

# 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 24<sup>th</sup> 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

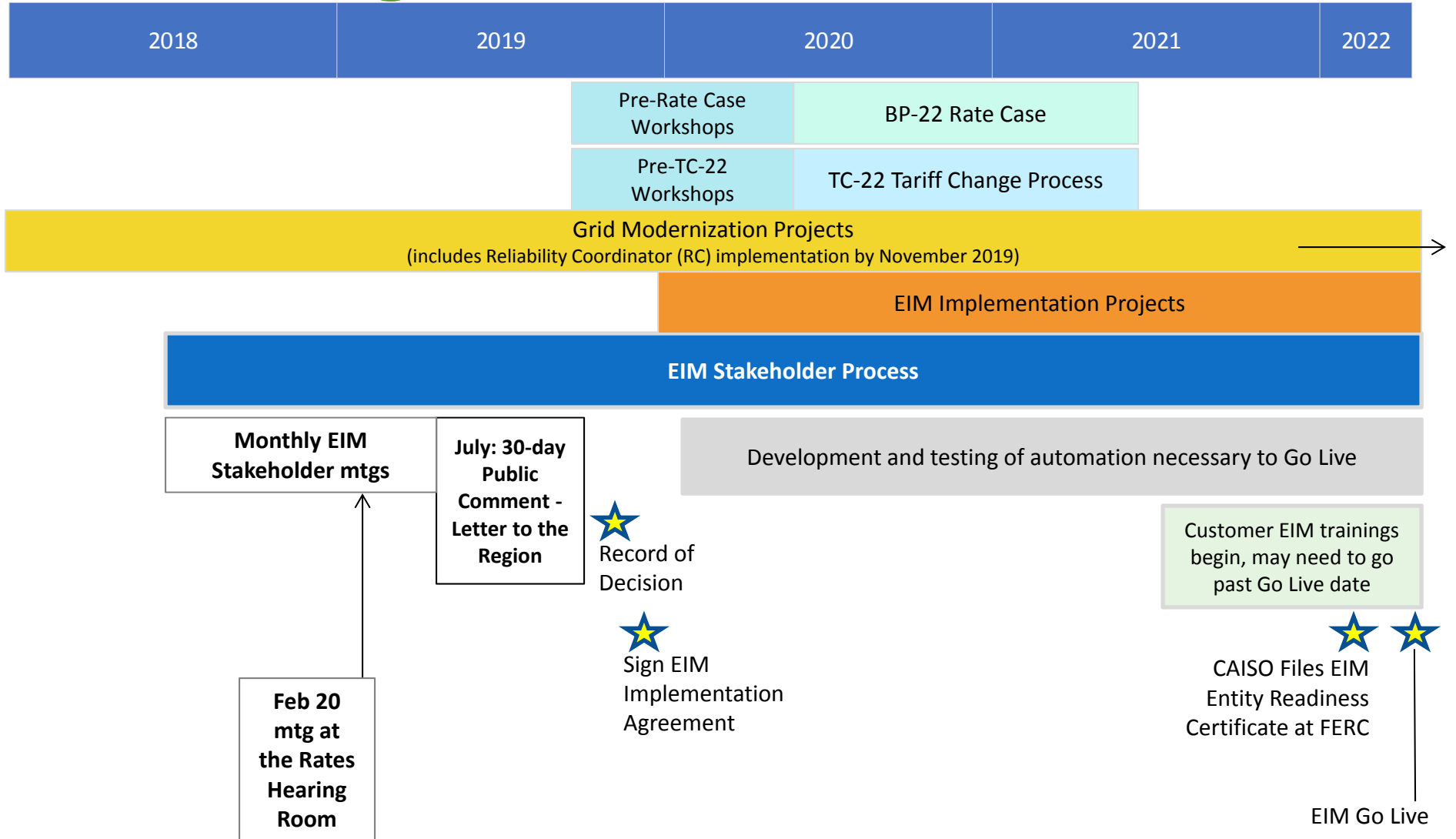
Agendas for previous and future monthly EIM Stakeholder meetings:

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	<p><b>Table Tops:</b> Discussion of Impacts to Customers</p> <p><b>Issues to be Discussed at upcoming monthly EIM Stakeholder meetings:</b></p> <ol style="list-style-type: none"> <li>1. Settlements</li> <li>2. Cost Benefit Analysis</li> <li>3. Market Mitigation</li> <li>4. Transmission</li> <li>5. Carbon Issues</li> </ol>
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.

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.

# BPA's High Level EIM Timeline



# 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

# Energy Bids

- Participating resource's Energy Bids are due 75 minutes before the operating hour (T-75)
  - Bid curves for Participating Resource dispatchable range made available to the market
- Energy bids cannot be changed after this time
- Use for Capacity and Flex Ramp Sufficiency Tests

# EIM Entity's Resource Plan



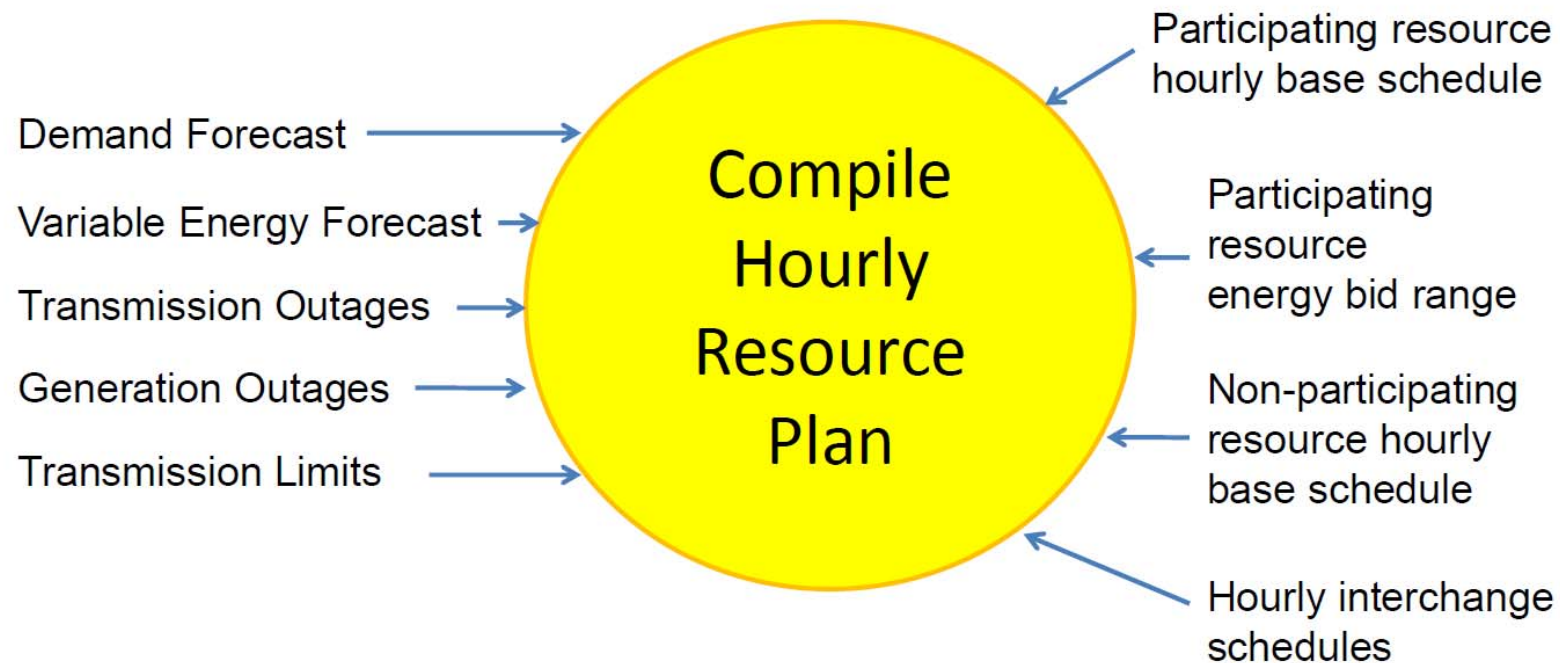
# EIM Resource Plan

- The EIM Entity submits a resource plan to CAISO every hour, which is evaluated for RS
  - BPA and customers will need systems and processes to collect information (e.g., generation schedules)
- The plan contains the resources the EIM Entity plans to use to serve the EIM BAA's load and uncertainty during the operating hour
- The Resource Plan contains:
  - Base schedules for participating resources (PRs), non-participating resources (NPRs), interchanges, and load
  - Energy bids, which are submitted only by participating resources
  - Ancillary service schedules
    - Reserves to meet NERC/WECC contingency reserve requirements
    - Capacity held for ACS, such as regulation service (sub 5-min)



