan		
7	**Scenario 2 ranking (Best Fit=1, Worst Fit=**	10-Jan		
7	**Scenario 3 ranking (Best Fit=1, Worst Fit=**	10-Jan		
7	**Alternative Execution Risk 1 ranking**	(Low = 1, Hi=10)		
7	**Alternative Execution Risk 2 ranking**	(Low = 1, Hi=10)		
8	**SELECT PREFERRED ALTERNATIVE**	√		

Common Decision Criteria in ADFs	Alternative A 1 APR (System)	Alternative B 3 APRs (GCL/CHJ, LSN, LCOL)	Alternative C 10 PRs	Alternative D Hybrid
Maximum flexibility of the FCRPS offered into the market				
Maximize the value to the FCRPS of differential locational marginal pricing (LMP) generally caused by congestion				
Maximize the value to the FCRPS of LMP due to different opportunity costs				
Maximum transmission congestion relief				
Systems and processes that are necessary to participate are simplest as possible to implement				
Likely to be accepted as a model of participation from the CAISO				
Market dispatch instructions are hydraulically feasible				
Market dispatch instructions do not violate any non-power objectives				
Settlements are easy to implement				
Prevent unintentional cost shifts among Transmission and Power customers				
Time to complete				
"Expected" Value				
"Worst Case" Value				
Useful/Effective Life – "Expected" Value				
Vendor financial strength				
Vendor reputation				
Stakeholder risks				
Internal Stakeholder Risk 1 (Financial)				
External Stakeholder Risk 2 (Audit, Fine)				
Technology risks				
Technology (Hardware) Risk 1				
Technology (Software) Risk 2				
Regulatory Compliance risks				
NERC CIP				
Other Risks				
Cyber Security				

	Safety					
	BPA Reputation					
	Scenario1 ranking (Best Fit=1, Worst Fit = 10)					
	Scenario 2 ranking (Best Fit=1, Worst Fit= 10)					
	Scenario 3 ranking (Best Fit=1, Worst Fit= 10)					
	Alternative Execution Risk 1 ranking					
	Alternative Execution Risk 2 ranking					
	Market dispatch instructions do not violate any non-power objectives					
	SELECT PREFERRED ALTERNATIVE					

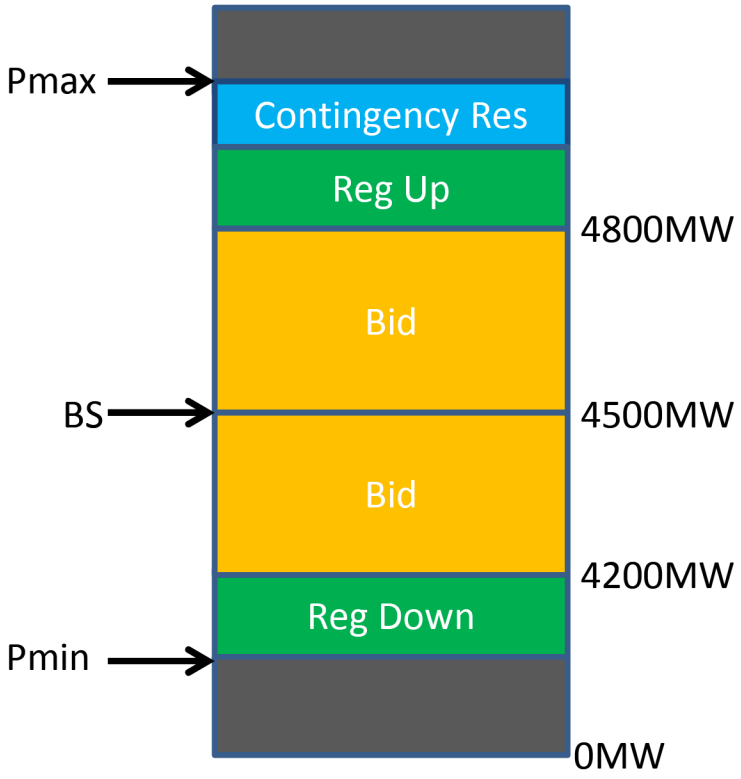
Traditional Setup:

APR
GCL + CHJ

GDF*:
GCL 0.67
CHJ 0.33

*GDF is calculated based on BP set by hydro scheduler. GDF here controls the distribution of MW for both BS and bid range.

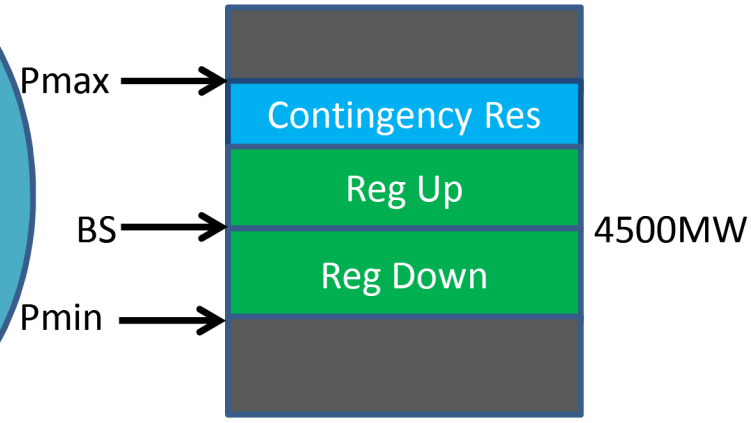
	BP (MW)	GDF
GCL	3000	3000/4500 = 0.67
CHJ	1500	1500/4500 = 0.33
SUM	4500	1



Powerex's Setup:

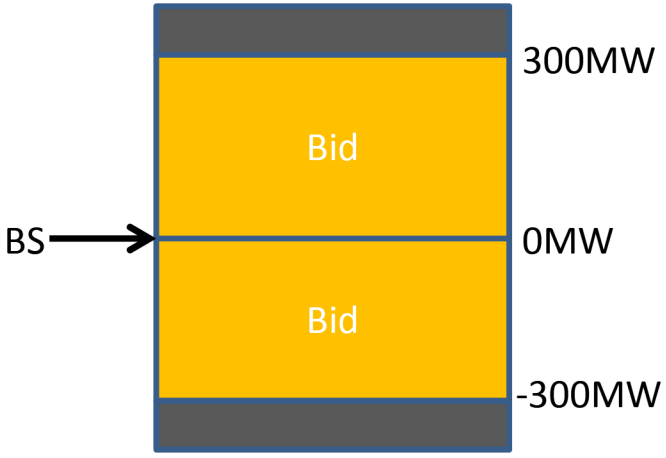
ANPR
GCL + CHJ

GDF**:
GCL 0.67
CHJ 0.33



APR (NGR)
GCL + CHJ

GDF***:
GCL 0.3
CHJ 0.7



**Controls the distribution of MW for BS (input to CAISO's EIM network model)

***Controls the distribution of MW for bid range

EIM Steering Committee Meeting

July 17, 2018

Agenda

1. Update on EDAM Engagement
2. Any final comments/questions regarding the “Big Tent” meeting
3. Review and discuss the timeline

Update on EDAM Engagement

What the CAISO is saying about EDAM

Extended Day-Ahead Market for the Region

Key benefits:

- Allows EIM participants to take advantage of day-ahead market enhancements
- Day-ahead unit commitment and scheduling across larger footprint improves market efficiency and more effectively integrates renewables

Key elements:

- Voluntary participation, easy entry, no exit fees
- Gross benefits expected to be significant
- Ensures resource sufficiency, while Balancing Authority Area maintains autonomy regarding resource and transmission investment
- Engage stakeholders on governance structure to reflect enhanced market participation

Agenda for July 24th

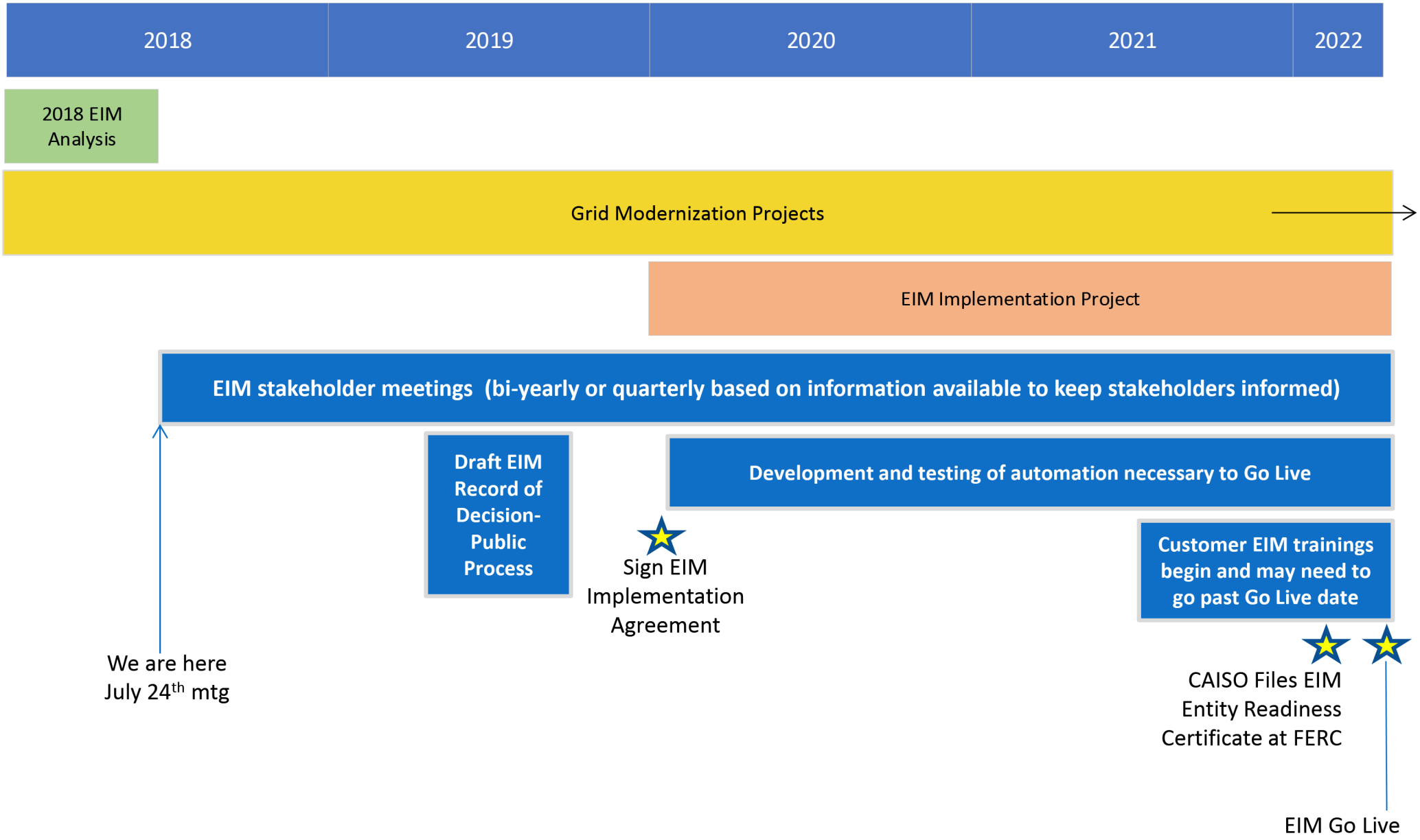
9:00-9:10	• Welcome, Safety Moment, Introductions
9:10 – 9:30	• Strategic Plan and Grid Modernization Overview
9:30 – 9:45	• EIM Overview
9:45 – 11:00	• EIM Initial Cost Benefit Analysis • Issues we are Reviewing • Draft EIM Timeline
11:00 – 11:10	• Next Steps
11:10 – 12:00	• Question and Answer Session

Link to July 24th presentation

Issues that BPA is Reviewing on July 24th

1. Market Power: Federovitch
   a) Determination (Conduct / Impact)
   b) Mitigation (DEB)
2. Carbon Obligation in EIM Federovitch
3. BA Resource Sufficiency Russ
   a) New data submissions
   b) Treatment of flexibility and uncertainty
   c) Obligations
   d) Impacts on Gen Inputs
4. EIM Settlements Russ
5. Treatment of Transmission Russ
   a) Provision: Customer vs EIM entity
   b) Who pays
6. Generation Participation Model (FCRSP, IPP) Kerns
7. Governance Kerns

Speakers identified in RED.

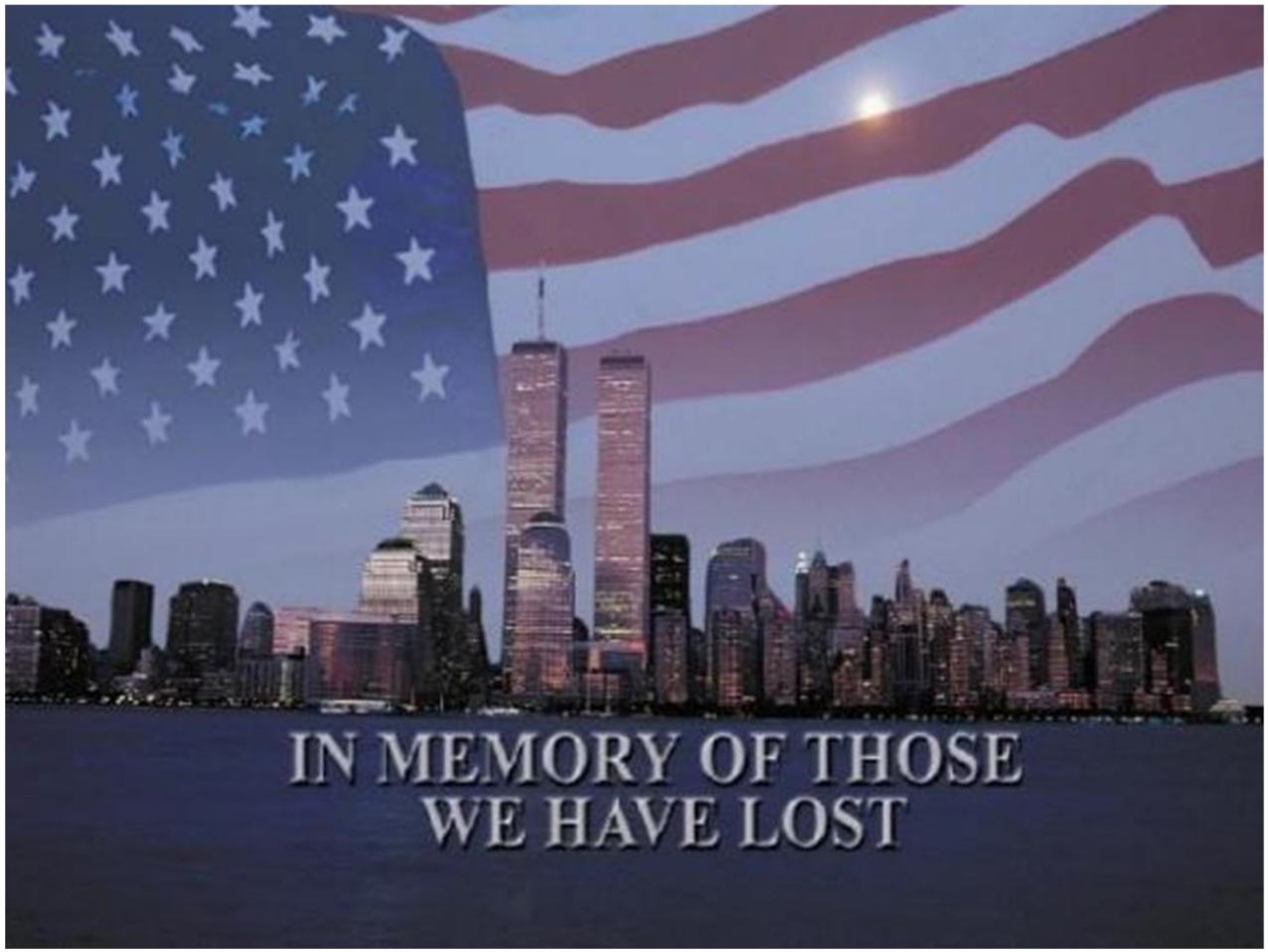


Link to EIM Timeline

EIM Steering Committee Meeting

July 31, 2018

September 11th



Agenda

1. Upcoming Meetings
2. Internal Staff Work

Upcoming Meetings

September 12 – PGP DEB/ RS Meeting
September 13 – EIM 101 Stakeholder Workshop
September 18 – ISO Kickoff Meeting**
October 11 – EIM Stakeholder Meeting at RHR

EIM Stakeholder Meetings at RHR:

- Oct 11
- Nov 20
- December to May we have a monthly day long hold at the RHR

** There will likely be more BPA/CAISO meetings scheduled in the coming weeks to discuss BPA's joining the EIM. The September 18th meeting is intended to scope the parameters for future meetings (who, when, where, and what topics). A lot will depend on CAISO's calendar.

Meeting Topics For Discussion

- Staff have already started engaging the Corps and the Bureau
  - Attended and have given Grid Mod / EIM overview at existing forums
  - Developing a Corps / Bureau Communication Plan that will be shared with our federal partners
- Who should staff be meeting with?
  - Groups or individual customers
  - PPC, IOUs/EIM Entities, Slicers, IPPs, NIPPC, Renewables, CA entities other than CAISO?
- What is the proper cadence for informal meetings with key stakeholders?
  - Biweekly, monthly or other
  - Staff leaning is to have monthly meetings that occur approximately two weeks before each monthly “big tent” public meeting
  - From time-to-time, additional informal targeted customer meetings may need to be scheduled to discuss particular topics
  - Lesson learned from NWPP MC effort was that customer meetings are a significant time sink for staff. BPA and its customers are not building a market in this context; rather, BPA is evaluating whether to join an already functional/operational market.

Internal Staff Work

- Developing preliminary outline of ROD

- Further developing and taking forward positions on various topics (most already discussed with this group)
  - Market Power/DEB
  - Carbon Obligation in EIM
  - **Relationship of EIM to Other Emerging Markets**
  - BA Resource Sufficiency
  - EIM Settlements
  - **Treatment of Transmission**
  - **Generation Participation Model (FCRPS, IPP)**
  - **Governance**
  - Oversupply/Reliability Tools

- Coordinating/managing customer outreach

EIM Steering Committee Meeting

Sept 25, 2018

Agenda

1. Past / Upcoming Meetings
2. Internal Staff Work
    1. Stakeholder Meeting Frequency
    2. High Level Process Map
    3. ROD Scope
    4. Matrix of Venues for EIM Decisions
    5. Proposed / Existing Sub-Teams for EIM Effort

Past / Upcoming Meetings

September 12 – PGP DEB/ RS Meeting
September 13 – EIM 101 Stakeholder Workshop
September 18 – CAISO Kickoff Meeting**
October 3 - PPC Member Forum
October 5 – CAISO / EIM Team Technical Meeting
October 11 – EIM Stakeholder Meeting at RHR

EIM Stakeholder Meetings at RHR:

- Oct 11
- Nov 20
- December to May we have a monthly day long hold at the RHR

** There will likely be more BPA/CAISO meetings scheduled in the coming weeks to discuss BPA's joining the EIM. The September 18th meeting is intended to scope the parameters for future meetings (who, when, where, and what topics). A lot will depend on CAISO's calendar.

Stakeholder Outreach

- Clarity is needed on the frequency of stakeholder outreach beyond the monthly EIM Stakeholder meetings (big tent).
  - A proposal has been made by PGP / PPC to attend a monthly customer forum, a week after each big tent, hosted by PPC / PGP for the purpose of hearing customer concerns and questions.
  - BPA would not prepare materials for these meetings.
  - This outreach would serve as a means to develop future big tent material and flesh out stakeholder concerns.
- Who should staff be meeting with?
  - Groups or individual customers
  - PPC, IOUs/EIM Entities, Slicers, IPPs, NIPPC, Renewables, CA entities other than CAISO?
- What is the proper cadence for informal meetings with key stakeholders?
  - Biweekly, monthly or other
  - Staff leaning is to have monthly meetings that occur approximately two weeks before each monthly “big tent” public meeting
  - From time-to-time, additional informal targeted customer meetings may need to be scheduled to discuss particular topics
  - Lesson learned from NWPP MC effort was that customer meetings are a significant time sink for staff. BPA and its customers are not building a market in this context; rather, BPA is evaluating whether to join an already functional/operational market.

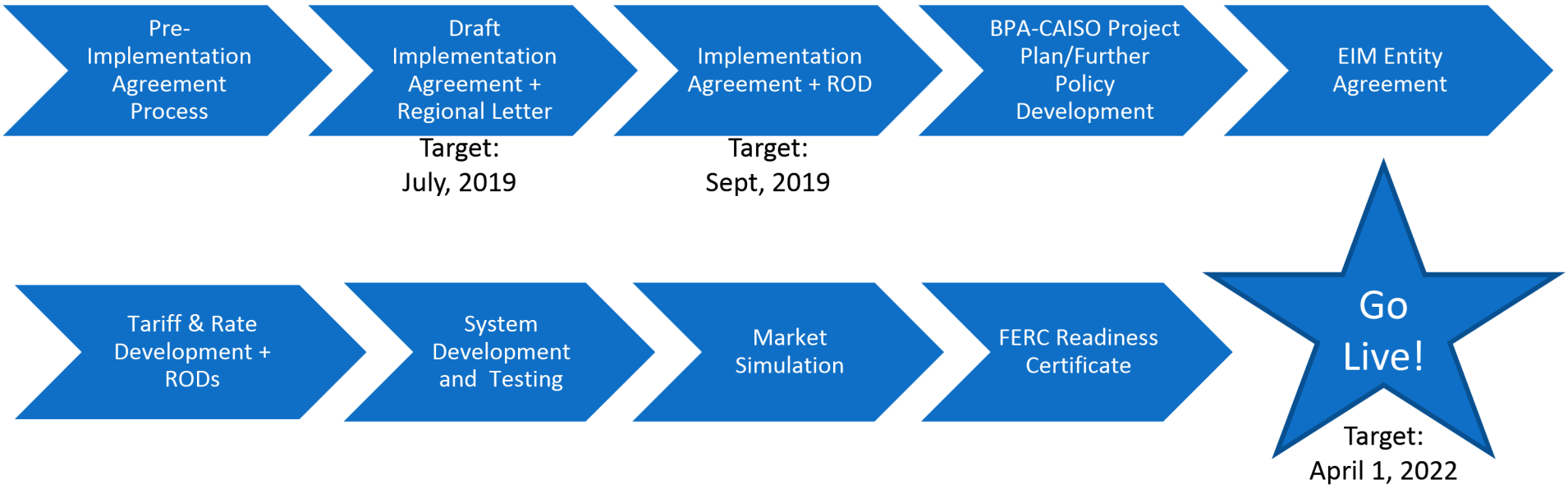
DRAFT High-Level EIM Process Map

This high-level visual represents the general steps in the process of BPA joining the EIM.

- These steps are not necessarily sequential– there will be some overlap which is not shown below.
- Staff is working on additional slides that will provide more detail and show overlap.
- The CAISO is also preparing a visual, at BPA's request, of its process for joining the EIM.

BPA can choose to not join the EIM at anytime in this process.

- This visual does not show all the respective decision points in the process.
- As the EIM process progresses, the level or degree of formality of the decision making process BPA should undertake should become more clear.
- For example, if BPA receives significant customer/stakeholder pushback, BPA may choose to prepare additional records of decision on certain topics, or, if it less receives less pushback, it may choose to notify customers using less formal methods such as letters and public meetings.



EIM Implementation Agreement

- An Implementation Agreement outlines the terms and conditions of moving forward in scoping and potentially joining the EIM. In other words, it officially starts the process toward joining but does not commit an entity to joining.

- It contains a project plan (Exhibit A) that outlines a schedule of milestones and associated payments to the CAISO for costs related to system changes, software licenses, and other configuration activities.

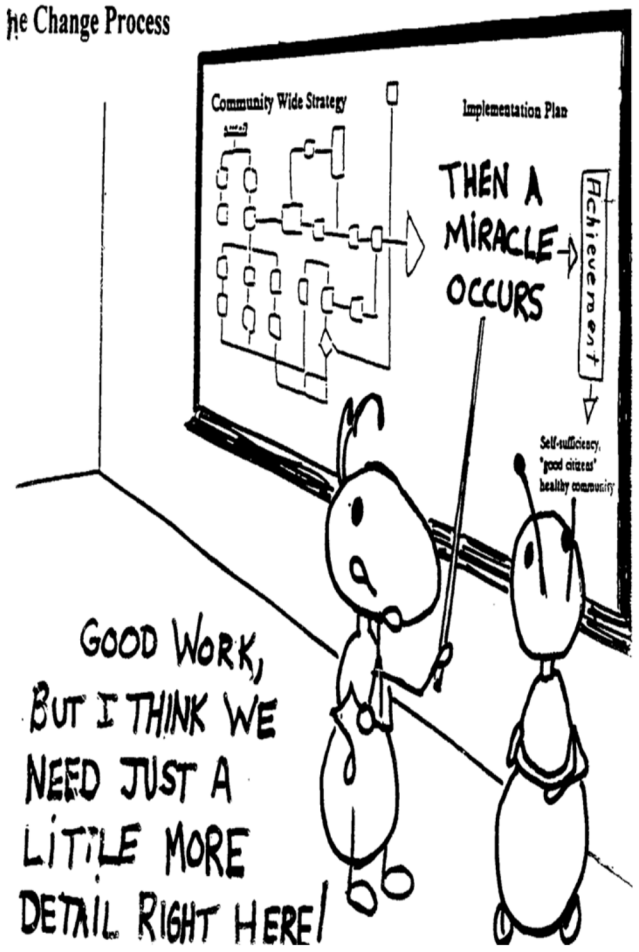
- Executing an Implementation Agreement DOES NOT mean that a potential EIM Entity has actually joined or committed to join the EIM.

- The CAISO's projected cost for work set forth in the Implementation Agreement is $2M.

Implementation Agreement Process: Regional Letter & Setting Expectations

- BPA staff/legal propose that the **draft** Implementation Agreement (IA) be presented to the region as part of a letter from the Administrator that solicits comments and feedback.

- BPA will respond to comments and feedback on the IA through a record of decision. The ROD will **not** include a decision to integrate (or join) BPA's BAA with the EIM. Rather, the ROD will include BPA's decision to sign the IA and move forward in the process to consider integrating.



Scope/Focus of Letter and ROD For the Implementation Agreement— Laying the Foundation For Joining

- Cost/Benefit Analysis– Explain why joining the EIM provides (or, alternatively, doesn't provide) business value to BPA and the region.

- Explain the legal basis for joining the EIM, assuming joining makes business sense.

- Describe substantive issues (transmission, DEB, etc.) if BPA joins, their status, and how/when they will be addressed. The letter/ROD will likely not contain final decisions on most of the identified issues on the next slide but rather a description and roadmap for resolution.

