System Market Power discussion

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Topics

- High Level Design Issues
- Import Competition and the Geographic Market Scope of Mitigation
- Time Frame for Mitigation

High Level Design Issues

Some important elements of a real-time system market power mitigation design not discussed in the CAISO conceptual design.

- Application of system market power in STUC, HASP and RTPD
- Ex post market power in real-time and the frequency of mitigation
- Appropriate test for system market power

High Level Design Issues

Will system market power mitigation be applied in STUC, HASP and RTPD?

- Resources that do not clear in the IFM because of their high offer prices but are scheduled in RUC (to meet price capped load that did not clear in the IFM or load met with virtual supply) would need to be committed in STUC or RTPD in order to be available to meet load in real-time.
- Is it intended that a test for system market power would be applied to these resources in STUC and RTPD and that the commitment of these resources would be evaluated based on mitigated offer prices?

If there were an attempt to exercise system market power in the day-ahead market, it would be necessary to apply market mitigation in STUC, HASP and RTPD in order to make efficient commitment decisions.

High Level Design Issues

There is potential for the exercise of ex post market power in real-time.

- A core role of the CAISO IFM is to commit generation needed to meet CAISO load and reliability requirements.
- By design the IFM does not commit all available generation.
- It should therefore be expected that there will be less capacity available to meet load in real-time than was evaluated in the IFM.
- Ex post market power exists when a supplier does not possess market power in the day-ahead time frame in which many resources could be committed to meet load, but possesses market power in real-time when some of the resources that were available day-ahead are off line and unable to provide supply.
- The potential for the IFM to create ex post market power when it commits some resources but not others is addressed by the financially binding schedules assigned to resources scheduled to provide energy or reserves in the IFM.

High Level Design Issues

The IFM design ensures that if resources scheduled to provide energy or reserves in the IFM reduce their real-time output below their IFM schedules, they will not be able to profitably exercise system market power by selling power at higher prices than determined in the IFM. Instead, they would be buying power in real-time at higher prices than those at which they sold it in the IFM (thereby losing money by selling low and buying high).

- The IFM would not be as effective in constraining the after the fact exercise of market power if there were no application of market power mitigation in the IFM and capacity was committed in the RUC rather than IFM to meet real-time load.
- Hence, if there is a potential for material economic withholding of supply in the day-ahead market in order to exercise system market power that is not subject to mitigation in the day-ahead market, the IFM would not be fully effective in constraining the exercise of ex post market power in real-time.

High Level Design Issues

If there were a potential for the exercise of material system market power, the application of system market power mitigation in real-time could in principle compensate for the potential lack of binding day-ahead financial schedules for resources committed in RUC.

However, the effectiveness of a design relying entirely on real-time mitigation would depend on:

- The accuracy of real-time DEBs for gas fired resources;
- The amount of supply treated as potentially withheld and available in applying a pivotal supplier test (i.e., ramp, start-up and shut-down assumptions). These assumptions would have an important effect on the frequency with which pivotal supplier test failures would trigger system offer price mitigation in RTD.

High Level Design Issues

If a system market power test is developed, should it be based on the 3 pivotal supplier test, on a conduct and impact test, or on some other test?

- Among the inherent flaws of the 3 pivotal supplier test is that it does not take account of generation pockets within the region analyzed, potentially overstating fringe supply.
- There are sometimes generation pockets within the California ISO and there are at times even larger generation pockets outside the California ISO.
- The finding that roughly 50% of the flexible ramping product scheduled by the California ISO is not actually deliverable is a dramatic demonstration of the potential scope of the problem.

High Level Design Issues

Another inherent limitation of a pivotal supplier test is that it does not take account of the cost effectiveness of the competition provided by fringe supply.

- Because the pivotal supplier test includes even very high cost fringe supply in the pivotality calculation, it can overstate the effectiveness of the competition provided by high cost fringe supply.
- This has the potential to become an increasingly important limitation within a CAISO and Western EIM in which there are an increasing amounts of energy limited resources, some having high and potentially difficult to accurately measure opportunity costs.

The use of a three pivotal supplier test rather than a one, or one and a half, pivotal supplier test provides a very rough balance for these limitations of a pivotal supplier test but the application of a 3 pivotal supplier test can be so stringent that it triggers mitigation when there is no potential for the exercise of market power.

High Level Design Issues

A flaw in the CAISO's implementation of the pivotal supplier test is that in testing pivotality it removes the price taking supply of potentially pivotal suppliers, thereby potentially triggering offer price mitigation when there is no potential for the exercise of market power.

- This could be an increasingly important flaw if the 3PS is applied to testing for system market power in a western EIM in which utilities may have large amounts of price taking intermittent resource output and also rely on energy limited resources whose energy needs to be reserved for balancing variations in intermittent resource output.

High Level Design Issues

Additional flaws in the CAISO's implementation of the pivotal supplier test are that it does not take account of the load serving obligations of regulated or public utilities and triggers mitigation without regard to the price level.