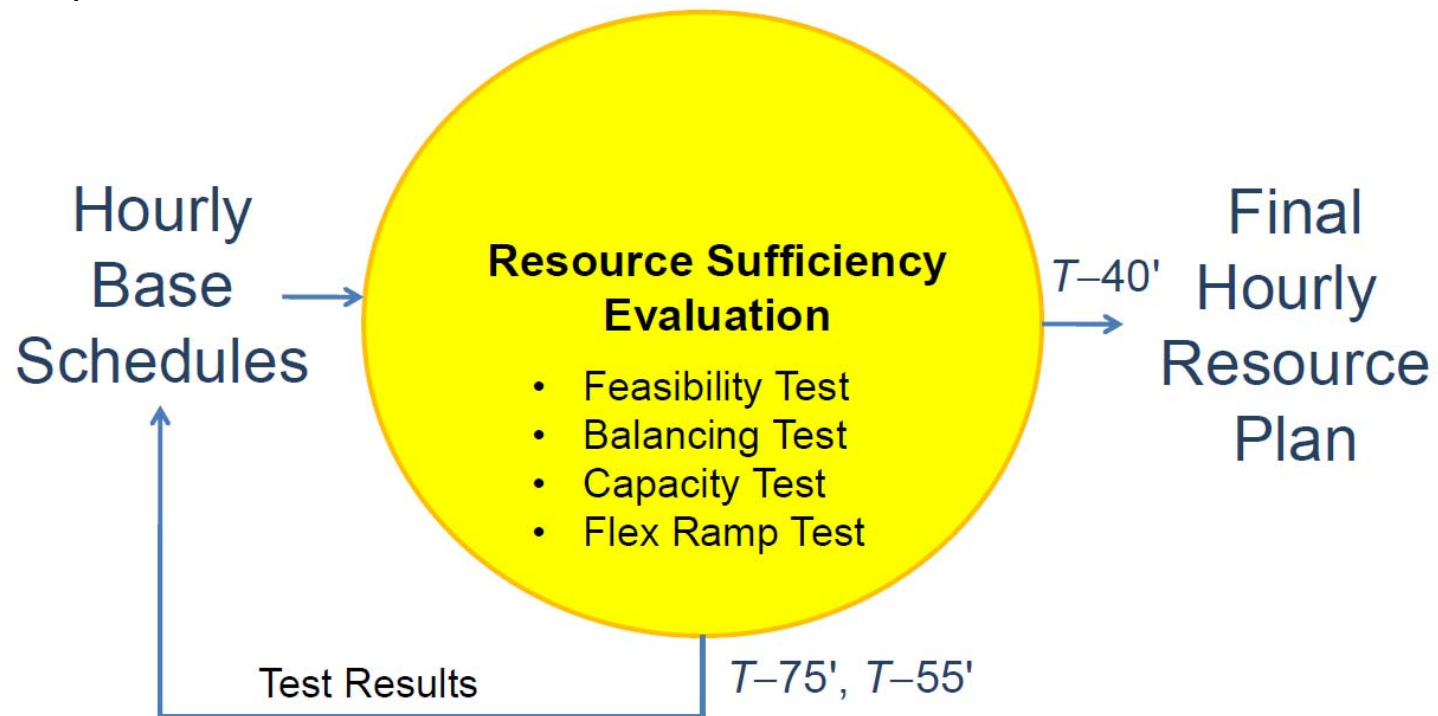
# EIM Resource Plan

An EIM Entity must submit a resource plan to CAISO every hour. The plan is evaluated for resource sufficiency.

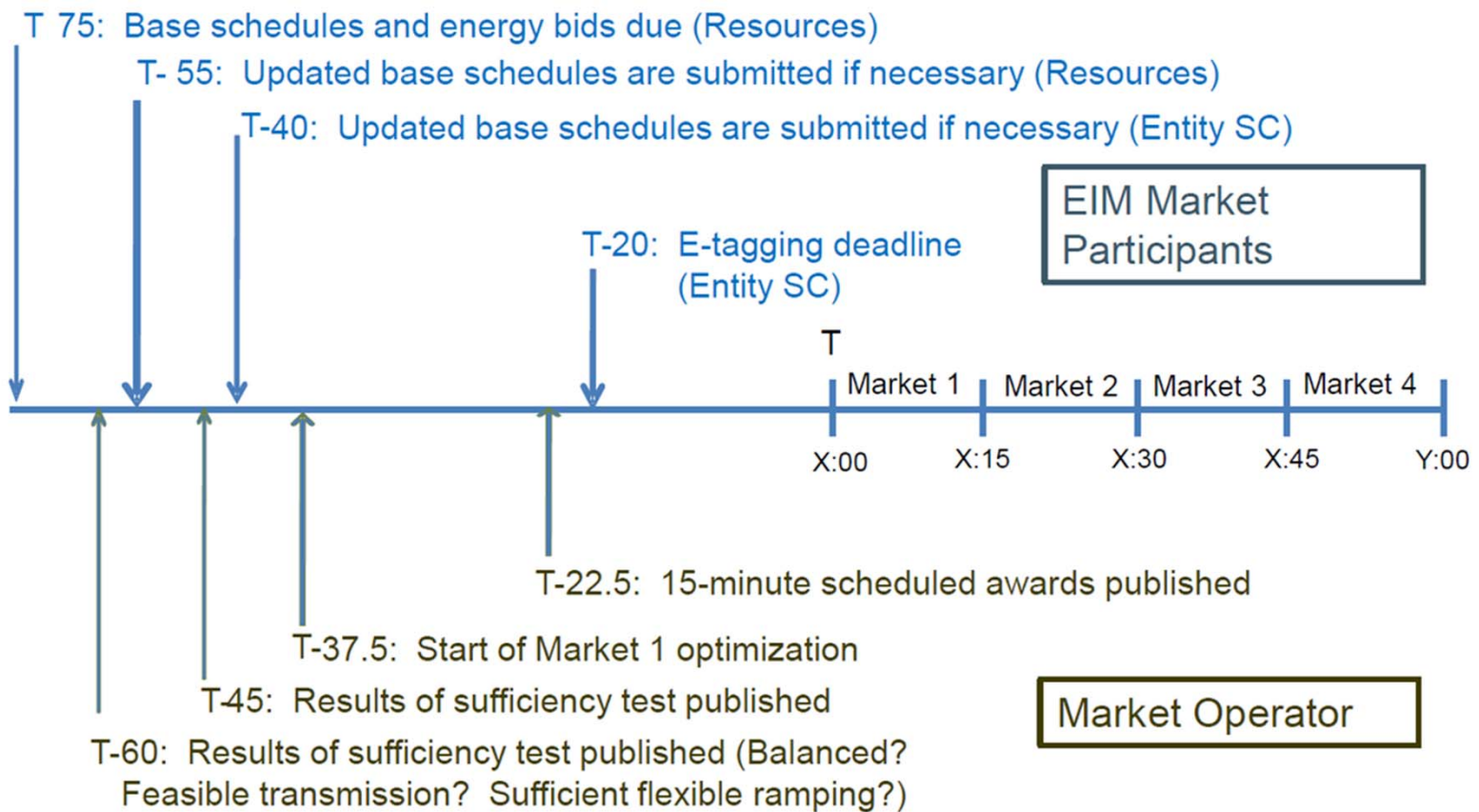


# EIM Resource Plan

The resource plan is evaluated for resource sufficiency at T-75, T-55, and T-40, at which point it becomes final. Adjustments to the resource plan are allowed up to T-40.



# RS Evaluation Timeline



# Resource Sufficiency Tests



# EIM Resource Sufficiency Tests

An EIM BAA is evaluated for RS every hour in real-time based on 4 tests, which are performed sequentially:

1. Transmission Feasibility Test
  - Identifies if base schedules are limited by congestion
2. Balancing Test
  - Ensures that the EIM Entity load/resources are balanced going into the hour
3. Bid Range Capacity Test (Capacity Test)
  - Ensures the EIM Entity has bid range to cover expected variability
4. Flexible Ramp Sufficiency Test
  - Ensures the EIM Entity has ramping capability to meet expected variability

# Test 1: Transmission Feasibility Test

This test informs the EIM Entity whether its base schedules result in transmission constraint violations within the EIM BAA:

- The test is advisory only—it's not binding
- The test provides the EIM Entity with the opportunity to resolve transmission constraint violations by adjusting base schedules prior to the operating/trading hour
- The EIM will attempt to prevent and/or resolve any transmission constraints through redispatch of participating resources, which may impact LMPs and LAPs and the congestion uplifts

## Test 2: Balancing Test

The balancing test evaluates how well the EIM BAA has scheduled to meet the forecasted load

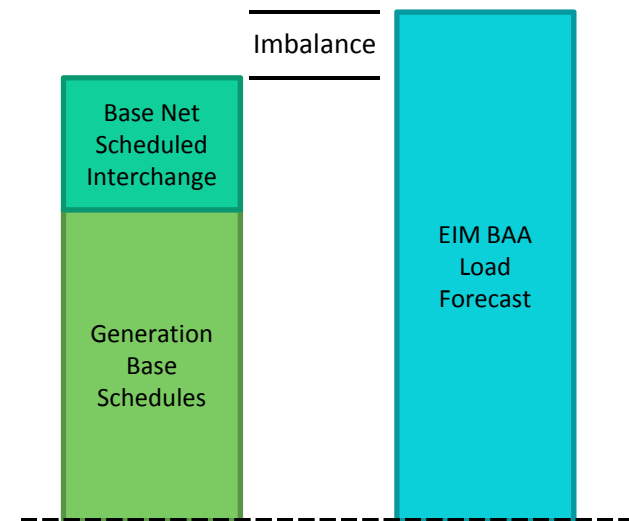
The test compares base schedules with the EIM BAA load forecast to determine whether or not the EIM Entity will be evaluated for over/under scheduling penalties:

- If the EIM Entity utilizes the CAISO's EIM BAA load forecast, it will not be evaluated after-the-fact for over/under scheduling penalties if it schedules to within 1%
- If the EIM Entity balances to an independent EIM BAA load forecast, then the EIM Entity is always evaluated after-the-fact for over/under scheduling penalties
- The Balancing Test never results in limits on EIM Import or Export Transfers
  - Least restrictive of Base EIM Transfer or Optimal transfer at T-7.5

## Test 2: Balancing test

If an EIM Entity elects to use the **CAISO's EIM BAA load forecast**, then...