EIM Issue Resolution Matrix

Issue	Venue(s)	Timeframes
Treatment of Transmission	BPA-CAISO Negotiations, BP-22, and TC-22	Now through late 2021
Generation Participation Model (FCRPS, IPP)	BPA-CAISO Negotiations	Now through Go Live (April 1, 2022)
Governance	CAISO Stakeholder Process	2019-20
Relationship of EIM to Other Emerging Markets	TBD—Likely Combination of Venues	Ongoing
BA Resource Sufficiency	CAISO Stakeholder Process and BP-22	Now through late 2021
Market Power/DEB	CAISO Stakeholder Process	Now through Go Live (April 1, 2022)
EIM Settlements	CAISO Stakeholder Process, BP-22, and TC-22	Now through late 2021
Carbon Obligation in EIM	Legislative, BPA-CAISO Negotiations	Now through Go Live (April 1, 2022)

Proposed / Existing Sub-Teams for EIM Effort

- EIM Teams
  - EIM Core Team (5 BTO + 3 (P,T,L))
  - Sub-Teams for EIM-related issues (some are already in flight)
    - Cost/Benefit Analysis
    - Market Mitigation
    - Ancillary Services in BP-22
    - Carbon Obligation in the EIM
    - Transmission Provision in an EIM
    - Resource Sufficiency
    - EIM Implementation
    - Settlements
    - Governance
    - Impact of Emerging Markets
    - Federal Resource Participation
    - Stakeholder Strategy
    - Statutory Obligations in an EIM
  - EIM Core Team will be working on a roadmap to plan this work
  - Staff assigned to work on these teams should use the “EIM – Existing” work order

EIM Steering Committee Meeting

October 9, 2018

Agenda

1. Past / Upcoming Meetings
2. Internal Staff Work
    1. ROD Process Update
    2. CAISO Kick-Off Update
        1. Generation Participation Model
        2. EIM Transfer Transmission

Past / Upcoming Meetings

September 12 – PGP DEB/ RS Meeting
September 13 – EIM 101 Stakeholder Workshop
September 18 – CAISO Kickoff Meeting**
October 3 - PPC Member Forum
October 5 – CAISO / EIM Team Technical Meeting
October 11 – EIM Stakeholder Meeting at RHR

EIM Stakeholder Meetings at RHR:

- Oct 11
- Nov 20
- December to May we have a monthly day long hold at the RHR

** There will likely be more BPA/CAISO meetings scheduled in the coming weeks to discuss BPA's joining the EIM. The September 18th meeting is intended to scope the parameters for future meetings (who, when, where, and what topics). A lot will depend on CAISO's calendar.

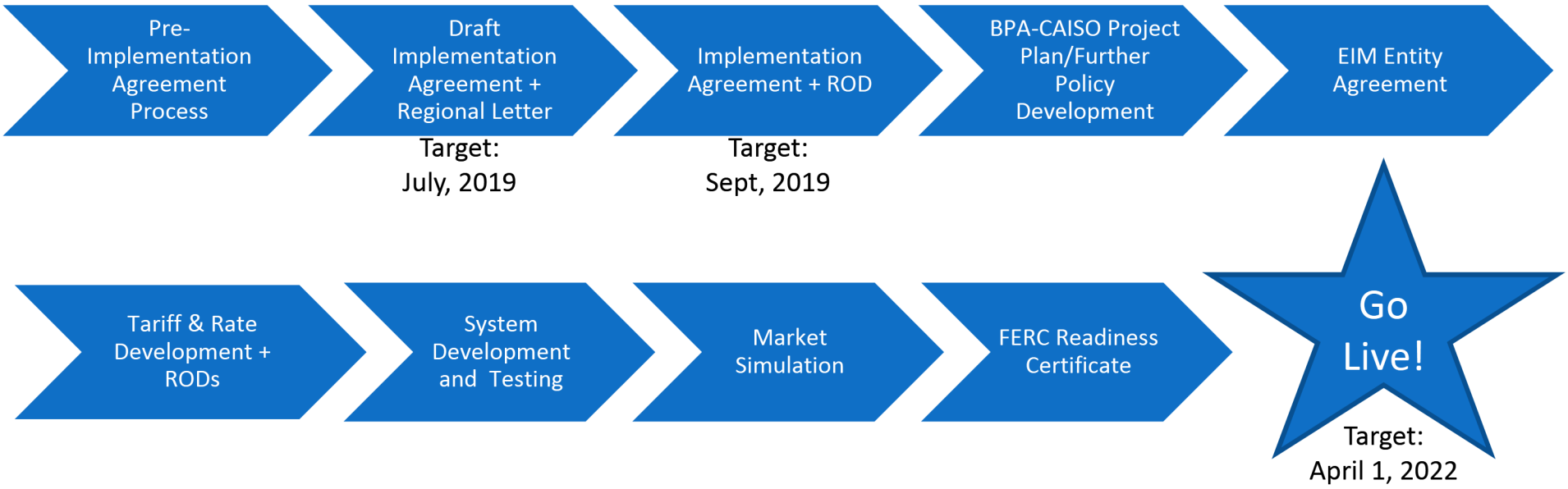
DRAFT High-Level EIM Process Map

This high-level visual represents the general steps in the process of BPA joining the EIM.

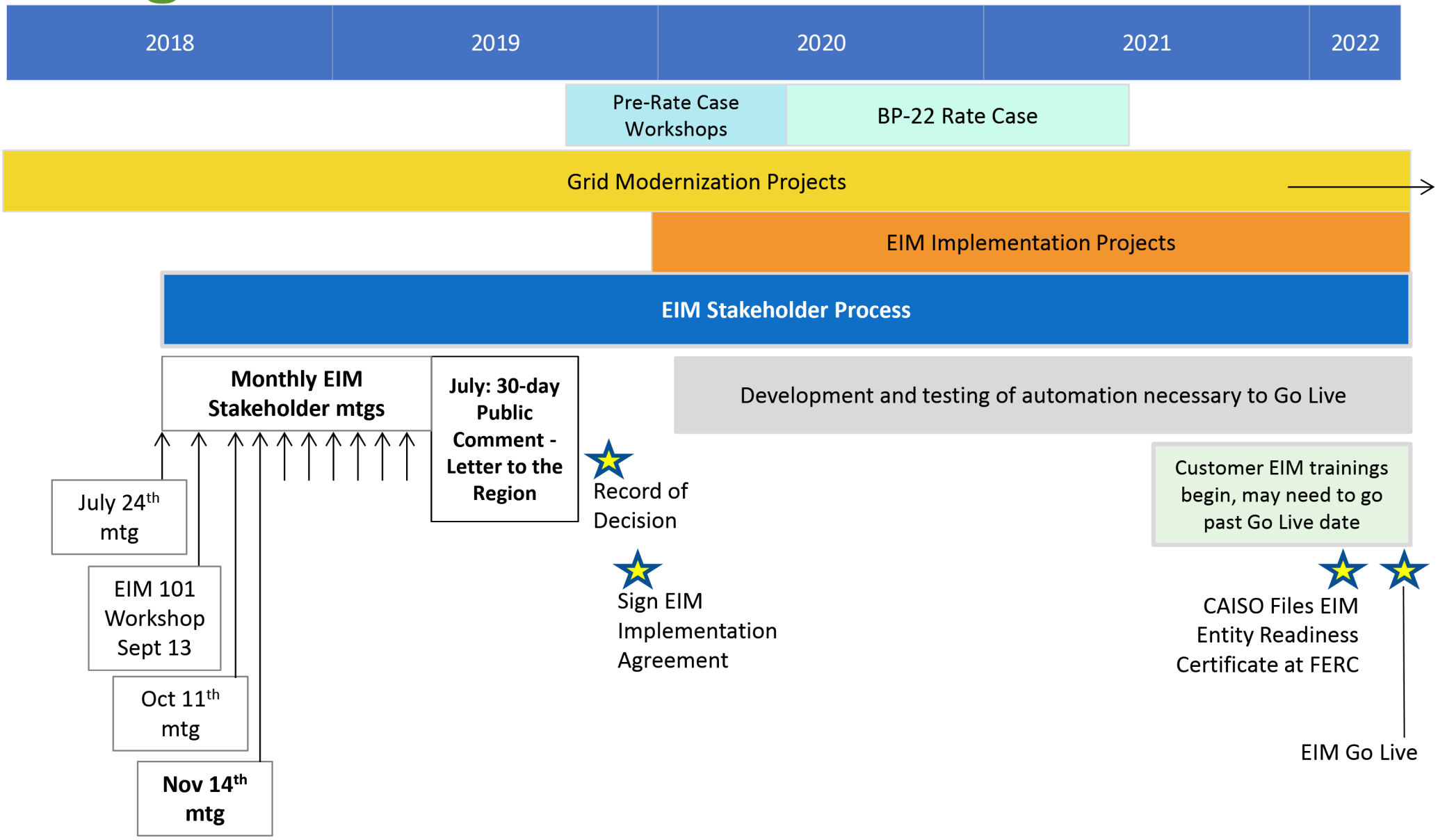
- These steps are not necessarily sequential– there will be some overlap which is not shown below.
- Staff is working on additional slides that will provide more detail and show overlap.
- The CAISO is also preparing a visual, at BPA's request, of its process for joining the EIM.

BPA can choose to not join the EIM at anytime in this process.

- This visual does not show all the respective decision points in the process.
- As the EIM process progresses, the level or degree of formality of the decision making process BPA should undertake should become more clear.
- For example, if BPA receives significant customer/stakeholder pushback, BPA may choose to prepare additional records of decision on certain topics, or, if it less receives less pushback, it may choose to notify customers using less formal methods such as letters and public meetings.



High Level EIM Timeline



Previous EIM Stakeholder Meeting Materials are available here: www.bpa.gov/goto/EIM

Technical Workshops

- Elliot asked that we hold technical workshops to explore impacts on individual customers prior to the Letter to the Region/Draft ROD.
- There workshops will NOT commit to specific policies or rates, but rather will explore issues and tools available to mitigate impacts as needed.
  - That process remains intact (see table below)
- These will help inform how the ROD addresses significant issues that may be brought up by customers.

EIM Issue Resolution Matrix

Issue	Venue(s)	Timeframes
Treatment of Transmission	BPA-CAISO Negotiations, BP-22, and TC-22	Now through late 2021
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Carbon Obligation in EIM	Legislative, BPA-CAISO Negotiations	Now through Go Live (April 1, 2022)

CAISO Face-to-Face - Generation

- **Big Picture – The CAISO is supportive of our approach to aggregation (3 Zones).**
- There is an outstanding question about whether there are any plants within zones that are on "opposite" sides (+/-) of a constraint.
- In general they agree that we can manage issues with generation distribution factors (GDF) and that more granularity wouldn't improve operations.
  - >granularity ≠ >flexibility

CAISO Face-to-Face – Transmission

- **Big Picture – Customer Donation works and there is no interest in developing a regional rate at this time.**
- 3rd-Party (i.e., non-Power Services) customers can also donate transmission on BPA's system under the current tariff.
  - We will need to figure out how to dispose of congestion revenue if their transmission binds
- BPA could also develop a rate to be directly charged to our Tx customers, as long as it's not enforced in the market.

CAISO Face-to-Face – Other Issues

- We touched on other issues, like Slice and other late breaking changes.
- There seems to be a lot that we can do to manage impacts.
  - Many are things available to other EIM Entities but they are not interested in implementing.
- The CAISO will work with us to help identify how various customer activity will play out between BPA and the CAISO.

Proposal for Grid Modernization and EIM Participation

January 24, 2018

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me Sequence of Stakeholder Engagement of Current EIM Entities

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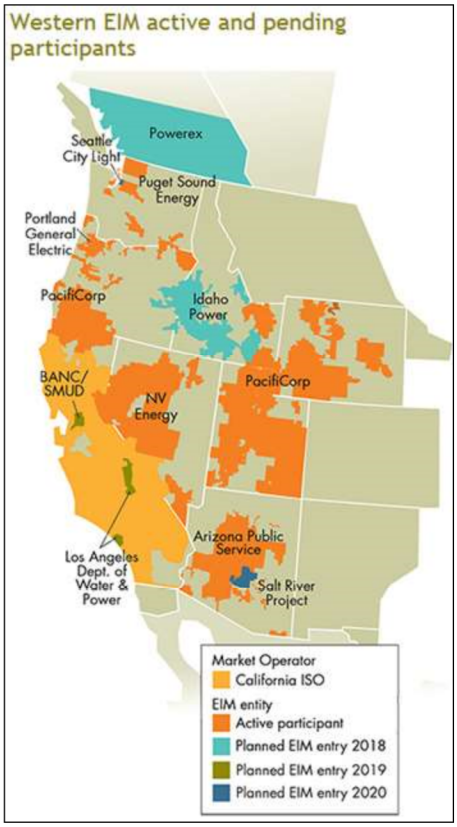

Arizona Public Service
5/28/2015: CAISO files CAISO/APS EIM Implementation Agreement for FERC approval
7/31/2015: FERC approves CAISO/APS EIM Implementation Agreement
8/21/2015: APS announces stakeholder engagement process
9/15/2015: 1st APS EIM tariff revisions stakeholder meeting
11/18/2015: 2nd APS EIM tariff revisions stakeholder meeting
2/12/2016: APS submits revised tariff for FERC approval
4/29/2016: FERC approves APS tariff
8/26/2016: CAISO files APS Readiness Certification with FERC
10/1/2016: APS EIM Go Live

Puget Sound Energy
3/5/2015: CAISO files CAISO/Puget EIM Implementation Agreement for FERC approval
5/20/2015: FERC approves CAISO/Puget EIM Implementation Agreement
7/17/2015: Puget announces stakeholder engagement process
8/7/2015: 1st Puget EIM tariff revisions stakeholder meeting
11/17/2017: 2nd Puget EIM tariff revisions stakeholder meeting
2/10/2016: Puget submits revised tariff for FERC approval
4/29/2016: FERC approves Puget tariff
6/7/2016: 3rd Puget EIM stakeholder meeting (final tariff, Business Practice)
8/24/2016: CAISO files Puget Readiness Certification with FERC
10/1/2016: Puget EIM Go Live

Portland General Electric
11/20/2015: CAISO files CAISO/PGE EIM Implementation Agreement for FERC approval
1/19/2016: FERC approves CAISO/PGE EIM Implementation Agreement
7/15/2016: PGE announces stakeholder engagement process
10/14/2016: 1st PGE EIM tariff revisions stakeholder meeting
1/12/2017: 2nd PGE EIM tariff revisions stakeholder meeting
3/1/2017: PGE submits revised tariff for FERC approval
4/19/2017: FERC approves PGE tariff
8/30/2017: CAISO files PGE Readiness Certification with FERC
10/1/2017: PGE EIM Go Live

Idaho Power Company
4/29/2016: CAISO files CAISO/IPC EIM Implementation Agreement for FERC approval
6/27/2016: FERC approves CAISO/IPC EIM Implementation Agreement
3/8/2017: IPC announces stakeholder engagement process
4/3/2017: 1st IPC EIM tariff revisions stakeholder meeting
5/12/2017: 2nd IPC EIM tariff revisions stakeholder meeting
7/11/2017: IPC submits revised tariff for FERC approval
9/11/2017: FERC approves IPC tariff
Projected 4/4/2018: IPC EIM Go Live

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Negotiation Strategy Proposal

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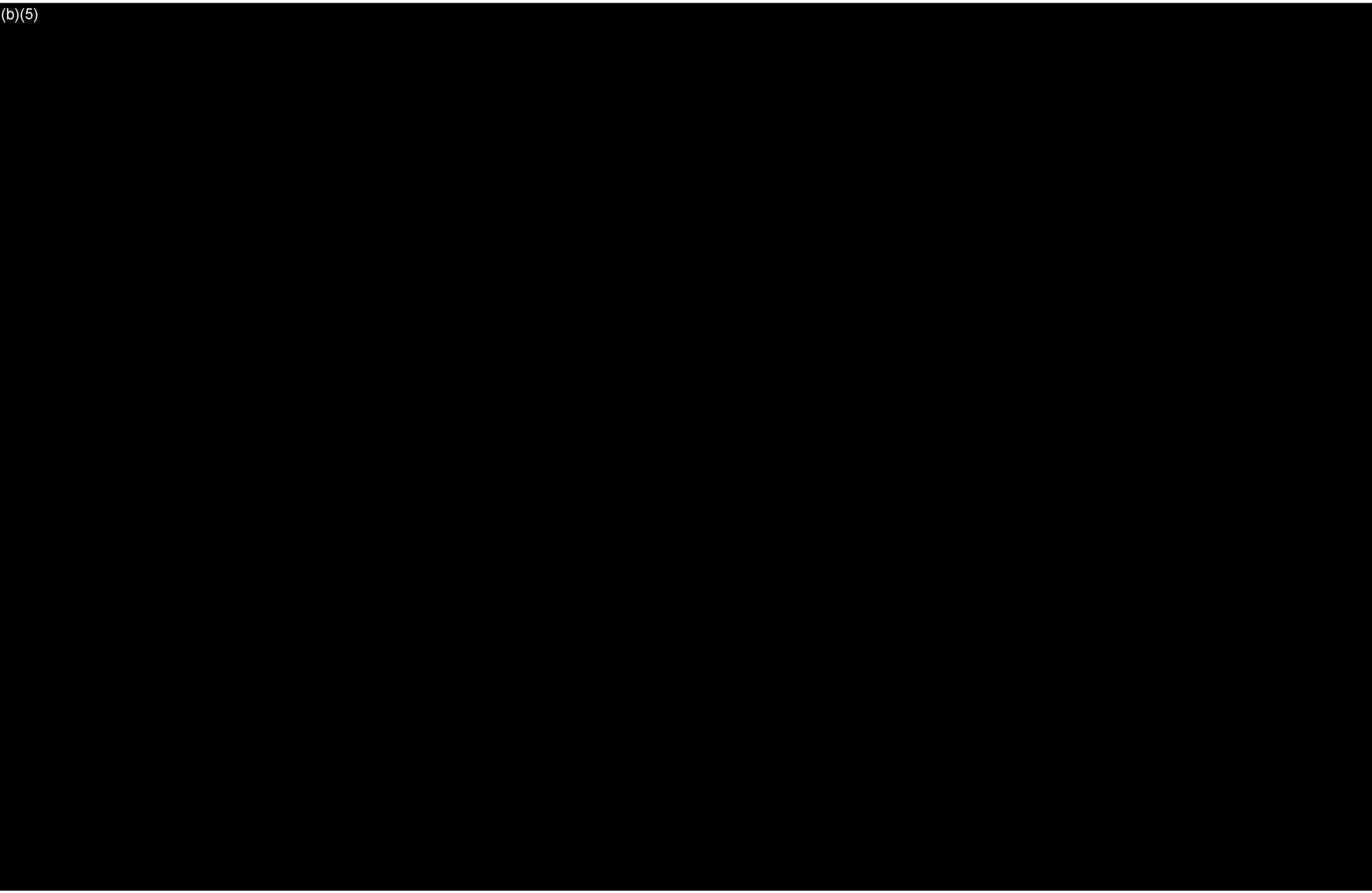
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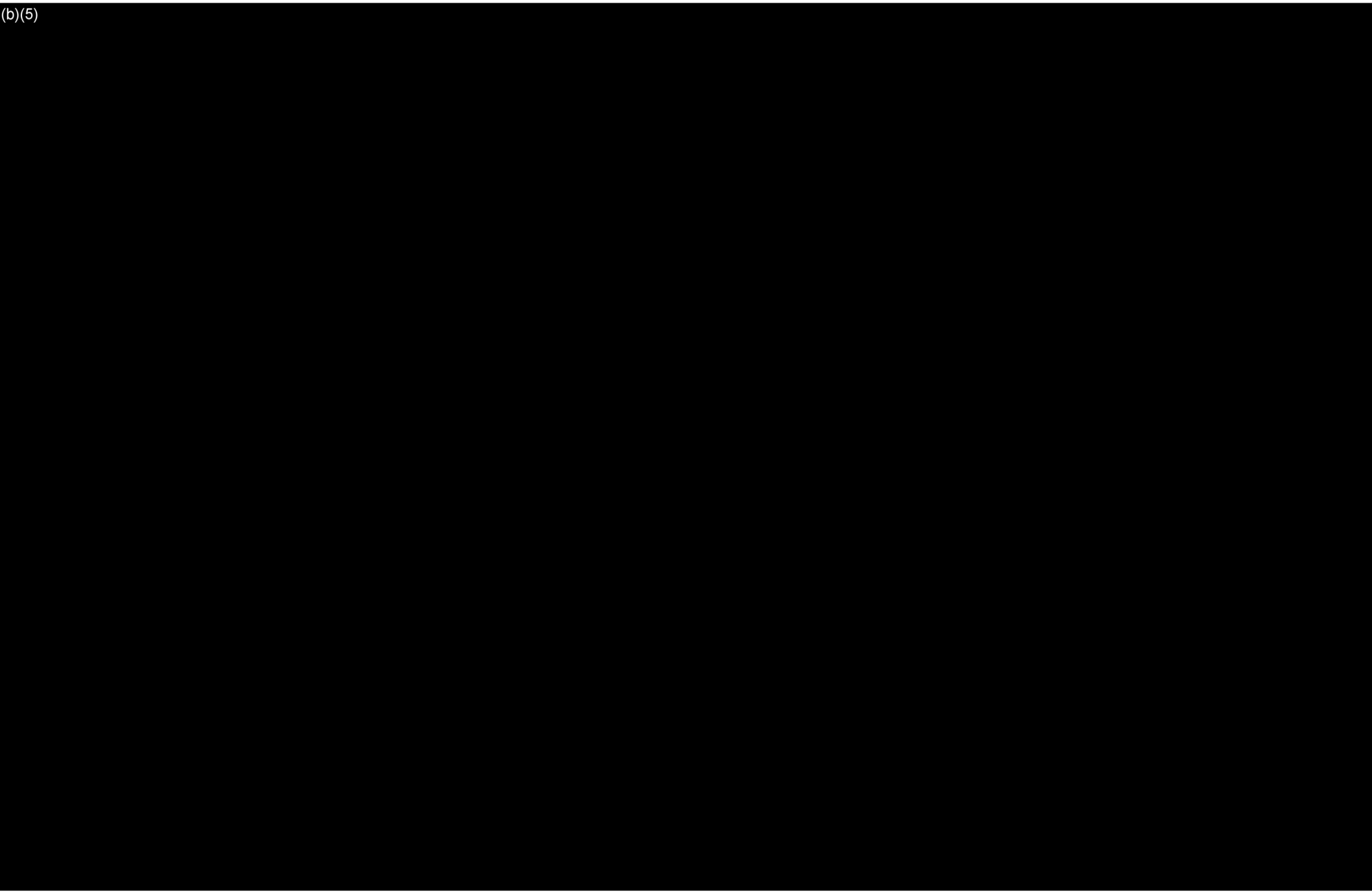
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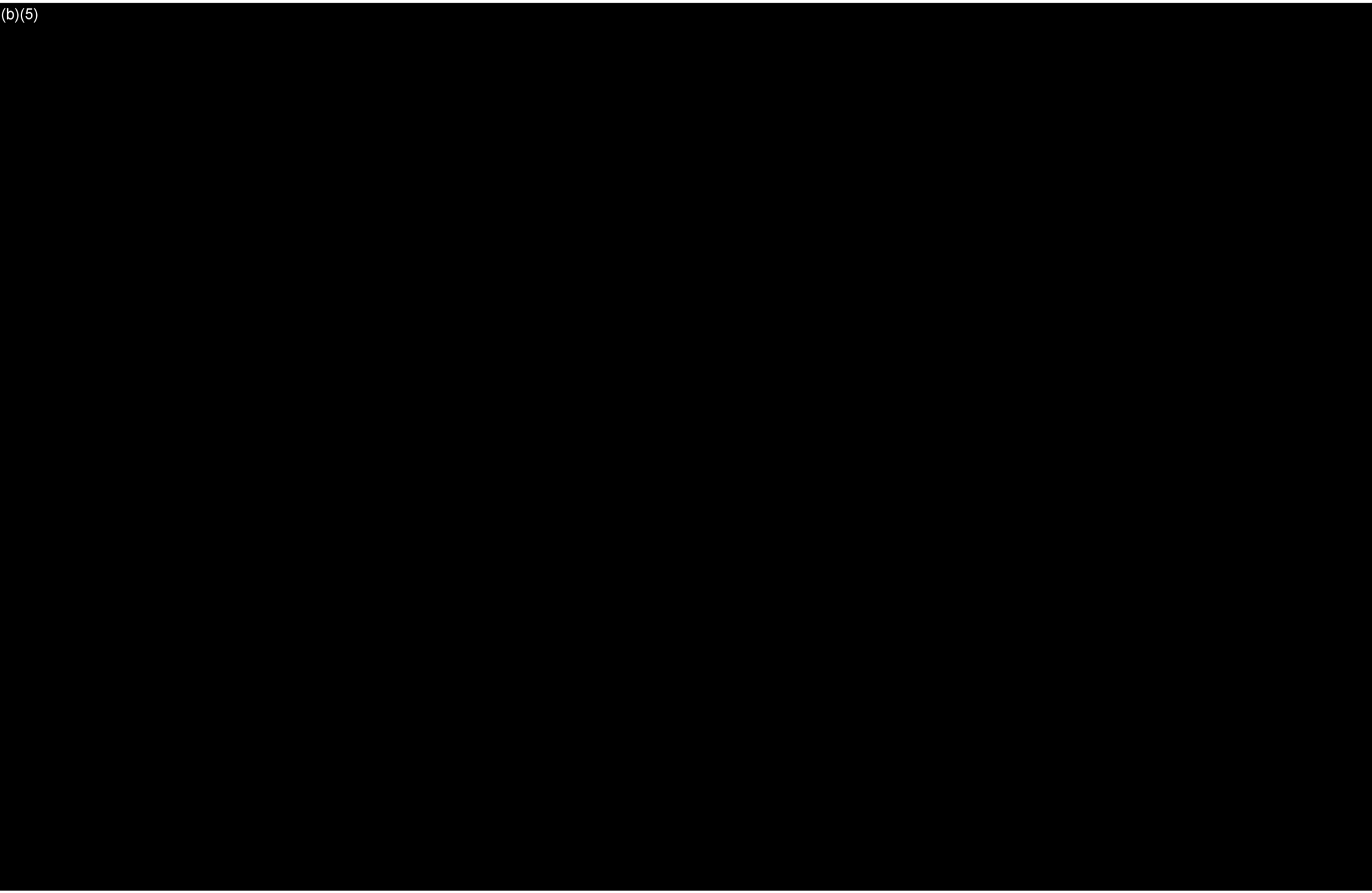
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Negotiation Team

This document is companion to the EIM Assessment Team's Negotiation Strategy document presented to Bonneville executives in February 2018. The format and structure of this document tracks the items identify in the strategy document. As reflected below, some of the items identified in the strategy document require further analysis and decision regarding how Bonneville will participate in the EIM while others are simply sideboards that will guide negotiation. For items needing further analysis and decision, a team, structure, and high level timeframes are proposed below. Another consideration is that some items will require management direction as to the level of priority the negotiation team should assign to the item. For example, what is the priority management should assign to governance?

1. **Core Team**
   a. Members: Tom Davis, Todd Miller, Mark Symonds, ALL Leads identified below
   b. Scope: Report on progress, successes, and challenges in each of the negotiation streams.
   c. Meeting Cadence: Weekly meeting (Wednesday morning) with additional meetings scheduled as necessary.

2. **EIM Participation of Federal Resources**
   a. Scope: Make a decision on the assumption for how Bonneville will participate in the EIM with the Federal hydro projects (aka Big 10 Projects).
   b. Members: Clarisse M., Dave D., Eric F., Steve K., Todd K., Juergen B., Rich G., Rebekah P., Kelii H., Eric K., Russ M., Tom D., Mark S., Chris S.
   c. Lead: Steve K.
   d. Expected Deliverables: ADF
   e. Timeframes:
      i. ADF Draft: 2nd week of March
      ii. Final Draft: 3rd week of March
      iii. Decision Timetable: Last week of March

3. **Provision of Transmission for EIM**
   a. Scope: Make a decision on the assumption regarding how Bonneville will use its transmission system for EIM transfers.
   b. Members: Russ M., Todd K., Troy S., Eric K., Tracey S., Ryan S., Jimmy H., Rich G., Eric F., Dave D., Steve G., Margaret P-M, Steve K., Clarisse M., Tom D., Mark S.
   c. Lead: Russ M.
   d. Expected Deliverables: ADF
   e. Timeframes:
      i. ADF Draft: 2nd week of March
      ii. Final Draft: 3rd week of March
      iii. Decision Timetable: Last week of March

4. **Red Box ADF Revisit**
    a. Scope: Revisit prior decision regarding resource sufficiency principles and BA obligations and determine if a change in policy/position is warranted.
    b. Members: Allen C., Marcus CT, Daniel F., Rebecca F., Steve K., Eric K., Russ M., Clarisse M., Margaret P-M, Frank P., Mai T., Libby K., Tom D., Mark S., others? Rich G?
    c. POC: Steve K.
    d. Expected Deliverables: Likely an ADF.
    e. Timeframes: Will be started in early April after Items 2 and 3 are complete.

