DAME Design Choices

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Topics

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- 15 minute ramp requirement for imbalance reserves
- Market Power mitigation
- RUC/Imbalance Reserves Deliverability Interactions
- CRR and Transfer revenue shortfalls

Introduction

This presentation focuses on a few outstanding DAME design choices.

We do not discuss alternative delivery test designs or the shape of the demand curve for imbalance reserves because those are covered in other presentations. This discussion focuses on:

- 15 minute ramp requirement for imbalance reserves.
- Market Power Mitigation
- RUC/IFM delivery test interactions
- CRR and Transfer Revenue Shortfalls

15 minute ramp for imbalance reserves

The current DAME design would require that all imbalance reserves scheduled in the IFM be dispatchable within a 15 minute ramp period.

- The requirement that imbalance reserves procured to cover load forecast uncertainty be dispatchable within 15 minutes has implications that have not been clearly discussed.
- This requirement makes sense in the RTPD flexiramp design and for procuring capacity to provide flexiramp in the IFM.
- This requirement has a questionable rationale when applied to capacity scheduled to cover load forecast uncertainty that gradually materializes over time during the operating day.

15 minute ramp for imbalance reserves

Core adverse impacts of a 15 minute ramp requirement for imbalance reserves covering net load forecast uncertainty are:

- Inflated energy and imbalance reserve prices
- Exclusion of non-fast start off-line resources
- Excess commitment of capacity

The inflated cost of imbalance reserves could also impact the coverage of net load uncertainty depending on the shape of the demand curve.

15 minute ramp for imbalance reserves

A core impact of a 15 minute ramp requirement, relative to a 30 or 60 minute ramp requirement, is that more low cost capacity will be dispatched down out of merit in the IFM solution, and more high cost capacity dispatched up, to provide a given level of imbalance reserves. This design will inherently raise energy and imbalance reserve prices in the IFM relative to a 30 or 60 minute ramp requirement.

- Dispatching low cost generation down, and high cost generation up, to spread imbalance reserves over more units to meet the ramp requirement will raise day-ahead market energy prices.
- Dispatching more low cost generation down to meet the ramp requirement will increase the opportunity cost of imbalance reserves, whose price will therefore be inflated both by a higher energy market price, and by the lower cost generation dispatched down to provide imbalance reserves.
- There is nothing conceptually wrong with this impact for the flexiramp requirement, higher spinning reserves requirements have the same impact on energy market prices.
- However, there is no need for the potentially large amount of imbalance reserves that would be procured to meet load forecast uncertainty to be dispatchable within 15 minutes. Load forecast uncertainty will materialize over a period of hours within the operating day.

15 minute ramp for imbalance reserves

A 15 minute ramp requirement would also displace slower starting off-line resources and demand response from being used to meet load forecast uncertainty.

- This requirement would be particularly costly in providing reserves for low probability net load forecast error.
- The 15 minute ramp requirement would also tend to force incremental imbalance reserves to be provided by on-line resources. Energy limited storage resources would not be a good choice for providing imbalance reserves for load forecast uncertainty which could persist over a number of hours.

A 15 minute ramp requirement could also require more thermal resources be committed to meet load net load forecast uncertainty than would be needed with a 30 or 60 minute ramp requirement.

- This is particularly likely on moderate load days with high levels of net load forecast uncertainty.
- Committing enough megawatts of capacity to cover the megawatt amount of net load forecast uncertainty may not provide the requisite ramp, requiring that excess capacity be committed, raising commitment costs and emissions.

15 minute ramp for imbalance reserves

One resolution of these issues would be to cover net load forecast error with a mixture of 15 minute and 30 or 60 minute ramp.

- The CAISO does not currently have a 30 minute reserve product, but perhaps this is the time to introduce one.
- The NYISO, MISO, PJM, ISO-New England, SPP and Ontario have introduced 30 minute type reserve products, or increased their 30 minute reserve requirements, over the last decade to help manage greater load and supply uncertainty.

Market Power Mitigation

There are good reasons to anticipate that there is less need for mitigation of imbalance reserve offer prices, than of offer prices in the energy market when there is transmission congestion.

- The procurement of imbalance reserves will be governed by a demand curve, so higher offer prices will reduce imbalance reserve procurement, reducing the price impact and profitability of offer price increases.
- Resources with high offer prices for imbalance reserves can be dispatched for energy at mitigated offer prices to displace energy imports and imbalance reserves provided by imbalance reserve imports, reducing the price impact and profitability of offer price increases.

Market Power Mitigation

There are, however, some countervailing considerations.

- The shape of the demand curve for imbalance reserves has not been resolved and a demand curve with high penalty prices over the entire range of imbalance reserve procurement would do very little to constrain the exercise of market power through inflated imbalance reserve offer prices.
- At present we have very limited experience with the impact of the nodal dispatch on imbalance reserve procurement and pricing, and actual trade off between energy and imbalance reserve imports. This makes it difficult to accurately assess the impact of offer prices on the potential for the exercise of material market power in imbalance reserves.
- We should not be California centric in assessing the potential for the exercise of market power. There will be EDAM balancing areas with very little competition in providing imbalance reserves within the balancing area.
- There may initially be a small number of balancing areas participating in EDAM, diminishing the impact of import competition in constraining the exercise of material market power in the supply of Imbalance reserves.

Market Power Mitigation

These considerations support the CAISO's proposal to implement a backstop market power mitigation design for imbalance reserves with the initial EDAM implementation..

- Once EDAM design choices are finalized, the EDAM market is implemented, the performance of the nodal dispatch design assessed, and the EDAM has expanded in scope beyond the initial participants, the CAISO and stakeholders can assess whether there is a continuing need for the market power mitigation design or if design changes are needed.

RUC, Ancillary Service and Imbalance Reserve Deliverability

The CAISO has discussed how the CAISO ensures deliverability of ancillary services in combination with imbalance reserves and the goal of implementing a delivery test.

- There is an additional issue relating to the deliverability of imbalance reserves in combination with RUC capacity in the day-ahead market.
- The CAISO proposes to test the deliverability of imbalance reserves using deployment scenarios in the IFM.
- The CAISO proposes to continue to test the deliverability of RUC capacity in combination with IFM energy schedules, but without deployment scenarios for imbalance reserves.
- If a material amount of capacity is scheduled in RUC, this will increase the potential for deliverability issues between RUC capacity and imbalance reserves.

It may be that the amount of capacity scheduled in RUC will be so low that these deliverability issues will be immaterial, but the potential impact should be kept in mind as the design is finalized.

CRR and Transfer Revenue Shortfalls

The CAISO has pointed out that if imbalance reserve costs allocated to load are calculated based on the payments to generators, these charges will not recover the cost of any transmission that is used over binding transmission or transfer limit constraints.

- There are reasons to anticipate that imbalance reserves will generally not be scheduled to use transmission over binding transmission of transfer limit constraints.
- However, it is not practical to assess the potential for congestion rent and transfer rent shortfalls prior to implementation. Even if the shortfalls are small in aggregate, they could consistently impact that same transmission constraints or transfers limits.
- The CAISO has observed that it is possible to avoid this potential for CRR and transfer limit congestion shortfalls by calculating the charges to load based on the delivered cost of the imbalance reserves. This will be the same as the payments to generators except when imbalance reserves are delivered over binding transmission and transfer constraints.
- If the congestion and transfer rent shortfalls are small, the additional charges to load will be small.

Accounting for transmission use in imbalance reserve charges avoids the potential impacts if the shortfalls are not small, or if the shortfalls are modest but consistently impact the same LSE or balancing area.