- **Pass:**
  - If the imbalance is within 1%, then the EIM Entity is not evaluated for over/under scheduling penalties
- **Fail:**
  - If the imbalance is greater than 1%, then the EIM Entity is evaluated for over/under scheduling penalties
  - The EIM Entity will be charged for over or under scheduling penalties if the actual load for the hour was not within 5% of the gen and interchange base schedules minus Tx losses

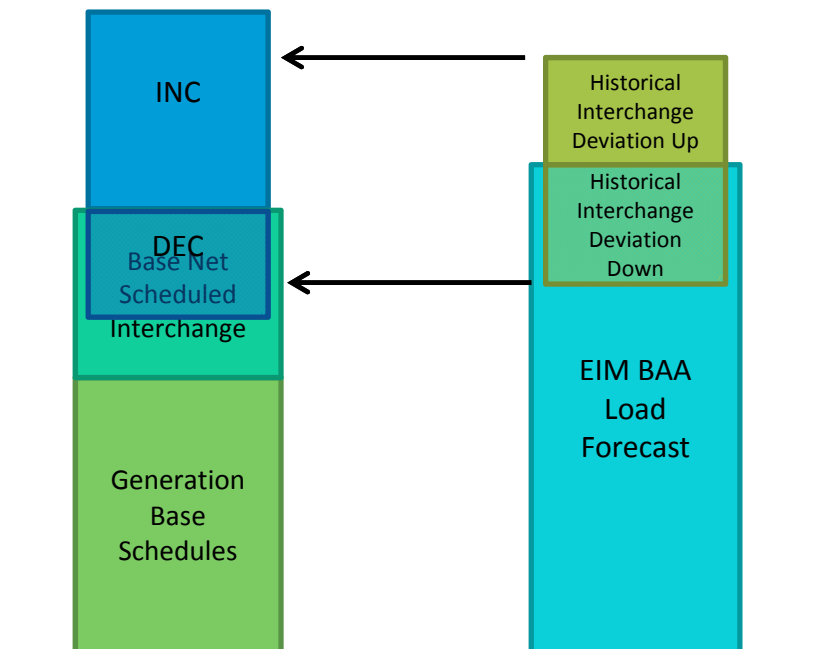




## Test 3: Capacity Test

This test evaluates whether there is sufficient upward and downward energy bid capacity from PRs to serve:

- The imbalance between the gen and interchange base schedules and the EIM BAA area load forecast, and the
- Historical up/down interchange deviations



The interchange deviation requirement is a measure of the historical difference between the base scheduled interchange @ T-40 versus the tagged interchange @ T-20

For example, the amount of interchange that was not tagged after T-40.

The interchange deviation requirement varies by hour, but is fixed for the month. It equals the P95 confidence interval of the past 3 months of historical interchange deviations.

## Test 3: Capacity Test

- **Pass:**
  - No restrictions are placed on net EIM Import or Export Transfers
  - The EIM Entity proceeds to the Flexible Ramp Sufficiency Test (Test 4)
- **Fail:**
  - If an Entity fails the upward Capacity Test, EIM Import Transfers cannot be increased from Base Transfer or Optimal transfer at T-7.5 for the hour
  - If an Entity fails the downward Capacity test, EIM Export Transfers cannot be increased from Base Transfer or Optimal transfer at T-7.5 for the hour
  - It's possible to fail in both directions
  - The EIM Entity also automatically fails the Flex Ramp Sufficiency Test (Test 4) in the direction failed for the hour

# Test 4: Flexible Ramp Sufficiency Test

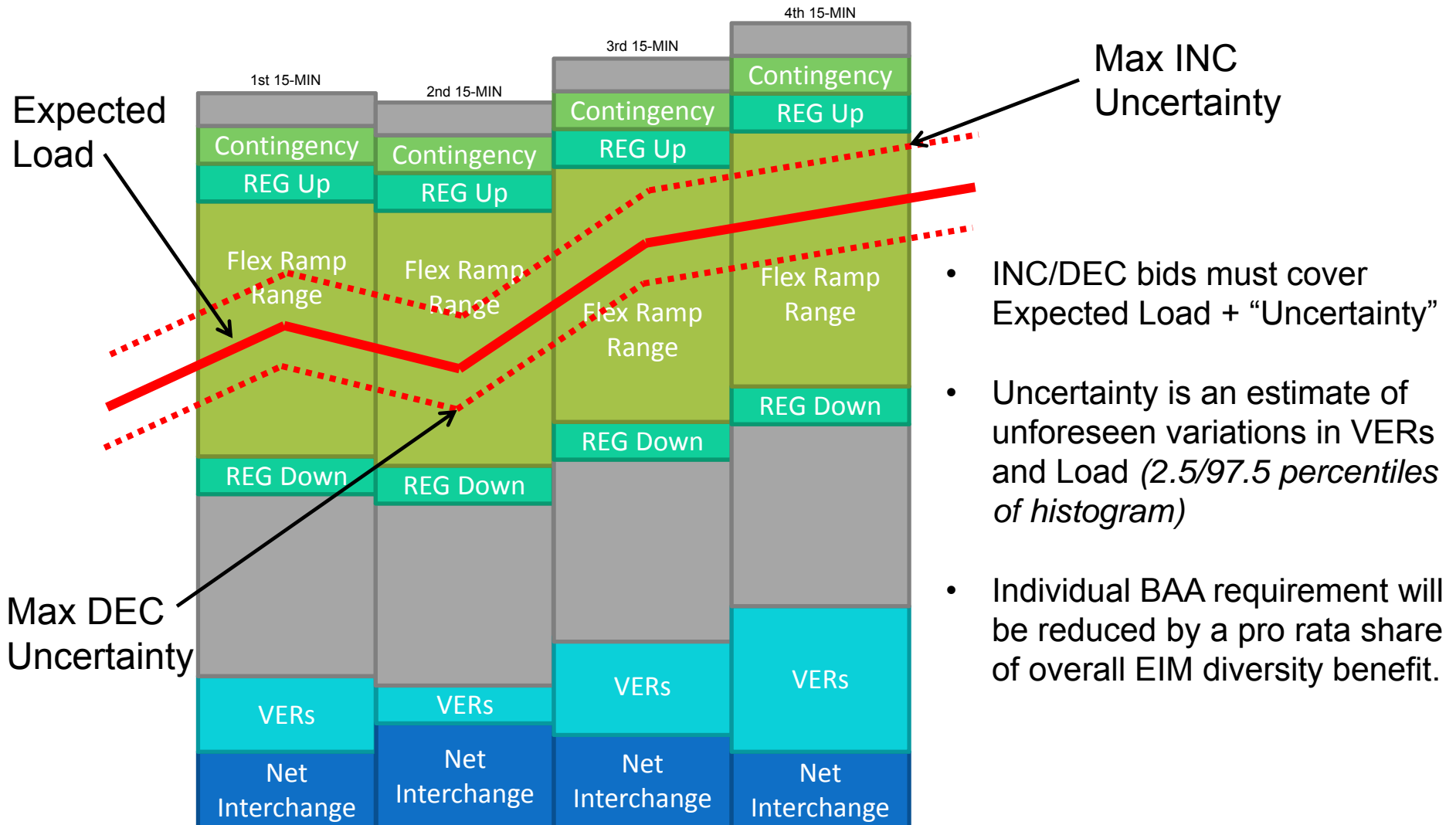
The Flexible Ramp Sufficiency Test (FRST) ensures that each EIM BAA has sufficient ramp capability and ramp capacity each hour to meet expected intra-hour upward and downward ramping needs

- The EIM BAA must have sufficient ramp capability and upward/downward capacity to meet the 15-min, 30-min, 45-min, and 60-min ramps within the hour
- Requirement is reduced by diversity benefit, limited to the available net import/export capability
- It's possible to pass the Capacity Test and fail the FRST
- Each 15-minute interval is evaluated separately but any failure is enforced for the hour