5. **Carbon Market Legislation**
    a. Scope: Track and advance carbon market legislation. This team will not meet on a regular cadence.
    b. Members: Courtney O., Sonya B., Doug M., Rebekah P., Eric F.
    c. Lead: Courtney O.
    d. Expected Deliverables: PowerPoint presentation slide (Eric F.)
    e. Timeframes: Elliot DC trip in March. Other timeframes identified as necessary.

6. **Tariff Process and Rate Process**

    At this time, track tariff process work and overlap with EIM. No need to form a cross agency team on this topic. Identified here solely for the purpose of tracking within the Negotiation team structure. Weekly meetings ongoing involving Beth L., Todd M., and Tom D. Eventually, a cross agency team (or teams) will need to be assembled to consider tariff and rate schedule changes but not necessary now.

7. **Cost Shifts to Transmission Customers**

    No team necessary. Monitoring cost shifts was identified as a sideboard for Bonneville participating in the EIM.

8. **Resource Sufficiency**
    a. Scope: Gain an understanding of current and proposed CAISO EIM Resource Sufficiency requirements. Determine whether Resource Sufficiency requirements will work for Bonneville. If not, determine strategy for negotiating changes to requirements.
    b. Members: Frank P., PG Rep?, Rich G., Rebekah P.
    c. POC: Larry K. (?)
    d. Expected Deliverables: TBD
    e. Timeframes: Start work in February 2018.

9. **Dynamic Transfer Capability**

    No team necessary. DTC was identified as a sideboard for negotiation.

10. **EIM Local Power Mitigation and DEB Requirements**
    a. Scope: Tracking and participating in CAISO stakeholder process.
    b. Members: Eric K., Rebekah P., Rich G., Others?
    c. POC: Eric K.
    d. Expected Deliverables: TBD. Likely stakeholder comments. May need to develop strategy in negotiation depending on outcome of stakeholder process.
    e. Timeframes: TBD

11. **Oversupply**
    No team necessary at this time. This item is identified as a negotiation sideboard ensuring that Bonneville's EIM participation does not negatively impact Bonneville's OMP.

12. **Settlements**
    a. Scope: Understand CAISO settlements process for the EIM. Benchmark other markets re settlements process. Identify potential options to make CAISO EIM settlements more simple and straightforward, resulting is fewer billing disputes.
    b. Members: TBD. Likely Rich G. and Virginia S. in OGC. Discussion with Karen Graves-Prych and others to scope further.

13. **Governance**
    Need management guidance on governance regarding priority and political feasibility before proceeding further. Public power appears to be strongly supportive of Bonneville staff's proposal regarding governance changes.

14. **Carbon Value**
    a. Scope: Track current stakeholder CAISO and CARB processes regarding carbon value. Determine and advocate best outcomes for Bonneville.
    b. Team: Courtney O., Eric F., and Alisa K.
    c. POC: Alisa K.

15. **Deployment of Contingency Reserves**

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16. **Maximum Generation Fuel-Limited Hydro**

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17. Late Breaking Constraints

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EIM Stakeholder Meeting

April 10, 2019
9am – 1:15pm
Rates Hearing Room

For our WebEx and phone participants:

- We have muted all calls on entry, if you have a question, you will need to unmute by using *6. Then please identify yourself by name and let us know who you represent.
- Please do not put this call on hold OR take other calls while you are dialed into this one.
- If we identify a noisy line, you may be disconnected from the meeting.

Agenda

9:00-9:05	• Welcome, Safety Moment, Introductions
9:05 – 9:10	• Topics for Today's Meeting • Review of BPAs EIM Principles and Timeline
9:10 – 10:00	• EIM Process and Venues
10:00- 11:00	• Carbon in the EIM
11:00 – 11:15	• Cost Benefit Analysis: Status Update
11:15 – 11:30	• Break
11:30– 1:00	• Structured Scenario
1:00 – 1:15	• Next Steps, Q&A

Topics For Today's Meeting

- Timeline Review
- All the issues that BPA identified at the initial July 24th EIM Stakeholder meeting have been discussed and evaluated:

1. Relationship of EIM to Other Emerging Markets
2. BA Resource Sufficiency
3. EIM Settlements
4. Market Power
5. Treatment of Transmission
6. Generation Participation Model (FCRPS)
7. Governance
8. Carbon Obligation in EIM

- Structured Scenario
- Question and Answer Session

Statement of BPA's Principles:

1. Participation is consistent with statutory, regulatory, and contractual obligations.

2. Maintain reliable delivery of power and transmission to our customers.

3. Resource participation in the EIM is and always will be voluntary.

4. BPA's decision to participate in the EIM will be based on a sound business rationale.

If BPA signs the EIM Implementation Agreement it would authorize BPA to begin spending on EIM implementation projects with the CAISO and signals BPA's intent to join the EIM as long as BPA's EIM principles continue to be met. However, it does not bind BPA to join the EIM.

Timeline Leading up to the ROD

Agendas for previous and future monthly EIM Stakeholder meetings:

July 24	•Grid Modernization Overview, Strategic Plan Connection, Intro to 8 Issues BPA is Reviewing, Initial Cost Benefit Analysis
September 13	•EIM 101
October 11	•Process Plan, Transmission, Generation, Governance
November 14	•Process Plan, Market Power
December 18	•Settlements, Non-Federal Generation Participation
January 16	•Resource Sufficiency, Emerging Markets
February 20	•Base Case Structured Scenario, Market Mitigation
March 13	•EIM Issues and Venues, Oversupply Management Protocol, Settlements, Structured Scenario
April 10	•Carbon in the EIM, Cost Benefit Analysis Status Update, Structured Scenario
May 15	• Cost Benefit Analysis
June 12	• Cost Benefit Analysis Update
July	•Letter to the Region with a 30 day public comment
August	•BPA drafts Record of Decision (ROD)
September	•Final ROD for signing the EIM Implementation Agreement

Previous EIM Stakeholder Meeting Materials are available here: www.bpa.gov/goto/EIM

EIM Decision Process

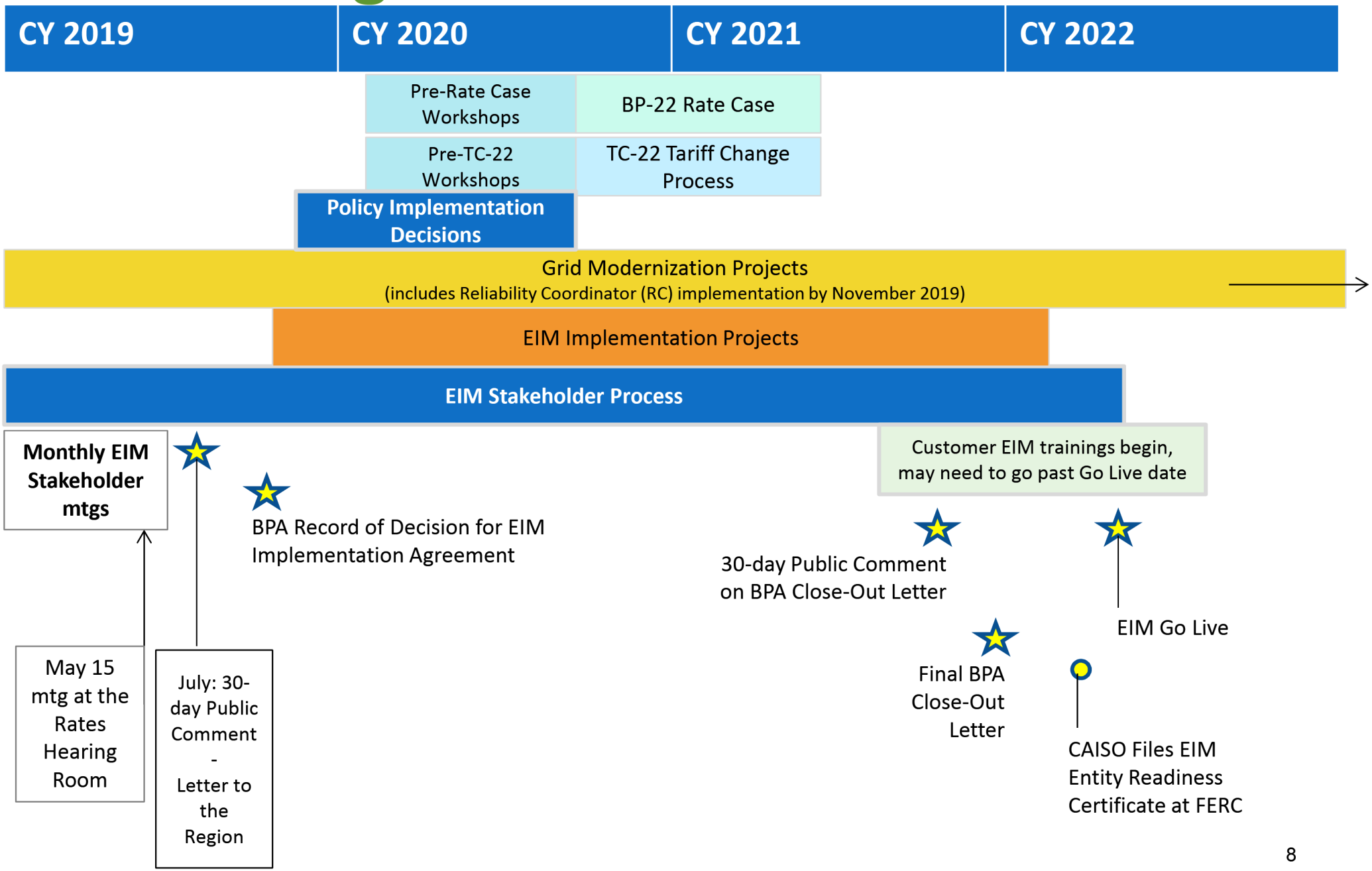
1. Letter to Region and Record of Decision — July 2019 – September 2019
   - Solicit stakeholder feedback on: Draft Implementation Agreement, Cost Benefit Analysis, Legal considerations, Roadmap of process/issues, Proposed Decisions on Certain Policy Issues, Principles for Joining
   - 30-day comment period
   - Final decision to sign Implementation Agreement, and on other items covered in Letter to Region

2. Policy Implementation Decisions — October 2019 – August 2020
   - Discuss all remaining policy issues with stakeholders.
   - Provide written proposal, solicit written stakeholder comment, and make final written decision(s) on policy issues
   - Final decisions on these policy issues

3. BP-22 and TC-22 Cases — October 2020 – July 2021
   - Settlement discussions August – October 2020
   - Follow 7(i) process and conclude with ROD / final decision

4. Draft and Final Close-Out Letters — October 2021 – December 2021
   - Draft Close-Out Letter addressing: principles for joining the EIM, any additional policy issues that have arisen, propose final decision whether to join the EIM, and incorporate final decisions made in steps 1 and 2 above.
   - 30-day comment period
   - Final Close-Out Letter: Address comments raised, Final Decision whether to join EIM, if decision is to join - move forward to sign relevant EIM Agreements

BPA's High Level EIM Timeline



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EIM Issues and Venues

This shows BPA's current thinking but the matrix will evolve over time

Legend:
F = Final Decision
I = Implementation

Issue	Letter to Region / ROD (July 2019 – September 2019)	Policy Implementation Decisions (October 2019 – August 2020)	TC-22 Tariff Terms & Conditions Case (October 2020 – July 2021)	BP-22 Rate Case (October 2020 – July 2021)	Close-Out Letter (October 2021 – December 2021)
BPA's EIM Principles Development / Evaluation	F – Development	I	I	I	F – Evaluation of the issues against the principles
Statutory Authority for Joining the EIM	F				Confirm consistency with the principles.
EIM Impacts on BPA Contractual Commitments	F				
NEPA and Environmental Obligations	F				
EIM Governance	F				
Cost Benefit Analysis	F				
Carbon Obligations	F				
Market Power (LMPM, DEB)	F				
Oversupply Management Protocol	F				
OCBR and other Reliability Tools	F				
Federal Generation Participation Plan	F				
Load Zone (LAP)	F		I	I	Final action regarding decision to join.
Resource Sufficiency — BAA Level	F				
Transmission — Interchange	F		I	I	
Transmission — Network		F	I	I	
Allocation of EIM Charge Codes		F		I	
Resource Sufficiency — Sub-BAA Level		F	I	I	
Transmission Losses		F	I	I	
Nonfederal Resource Participation Requirements		F	I	I	
Settlements/Billing (Mechanics)		F	I		
Data Submission Requirements		F	I		
Metering Requirements		F	I		

Carbon in the EIM

Background : California Cap-and-Trade

- The California cap-and-trade program for greenhouse gas (GHG) emissions was implemented in 2013
  - A market-based program covering multiple sectors, including electricity generated in or imported into California
  - Sets a cap on GHG emissions, which decreases annually to achieve the states target reduction in GHG emissions (40% below 1990 levels by 2030)
  - Covered entities must obtain “allowances” to cover their reported GHG emissions

- Entities also report GHG emissions annually to California under the California Air Resource Board’s (CARB) Mandatory Reporting Requirements (MRR) regulation
  - BPA voluntarily reports its GHG emissions to CARB

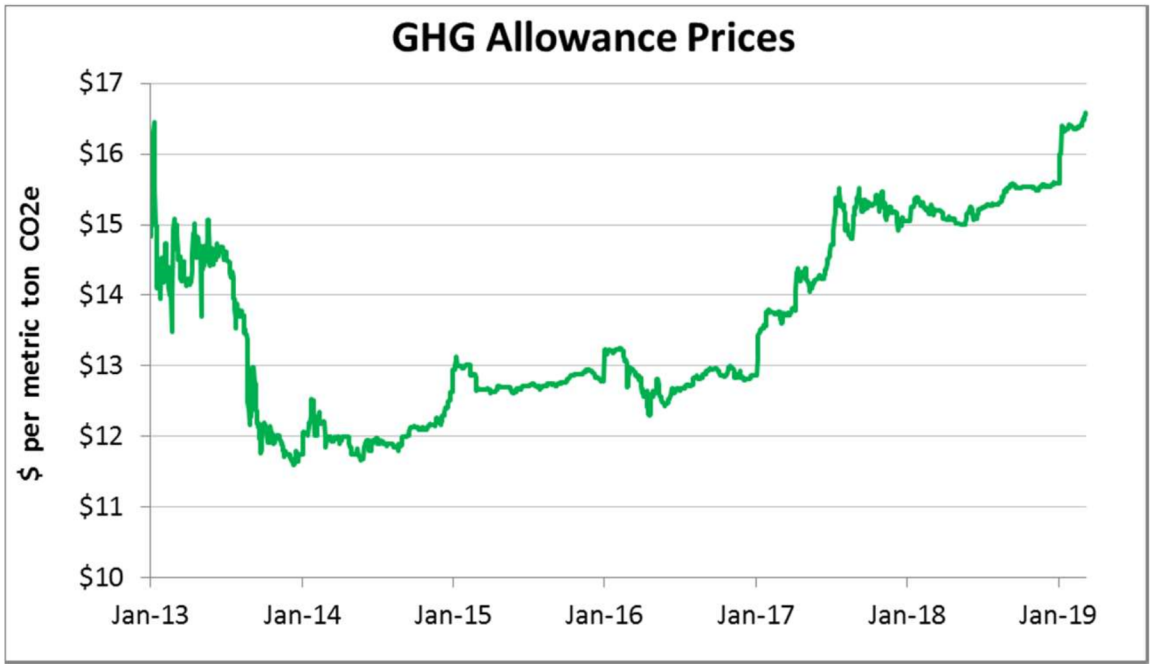
Background : California Cap-and-Trade

- An allowance can be thought of as a permit authorizing an entity to emit one metric ton of carbon dioxide equivalent (CO2e)

- CARB distributes allowances in accordance with the cap through direct distribution to certain covered entities and sales at quarterly auctions
  - The auction has a price floor that escalates each year, and starting in 2020 there will also be an escalating price ceiling

- Entities can also buy and sell allowances in secondary markets

- Allowance prices at the auctions currently are ~$16 per metric ton CO2e
  - Fluctuates due to the supply demand balance of allowances



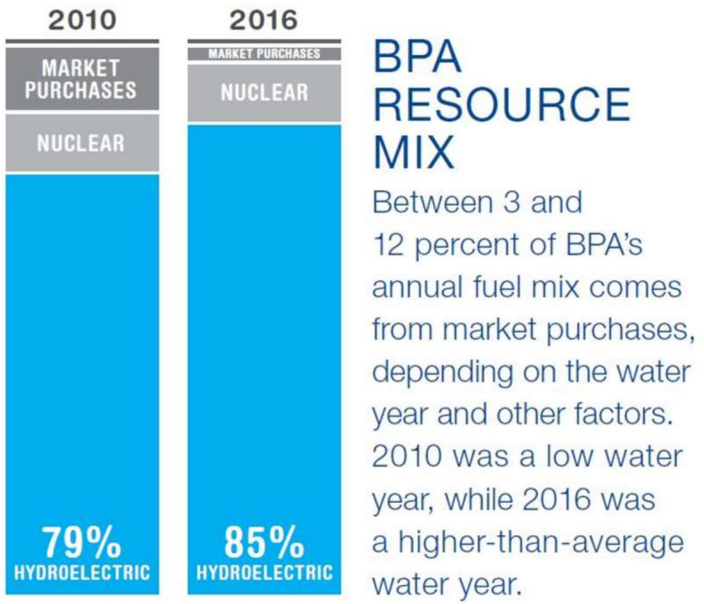
Background : California Cap-and-Trade

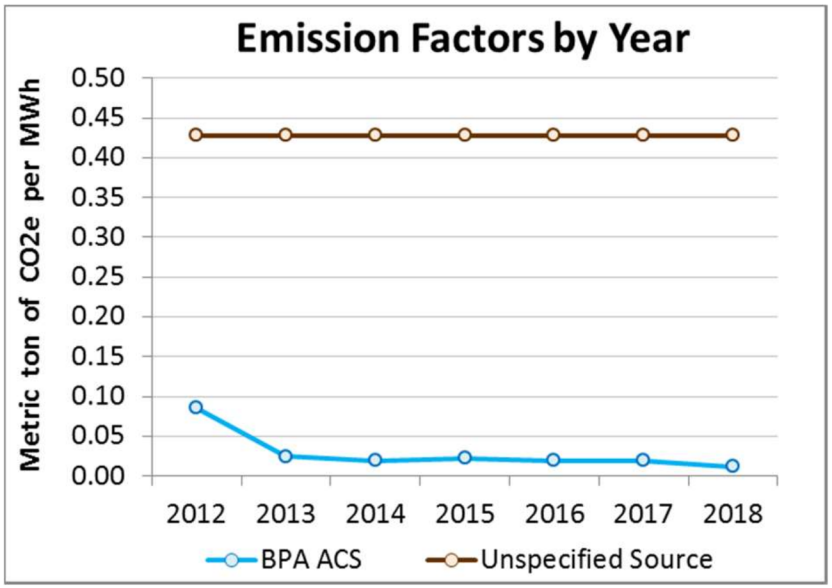
- Electricity generated in or imported into California is subject to the California cap-and-trade program
- The source of electricity is either specified (known) or unspecified (unknown)
- An emission factor is assigned to a generation source based on its fuel source
  - In units: metric ton of CO2e emitted per MWh
- The emissions factor for an unspecified source is 0.428 metric ton CO2e per MWh
  - Roughly equivalent to natural gas thermal generation

BPA Power System Fuel Mix

- BPA sells power from the Federal system
  - The dams (hydro) and CGS (nuclear) produce carbon-free power
  - Emissions are attributed to BPA's market purchases

- BPA reports to California annually and is recognized as an Asset Controlling Supplier (ACS)
  - An ACS owns or operates interconnected electricity generating facilities or serves as an exclusive marketer for these facilities even though it does not own them
  - ACS emission factors are based on the resource mix reports (a 2 year delay)





GHG Cost

- Comparison between BPA ACS and Unspecified Source power

Units:	Metric ton CO2e per MWh	MWh	$ per metric ton CO2e	$ per MWh
Source	**Emission Factor**	**Imported Power**	**GHG Allowance Price**	**GHG Cost**
Unspecified Source	0.43	1	$16	$6.8
BPA ACS	0.02	1	$16	$0.3
Difference	0.41			$6.5

Carbon in the EIM

- Energy generated in or imported into California is subject to California's greenhouse gas (GHG) regulations.
- For imports into California through the EIM, the Participating Resource Scheduling Coordinator is considered the first deliverer into California, and is responsible for purchasing allowances.
- Resources outside California have the option to sell directly into California.
  - California bids would include a GHG compliance cost adder separate from the energy bids.
  - If BPA were to participate in the EIM, any carbon attributed to imports into CA would incur a compliance obligation with California's cap-and-trade program

Carbon in the EIM

- BPA currently cannot purchase carbon allowances under CARB's cap and trade program.
  - Carbon allowances are considered a state tax by the U.S. DOE, BPA, and other federal agencies.
  - Federal agencies have sovereign immunity from state taxes and cannot pay them unless Congress specifically authorizes it.

- Currently, BPA sales into California use third-party arrangements. These third-parties are responsible for the carbon compliance obligation.
  - These arrangements are inefficient and have an incremental cost

BPA's Approach for Carbon in the EIM

- Congressional authorization to purchase allowances
  - BPA would need statutory expenditure authorization to directly purchase carbon allowances under California and potentially other state carbon programs, to avoid additional costs when selling into those power markets.

- Opt to not have EIM deliveries directly sent to California
  - Potential impact to the value obtained by EIM participation, especially if carbon pricing expands to other states in the EIM footprint

- **Conclusion:** California's carbon policy is not a barrier to participation in the EIM. However, until BPA obtains Congressional Authorization BPA intends to opt out of directly delivering EIM energy into California.

Cost Benefit Analysis

Cost Benefit Analysis

- In 2017, BPA performed an initial Cost/Benefit Analysis for joining the EIM that indicated the following:
  - ~$10M in annual dispatch benefits, net of ongoing costs and opportunity cost
  - A variety of qualitative Transmission benefits
  - ~$35M in startup costs

- We're updating the business case to achieve multiple objectives
  - Utilize an approach consistent with almost all potential and current EIM participants
  - Evaluate benefits in multiple scenarios
  - Refresh market assumptions and cost estimates
  - Flesh out Transmission benefits, potentially quantifying some of them
  - Provide more comprehensive support for an EIM-related ROD

- Steps taken to date
  - Contracted with E3 to perform an "industry standard" Benefits Analysis
  - Reviewing and updating cost estimates provided by Utilicast in 2017

- Expected timeline at upcoming EIM stakeholder meetings:
  - May 2019: Share draft results and request feedback
  - June 2019: Discuss customer comments

Break

Structured Scenario

Structured Scenarios: Overview

- A Load Serving Entity (LSE) is using three resources to serve their load
  - BPA Slice delivery
  - Wind resource located inside the BPA EIM BAA
  - Tagged purchase from a resource inside the BPA EIM BAA

- They are managing uncertainty regarding the Slice amount, wind output, and market conditions

VERS in EIM

- Like all resources, Variable Energy Resources ("VERS") - like wind - will need an hourly base schedule
- However, unlike dispatchable resources, VERS have their 5-minute schedules/dispatches updated to reflect their expected output within the hour
- Those adjustments are a combination of a short-term persistence value adjusted by forecast data

VERS in EIM Continued

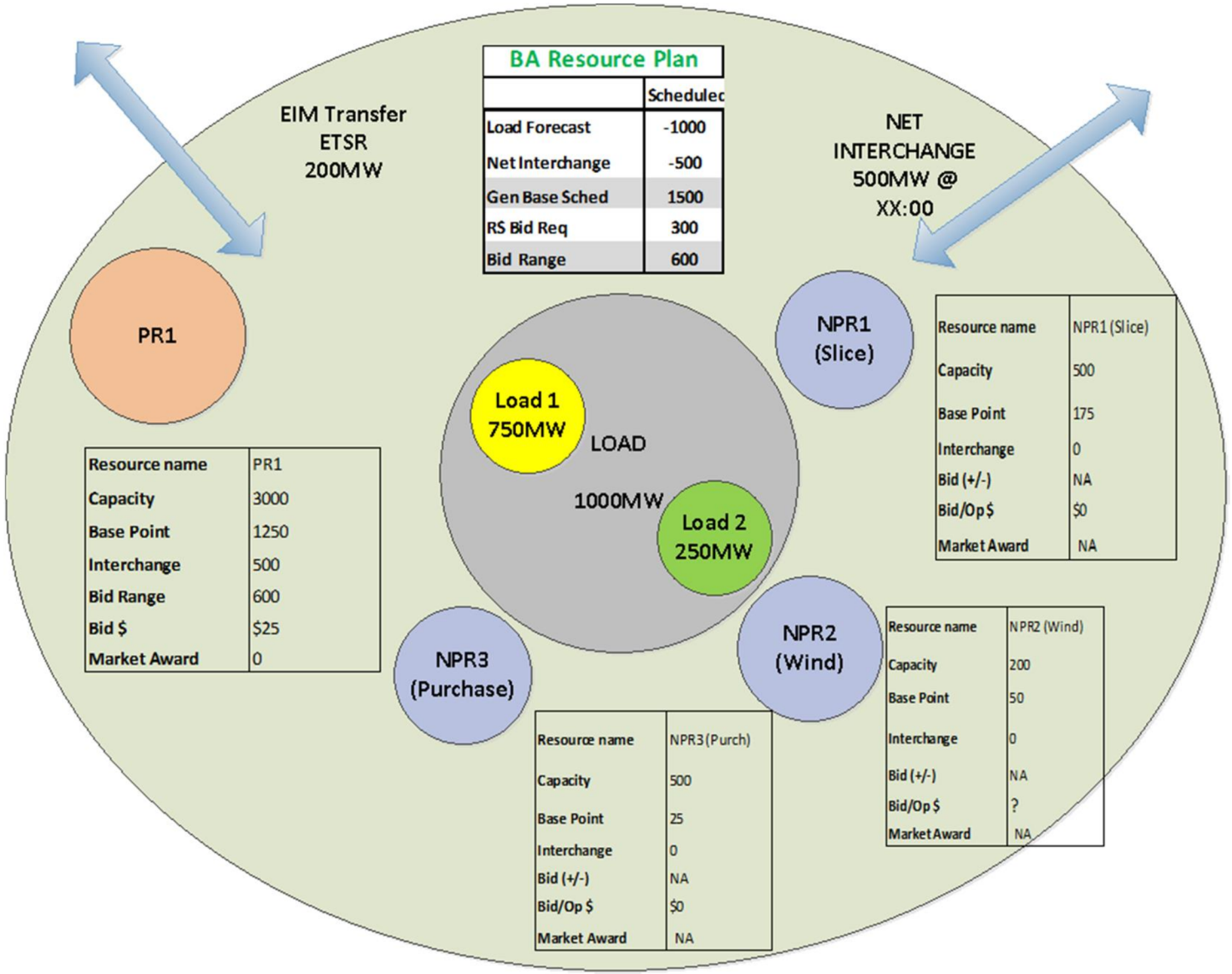
- For simplicity, today's scenario BPA is using an 10/5 persistence value to adjust 5-minute schedules/dispatches
  - I.E., the actual output of a resource 10-minutes prior to the start of a RTD interval sets the schedule/dispatch for that 5-minute period
- Note - this is true irrespective of the energy values submitted via an eTag for either inter or intrachange
  - Differences between wind output and a load or eTag for export are treated as imbalance that will either be served by the market or a manual dispatch

Structured Scenarios: 3.A

- All LSE resources are non-participating
- Wind base schedule is set at T-55*
- Slice is expected to be 175MW but is reduced to 165MW at T-35
- A purchase was increased 10MW at T-30 to account for the Slice reduction
- Wind actual generation drops throughout the hour

** BPA has not determined the cutoff time for Base Schedule submission*

3.A – Wind to Load with Slice/Purchase



BA Resource Plan	Scheduled
Load Forecast	-1000
Net Interchange	-500
Gen Base Sched	1500
RS Bid Req	300
Bid Range	600

