Day-ahead market enhancement discussion

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New approach is needed to address operations need to bias residual unit commitment (RUC) process

- Add imbalance reserve up and down to IFM to provide intra-hour ramp and cover uncertainty
  - Addresses need to bias RUC load forecast

- Return RUC to its original purpose and enhance
  - Procure reliability capacity up and down. Does not shut down resources.
  - Establish export/import energy schedule to be tagged for checkout and establish real-time priority
  - Establish binding MSG configuration based upon RUC schedule
Sequential approach to commit additional resources if physical supply clears IFM less than ISO net load forecast.
Summary of new design elements

• Sequential IFM and RUC
• Deviation settlement for imbalance reserves (ramp)
• Imbalance reserve deployment scenarios added to CRR model
• VERs can select to be CAISO forecasted (eligible for IRU/RCU) or SC forecasted (not eligible for IRU/RCU)
• Clarify that only exports linked to internal non-RA capacity will have high priority in real time. Addresses imbalance reserve demand curve allowing exports to clear.
• Transition period when RA resources will bid zero for imbalance reserves and reliability capacity and have a real-time must offer obligation even if not awarded
Summary of modified design elements

• Address high cost energy receiving IRU or RCU through a SIBR rule that makes the resource ineligible to be awarded if a bid submitted above a price established prior to bids submitted.

• Market power mitigation to higher of historical spin or competitive capacity price. Energy, imbalance reserve and reliability capacity will all be mitigated if congestion in MPM run.

• Imbalance reserve cost allocation: tier 1 to deviations that require dispatch of other resource, tier 2 to metered load.

• Reliability capacity cost allocation: tier 1 to load and SC-forecasted VER deviations and SC net virtual position, tier 2 to metered load.

• Unavailable imbalance reserves/reliability capacity charged the higher of the day-ahead price, FMM FRP or RTD FRP price.
Settlement of ramp deviations between IFM, FMM and RTD

• Ramp is composed of …
  1. *Forecasted movement* is the change in energy schedules between intervals in same market run
  2. *Uncertainty awards* are additional ramp capability held back to meet changes in net load between market runs

• Marginal value of ramp is the same for both types

• Complications in designing a deviation settlement
  - Forecasted movement compensation can occur through energy price (IFM) or a side payment (FMM & RTD)
    • Side payment if moving up is paid FRU and charged FRD
  - Uncertainty granularity difference between 15-min imbalance reserves and 5-min flexible ramping products
  - Ramp for uncertainty awards comes from unloaded capability and energy schedule changes in opposite direction
Ramp deviation settlement is broken down into forecasted movement and uncertainty awards

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<thead>
<tr>
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<th><strong>Ramp Settlement</strong></th>
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<tr>
<td><strong>IFM Forecasted Movement</strong></td>
<td>No side payment, paid energy price</td>
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<tr>
<td><strong>IFM Imbalance Reserve Award</strong></td>
<td>Pay award</td>
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<td><strong>FMM Forecasted Movement</strong></td>
<td>Settle deviation from IFM 5-minute forecasted movement</td>
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<tr>
<td><strong>FMM FRP Uncertainty Award</strong></td>
<td>Settle deviation from embedded 5-minute ramp within IR award</td>
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<tr>
<td><strong>RTD Forecasted Movement</strong></td>
<td>Settle deviation from FMM 5-minute forecasted movement</td>
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<td><strong>RTD FRP Uncertainty Award</strong></td>
<td>Settle deviation from FMM</td>
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<tr>
<td><strong>No-Pay 15-Minute Resource</strong></td>
<td>If bid range does not support IR award charged higher IR or FRP</td>
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<tr>
<td><strong>No-Pay 5-Minute Resource</strong></td>
<td>If bid range does not support IR award, charged higher IR or FRP for quantity above embedded 5-minute ramp</td>
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Observations of proposed settlement

- No deviation settlement for reliability capacity because there is no energy settlement in RUC. No pay rules apply if bid range doesn’t support awards.
- Quantity of embedded 5-minute ramp in imbalance reserve awards depends if ramp is from energy schedule changes or holding back ramp capability.
- Imbalance reserve no pay rules apply to awards above the resource’s embedded 5-minute ramp.
- Both 15-minute and 5-minute resources are settled for forecasted movement deviations in FMM and RTD.
- Only 5-minute dispatchable resources are subject to deviation settlement for uncertainty awards because 15-minute resources have no embedded 5-minute ramp.
- Ramp deviation settlement only occurs if a resource reaches its \( \text{Pmax}/\text{Pmin} \) at a different time than the prior market.
Seeking comparable scheduling priorities of exports as the rest of WECC

- High priority exports are supported by contracted internal non-RA supply prior to the day-ahead market. Receive same priority as ISO load in all markets.

- Low priority exports can clear the IFM, but energy that can be self-scheduled and tagged prior to real-time is the RUC schedule.

- Low priority RUC schedules will have lower self-schedule scheduling priority than ISO load in real-time.

- Low priority RUC schedules have higher priority than new real-time export self-schedules.

- In EDAM straw proposal, proposed EDAM transfers of energy, imbalance reserves, reliability capacity, & AS equivalent priority to high priority exports and native load.
Interaction between imbalance reserve demand curve and export scheduling priority

• Demand curve is currently capped at $247
• Export bids above this level could clear by reducing the amount of imbalance reserve requirement met
• Imbalance reserve awards are held fixed in RUC. Unable to commit additional supply to backfill.
• If uncertainty materializes in real-time, low priority exports can be curtailed because of lower scheduling priority than ISO load
• ISO plans to notify market participants if imbalance reserve demand curve has reduced procurement