## Test 4: Flexible Ramp Sufficiency Test

- Data used:
  - Initial Participating Resource operating points used as the last FMM for the prior hour (at  $T-7.5'$ )
    - Advisory solutions from FMM at  $T-75'$  and  $T-55'$  are used
    - Binding solution from FMM at  $T-40'$
  - Participating Resources energy bids and ramp rates
  - VER and Demand Forecasts at 15' intervals
  - 15' Flexible Ramp Uncertainty up/down requirements
    - Historical Load net VER difference from last Advisory 15-min run versus Binding 5-min market runs within that Hour of the Day
    - Reduced by a prorated EIM diversity benefit
    - Reduced by any credit for net outgoing/incoming EIM transfer at  $T-7.5'$
    - Reductions limited by the available net import/export capability

# Test 4: Flexible Ramp Sufficiency Test

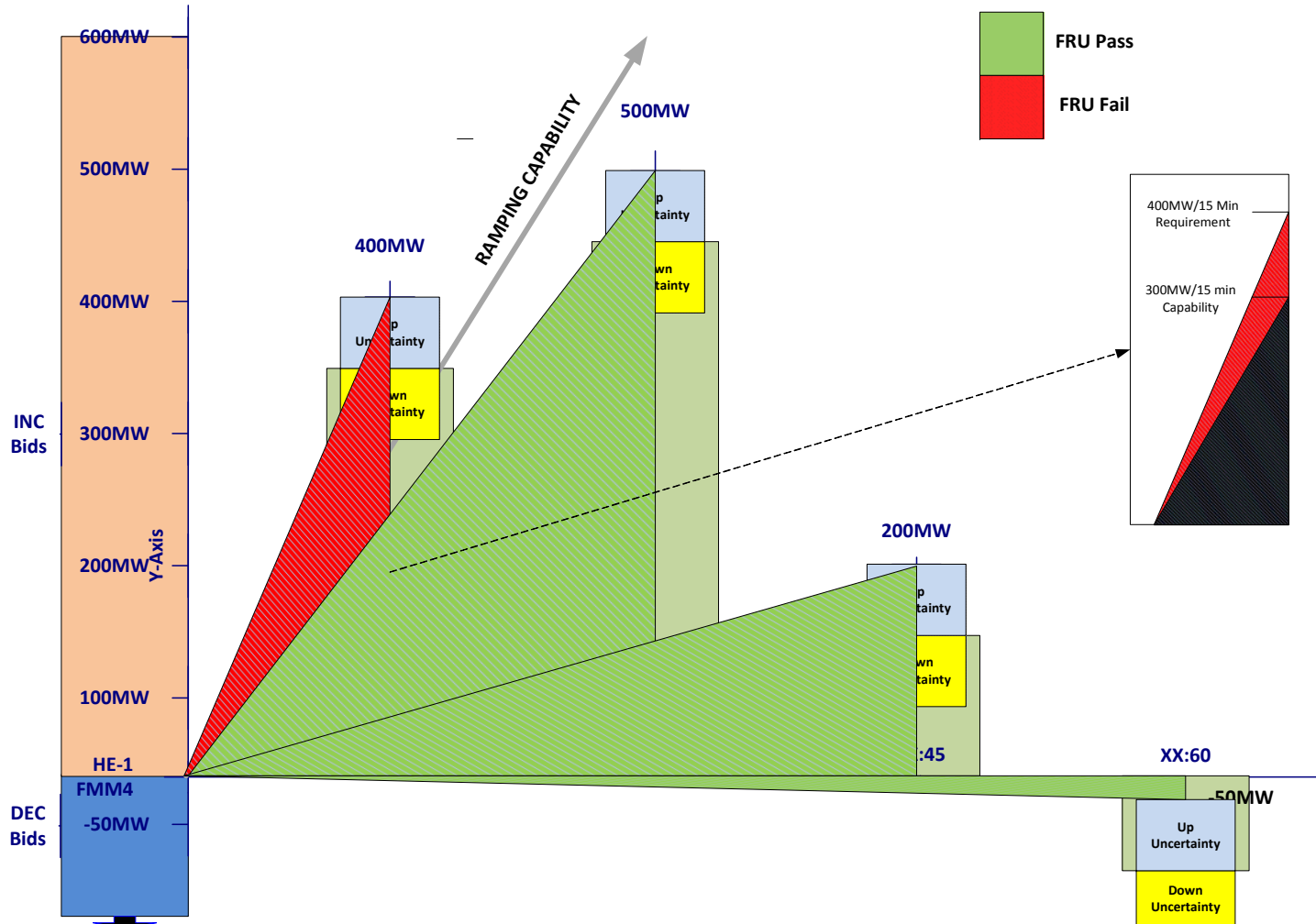


- INC/DEC bids must cover Expected Load + “Uncertainty”
- Uncertainty is an estimate of unforeseen variations in VERs and Load (*2.5/97.5 percentiles of histogram*)
- Individual BAA requirement will be reduced by a pro rata share of overall EIM diversity benefit.

<https://www.caiso.com/Documents/BusinessRequirementsSpecification-FlexibleRampingProduct.pdf>

# Test 4: Flexible Ramp Sufficiency Test

Flex Ramp Up Requirement Example  
 20MW/Min Ramp Capability  
 Passes Bid Capacity but Fails Flex Ramp in Interval 1



## Test 4: Flexible Ramp Sufficiency Test

- **Pass:**
  - No restrictions are placed on EIM Import or Export Transfers
- **Fail:**
  - If an Entity fails the upward sufficiency test, EIM Import Transfers cannot be increased from Base Transfer or Optimal transfer at T-7.5
  - If an Entity fails the downward sufficiency test, EIM Export Transfers cannot be increased from Base Transfer or Optimal transfer at T-7.5
  - It's possible to fail in both directions

# Illustrations of RS Evaluation and EIM Transfers





## Failing RS in the Up Direction

- When an EIM Entity has insufficient upward capacity to meet the RS requirement, it fails in the up direction
- CAISO will not allow an increase in net EIM Import Transfers for the hour from Base Transfer or Optimal transfer at T-7.5
- This helps to prevent the EIM BAA from leaning on other EIM BAAs

# Failing RS in the Down Direction

- When an EIM Entity has insufficient downward capacity to meet the RS requirement, it fails in the down direction
- CAISO will not allow an increase in net EIM Export Transfers for the hour from Base Transfer or Optimal transfer at T-7.5
- This helps to prevent the EIM BAA from leaning on other EIM BAAs

# Base and Optimal EIM Transfers

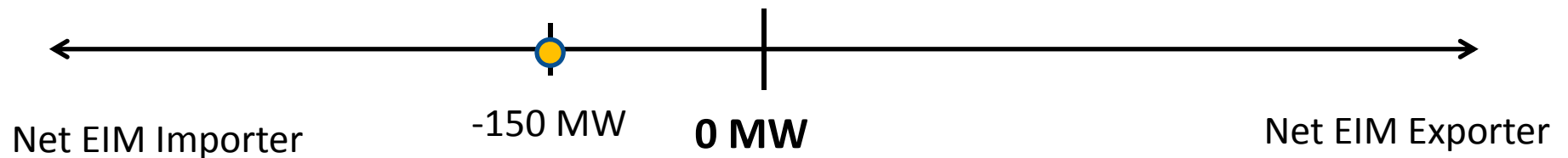
- The base EIM Transfer equals the base net scheduled interchange between an EIM BAA and other EIM BAAs
  - The base EIM Transfer does not include net scheduled interchange with non-EIM BAAs
  - The base EIM Transfer is due at T-40'
- The total base net scheduled interchange for an EIM BAA is the sum of two net scheduled interchanges:
  - 1). the base EIM Transfer and
  - 2). the base net scheduled interchange with non-EIM BAAs
- The optimal EIM transfer is the net interchange (15-min/5-min) between an EIM BAA and other EIM BAAs as determined by CAISO's market models
  - The FMM determines the optimal 15-min EIM Transfer, and the RTD determines the optimal 5-min EIM Transfer

## Base and Optimal EIM Transfers

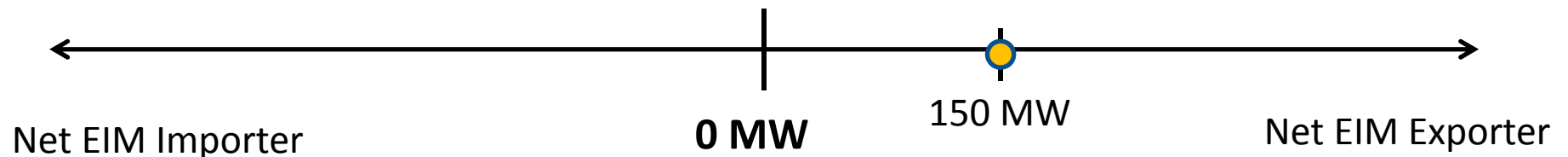
- If the base EIM transfer  $< 0$ , then the EIM BAA is scheduled as a net EIM importer within the EIM area for the next operating hour
- If the base EIM transfer  $> 0$ , then the EIM BAA is scheduled as a net EIM exporter within the EIM area for the next operating hour
- During the operating hour, the FMM and RTD determine the optimal EIM Transfers (15-min/5-min), which may be above or below the base EIM transfer

## Direction of the Base EIM Transfer

- If the base EIM Transfer is negative, then the Entity is scheduled as net EIM importer in the EIM area
  - For example, assume the base EIM Transfer = -150 MW