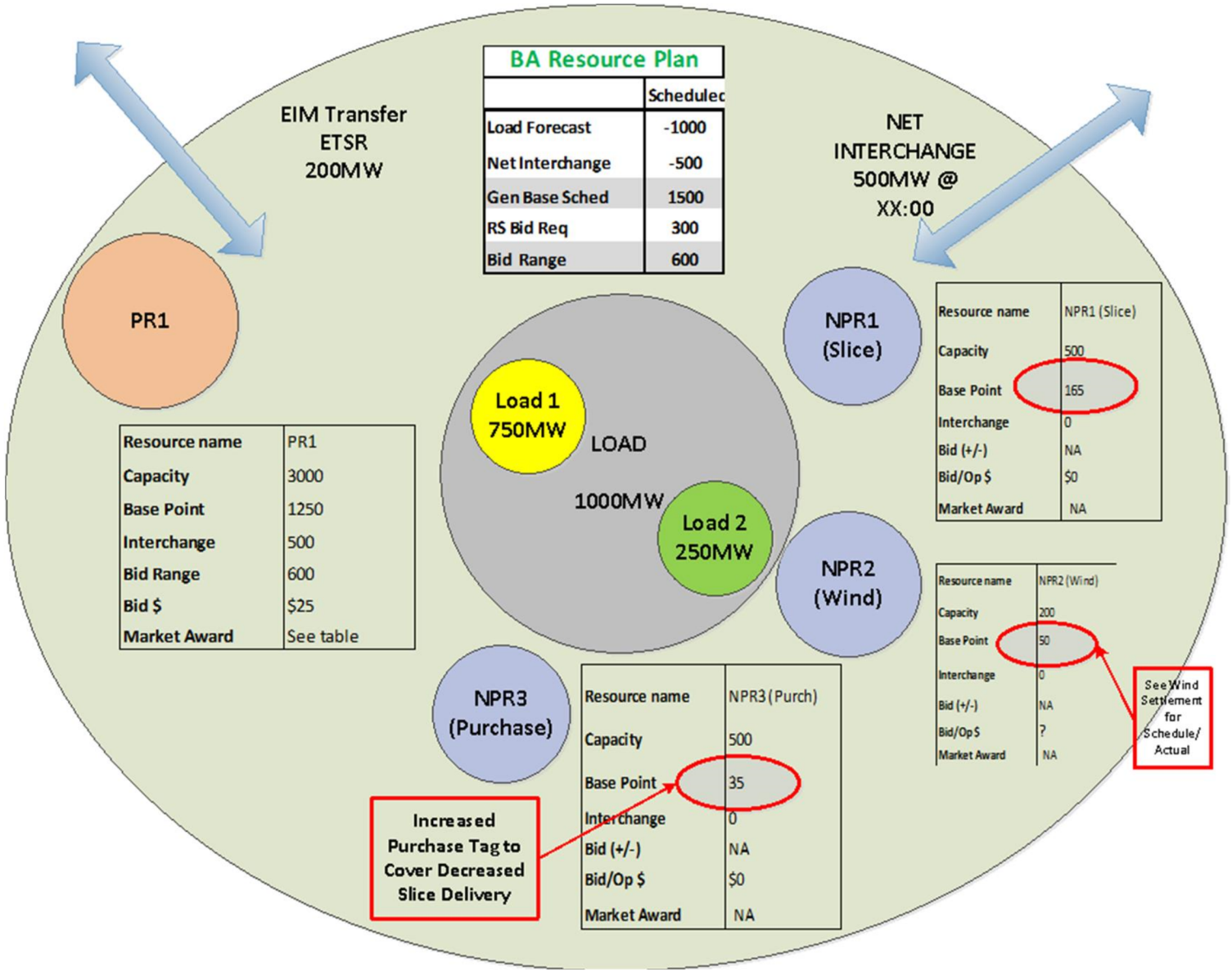
Resource name	PR1
Capacity	3000
Base Point	1250
Interchange	500
Bid Range	600
Bid $	$25
Market Award	0

Resource name	NPR1 (Slice)
Capacity	500
Base Point	175
Interchange	0
Bid (+/-)	NA
Bid/Op $	$0
Market Award	NA

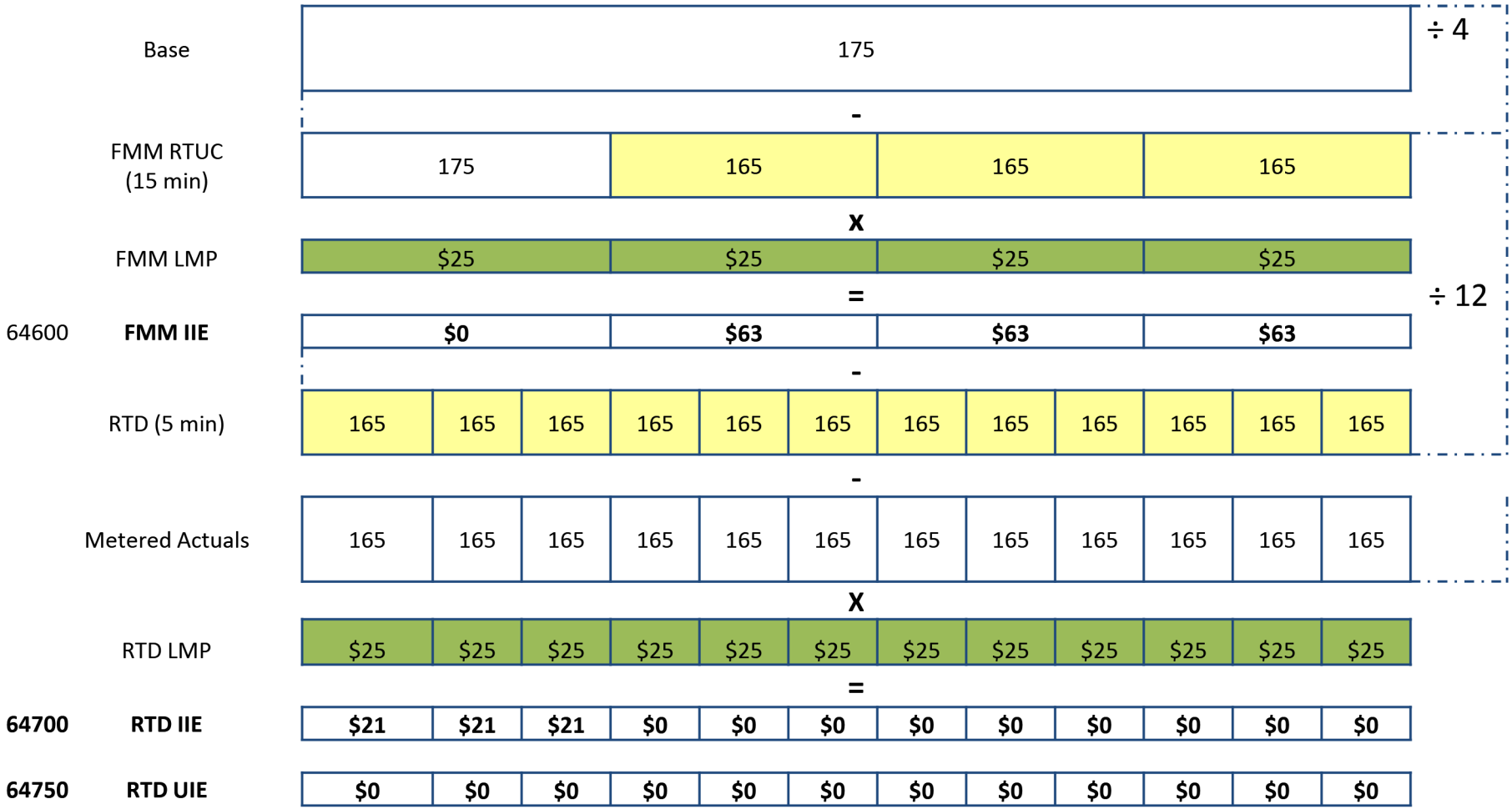
Resource name	NPR2 (Wind)
Capacity	200
Base Point	50
Interchange	0
Bid (+/-)	NA
Bid/Op $	?
Market Award	NA

Resource name	NPR3 (Purch)
Capacity	500
Base Point	25
Interchange	0
Bid (+/-)	NA
Bid/Op $	$0
Market Award	NA

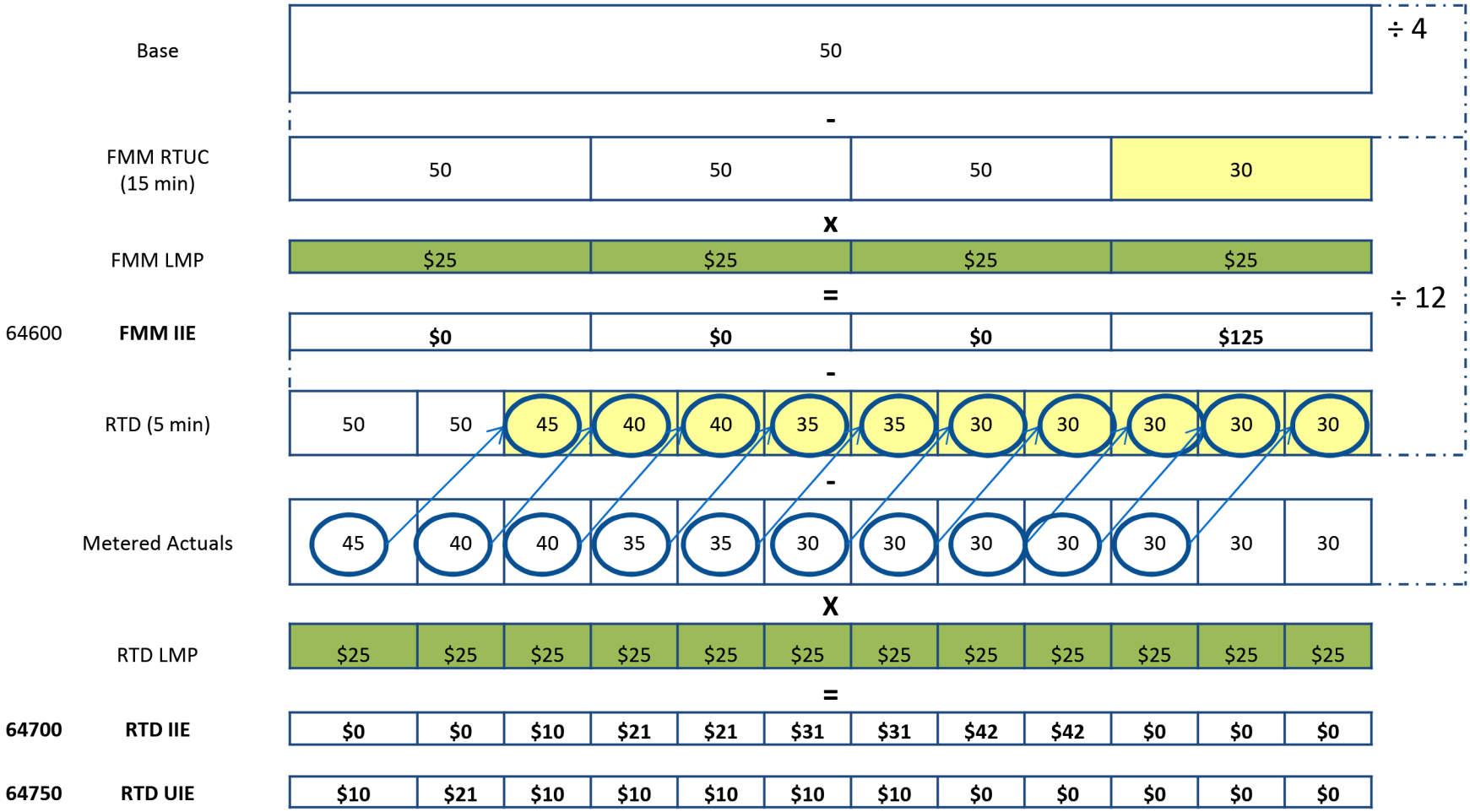
3.A – Wind to Load with Slice/Purchase



3.A Settlements – NPR1 (Slice)

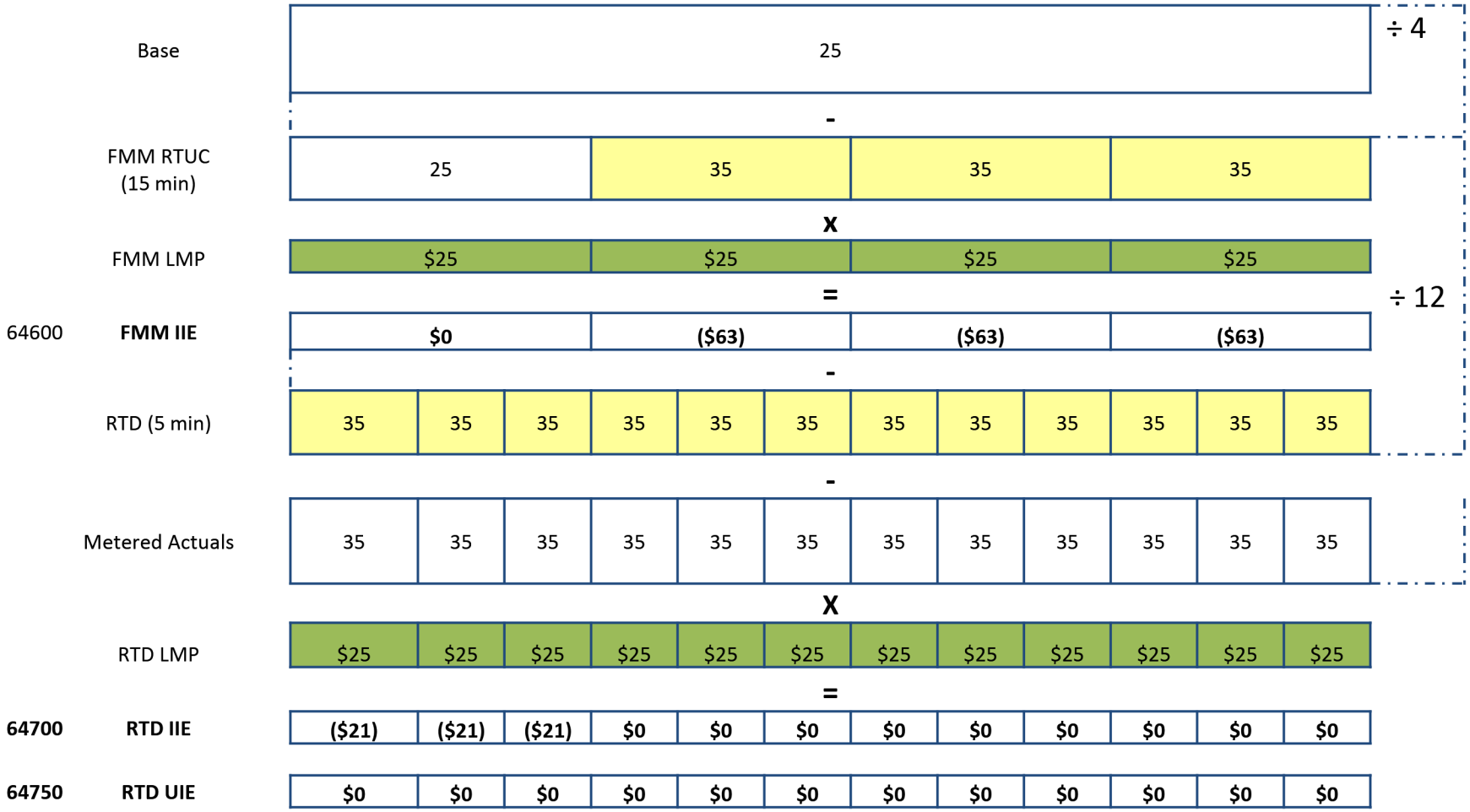


3.A Settlements – NPR2 (Wind)



Note: Actual persistence and forecast values based on telemetered State Estimator Data, which may differ from "Metered Actuals" for settlements

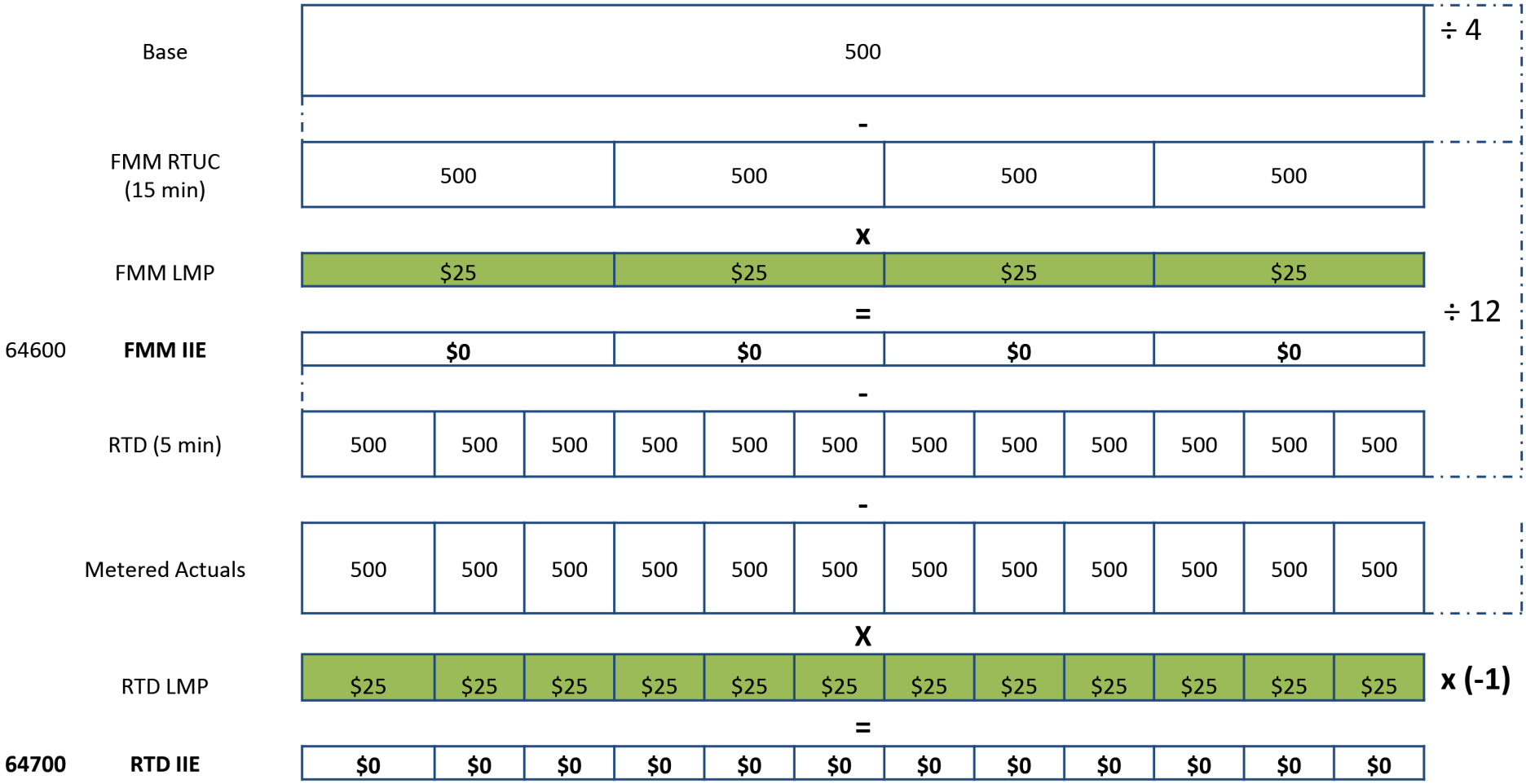
3.A Settlements – NPR3 (Purchase)



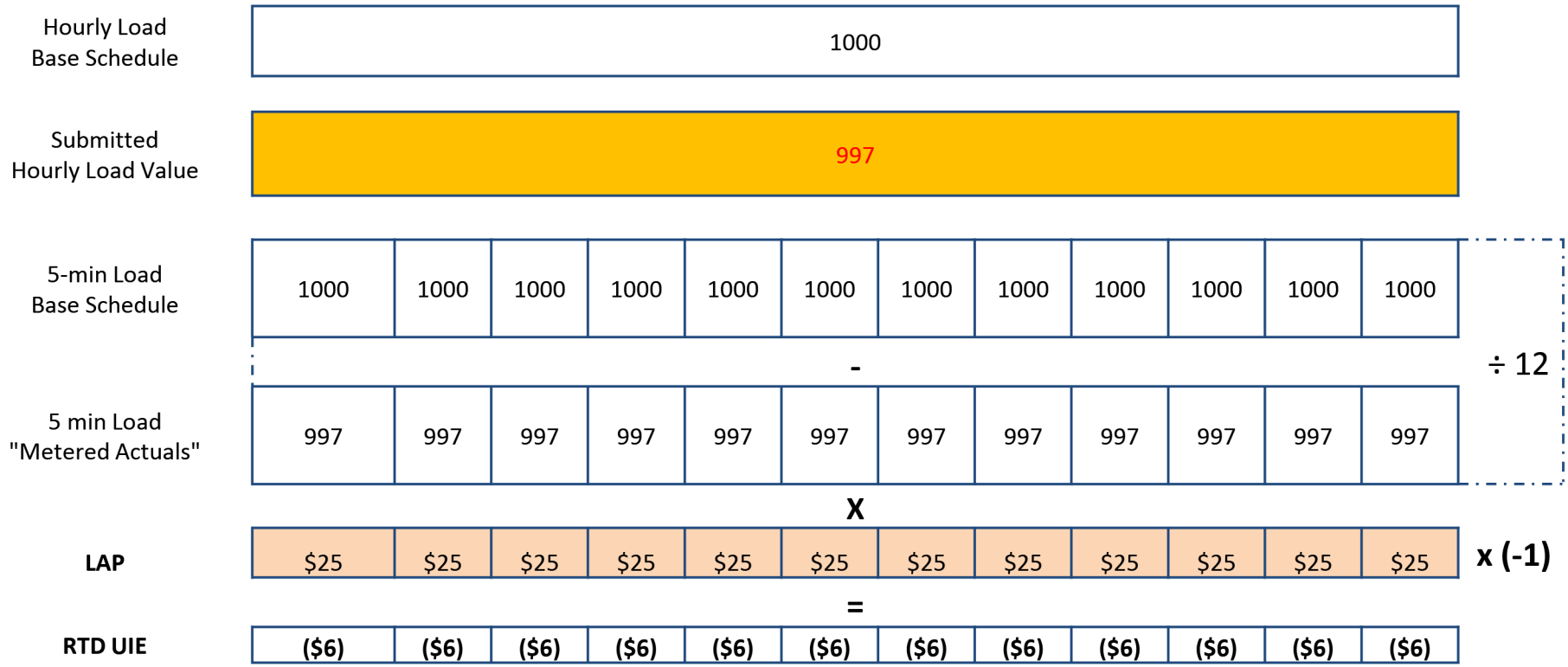
3.A Settlements – PR1

	Base	1250											÷ 4
		-											
	FMM RTUC (15 min)	1250			1250			1250			1270		
		x											
	FMM LMP	$25			$25			$25			$25		
		=											÷ 12
64600	**FMM IIE**	**$0**			**$0**			**$0**			**($125)**		
		-											
	RTD (5 min)	1250	1250	1255	1260	1260	1265	1265	1270	1270	1270	1270	1270
		-											
	Metered Actuals	1250	1252	1257	1260	1262	1265	1267	1270	1270	1270	1270	1270
		x											
	RTD LMP	$25	$25	$25	$25	$25	$25	$25	$25	$25	$25	$25	$25
		=											
64700	**RTD IIE**	**$0**	**$0**	**($10)**	**($21)**	**($21)**	**($31)**	**($31)**	**($42)**	**($42)**	**($42)**	**($42)**	**($42)**
64750	**RTD UIE**	**$0**	**($4)**	**($4)**	**$0**	**($4)**	**$0**	**($4)**	**$0**	**$0**	**$0**	**$0**	**$0**

3.A Settlements - Interchange



3.A Settlements - Load



Summary

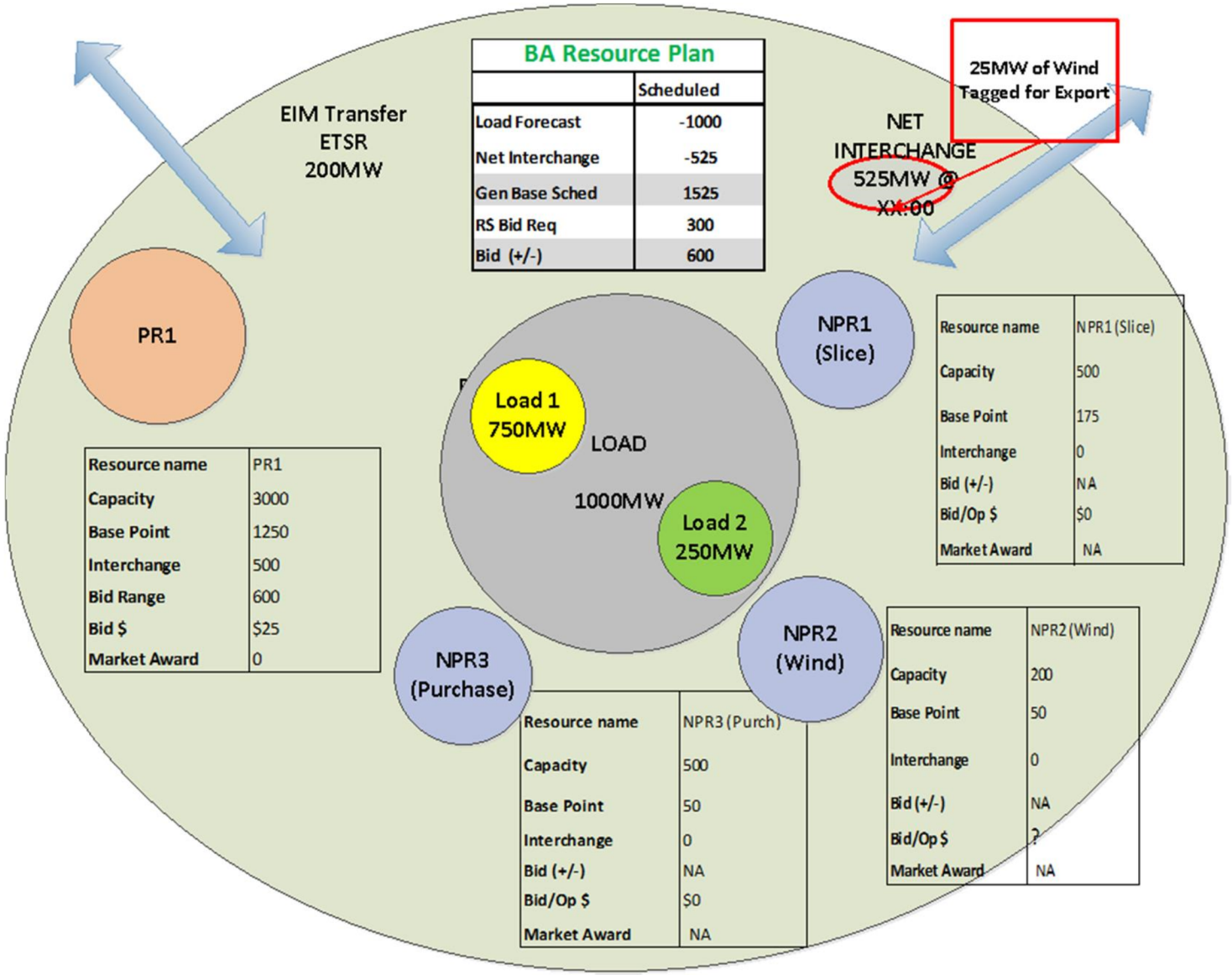
LSE		PR		Load	
NPR 1 IIE	$250	IIE	($323)	UIE	($67)
NPR 1 UIE	$0	UIE	($17)		
NPR 2 IIE	$323				
NPR 2 UIE	$83				
NPR 3 IIE	($250)				
NPR 3 UIE	$0				
Total	$406	Total	($340)	Total	($67)

