

EIM Commitment Cost Issues

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Critical thinking at the critical time™

TOPICS

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GOALS

The California ISO needs to constrain or mitigate the start-up and minimum load offers of resources potentially able to exercise locational market power, while also providing resources with the flexibility to accurately reflect their costs and opportunity costs in their offers.

GOALS

The preferred approach to bidding of commitment costs in both the day-ahead market and in real-time, would be to allow market participants to adjust their start-up and minimum load offer prices from day-to-day to reflect variations in costs, including the estimated opportunity costs of use limited resources, fuel costs, and the resource operator's assessment of start-related costs.

- A critical impediment to the California ISO implementing such a flexible approach is the need to preclude the use of inflated offer prices to exercise locational market power.

CURRENT DESIGN

The potential for the exercise of locational market power through inflated incremental energy offer prices is constrained within both the California ISO and the Western EIM by the application of the pivotal supplier test, and potentially offer price mitigation when transmission constraints bind and there is insufficient competition within the constrained region.

- A core issue impacting the design for mitigation of commitment costs is a concern that excessive start-up and minimum load offer costs can be used both to economically withhold supply and raise energy prices when transmission constraints are binding in the final dispatch solution and to transfer wealth through uplift payments, which can occur even if no transmission constraint is binding in the final dispatch solution of the IFM or RTPD.

CURRENT DESIGN

- Even if these uplift costs were allocated to the balancing authority area in which they were incurred, there could be a shifting of costs between load serving entities within the constrained region.

CURRENT DESIGN

The current California ISO approach to addressing the potential for inflated start-up and minimum load offer prices to in turn inflate uplift costs when a resource is committed to resolve a constraint but no transmission constraint is binding in the dispatch solution is to always apply mitigation to start-up and minimum load offers, that is, to always commit resources based on estimated costs.

- A limitation of this approach is that if the commitment cost estimates do not include, or do not accurately measure, all costs, the approach can result in resources being uneconomically committed, even when there is no transmission congestion and no potential for the exercise of locational market power, e.g. if a resource was committed to support exports.

CURRENT DESIGN

- Reliance on this approach can reduce the benefits of EIM participation because a utility can incur commitment costs for capacity committed to serve load elsewhere in the EIM that it would not recover either in market prices or uplift payments.
- Reliance on a mitigation design that prevents EIM entities from accurately reflecting their costs in their EIM offers may cause EIM entities to withhold resources from the EIM dispatch because of the economic and/or reliability costs of uneconomic resource commitments.

IMPROVEMENTS

There are a number of approaches the CAISO could take to reduce the adverse impacts from the inappropriate application of commitment cost mitigation. We discuss three below:

- Improve measurement of commitment costs;
- Limit the application of commitment cost mitigation to resources relieving a constraint that was in the transmission constraint set monitored in the IFM or RTPD, even if the constraint was not binding in the final energy dispatch solution of the market power pass;
- Limit the ex ante application of commitment cost mitigation to resources relieving a transmission constraint that binds in the final energy dispatch solution of the market power pass of the IFM or RTPD. Apply commitment cost mitigation to the calculation of uplift in settlements.

Improve measurement of commitment costs:

- The CAISO has taken a number of steps to achieve this goal:
 - Taking account of more start-related costs and opportunity costs;
 - Basing the calculation of mitigated costs on more current gas price indexes.
- Additional improvements would be to:
 - Add an ability to base mitigation on a negotiated value;
 - Add an ability to base mitigation on market participant gas costs submissions subject to automated ex ante reasonableness verification.

Improvements in the measurement of commitment costs should be pursued to the extent feasible. But a mitigation design based on automated ex ante verification relying on published indexes or ICE transactions will not be able to eliminate uneconomic commitments in some situations:

- Not all gas fired generation is located at liquid trading points with published indexes;
- Even at locations with liquid trading for day-ahead gas, the volume of intra-day transactions may be very thin;
- Not all types of trades take place on ICE, e.g. weekend trades for gas flowing on Monday.

Limit the application of commitment cost mitigation to resources relieving a constraint that was in the transmission constraint set monitored in the IFM or RTPD, even if the constraint was not binding in the final energy dispatch solution of the market power pass.