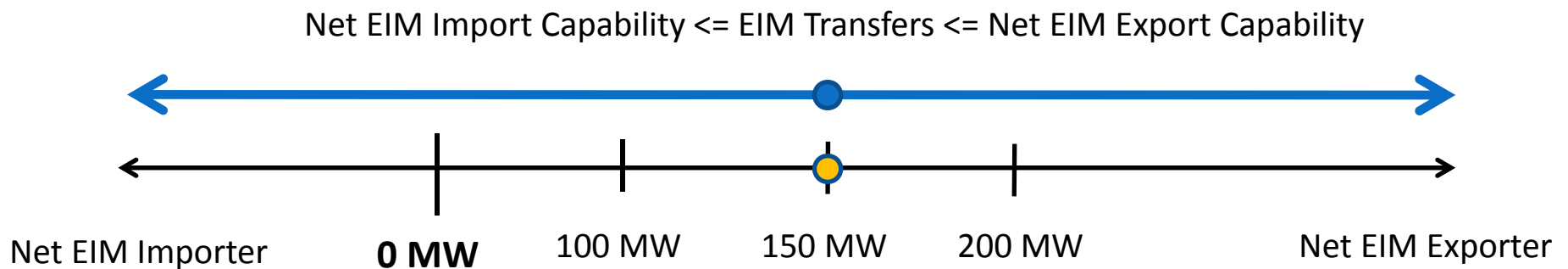


- If the base EIM Transfer is positive, then the Entity is scheduled as a net EIM exporter in the EIM area
  - For example, assume the base EIM Transfer = 150 MW



# Feasible Range for EIM Transfers

- For the following examples, assume the base EIM Transfer always equals 150 MW, i.e., the EIM BAA is scheduled as a net EIM exporter during the next hour
  - The base EIM Transfer for the next hour T is 150 MW
- If the Entity passes the RS evaluation in the up and down direction, then no additional limits are placed on the 15-min/5-min EIM Transfers in hour T—the only limitations are the available Tx capacity and the bid range capacity

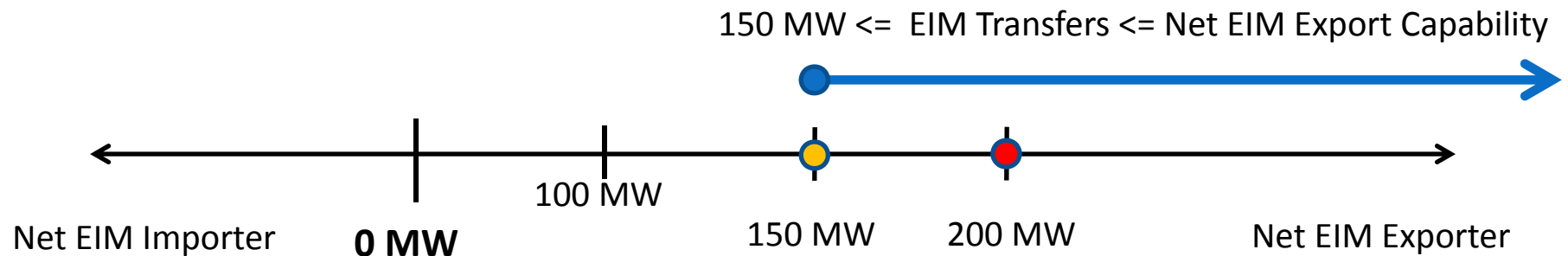


# Limit on EIM Transfers if Fail Up

- If the Entity fails RS in the Up direction, then the EIM Transfers in hour T are limited from increasing in the net import direction
  - i.e., limited from moving further to the left on the horizontal axis
- The limit on the EIM Transfers in hour T equals:
  - the least restrictive amount between the optimal EIM Transfer at T-7.5' and the base EIM Transfer for hour T
- EIM Transfer Limit = Min(optimal EIM Transfer at T-7.5', Base EIM Transfer for hour T)

# Feasible Range for EIM Transfers if Fail Up

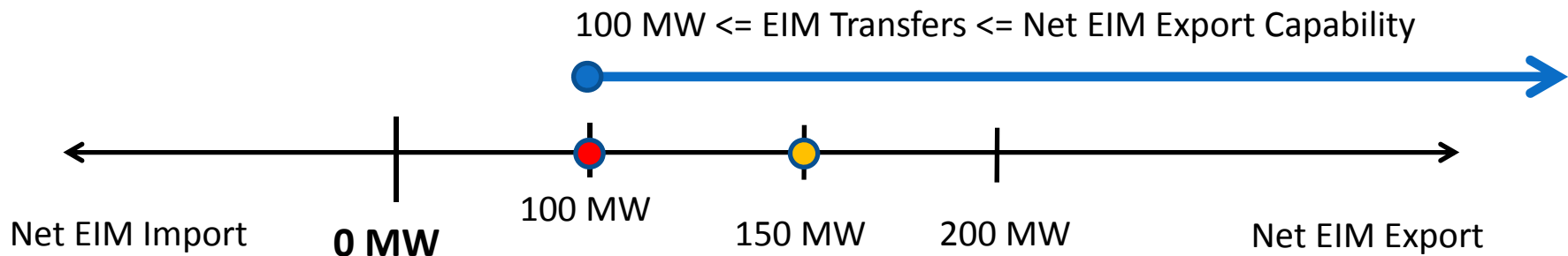
- Assume:
  - The optimal EIM Transfer at T-7.5' is 200 MW
  - The base EIM Transfer for next hour T is 150 MW
  - The EIM Transfer Limit for the next hour equals  $\text{Min}(200 \text{ MW}, 150 \text{ MW}) = 150 \text{ MW}$
- The feasible range for the EIM Transfers in hour T includes both the base EIM Transfer and the optimal EIM Transfer at T-7.5'





# Feasible Range for EIM Transfers if Fail Up

- Assume:
  - The optimal EIM Transfer at T-7.5' is 100 MW
  - The base EIM Transfer for hour T is 150 MW
  - The EIM Transfer Limit for the next hour equals  $\text{Min}(100 \text{ MW}, 150 \text{ MW}) = 100 \text{ MW}$
- The feasible range for the EIM Transfers in hour T includes both the base EIM Transfer and the optimal EIM Transfer at T-7.5'

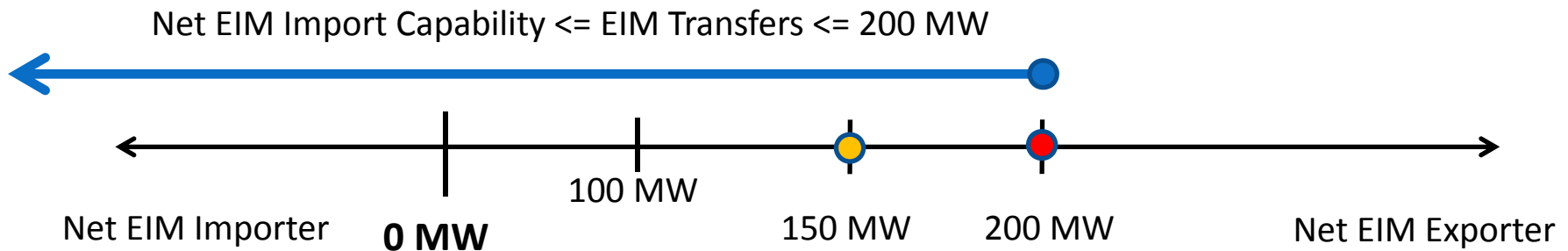


## Limit on EIM Transfers if Fail Down

- If the Entity fails RS in the Down direction, then the EIM Transfers during hour T are limited from increasing in the net export direction
  - i.e., limited from moving further to the right on the horizontal axis
- The limit on EIM Transfers in hour T equals:
  - the least restrictive amount between the optimal EIM Transfer at T-7.5' and the base EIM Transfer for hour T
- EIM Transfer Limit = Max(optimal EIM Transfer at T-7.5', Base EIM Transfer for hour T)

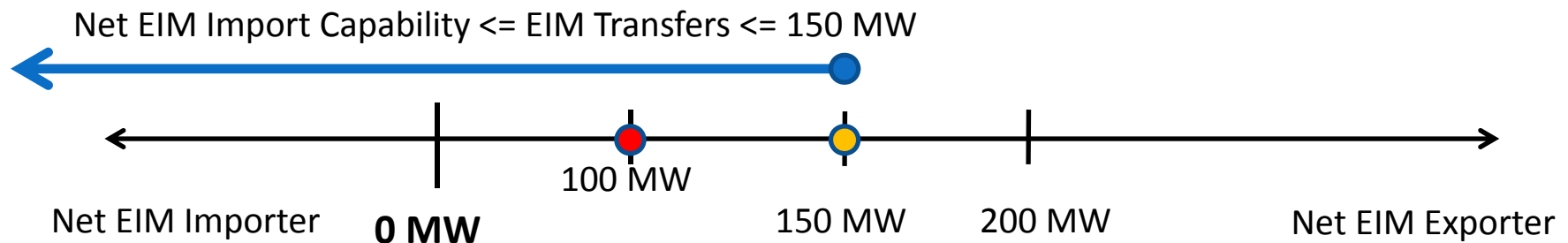
# Feasible Range for EIM Transfers if Fail Down