- The Slice and Purchase transactions offset (NPR 1/3 IIE)
- The NPR 2 and PR IIE offset and require transactions among the BAA/MO/PR
- Load UIE is equal to the UIE of resources in the BAA and require transactions among customer/BAA/MO/PR

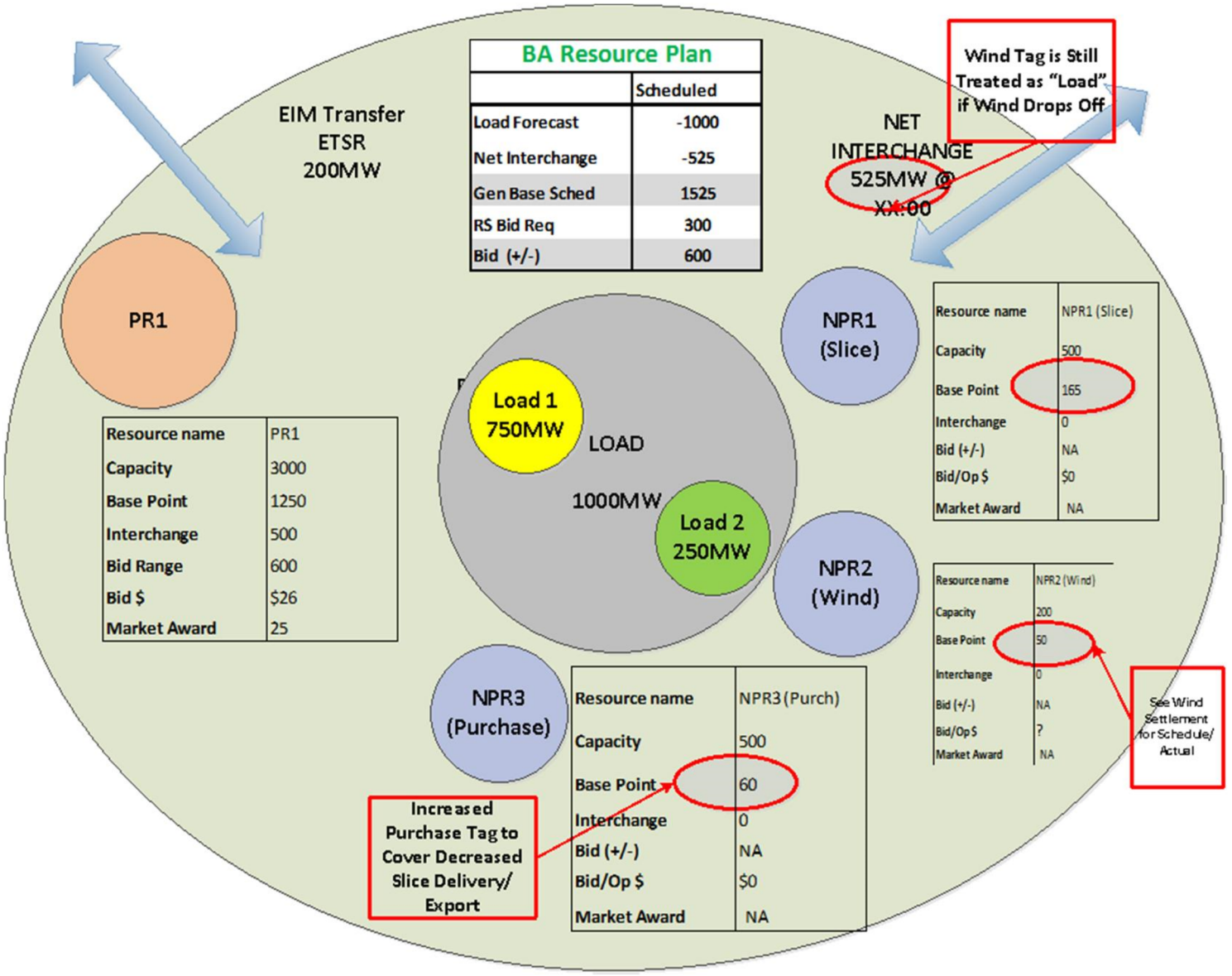
Structured Scenarios: 3.B

- All resources are non-participating
- Wind base schedule is set at T-55
- 25MW of wind is tagged at T-55 as an export for a sale
- Slice is expected to be 175MW but is reduced to 165MW at T-35
- A purchase was increased 10MW at T-30 to account for the Slice reduction
- Wind actual generation drops throughout the hour

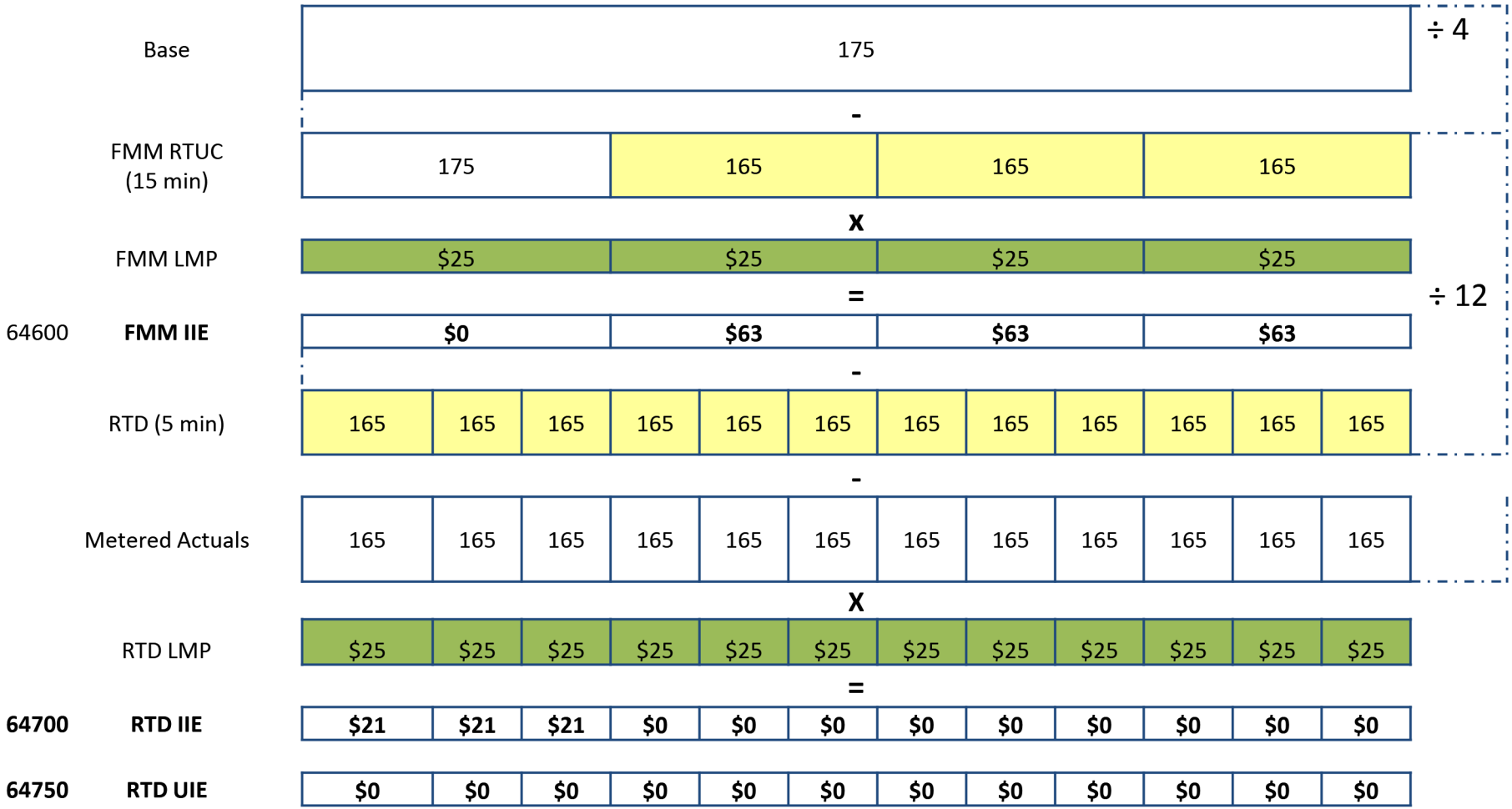
3.B – Wind to Load and Export with Slice/Purchase



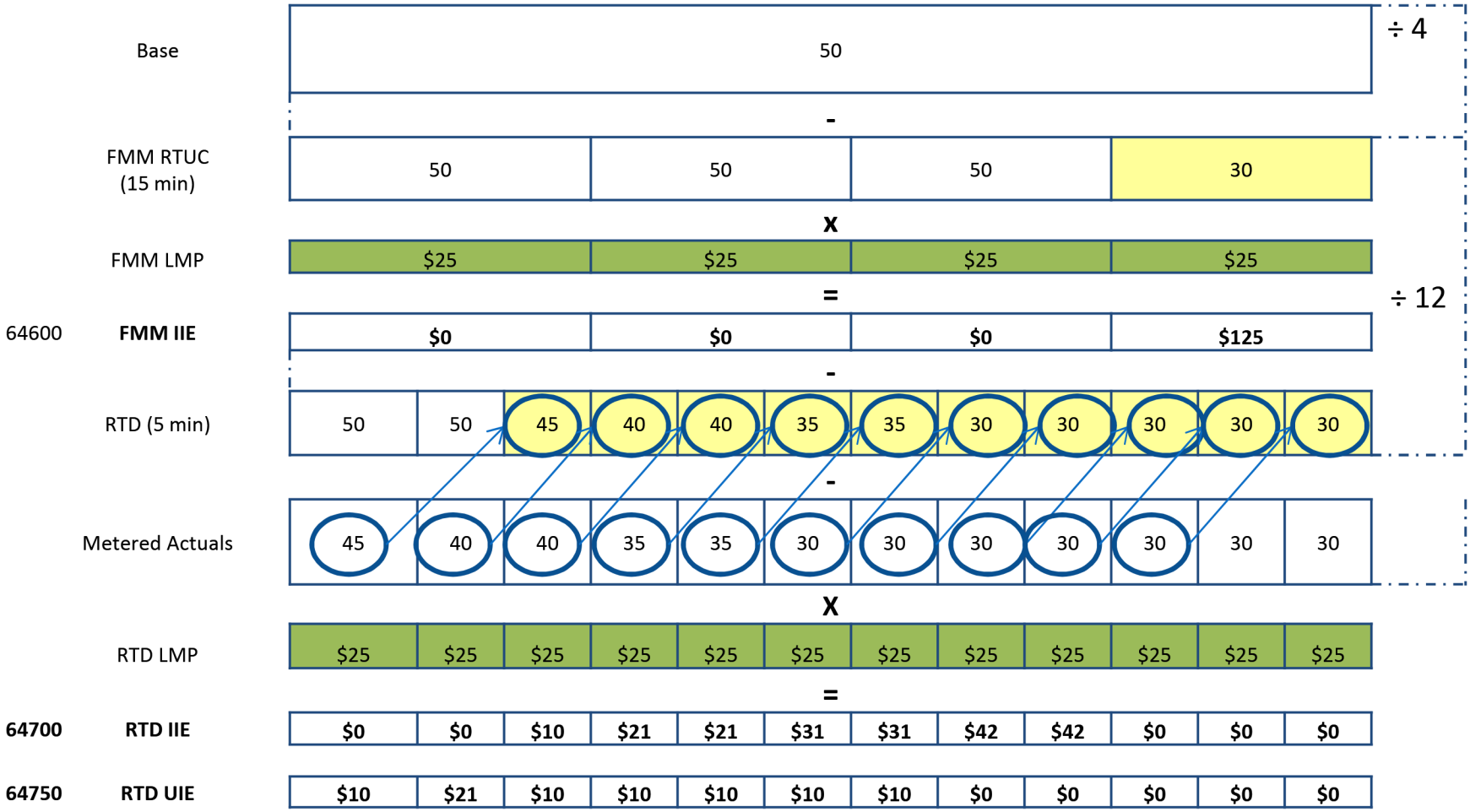
3.B – Wind to Load and Export with Slice/Purchase



3.B Settlements – NPR1 (Slice)

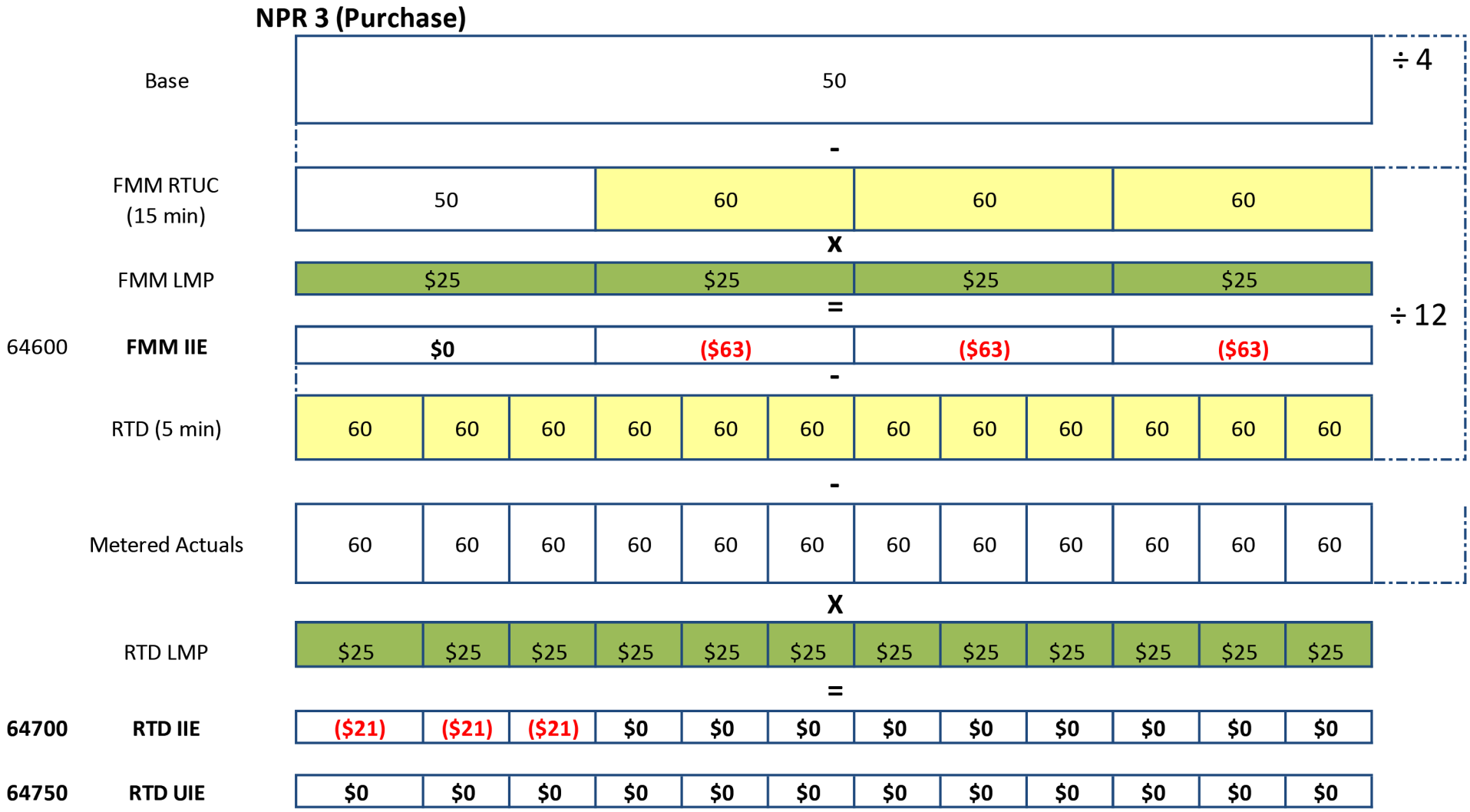


3.B Settlements – NPR2 (Wind)



Note: Actual persistence and forecast values based on telemetered State Estimator Data, which may differ from "Metered Actuals" for settlements

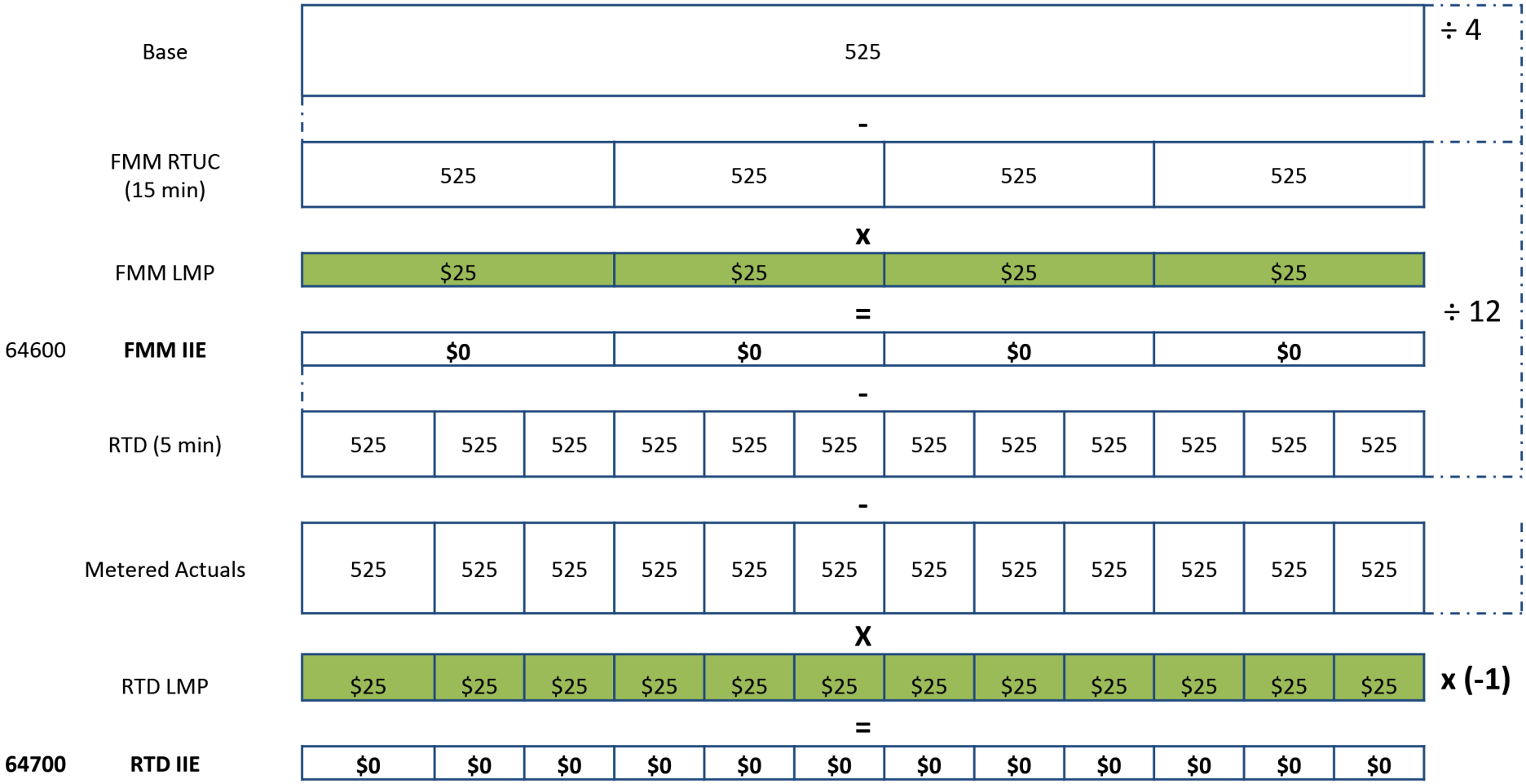
3.B Settlements – NPR3 (Purchase)



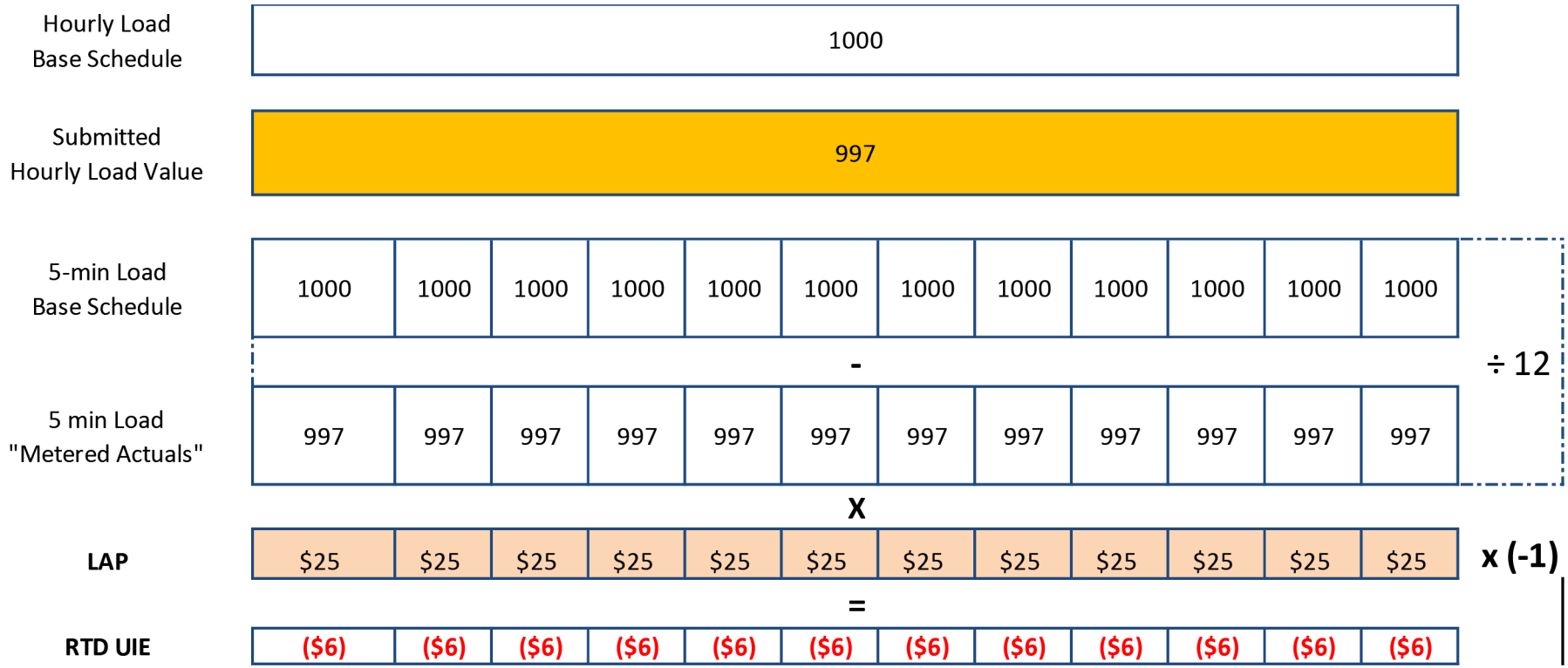
3.B Settlements – PR1

	Base	1250											÷ 4
		-											
	FMM RTUC (15 min)	1250			1250			1250			1270		
		x											
	FMM LMP	$25			$25			$25			$25		
		=											÷ 12
64600	**FMM IIE**	**$0**			**$0**			**$0**			**($125)**		
		-											
	RTD (5 min)	1250	1250	1255	1260	1260	1265	1265	1270	1270	1270	1270	1270
		-											
	Metered Actuals	1250	1252	1257	1260	1262	1265	1267	1270	1270	1270	1270	1270
		x											
	RTD LMP	$25	$25	$25	$25	$25	$25	$25	$25	$25	$25	$25	$25
		=											
64700	**RTD IIE**	**$0**	**$0**	**($10)**	**($21)**	**($21)**	**($31)**	**($31)**	**($42)**	**($42)**	**($42)**	**($42)**	**($42)**
64750	**RTD UIE**	**$0**	**($4)**	**($4)**	**$0**	**($4)**	**$0**	**($4)**	**$0**	**$0**	**$0**	**$0**	**$0**

3.B Settlements - Interchange



3.B Settlements - Load



Net Conclusions

LSE		PR		Load	
NPR 1 IIE	$250	IIE	($323)	UIE	($67)
NPR 1 UIE	$0	UIE	($17)		
NPR 2 IIE	$323				
NPR 2 UIE	$83				
NPR 3 IIE	($250)				
NPR 3 UIE	$0				
Total	$406	Total	($340)	Total	($67)

- Net Imbalance is the same
- In this example the PR is essentially backfilling the export instead of the load

Future Structured Scenarios

- BPA proposes to not do anymore Structured Scenarios in this stage of the stakeholder process

- If BPA executes the IA it expects to continue this work in the “Post-Rod” policy process

- BPA is happy to work with individual stakeholders to support their own evaluation of scenarios

Next Steps

Next Steps

- Next meeting scheduled for **Wednesday May 15th** at the Rates Hearing Room. This will be an all-day meeting to discuss our next structured scenario.
  - WebEx and Phone participation will be available
  - Agenda and materials will be distributed in advance via Tech Forum

- We welcome feedback on this meeting. Your comments will help shape future EIM Stakeholder Meetings, please email us at techforum@bpa.gov and reference "EIM Stakeholder Meeting" in the subject. Comments are due by April 24th Wednesday.

- For more information on BPA's EIM Stakeholder process and meetings please visit:
  https://www.bpa.gov/Projects/Initiatives/EIM/Pages/Energy-Imbalance-Market.aspx

- For more information on BPA's Grid Modernization Initiative please visit:
  https://www.bpa.gov/goto/GridModernization

Question and Answer Session

EIM Stakeholder Meeting

February 20, 2019
9am -12pm
Rates Hearing Room

For our WebEx and phone participants:

- We have muted all calls on entry, if you have a question, you will need to unmute by using *6. Then please identify yourself by name and let us know who you represent.
- Please do not put this call on hold OR take other calls while you are dialed into this one.
- If we identify a noisy line, you may be disconnected from the meeting.

Agenda

9:00-9:05	• Welcome, Safety Moment, Introductions
9:05 – 9:10	• Topics for Today's Meeting • Review of BPAs EIM Principles • Review Timeline
9:10 – 10:00	• Local Market Power Mitigation
10:00 – 10:15	• Break
10:15 – 11:30	• Base Case Structured Scenario Discussion
11:30 – Noon	• Next Steps • Question and Answer Session

Topics For Today's Meeting

- Review of EIM Stakeholder Topics Discussed to Date
- Timeline Review
- Issues that BPA presented at the July 24th EIM Stakeholder meeting that we will be discussing in more depth at a future meeting.

1. Relationship of EIM to Other Emerging Markets
2. BA Resource Sufficiency
3. EIM Settlements
4. Market Power
5. Treatment of Transmission
6. Generation Participation Model (FCRPS)
7. Governance
8. **Carbon Obligation in EIM**

Issues discussed at previous EIM Stakeholder meetings.

This issue will be discussed at a future meeting.