- This approach would apply mitigation to the minimum load and start-up cost offers of any resource relieving a constraint that was active in the final iteration of the IFM or RTPD, even if the constraint was not binding in the final dispatch solution of the market power mitigation pass.
- If a constraint was not in the monitored transmission constraint set, it could not have caused a resource to be committed.
- Units that could not have been committed to relieve a constraint would be able to submit market based offers and accurately reflect both gas and start related costs in their offers.

Such a design change would address some circumstances in which resources would be uneconomically committed under the current design for reasons unrelated to any transmission constraint, such as to support exports.

- This approach would require some software changes.
- It is possible that this approach would still inappropriately trigger mitigation relatively frequently if the constraint set includes a lot of constraints that never actually bound but were active because the flows were within the threshold used to determine the constraint set. We will not know whether this impact would be material without empirical analysis.

Limit the ex ante application of commitment cost mitigation to resources relieving a transmission constraint that binds in the final energy dispatch solution of the market power pass of the IFM or RTPD. Apply commitment cost mitigation to the calculation of uplift in settlements.

- Such a design should greatly reduce the likelihood of EIM resources being uneconomically committed to support exports;
- Such a design would continue to preclude the exercise of locational market power to either raise energy market prices or uplift costs.

Consider a hypothetical example of an off-line unit whose commitment would relieve a transmission constraint. There are four possible outcomes in RTPD if a resource could be committed to relieve the constraint:

- Constraint binds in the RTPD solution, resource is committed
- Constraint binds in the RTPD solution, resource is not committed
- Constraint does not bind in the RTPD solution, resource is committed
- Constraint does not bind in the RTPD solution, resource is not committed.

We will discuss each scenario from the standpoint of mitigation and the application of this third approach.

Constraint binds in RTPD dispatch solution, resource is committed

- Because the constraint binds in the RTPD dispatch solution, the current market power mitigation design would be triggered;
- If the supplier were determined to possess locational market power, mitigation would be applied to both incremental energy offers and commitment costs;
- Mitigation could result in lower energy prices and lower production costs in the physical dispatch.

Constraint binds in RTPD dispatch solution, resource is not committed.

- Because the constraint binds in the RTPD dispatch solution, the current market power mitigation design would be triggered;
- If the supplier were determined to possess locational market power, mitigation would be applied to both incremental energy offers and commitment costs;
- Mitigation could result in the resource being committed, reducing total system production costs and typically reducing energy market prices in the physical dispatch.

Constraint does not bind in RTPD dispatch solution, resource is committed.

- Because the constraint does not bind, the current market power mitigation design would not be triggered;
- Because the constraint does not bind and the resource is committed, the lack of mitigation of commitment costs would not impact real-time prices or output;
- Because mitigation was not applied, the resource's commitment cost offers could be excessive, resulting in excess uplift costs for power consumers;
- Commitment costs that inflate uplift charges do not need to be mitigated ex ante, they could be mitigated after the fact if the offers cannot be cost justified.

Constraint does not bind in RTPD dispatch solution, resource is not committed.

- Because the constraint does not bind in the RTPD dispatch solution, the current market power mitigation design would not be triggered;
- Because the constraint does not bind, the lack of mitigation would not impact either real-time prices or output within any constrained region.
- Because the resource is not committed, there would not be any uplift costs requiring mitigation.

Because a resource's commitment evaluation would be based on its unmitigated commitment cost offers, resources would not be uneconomically committed to support exports.

WHAT DO WE DO?

While improvements in the calculation of mitigated offer prices should be pursued, a mitigation design based on published indexes and limited to ICE transactions will inevitably at times result in mismeasurement of commitment costs and in turn lead to uneconomic commitment of resources to support exports, not to relieve congestion within a constrained region.

- Improvements that would limit the application of commitment cost mitigation based on the set of monitored constraints might reduce the impact of inappropriate mitigation and commitment but this supposition would require empirical analysis to confirm.

WHAT DO WE DO?

- Limiting the application of ex ante mitigation to circumstances in which transmission constraints are binding a resource fails the pivotal supplier test would eliminate inappropriate mitigation of resources committed to support exports.
- Mitigation of excess commitment costs giving rise to uplift charges could be applied in settlements.
- Resources whose commitment is not needed to relieve a transmission constraint would not be committed based on estimated costs.

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