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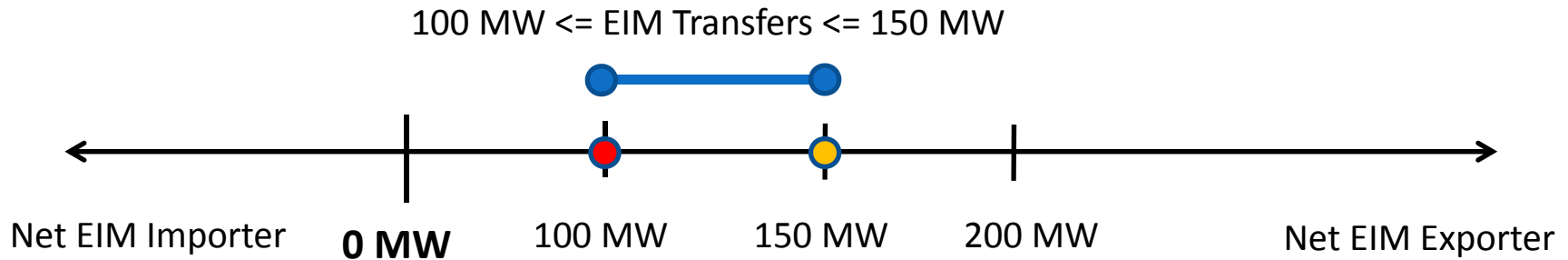
# Feasible Range for EIM Transfers if Fail Down

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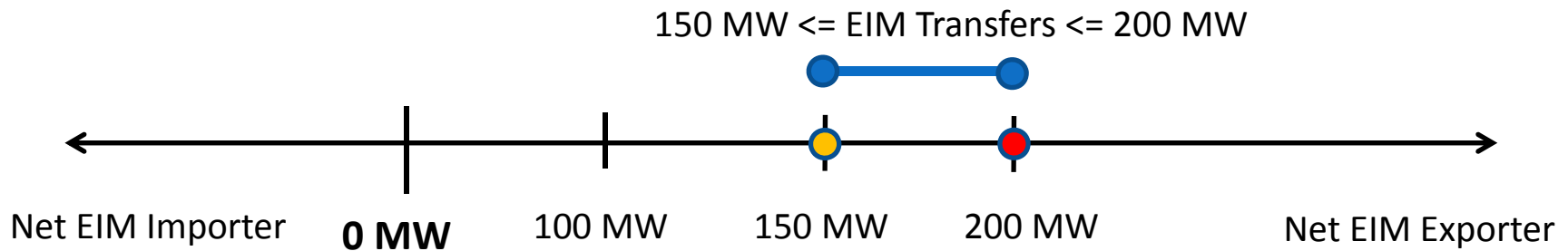
# Feasible Range for EIM Transfers if Fail Down and Up

- Assume:
  - The optimal EIM Transfer at T-7.5' is 100 MW
  - The base EIM Transfer for hour T is 150 MW
  - Failed Down: The EIM Transfer limit for the next hour equals  $\text{Max}(100 \text{ MW}, 150 \text{ MW}) = 150 \text{ MW}$
  - Failed Up: The EIM Transfer limit for the next hour equals  $\text{Min}(100 \text{ MW}, 150 \text{ MW}) = 100 \text{ MW}$



# Feasible Range for EIM Transfers if Fail Down and Up

- Assume:
  - The optimal EIM Transfer at T-7.5' is 200 MW
  - The base EIM Transfer for hour T is 150 MW
  - Failed Down: The EIM Transfer Limit for the next hour equals  $\text{Max}(200 \text{ MW}, 150 \text{ MW}) = 200 \text{ MW}$
  - Failed Up: The EIM Transfer Limit for the next hour equals  $\text{Min}(200 \text{ MW}, 150 \text{ MW}) = 150 \text{ MW}$



# Relationship of EIM to Other Emerging Markets



# Relationship of EIM to Other Emerging Markets

- What are these other emerging markets?
- BPA's principles for other emerging markets
- High-level review of specific initiatives:
  - What is happening?
  - If, how and when will other emerging markets impact EIM?
  - What is BPA doing to address possible impacts?



# Presentation Assumptions

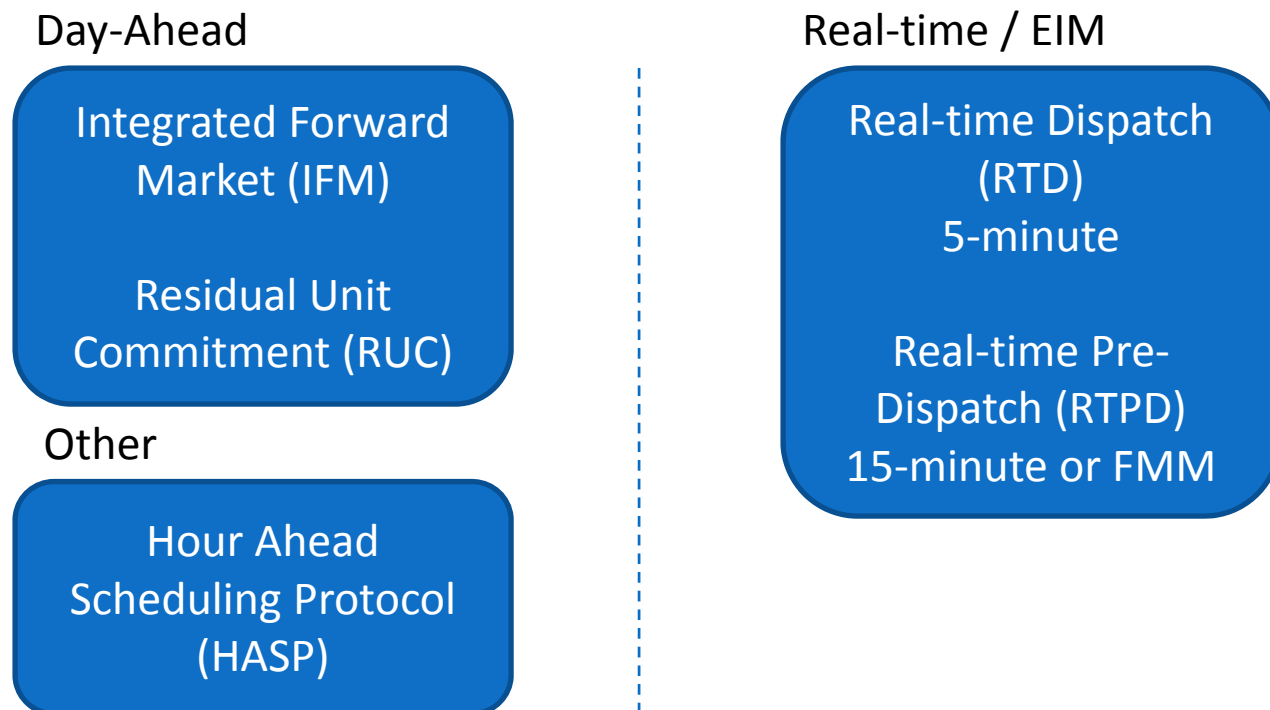
- Basic familiarity with the EIM and other CAISO markets, such as day-ahead
- Basic familiarity with CAISO initiative process elements
- Review of previous BPA stakeholder materials

## What are Other Emerging Markets?



## Other Emerging Markets

- CAISO currently bifurcates its markets between day-ahead and real-time, with EIM encompassing the real-time markets



## Other Emerging Markets

- CAISO markets prior to real-time:
  - Currently operate at an hourly scheduling granularity
  - Are open to participation from outside the ISO footprint
- BPA actively participates in day-ahead and HASP markets today
- Like EIM, these markets are subject to both possible enhancements and/or expansion through the CAISO initiative processes
- BPA's consideration of whether and how to join the EIM will address whether these enhancements or expansions impact our decision(s) regarding EIM

# CAISO Policy Initiative Processes

- CAISO's 2019 Policy Initiatives Roadmap identifies several existing and possible initiatives in this emerging market space:
  - Day-Ahead Market Enhancements (DAME) – Phase 1 (aka DAME 15)
  - DAME – Phase 2 (aka DAME FRP)
  - Expansion of the Day-Ahead Market to EIM (EDAM)
- CAISO could introduce other initiatives in this space
- Latest information is available at:

<http://www.caiso.com/informed/Pages/StakeholderProcesses/AnnualPolicyInitiativesRoadmapProcess.aspx>

# BPA's Principles for Other Emerging Markets



# Statement of BPA's Principles for EIM Process (repeat of slide 5):

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.