- Question and Answer Session

Statement of BPA's Principles:

1. Participation is consistent with statutory, regulatory, and contractual obligations.

2. Maintain reliable delivery of power and transmission to our customers.

3. Resource participation in the EIM is and always will be voluntary.

4. BPA's decision to participate in the EIM will be based on a sound business rationale.

Timeline Leading up to the ROD

Agendas for previous and future monthly EIM Stakeholder meetings:

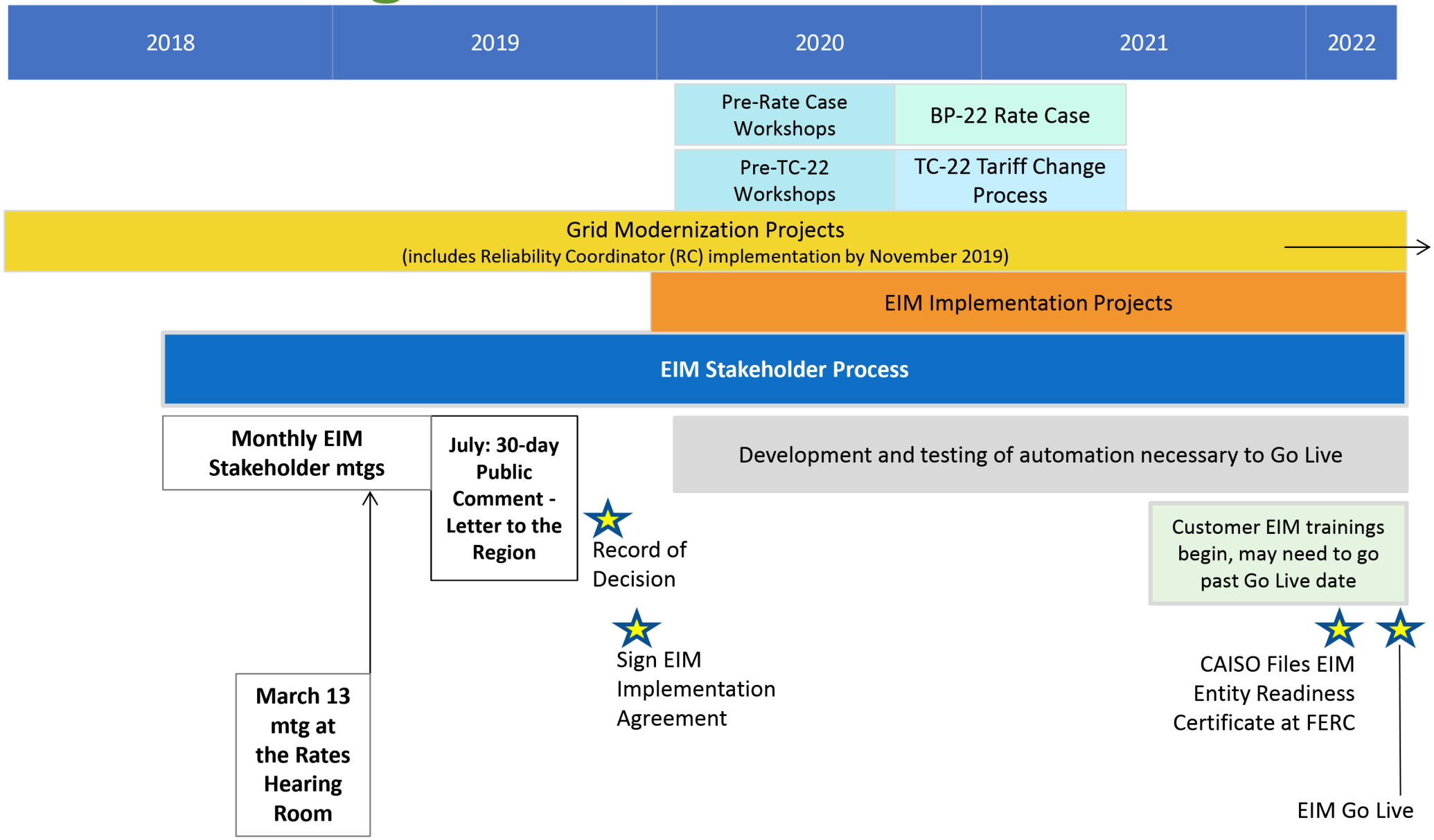
July 24	•Grid Modernization Overview, Strategic Plan Connection, Intro to 8 Issues BPA is Reviewing, Initial Cost Benefit Analysis
September 13	•EIM 101
October 11	•Process Plan, Transmission, Generation, Governance
November 14	•Process Plan, Market Power
December 18	•Settlements, Non-Federal Generation Participation
January 16	•Resource Sufficiency, Emerging Markets
February 20	•Base Case Structured Scenario, Market Mitigation
March 13	•Settlements, Structured Scenario
April 10	**Structured Scenarios:** Discussion of Impacts to Customers
May 15	**Issues to be Discussed at upcoming monthly EIM Stakeholder meetings:** 1. Cost Benefit Analysis 2. Carbon in the EIM
June	
July	•Letter to the Region with a 30 day public comment
August	•BPA drafts Record of Decision (ROD)
September	•Final ROD for signing the EIM Implementation Agreement

These meetings will be full day.

Signing of the EIM Implementation Agreement authorizes BPA to begin spending on EIM implementation projects with the CAISO but does not bind BPA to join the EIM.

Previous EIM Stakeholder Meeting Materials are available here: www.bpa.gov/goto/EIM

BPA's High Level EIM Timeline



Previous EIM Stakeholder Meeting Materials are available here: www.bpa.gov/goto/EIM

EIM Issues and Venues

- BPA has been tracking EIM issues that will be resolved in future BPA processes or workshops where BPA anticipates EIM issues will be addressed.

Letter to Region/ Implementation Agreement ROD	TC-22 Tariff Terms & Conditions Case	BP-22 Rate Case	Business Practices	Other
Joining the EIM is consistent with BPA's statutory authority	Explanation of EIM charges codes	Cost Allocation – which rates recover which EIM costs		
Business Case / Cost Benefit Analysis	Dispute Resolution process for EIM charges			

Local Market Power Mitigation

CAISO Market Power

The CAISO Department of Market Monitoring (DMM) is responsible for protecting consumers and market participants by identifying and reporting:

- Market design flaws
- Potential market rule violations
- Market power abuses

When there is a binding constraint, how is Market Power measured?

- Pivotal Supplier Test
  - If supply is insufficient to meet demand with the supply of any individual supplier removed, then this supplier is pivotal
- Residual Supply Index
  - The residual supply index is the ratio of supply from non-pivotal suppliers to demand
  - A residual supply index less than 1.0 indicates an uncompetitive level of supply

If determined to have market power, a market participant may have its CAISO bid prices mitigated to a Default Energy Bid (DEB), which will be used for CAISO's optimization

Default Energy Bids

The CAISO currently employs 3 options for calculating a participant's, or resource's, DEB

1. Variable Cost Option
   - Based on heat rate, fuel price, GHG costs, etc.
2. Locational Marginal Price (LMP) Option
   - Based on lowest 25th percentile of LMPs at which resource was dispatched in the last 90 days
3. Negotiated Rate Option
   - Formula negotiated between the resource's scheduling coordinator and CAISO/DMM

There is concern that none of the cost options adequately reflect the opportunity cost applicable to fuel-limited hydro resources

- Opportunity cost is influenced by:
  - Non-power obligations of hydro resources
  - Expected value of energy in future periods
  - Physical system characteristics (storage, flow limitations, hydrological topology, generating capability)
  - Risk preference of hydro operator

Recent Developments: Market Power & DEBs

The CAISO has been receptive to concerns expressed by NW parties, and is proceeding with an initiative that proposes enhancements to current LMPM and DEB implementation. Potential market changes would apply to the entire ISO market, in addition to the EIM.

Major issues have been largely satisfied, such as:

- **Mitigate for the right time interval**: Mitigation should only apply to the interval when market power has been determined (not balance of the hour)
- **Mitigate the right quantity**: Do not mitigate supply that is voluntary in nature (mitigation only applies to supply needed for RS, Flexi Ramp Up, and diversity credit)
- A proposed **DEB option that reflects the opportunity cost of hydro**; including the recognition of the combined value of energy and firm TX rights when coupled together (see coming slides)
- The specific parameters (such as the multiplier levels) can be updated upon request

CAISO Proposed Hydro DEB Calculation

The newly proposed DEB accounts for:

- Maximum storage horizon
- Ability to sell energy at different locations inside and outside of the BA
- Opportunity cost of generation by substituting local gas resources
- Potential short-term limitations

$$DEB = MAX\ (\textbf{\textit{Gas Floor}}, \textbf{\textit{ST Floor}}, \textbf{\textit{LT Geo Floor}})$$

Where:

Gas Floor = (*Peaker Heat Rate * Gas Price Index*) * 1.1 — *Daily peaks / Replacement Cost*

ST Floor = $MAX(DA\ Index, BOM\ Index, M\ Index_{+1})*Mult$ — *Short-Term / Local OC*

LT Geo Floor = $MAX(DA\ Index, BOM\ Index, M\ Index_{+1}, \ldots, M\ Index_{+12}) * 1.1$ — *Long-Term / Different Trading Hubs OC*

Gas floor may be updated in real-time if needed

This content is taken from the LMPM Enhancements Draft Final Proposal (Updated) , page 35

http://www.caiso.com/Documents/DraftFinalProposal-LocalMarketPowerMitigationEnhancements-UpdatedJan31_2019.pdf

CAISO Proposed Hydro DEB: Stress Events

Recall that the most concerning impact of an overly restrictive default energy bid – a DEB that does not accommodate potential differences in reasonable views of a hydro resource's opportunity cost – was unintended dispatch.

- Depletion of resource's fuel prior to a stress event
- Uneconomic / unreliable market outcomes

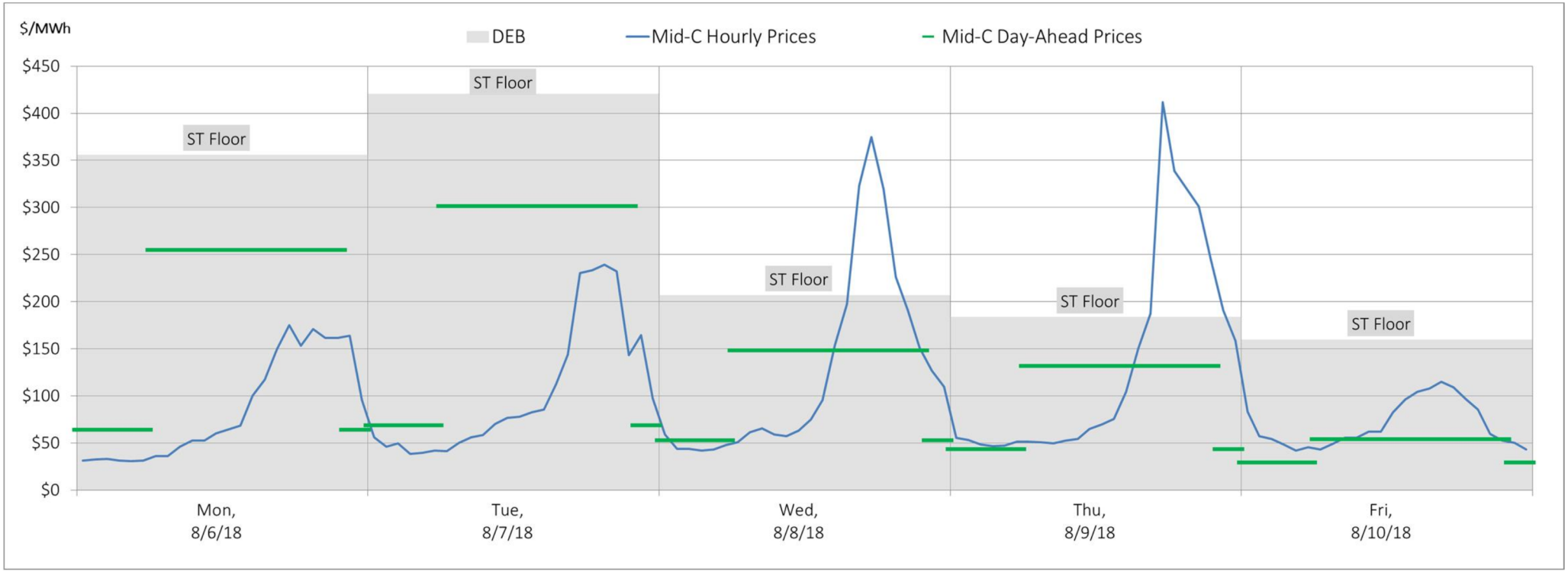
Under typical or normal conditions there appears to be little or no unintended dispatch and/or uneconomic outcomes

To estimate the potential for unintended dispatch and/or uneconomic outcomes, BPA retrospectively tested the proposed default energy bid formulation against historical market conditions, with a specific focus on several market-stress events

- Anticipated Stress Event: market and operational response is anticipated prior to event
- Unplanned Stress Event: market and operational response coming in near real-time

Note: we did not incorporate trading hubs beyond Mid-C into the LT Geographic Floor

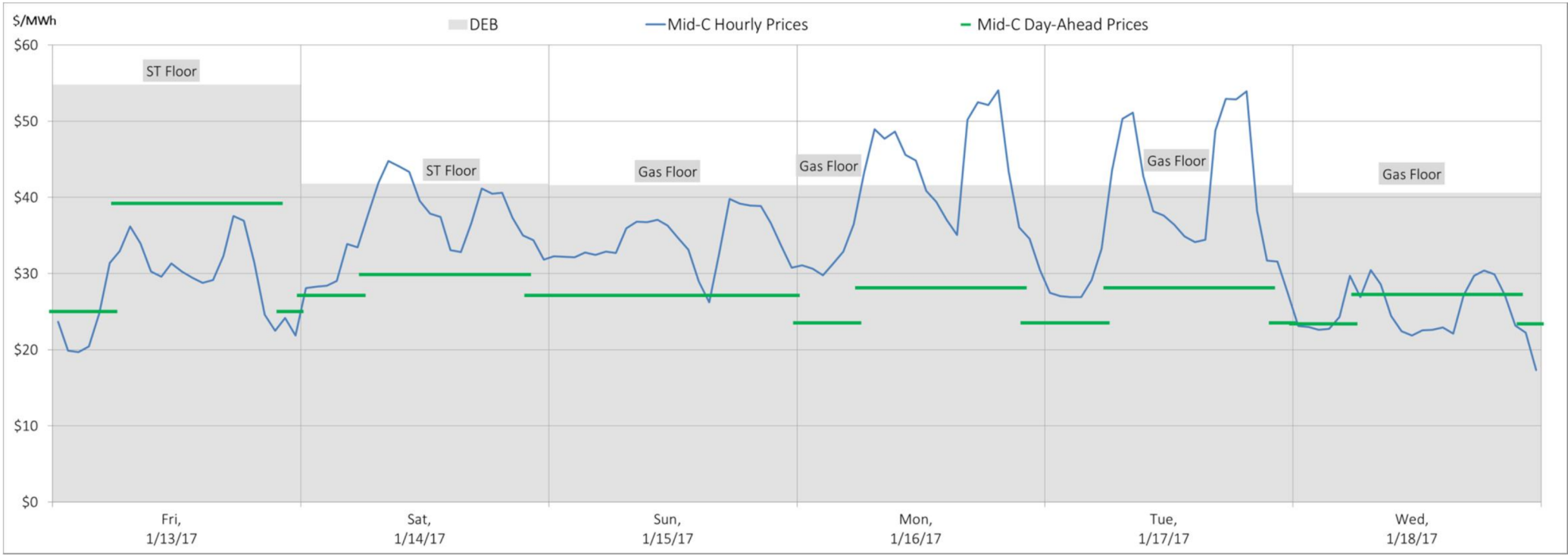
DEB Response - Anticipated Event



- **Event Description:** West-wide heat Portland, Seattle and Spokane experiencing temps in the low 90s with significantly elevated southern California gas prices drive elevated power prices across the west.

- **Observations:** DEB responds as expected to market signals; NW hourly prices remain high during the evening peak hours. Premature dispatch is avoided, preserving limited energy for periods of high market stress. Hydro resources participating in the EIM during the stress periods would have been awarded a price lower than NW hourly indexed price if they were found to have market power.

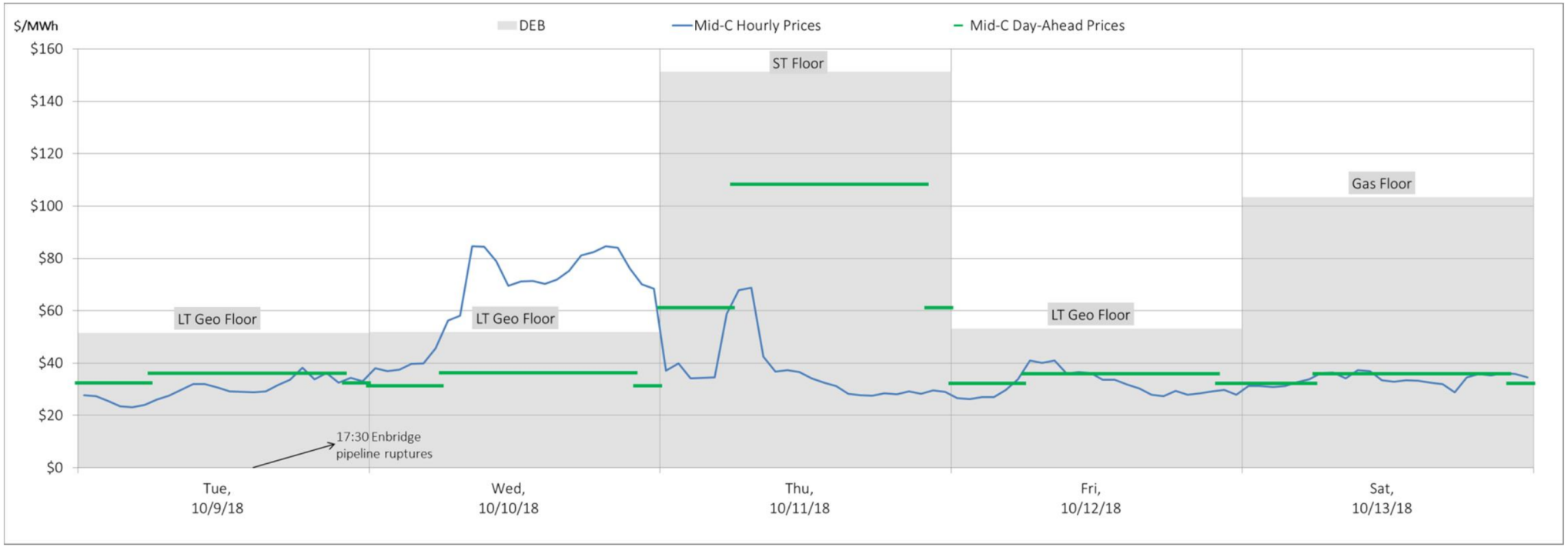
DEB Response - Anticipated Event



- **Event Description:** NW cold snap with temperatures regularly more than 15 degrees below average and spanning a holiday weekend. Holiday trading exacerbated the normal lag between trading day and delivery day (DA price on 1/17 determined on 1/13).

- **Observations:** Highlights the downside of the Gas/NW trading schedule as the DEB is indexed to stale NW day-ahead prices. NW hourly prices remain high during the morning and evening peak hours. Premature dispatch is largely avoided, preserving limited energy for periods of high market stress. Hydro resources participating in the EIM during the stress periods would have been awarded a price lower than a NW hourly indexed price if they were found to have market power.

DEB Response - Unanticipated Event



- **Event Description:** The Westcoast Pipeline explosion occurred late on October 9, 2018, and significantly impacted the main route for supplying natural gas to western Washington and Oregon. The reduced supply immediately caused industrial demand and gas-fired power generation to drop and resulted in elevated prices for natural gas and power within the region.
- **Observations:** Given the timing of the event, the DEB response is delayed. Hydro resources participating in the EIM during the event would have been awarded a price lower than NW hourly indexed price if they were found to have market power.

Summary

- The current CAISO proposal balances competing objectives
  - opportunity cost nature of hydro
  - efficient and economic market outcomes
  - current and future resource participation levels

- During the stress periods, the dispatch of hydro generation remained as planned through out the duration of the event

- While infrequent, there are conditions when hydro resources participating in the EIM would have been awarded a price lower than NW hourly indexed price if they were found to have market power.

- Current proposal addresses concerns. In addition, BPA may avail itself of any DEB option, including a negotiated option.

Structured Scenario: Base Case

Structured Scenarios: Overview

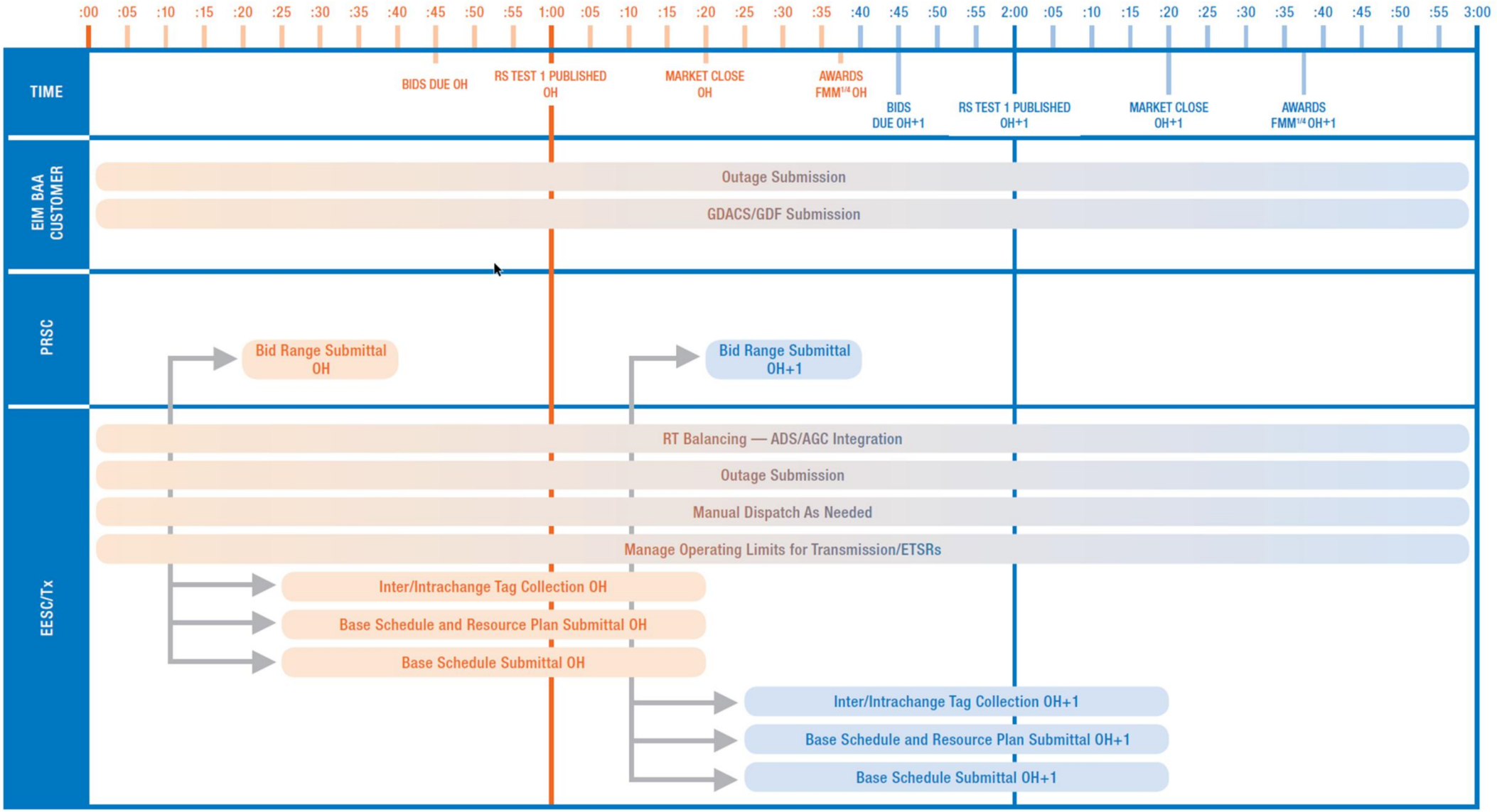
- BPA will use structured scenarios, or “table tops”, to walk through EIM mechanics for customers and stakeholders.
- These structured scenarios are intended to provide education and to identify how certain activities would impact EIM operations and settlements.
- These outcomes should help customers and stakeholders begin to understand how BPA’s EIM participation would:
  - Potentially impact their business and operations, and
  - Help them prepare for how EIM issues would be addressed in upcoming Rates and Terms & Conditions Cases.

Structured Scenarios

	Transmission Congestion In Market	Participating Resources	Scheduling	Real-Time Reliability Actions (Out of Market)
Scenario 1: Base Simple	• None – ETSRs and internal constraints are non-binding	• FCRPS aggregated into three zones	• All base schedules (inter and intrachange) completed by T-40 and flat for the hour	• None
• **Scenario 1a: Base with Export Reduction**	• "	• "	• All base schedules (inter and intrachange) completed by T-40 with reduction in exports within the hour at XX:10 by 75 MW	• "

Structured Scenario: Base Case

The base case scenario describes what actions BPA would take to engage in the EIM market during specified operating hours (OH).



Key Roles in EIM for Structured Scenarios

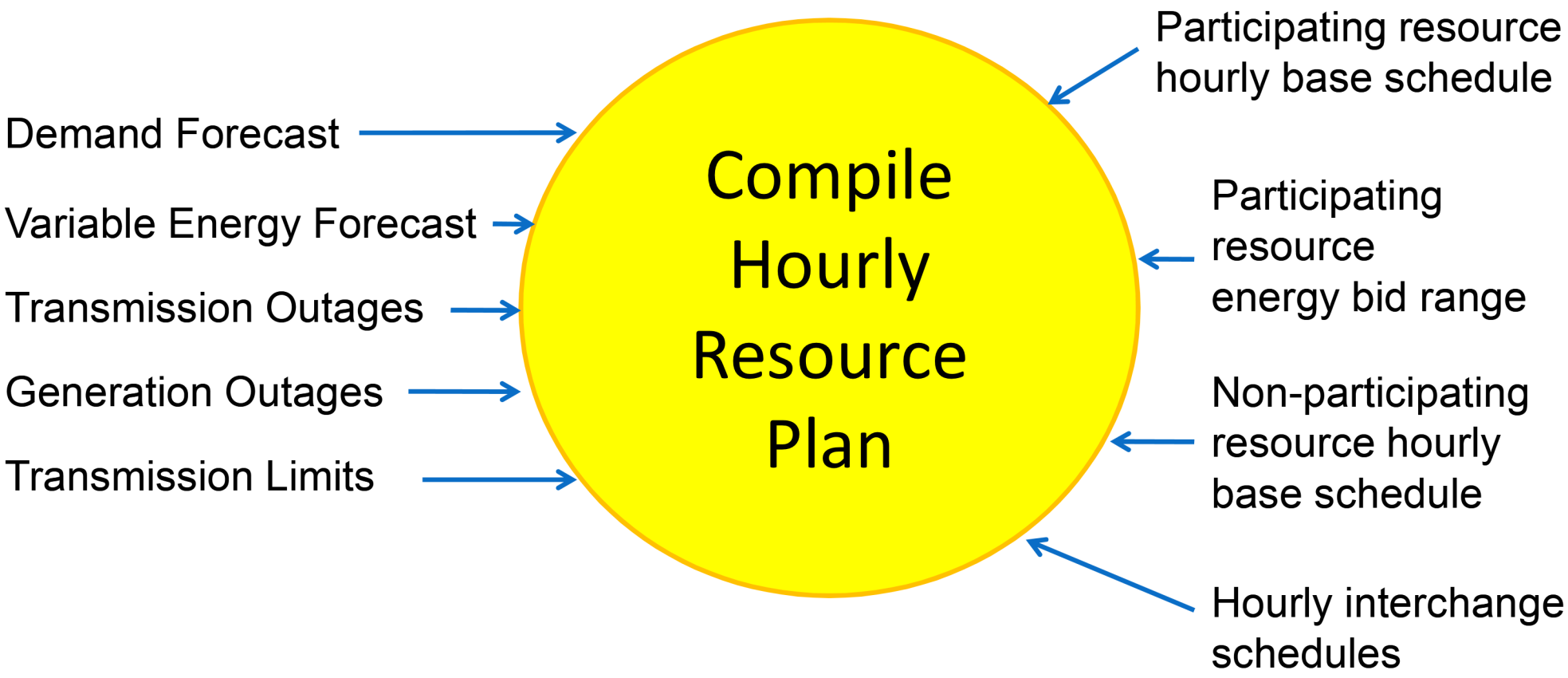
- EIM Entity Scheduling Coordinator (EESC)
  - Directly interfaces with both BPA Balancing Authority (BA/BAA) customers and with the CAISO.
  - Manages systems and processes related to real-time balancing, scheduling/tagging, and submission of Resource Sufficiency (RS) and interchange data to CAISO.
  - Settles financially with the CAISO for the BAA invoices and with customers for BPA's own Ancillary and Control Area Services (ACS) invoices.