# BPA's Principles for Other Emerging Markets

- EIM principles still apply, plus likely additions:
  - **Governance:** Independent, Representative
  - **Resource Adequacy:** Provides for reliability and equity; Respects existing jurisdictional authorities
  - **Transmission:** Access and utilization are comparable; Adequate compensation; Equitable cost allocation
  - **Market Power Mitigation:** Recognize the opportunity costs of hydro; Apply when there is an opportunity to exercise; Consider voluntary nature of the market
  - **Market Price Formation:** Appropriate compensation for the services provided (e.g. energy, capacity, ancillary services, environmental attributes)



# BPA's Application of Principles for Other Emerging Markets

- Criteria for evaluating other emerging markets impact on BPA's decision to join the EIM:
  - Is there an impact on EIM?
  - If so, what is it and how is EIM impacted?
    - Is it mandatory or optional?
    - Is the nature of the impact qualitative? For example:
      - Reliability impact?
      - Additional certainty or uncertainty?
    - Can the impact be quantified? For example:
      - Revenue impact?
      - Cost impact?
  - When are EIM participants impacted?
- How these policy initiatives impact existing business and/or future decision(s) are not within scope of this EIM Implementation Agreement decision process

# High-level Review of Specific Initiatives



# Day-Ahead Market Enhancements (DAME) – Phase 1 (aka DAME 15)

- Stage:
  - CAISO policy initiative in draft final proposal stage
  - Implementation expected in Fall 2020
- High-level summary:
  - Institutes 15-minute scheduling and 15-minute bidding
- Does it impact EIM?
  - Yes. Base schedules would move to 15-minute granularity, which could impact process and system requirements for EIM. Resource Sufficiency tests move to 15-minute. Scheduling coordinators able to submit unique bids for the 4 15-minute intervals of the operating hour. Hourly block still available at interties and EIM retains support for hourly bid submissions.
- How is BPA involved?
  - BPA has commented in the CAISO's policy initiative process:

<http://www.caiso.com/Documents/BPAComments-Day-AheadMarketEnhancements15-MinuteGranularity-SecondRevisedStrawProposal.pdf>

- More information:
  - Second Revised Straw Proposal
  - [September 4, 2018 web conference presentation](#)

# DAME – Phase 2 (aka DAME FRP)

- Stage:
  - CAISO policy initiative underway and in Issue Paper stage
  - Implementation expected in Fall 2021
- High-level summary:
  - Development of day-ahead Flexible Reserve Product
  - Had considered collapsing and reformulating IFM and RUC
- Does it impact EIM?
  - Unclear. It may impact real-time flexible ramping product.
- How is BPA involved?
  - BPA will be commenting in the CAISO's policy initiative process, but the first comment period was retracted
- More information:  
<http://www.caiso.com/informed/Pages/StakeholderProcesses/Day-AheadMarketEnhancements.aspx>

# Expansion of the Day-Ahead Market to EIM (EDAM)

- Stage:
  - Currently in pre-CAISO policy initiative conceptual phase
  - Kick-off of CAISO policy initiative expected by mid-2019
  - Implementation expected in Fall 2021
- High-level summary:
  - Expands the enhanced day-ahead market to some or all EIM Entity BAAs (ie. with 15-minute granularity and FRP)
- Does it impact EIM?
  - Unclear
- How is BPA involved?
  - As this is in a pre-CAISO policy initiative conceptual phase, BPA is not currently involved.
  - After the CAISO policy initiative begins BPA will become involved
- More information:  
<http://www.caiso.com/informed/Pages/StakeholderProcesses/AnnualPolicyInitiativesRoadmapProcess.aspx>

# Next Steps



# Next Steps

- Next meeting scheduled for **Wednesday February 20<sup>th</sup>** at the Rates Hearing Room.
  - 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](mailto:techforum@bpa.gov) and reference “EIM Stakeholder Meeting” in the subject. Comments are due by January 31<sup>st</sup> Thursday.
- 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

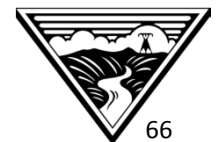




# Appendix



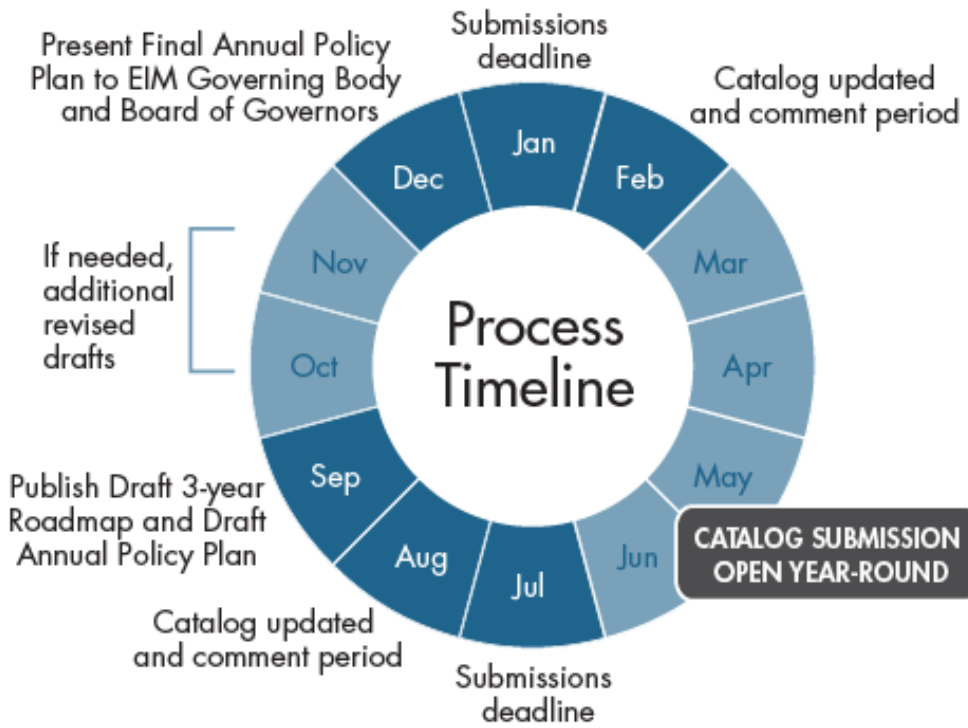
# CAISO Policy Initiative Development Processes



# CAISO's Policy Initiative Roadmap Process

## Annual policy initiatives roadmap process

The annual roadmap process captures the policy initiatives the ISO will undertake in the following year and their approximate timeframes. The development of the annual roadmap includes updating the Policy Initiatives Catalog. The catalog, updated twice a year, is a comprehensive directory of current, planned and potential policy initiatives that require a stakeholder process.

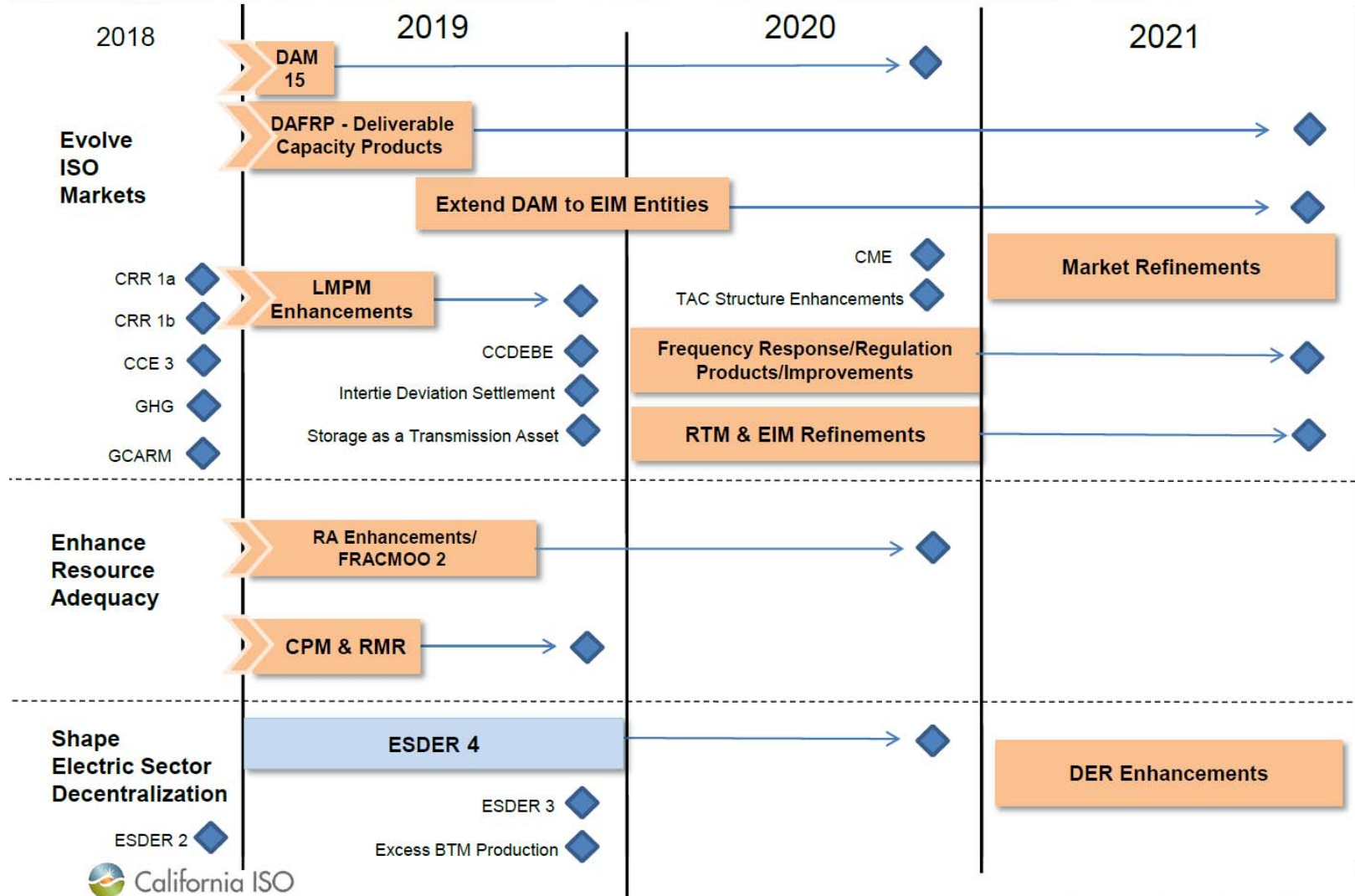


Source:

<http://www.caiso.com/informed/Pages/StakeholderProcesses/AnnualPolicyInitiativesRoadmapProcess.aspx>

# CAISO's 3-year Policy Initiative Roadmap

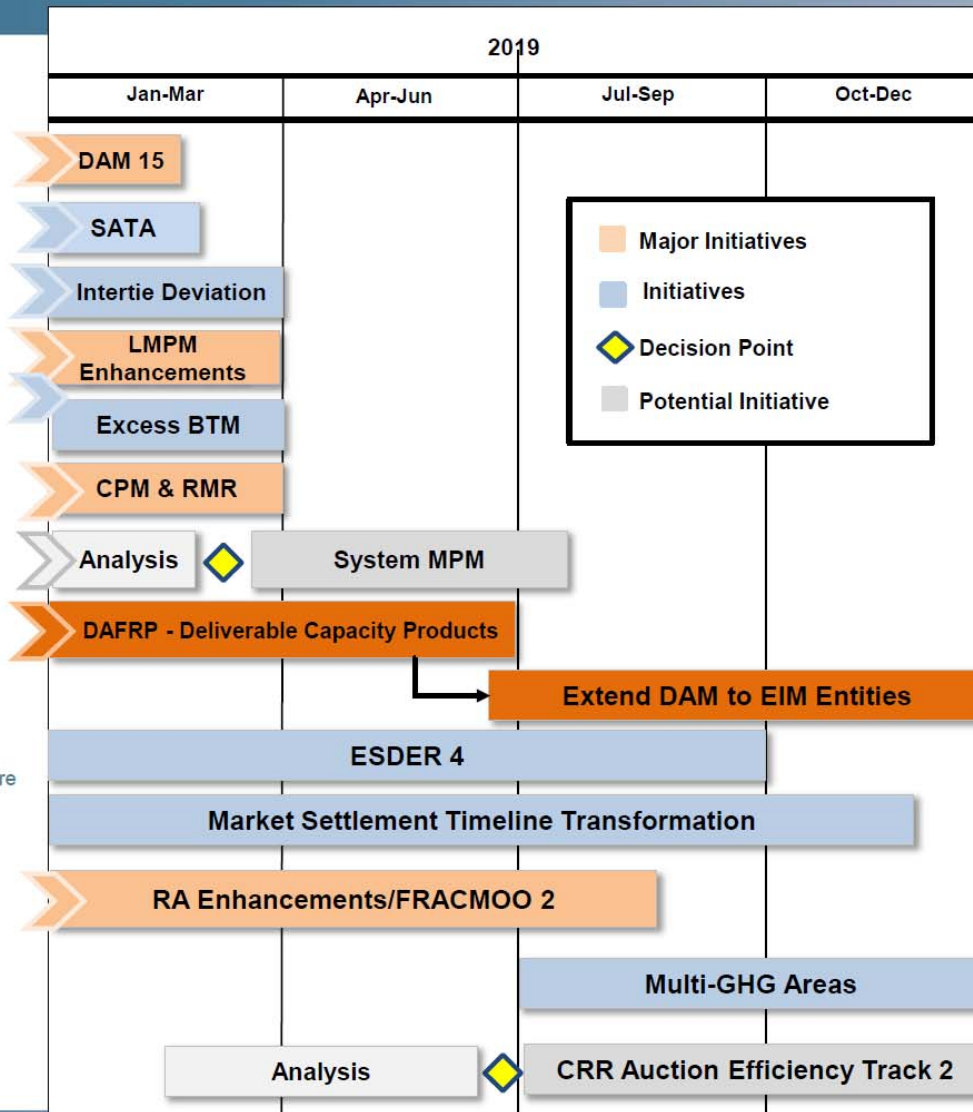
Proposed Three-year Policy Roadmap of Major Initiatives ◆ = Implementation



# CAISO's 2019 Policy Initiative Roadmap

## 2019 Draft Annual Plan

\*Timeframes are approximate and are subject to change



# CAISO's Policy Development Process



Source:

<http://www.caiso.com/informed/Pages/StakeholderProcesses/Default.aspx>

# Current Scope and Status of Selected Initiatives

## DAME – Phase 1



# Day-Ahead Market Enhancements (DAME) – Phase 1 (aka DAME 15)

- Current status



# Day-Ahead Market Enhancements (DAME) – Phase 1 (aka DAME 15)

- Current scope:
  - CAISO presentation from Sep 4<sup>th</sup> Web conference encompassing the Second Revised Final Proposal describe the EIM changes included in DAME Phase 1
  - More complete description of the entire initiative can be found in the Second Revised Final Proposal

# Day-Ahead Market Enhancements (DAME) – Phase 1 (aka DAME 15)

EIM changes needed to align with ISO day-ahead market

- EIM base schedules are currently hourly consistent with ISO's current day-ahead scheduling granularity
- With DAM enhancements implementation, base schedules will now be submitted with 15-minute granularity
- 15-minute base schedules change from tests from hourly to 15-minute evaluation
  - Resources sufficiency evaluation capacity and balance test
  - Over/under scheduling penalties

Source:



California ISO

<http://www.caiso.com/Documents/Presentation-Day-AheadMarketEnhancementsFifteen-MinuteGranularity-Sep42018.pdf>

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# Day-Ahead Market Enhancements (DAME) – Phase 1 (aka DAME 15)

Resource sufficiency evaluation ensures EIM entities don't lean on others capacity, flexibility or transmission

- Currently, performed hourly if any test is failed, EIM transfers cannot exceed prior hour's level
- Changes that will be implemented with move to 15-minute base schedules
  - Capacity test by 15-minute interval
  - Balance test by 15-minute interval
- Changes that will be implemented ASAP through BPM change process
  - Flexible ramping test failure freeze by 15-minute interval
  - Flexible ramping test passes if within 1% of requirement

# Day-Ahead Market Enhancements (DAME) – Phase 1 (aka DAME 15)

Over / under scheduling penalty will align with 15-minute base schedules

- Determine if penalty should apply each 15-minute interval
- Penalty only applies for 15-minute interval not entire hour
- Under extended DAM, this penalty is no longer applicable because EIM participants can't determine how much imbalance is settled in EIM

# Current Scope and Status of Selected Initiatives

## DAME – Phase 2



## DAME – Phase 2 (aka DAME FRP)

- Current status and scope:
  - Scope in the Spring of 2018 was to:
    - Establish DA FRP product
    - Combine IFM and RUC
  - Nov 30<sup>th</sup> Working Group meeting made clear IFM and RUC could not be combined and posited two alternatives to reformulate and possibly re-sequence IFM and RUC.
  - Dec 14<sup>th</sup> the ISO cancelled the Dec 21<sup>st</sup> comment deadline regarding the Working Group meeting (see [market notice](#))
  - Dec 17<sup>th</sup> Board meeting and annual policy roadmap continues to highlight moving forward with DA FRP portion of this policy initiative in 2019 and implementation 2021

# Current Scope and Status of Selected Initiatives

## EDAM



# Expansion of the Day-Ahead Market to EIM (EDAM)

Extending DAM to EIM Entities provides additional regional benefits

- Key benefits:
  - Allows EIM participants to benefit from day-ahead market enhancements
  - Day-ahead unit commitment and scheduling across larger footprint improves market efficiency and more effectively integrates renewables
- Key principles:
  - Each balancing authority retains reliability responsibilities
  - States maintain control over integrated resource planning
    - Resource adequacy procurement decisions remain with local regulatory authority
    - Transmission planning and investment decisions remain with each balancing authority and local regulatory authority
  - Voluntary Market, like EIM



# Expansion of the Day-Ahead Market to EIM (EDAM)

Scope of stakeholder initiative to extend day-ahead market to EIM Entities

- Transmission provision for Day-Ahead Market
  - Transmission cost recovery
- Day-ahead resource sufficiency evaluation
  - Provide functionality to enable entities to trade capacity for resource sufficiency tests
- Mechanism to distribute congestion revenues
- Full network model enhancements
- Day-ahead GHG attribution for states with carbon cost policies
- Governance to account for larger market scope