- Participating Resource Scheduling Coordinator (PRSC)
  - May be fulfilled in BPA or customers (non-BPA) may also serve in this role.
  - Submits bids for Participating Resources.
  - Settles directly with the CAISO for Participating Resource Invoices

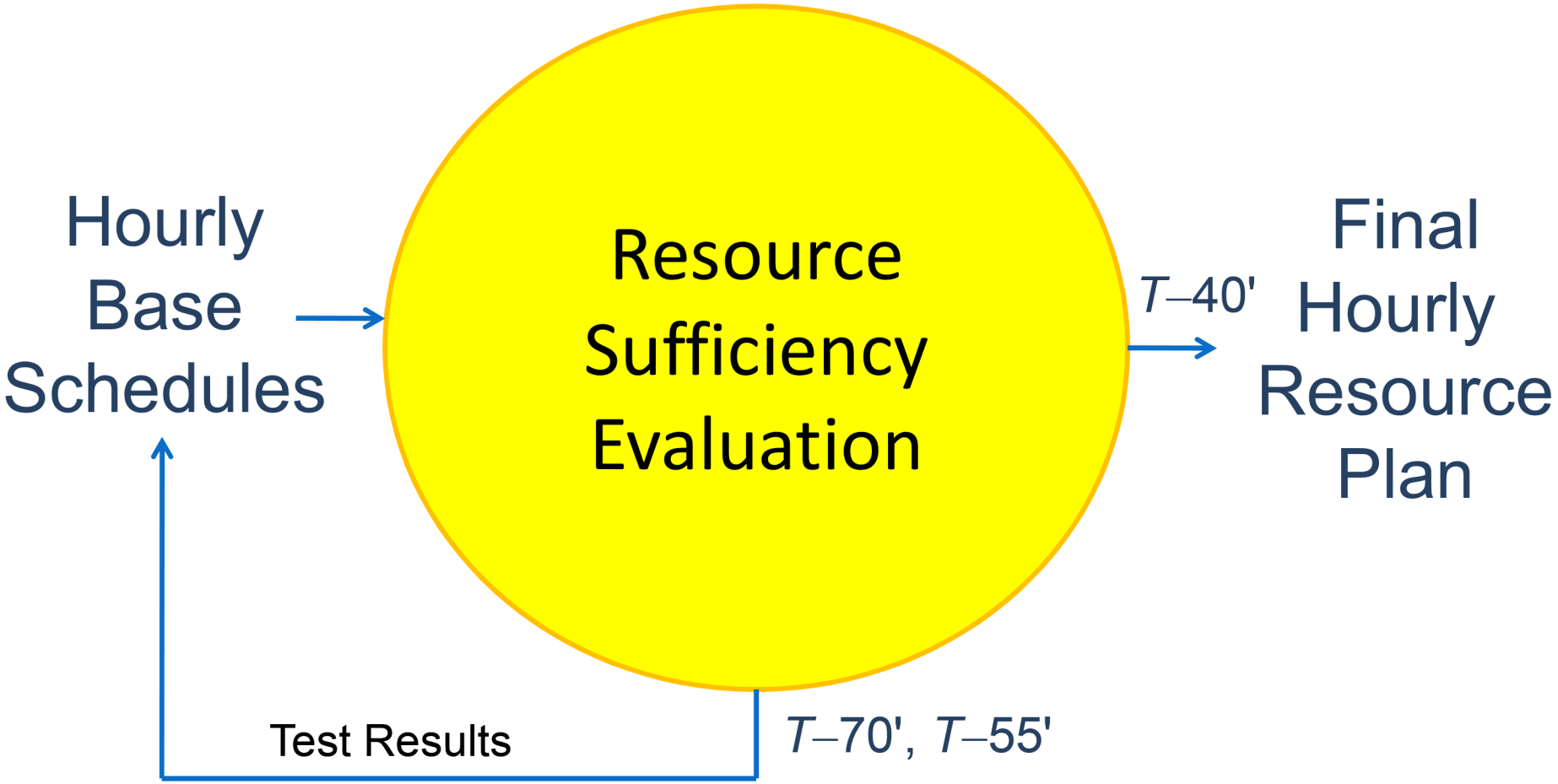
Key Roles in EIM for Structured Scenarios

- BPA BA Customers
  - Individual, non-BPA customers, may perform multiple functions when we join the EIM.
  - Non-load following customers will need to submit base schedules for load and resources to the EESC. This information is used for the EESC submission of the EIM Entity Base Schedule and Resource Plan.
  - Interacts directly with the EESC, not the CAISO if they don't own a Participating Resource.

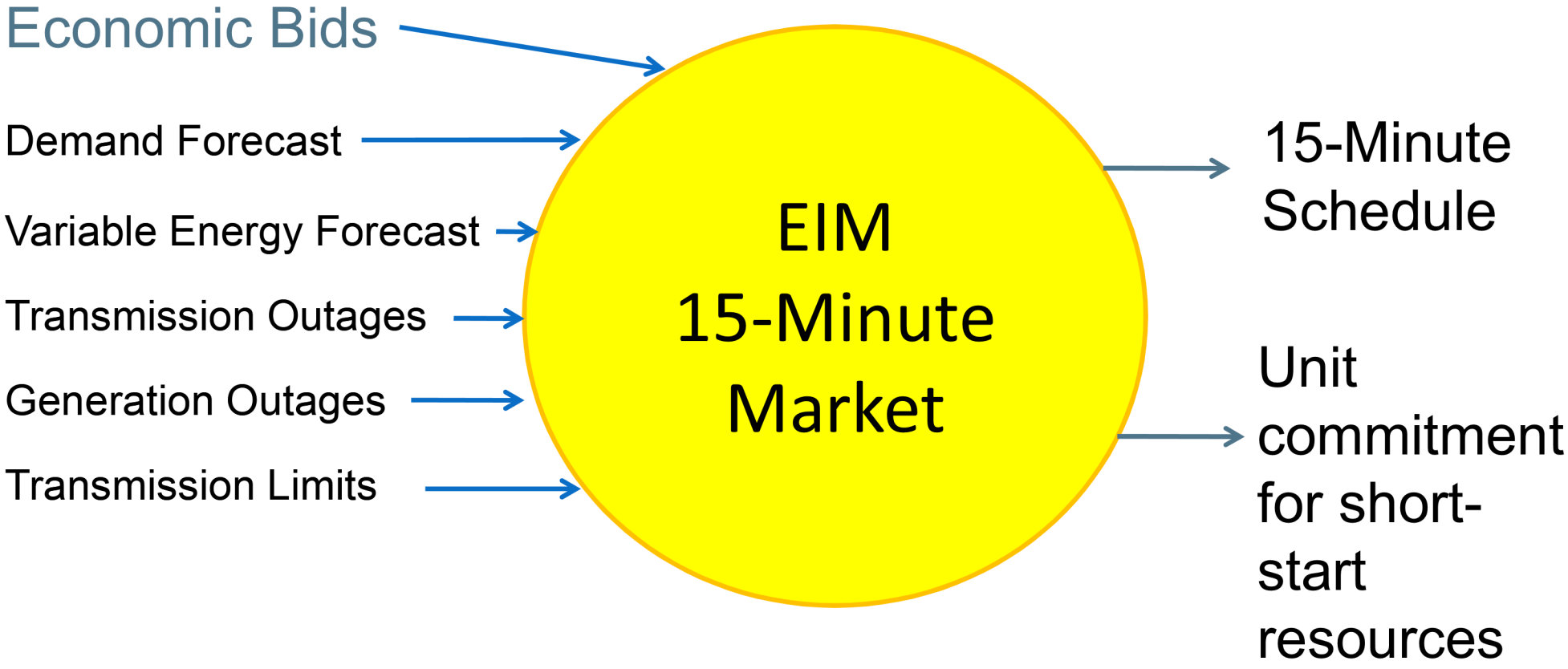
Market Activities



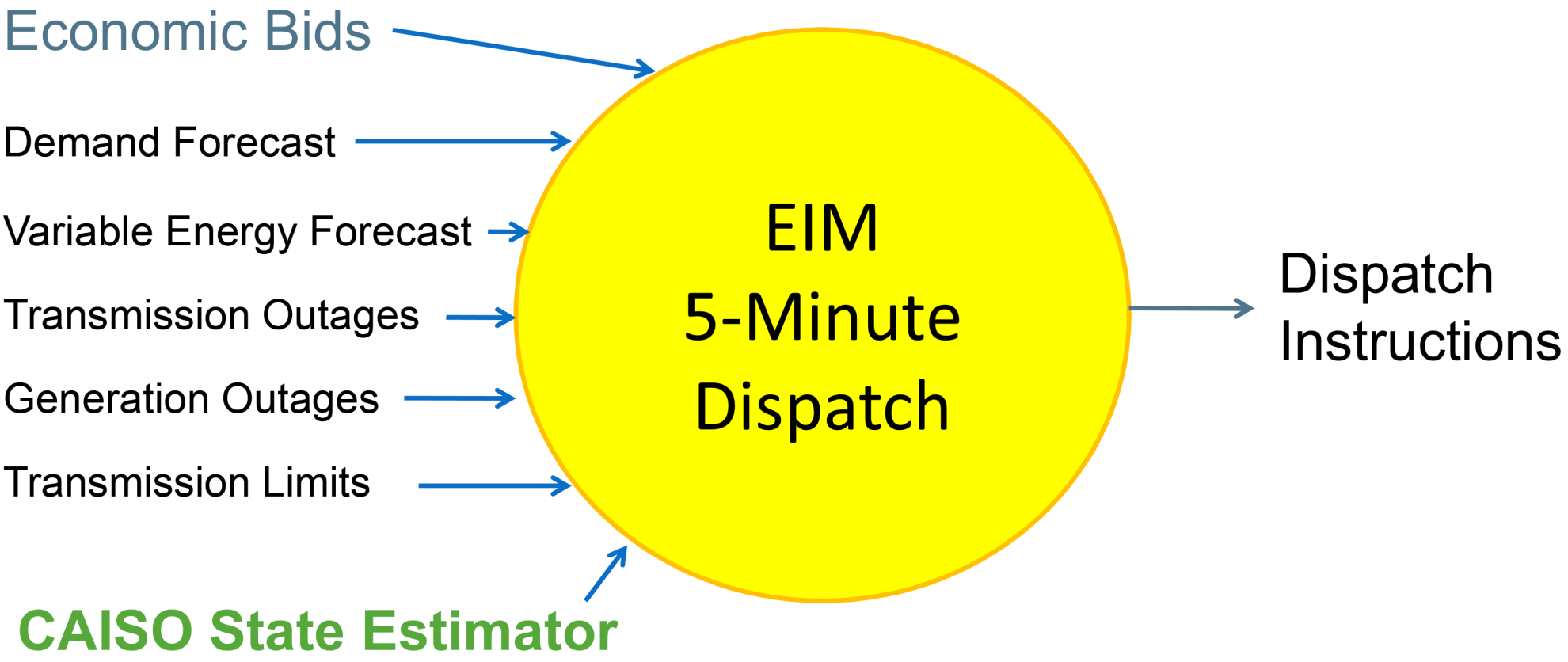
Market Activities



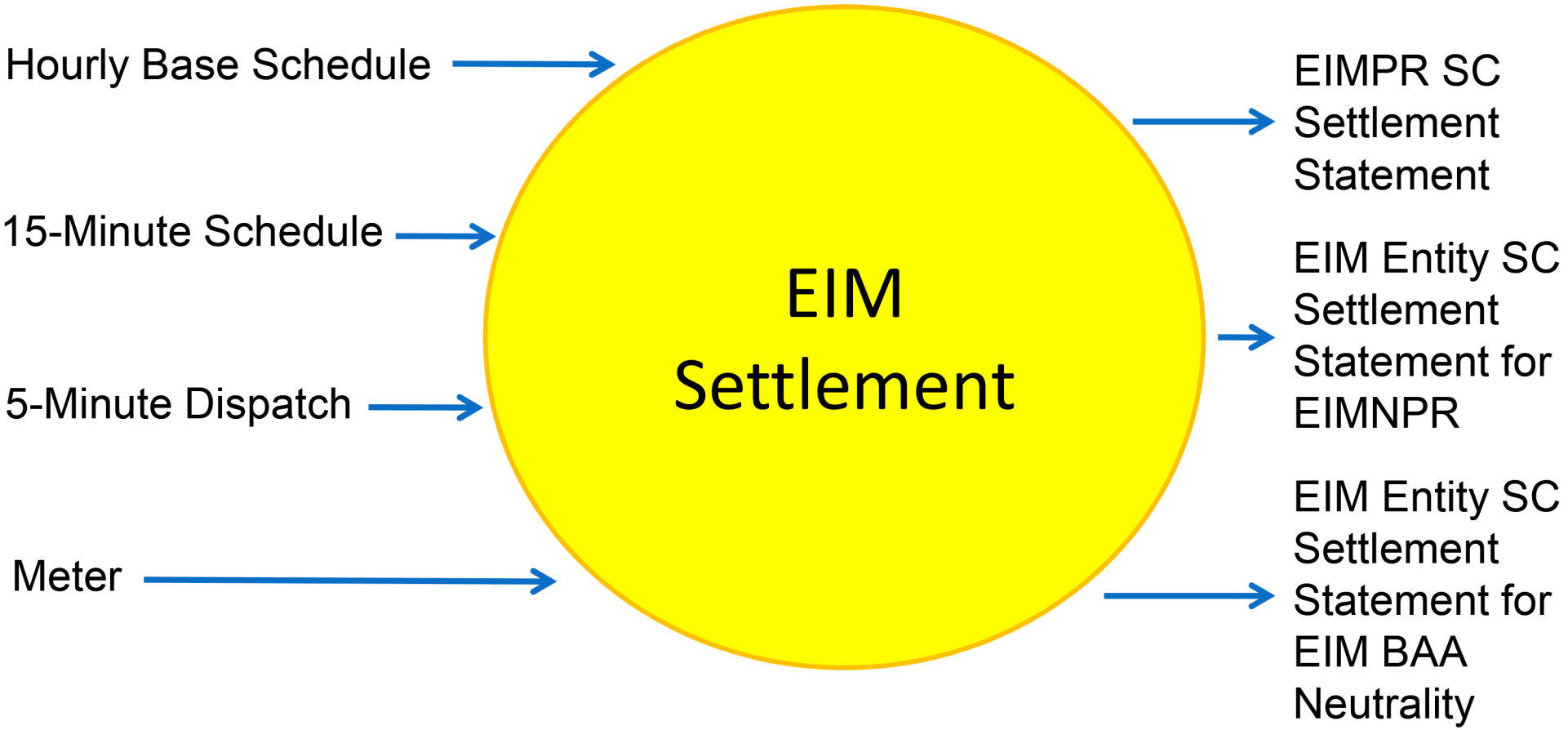
Market Activities



Market Activities



Market Activities



Structured Scenario: Base Case

- Today's focus is on a "Base Case", which is an extremely simplified example of EIM Operations intended to create a foundation of essential EIM functions.

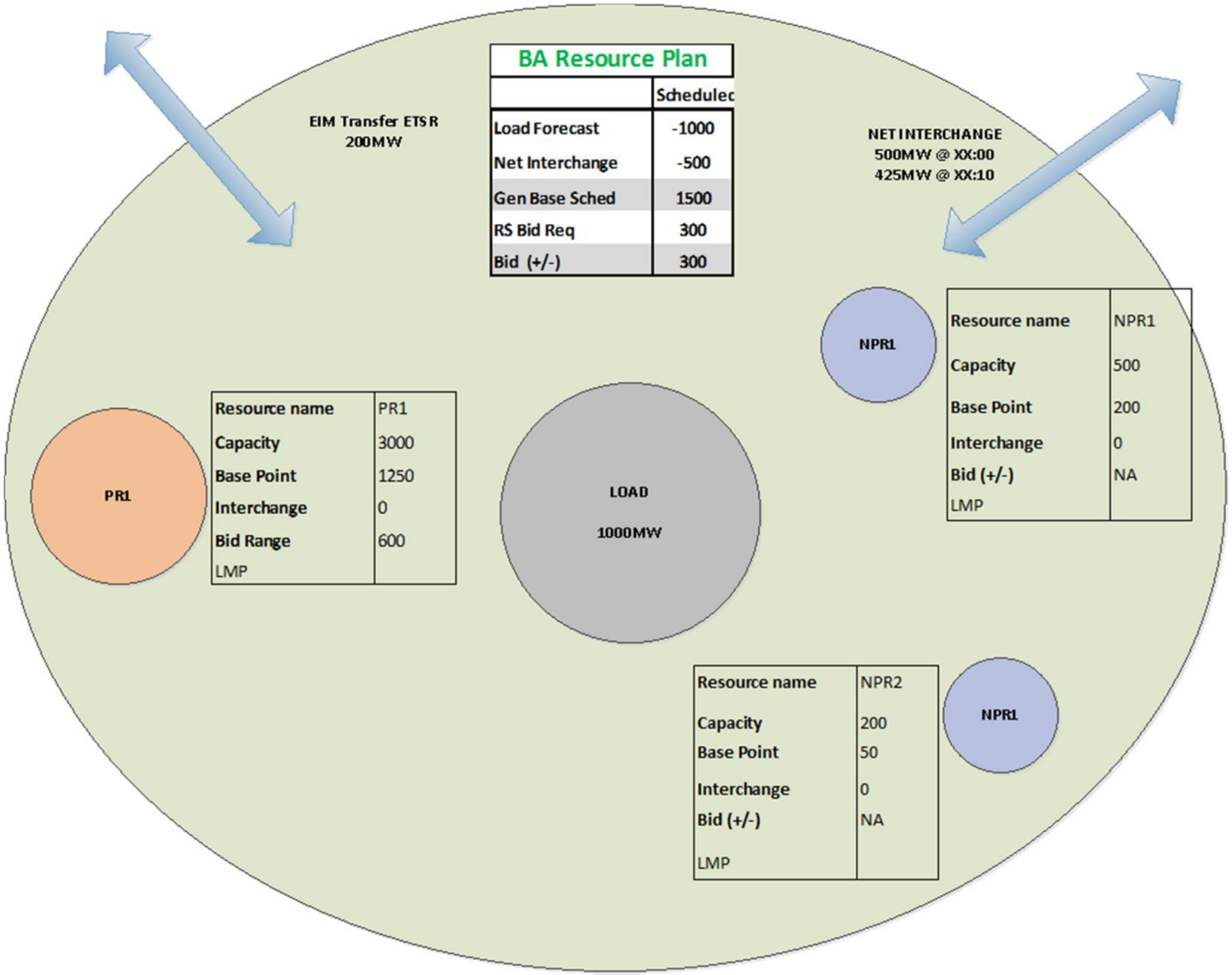
- This case is not meant to represent how BPA's actual operations would work, rather to provide a sort of "pure" example from which future scenarios and analysis can be compared.

- As such, assumptions are made for the purpose of the Base Case for multiple decisions that have not yet been made by BPA.

Base Scenario with Interchange

- Today's scenario has one source of imbalance, which is a reduction in interchange.
- Absent an auto-match the market will match the interchange deviation.
- Though there are 200MW of ETSR's made available this scenario assumes the single Participating Resource in the BAA is the economic resource.

Base Scenario Overview



Key Actions

- See BPA EIM Scenario Worksheet No. 1

BPA EIM Structured Scenario Worksheet

Structured Scenario Name: Base

Overview:

- This scenario is meant to establish a “base case” against which other scenarios will be compared. The Base scenario describes the simplest reasonable operational conditions and actions for an EIM Entity and the Participating Resources to successfully navigate a single operational hour. The Base Scenario will help develop a fundamental understanding of EIM requirements and impacts which will help stakeholders identify those elements that are intrinsic to EIM Participation and present a comparison for future scenarios to identify those elements which are particular BPA and to individual customer actions.

Assumptions:

- Only one PRSC Participating Resources (PR) in Balancing Authority Area (BAA)
- BPA is using the FCRPS to pass all resource sufficiency evaluations
- We will have ETSRs to donate, and non-constrained
  - Use "customer donation" for imports/exports
  - PRSC would redirect PTP for ETSRs
  - Not defining at this point which other EIM Entity BAAS we are setting them up for
- Bid=RS requirements
- Tx = EIM Entity
  - EIM Desk, Gen Dispatch, Tx Dispatch
  - Questions about where functions lie - EIM Desk, integrated throughout Tx, or relationship with PG et al.
- Default Energy Bid (DEB) Reference price set in DA
- Can hit whole bid range in any interval for the purposes of the Flexible Ramp Sufficiency Tests
  - I.e., not ramp limited from hitting any Dispatch Operating Target (DOT)

BPA EIM Structured Scenario Worksheet: Actions

Structured Scenario Name: Base

Up to T-55	
PRSC	• Submit bids for OH (300MW) • Update Base Schedules for OH (1250MW/0MW) • Update GDFs for OH • Submit ETSR Tags (XMW) for OH (200MW)
EESC/Operations	• Pull tags and populate Base Schedule for OH (1500MW) • Update ETSR limits (</= ETSR Tags) for OH (200MW) • Update outages and other transmission limits for OH • Evaluate preliminary RS Tests for OH
Customers	• Submit Base Schedules (200MW/50MW) • Submit tags for inter/intrachange for OH • Submit ETSR tags if desired for OH

T-55 to T-40	
PRSC	• Preparing bids for next OH1 • Update ETSR tags for OH if needed/directed
EESC/Operations	• Update Base Schedules and finalize Base Schedules and Resource Plan for OH • Outages and transmission limits as needed for OH
Customers	• Updating schedules as desired/directed for OH

BPA EIM Structured Scenario Worksheet: Actions

Structured Scenario Name: Base

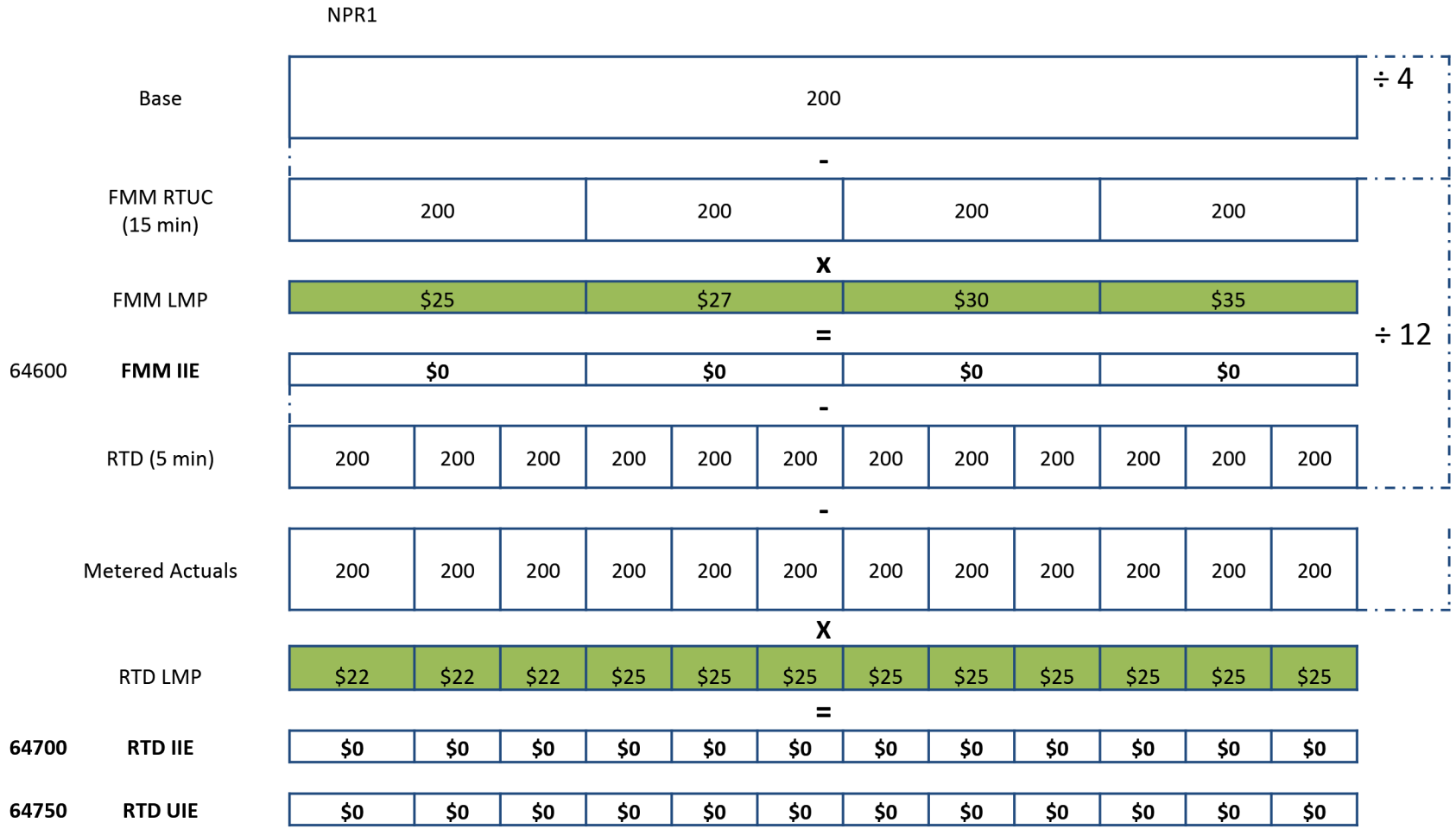
	T-40 to Start of OH
PRSC	• Submit Bids for OH1 • Submit ETSR for OH1 • Outages for PR as needed for OH • Update ETSR tags for OH as desired/directed
EESC	• Receive and implement initial dispatches and operations for OH • Update outages as needed for OH • Implement schedule updates and communicate to MO as needed for OH • Pull tags and populate Base Schedule for OH1 • Update ETSR limits (</= ETSR Tags) for OH1 • Update outages and other transmission limits for OH1 • Evaluate preliminary RS Tests for OH1
Customers	• Update tags as desired/directed for OH • Submit tags for inter/intrachange for OH1 (Reduction of 75MW at XX:10) • Submit ETSR tags if desired for OH1

BPA EIM Structured Scenario Worksheet: Actions

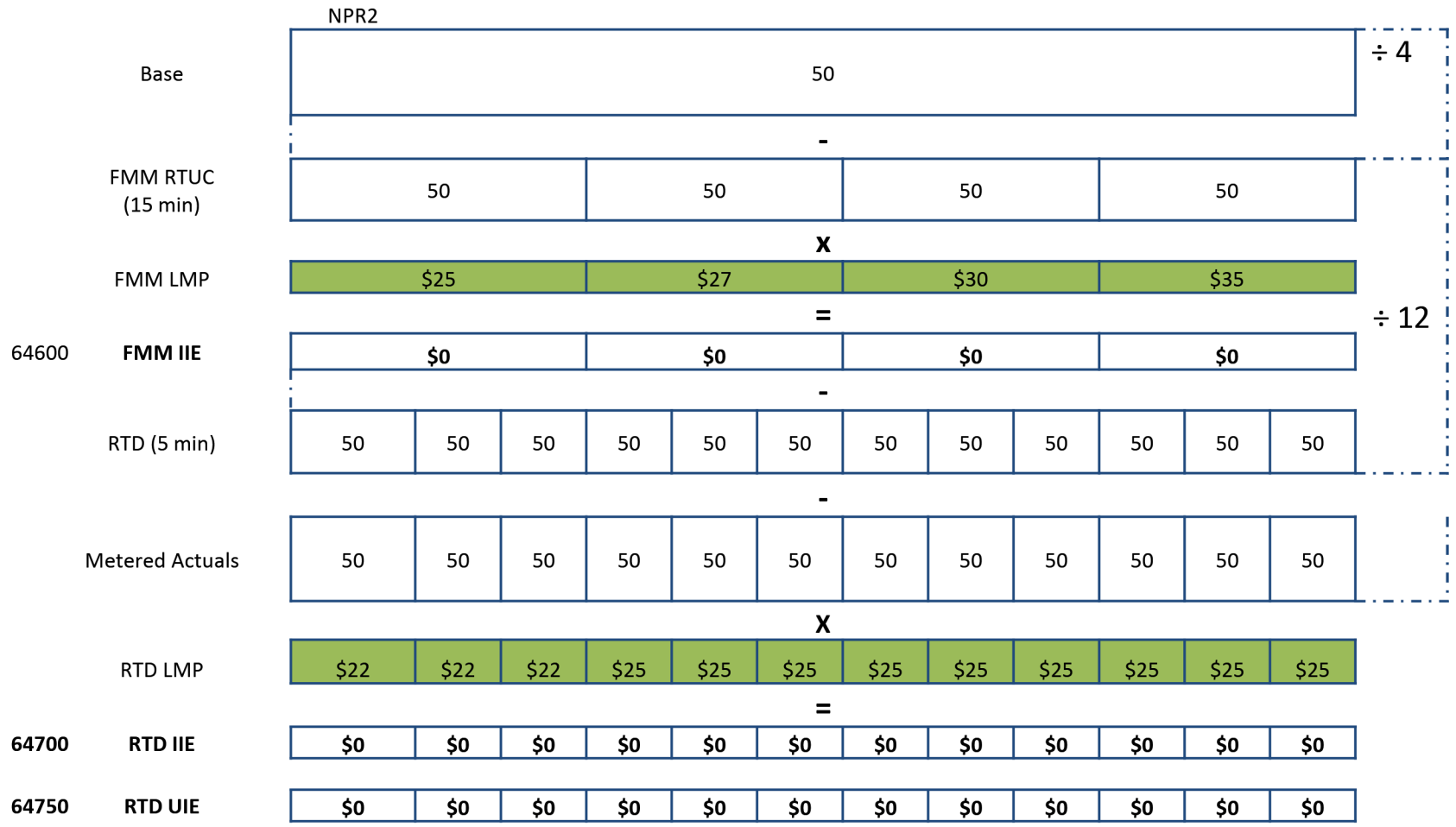
Structured Scenario Name: Base

	Operating Hour (Entire Hour)
PRSC/Bulk Marketing	• Outages as need for OH • Update ETSR tags as needed for OH1 • Submit Bids for OH2 • Submit ETSR tag for OH2 • Outages for PR as needed for OH1
EESC/Operations	• Receive and implement remainder of dispatches and operations for OH • Manage Outages and communicate to MO for OH • Receive and implement initial dispatches and operations for OH1 • Update outages as needed for OH1 • Implement schedule updates and communicate to MO as needed for OH1 • Pull tags and populate Base Schedule for OH2 • Update ETSR limits (</= ETSR Tags) for OH2 • Update outages and other transmission limits for OH2 • Evaluate preliminary RS Tests for OH2
Customers	• Update tags for as desired/directed for OH • Update tags as desired/directed for OH1 • Submit tags for inter/intrachange for OH2 • Submit ETSR tags if desired for OH2

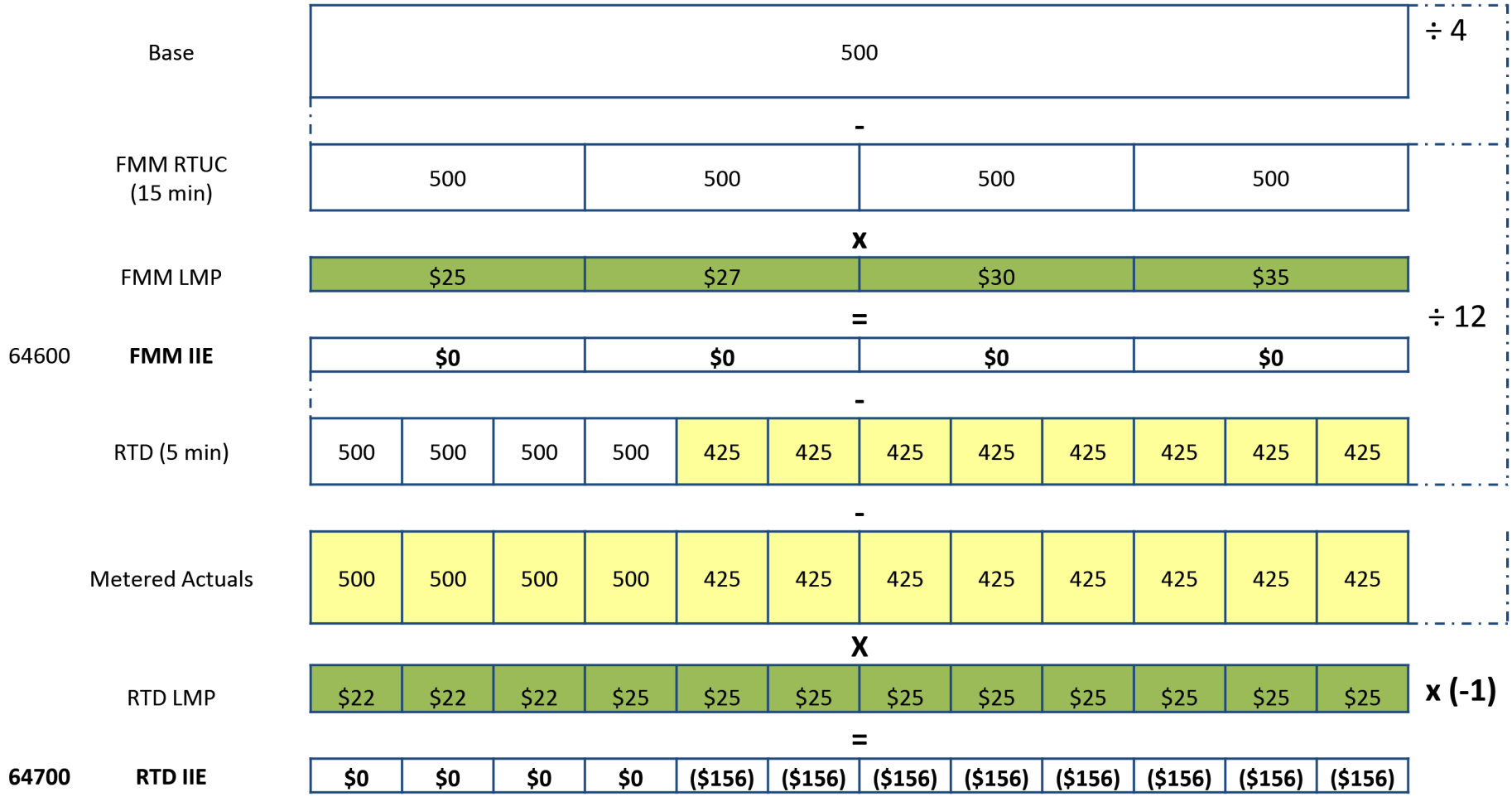
Settlement Activities NPR1



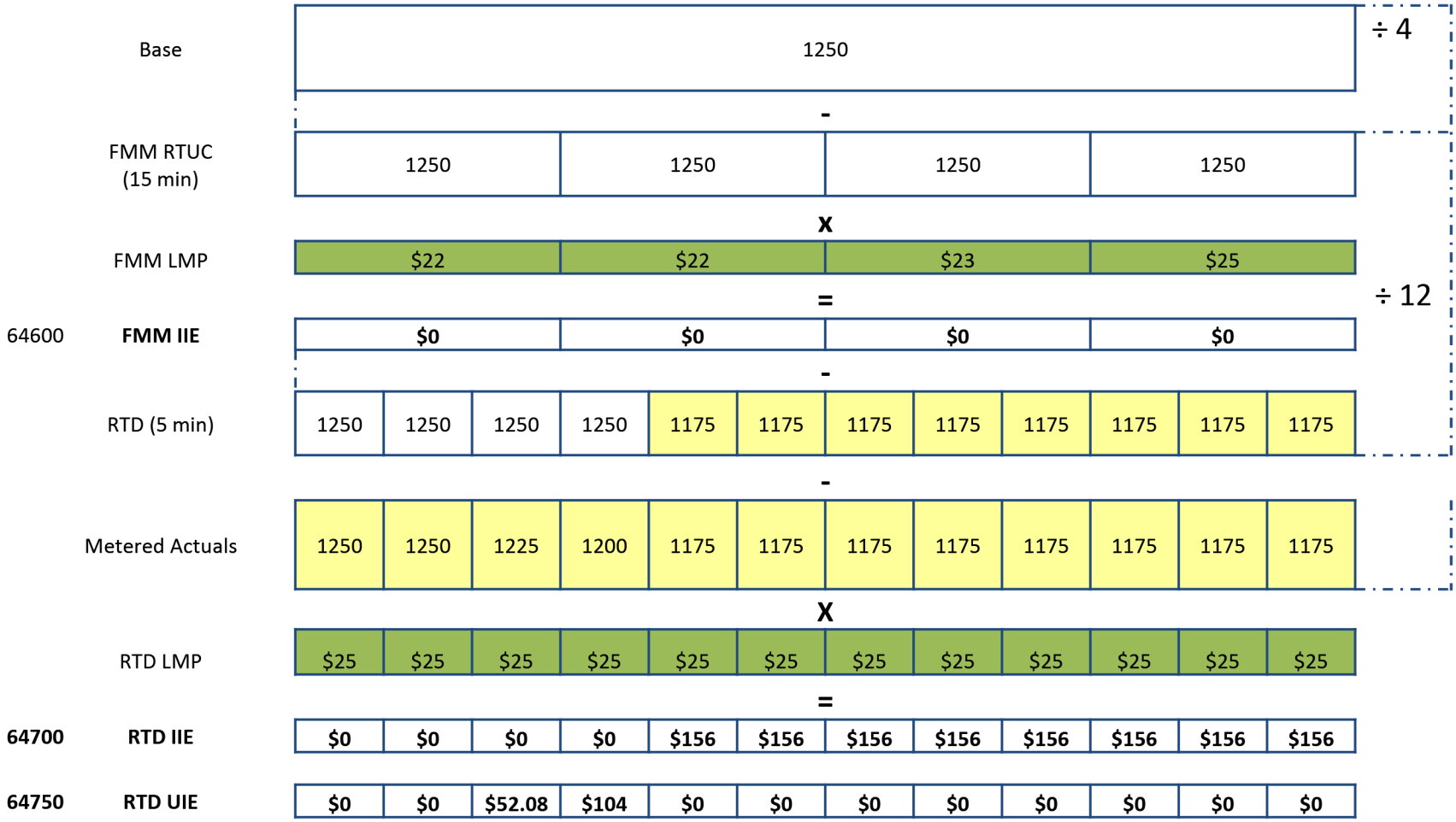
Settlement Activities NPR2



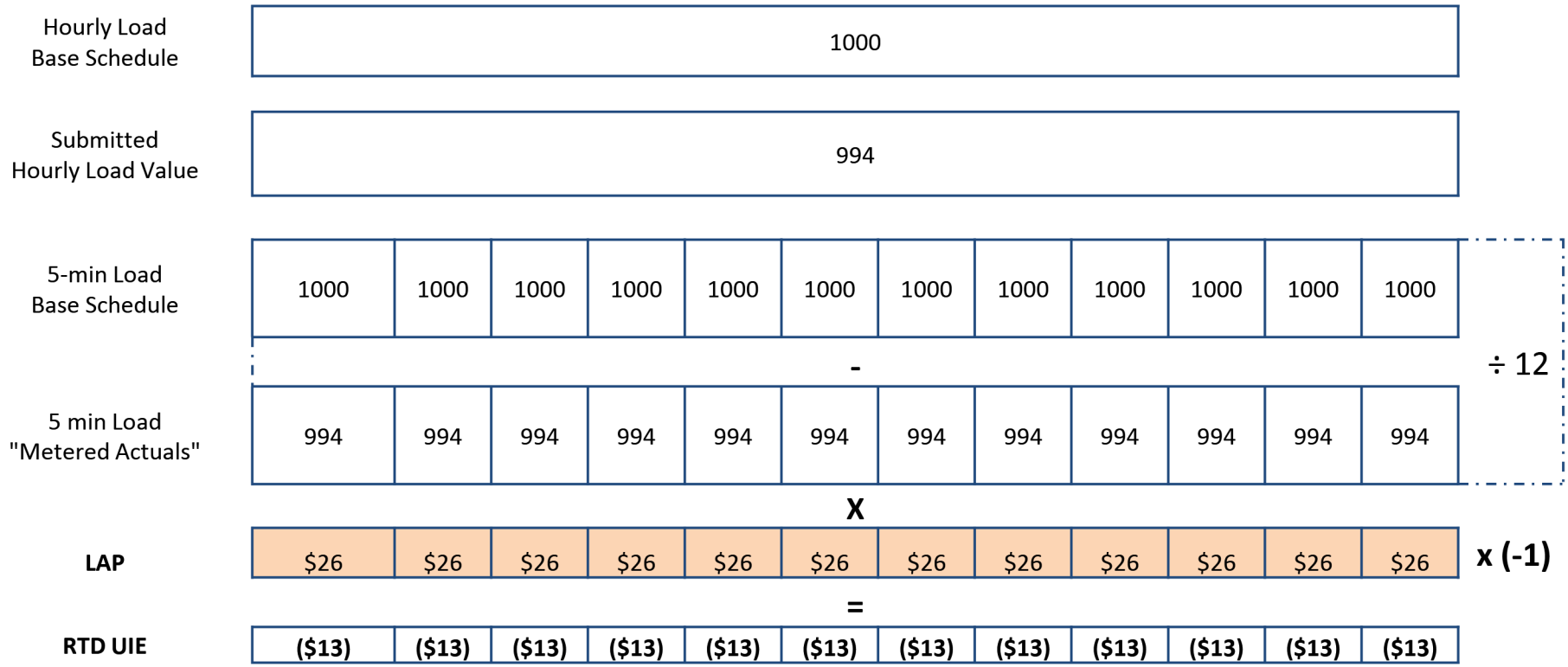
Settlement Activities Interchange



Settlement Activities PR1



Settlement Activities Load



Outcomes

- The EIM Entity ends up collecting ~$1404 due to the reduction in exports.
  - Interchange for $1248 and Load for $156.
- The Participating Resource pay ~$1404 for decrementing it's resource.
- On balance the market is revenue neutral.
- **NOTE** – This example is purposefully very simple to demonstrate basic concepts.

Future Structured Scenarios

Scheduled for March, April and May will include:

- Slice Customers
- VERs (participating / non-participating)
- Self Supply

Next Steps

Next Steps

- Next meeting scheduled for **Wednesday March 13th** at the Rates Hearing Room. This will be an all-day meeting to discuss our first Table Top.
  - WebEx and Phone participation will be available
  - Agenda and materials will be distributed in advance via Tech Forum

- We welcome feedback on this meeting. Your comments will help shape future EIM Stakeholder Meetings, please email us at techforum@bpa.gov and reference "EIM Stakeholder Meeting" in the subject. Comments are due by March 1st Friday.

- For more information on BPA's EIM Stakeholder process and meetings please visit: https://www.bpa.gov/Projects/Initiatives/EIM/Pages/Energy-Imbalance-Market.aspx

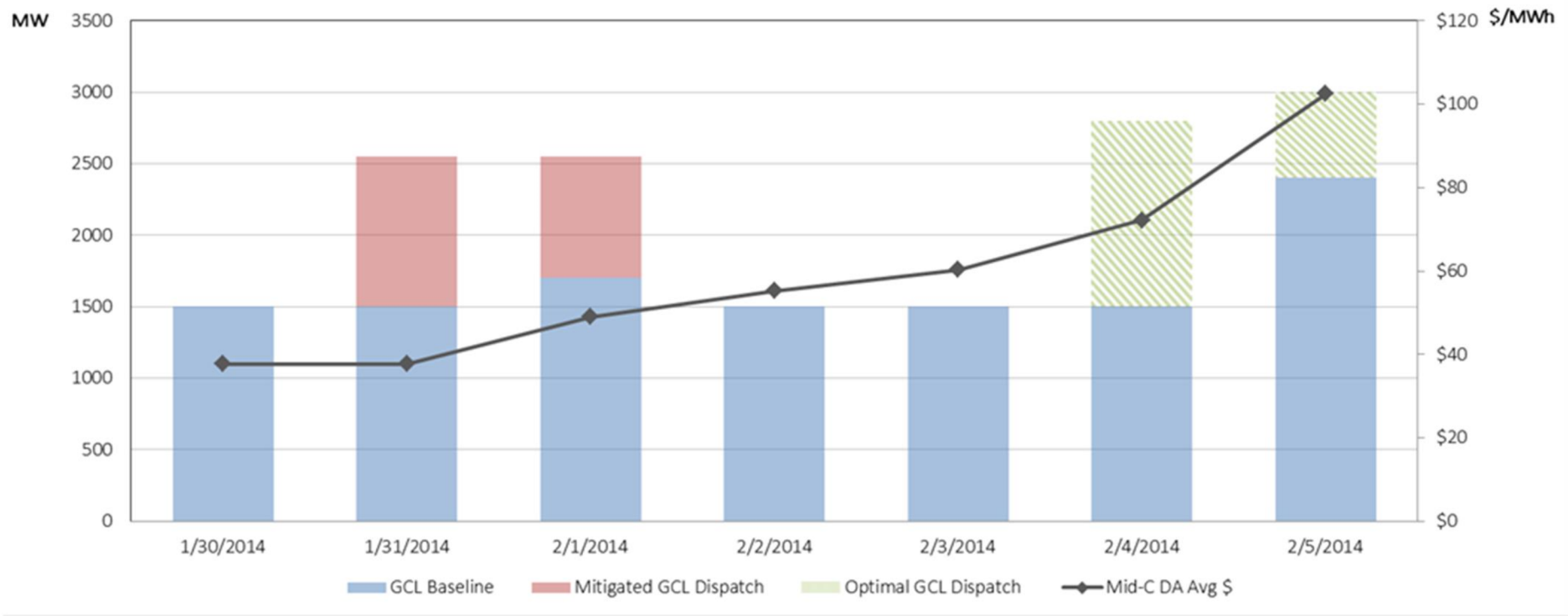
- For more information on BPA's Grid Modernization Initiative please visit: https://www.bpa.gov/goto/GridModernization

Question and Answer Session

Appendix

Why is Unintended Dispatch Bad?

- Mitigation could negatively impact FCRPS dispatch during cold snap conditions.
- An example of potential changes to GCL's dispatch is below.



EIM Stakeholder Meeting

January 16, 2019
9am -12pm
Rates Hearing Room

For our WebEx and phone participants:

- We have muted all calls on entry, if you have a question, you will need to unmute by using *6. Then please identify yourself by name and let us know who you represent.
- Please do not put this call on hold OR take other calls while you are dialed into this one.
- If we identify a noisy line, you may be disconnected from the meeting.

Agenda

9:00-9:05	• Welcome, Safety Moment, Introductions
9:05 – 9:10	• Topics for Today's Meeting • Review of BPAs EIM Principles • Review Timeline
9:10 – 10:30	• Resource Sufficiency
10:30 – 10:40	• Break
10:40 – 11:30	• Relationship of EIM to other Emerging Markets
11:30 – Noon	• Next Steps • Question and Answer Session

Topics For Today's Meeting

- Review of EIM Stakeholder Topics Discussed to Date
- Timeline Review
- Issues that BPA presented at the July 24th EIM Stakeholder meeting that we will be discussing in more depth **today**:

1.Relationship of EIM to Other Emerging Markets
2.BA Resource Sufficiency
3.EIM Settlements
4.Market Power
5.Treatment of Transmission
6.Generation Participation Model (FCRPS)
7.Governance
8.Carbon Obligation in EIM

Issues we will be discussing today.

Issues discussed at previous EIM Stakeholder meetings.

This issue will be discussed at a future meeting.

- Question and Answer Session

Statement of BPA's Principles:

1. Participation is consistent with statutory, regulatory, and contractual obligations.

2. Maintain reliable delivery of power and transmission to our customers.

3. Resource participation in the EIM is and always will be voluntary.

4. BPA's decision to participate in the EIM will be based on a sound business rationale.

Timeline Leading up to the ROD

Agendas for previous and future monthly EIM Stakeholder meetings:

July 24	•Grid Modernization Overview, Strategic Plan Connection, Intro to 8 Issues BPA is Reviewing, Initial Cost Benefit Analysis
September 13	•EIM 101
October 11	•Process Plan, Transmission, Generation, Governance
November 14	•Process Plan, Market Power
December 18	•Settlements, Non-Federal Generation Participation
January 16	•Resource Sufficiency, Emerging Markets
February 20	•Base Case Scenario Table Top, Market Mitigation
March 13	**Table Tops:** Discussion of Impacts to Customers
April 10	
May 15	
June	
July	•Letter to the Region with a 30 day public comment
August	•BPA drafts Record of Decision (ROD)
September	•Final ROD for signing the EIM Implementation Agreement

These meetings will be full day.

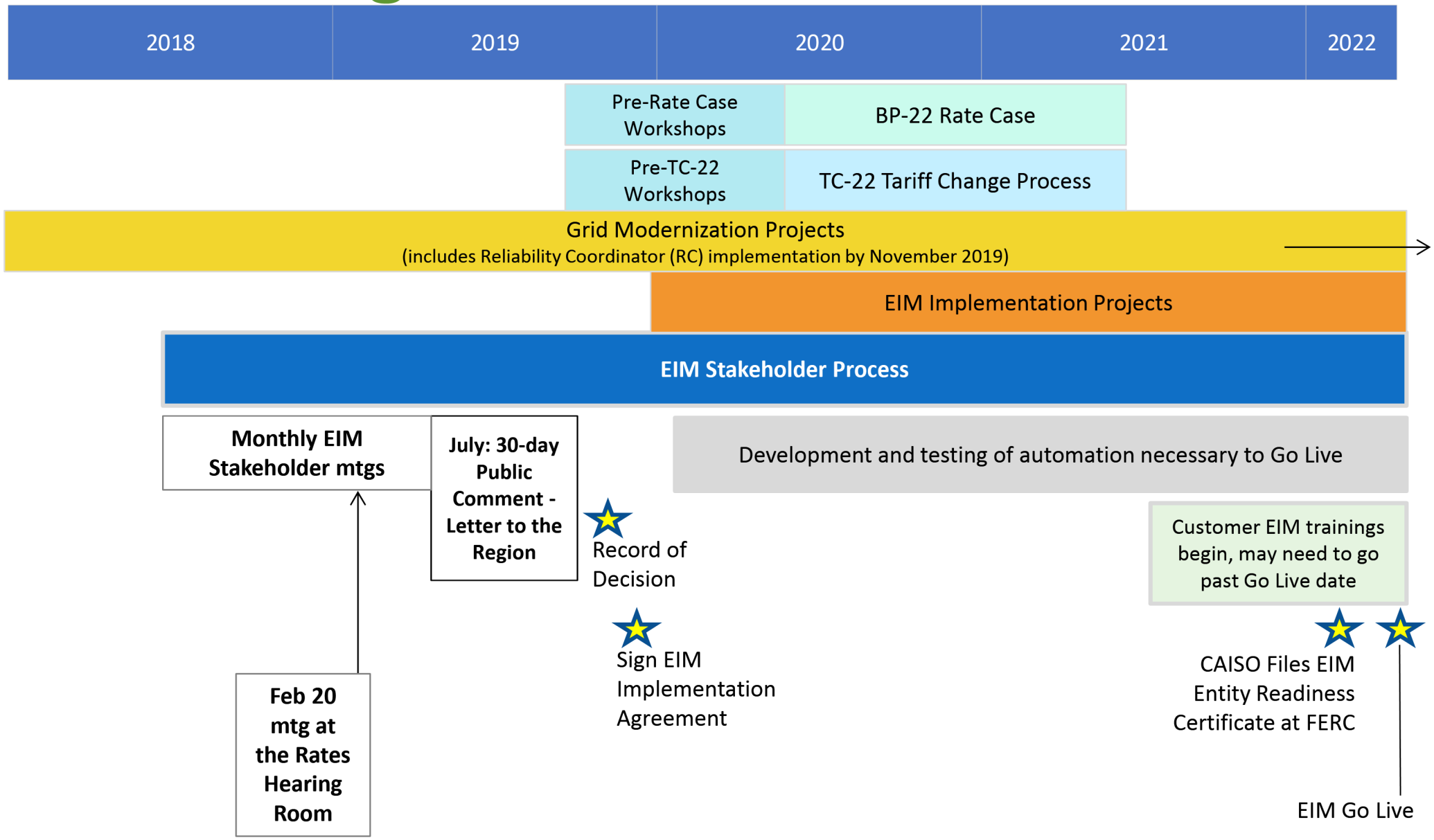
Issues to be Discussed at upcoming monthly EIM Stakeholder meetings:

1. Settlements
2. Cost Benefit Analysis
3. Market Mitigation
4. Transmission
5. Carbon Issues

Signing of the EIM Implementation Agreement authorizes BPA to begin spending on EIM implementation projects with the CAISO but does not bind BPA to join the EIM.

Previous EIM Stakeholder Meeting Materials are available here: www.bpa.gov/goto/EIM

BPA's High Level EIM Timeline



Previous EIM Stakeholder Meeting Materials are available here: www.bpa.gov/goto/EIM

What is Resource Sufficiency?

Resource Sufficiency

- The resource sufficiency (RS) evaluation determines whether each EIM BAA has procured, prior to each operating hour, sufficient resources and flexibility (both internal and external) to serve the EIM BAA's area load and load/VERs uncertainty

- The goal of EIM RS is to ensure EIM BAAs do not "lean" on other EIM BAAs in real-time
  - The EIM BAA should not need to rely on EIM Import or Export Transfers from other EIM BAAs to meet its needs

- EIM RS is not CAISO's resource adequacy program
  - The EIM does not enforce resource adequacy requirements
  - There are no capacity payments or must-offer obligations associated with RS

- If each EIM BAA procures the necessary resources to meet its own needs, then EIM BAAs shouldn't need to "lean" on other EIM BAAs in real-time for energy, capacity, flexibility, or transmission

Resource Sufficiency

- Each EIM BAA is evaluated every hour in real-time for RS based on four tests
  - Transmission Feasibility Test – not binding
  - Balancing Test – binding
  - Bid Range Capacity Test (Capacity Test) – binding
  - Flexible Ramp Sufficiency Test – binding
- The RS tests are designed to allow market participation while preventing “leaning” on the resources of neighboring EIM BAAs
- The RS tests do not determine whether an EIM BAA is meeting or can meet NERC/WECC reliability standards
- Capacity held for regulation is not considered as part of the capacity needed to meet RS
- RS tests determine the EIM Entities’ access to the full market footprint

Out of Scope for Today

- BPA understands that there are myriad complicated Resource Sufficiency questions that will need to be answered if BPA ultimately joins the EIM

- BP-22 and TC-22 processes will be where these questions are ultimately answered (including pre-rate case and pre-terms and conditions case workshops)

- We expect tabletop sessions to help articulate issues regarding some of these questions, including:
  - Load Serving Entity obligations
  - Impact of resource participation on passing RS tests
  - Self-supply of reserves and obligations for RS
  - Impact of various products on RS, including Slice

Base Schedules and Energy Bids

Base Schedules

- A Base Schedule is a forward hourly energy schedule
  - It is the reference for measuring imbalance deviations for EIM settlement
  - It includes generation and interchange schedules, and the load forecast (base scheduled load)
- Participating resource's Base Schedules are due 55 minutes before the operating hour (T-55)
- EIM Entity's final Base Schedules are due 40 minutes before the operating hour (T-40)
  - Provisional base schedules can be submitted as early as a week in advance
- Used in all RS Tests