If a potential for the exercise of material system market power were to develop or were expected to develop, it would be desirable to apply a test for system market power that would accurately detect the potential for the exercise of system market power but would not routinely trigger mitigation when there is little or no potential for the exercise of material system market power.

This might be addressed to a degree with changes in the way the CAISO applies the pivotal supplier test or might be better addressed by shifting to a different test for the exercise of system market power.

Import Competition

Should a system market power test be triggered only if the CAISO is import constraint or should unconstrained interties define regions broader than the CAISO over which a system market power test would be applied?

Import Competition

What should be the criteria for determining whether the CAISO is sufficiently import constrained that system market power mitigation should be triggered?

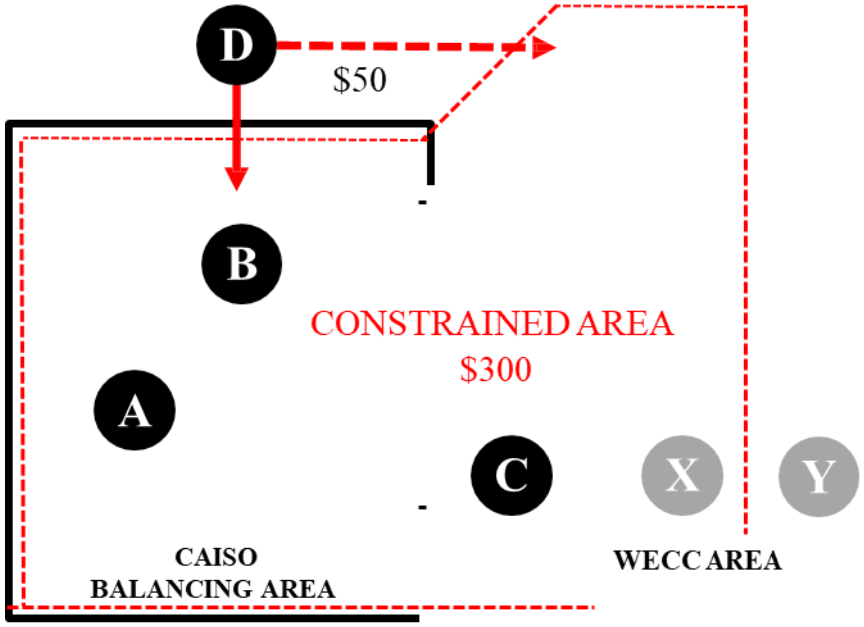
- The trigger should not require that every intertie be import constrained. Some interties have limited competitive impact because they draw upon limited sets of resources that might be fully dispatched in real-time, might be off line, or might be very high cost.
- Triggering tests for system market power only if the major intertie are import constrained would be consistent with applying mitigation when the exercise of system market power by suppliers within the CAISO would not be effective less constrained by import competition.

Import Competition

Models of unilateral economic or physical withholding, as well as models of tacit collusion to withhold output from the market, have a common prediction that it is suppliers controlling a material portion of supply, or uncontracted supply, that potentially have the incentive and ability to materially impact market prices by economically or physically withholding supply from the market.

- Conventional economic theories of the exercise of market power do not predict that fringe competitors with small shares of sales and capacity are likely to find it profitable to economically or physically withhold their output from the market in order to raise market prices.
- Hence, it is not necessary for the CAISO to have the ability to mitigate the offers of every supplier within the relevant market in order to constrain the exercise of market power.
- It is only necessary for the CAISO to have the ability to mitigate the offers of suppliers with the incentive and ability to materially impact market prices by economically withholding output.

Import Competition



Import Competition

Suppose, for example, that fringe suppliers at C and X in the constrained area in the figure above only controlled 5 megawatts of capacity, while suppliers at A and B controlled a thousand megawatts of supply within the CAISO.

- There would be no need to mitigate the offers of the fringe suppliers at C and X in order to prevent the exercise of material market power within the constrained area.
- The potential output of the fringe suppliers at C and X is tiny relative to the supply in the market and relative to the amount of supply A and B could withhold.

Import Competition

Even if the constrained region were broader than the CAISO, the only suppliers that possess market power within the broader market could be suppliers located within the California ISO balancing area.

- All of the analysis of potential economic withholding and clearing prices in the CAISO stakeholder process has been limited to resources within the CAISO.
- There is no empirical basis for presuming there has been any exercise of system market power by withholding the output of resources located outside the CAISO.

If the potential for material economic withholding in order to exercise system market power is limited to suppliers controlling resources largely located within the CAISO, there is no need to apply system market power mitigation over a broader region.

Import Competition

Extending the application of a pivotal supplier test for system market power to include resources located outside the CAISO balancing area would increase the importance of accurate modeling of transmission constraints that create generation pockets within that broader region, which may be a substantial challenge.

Conversely, if a pivotal supplier test for system market power were applied to regions broader than the CAISO, limitations in the design or CAISO implementation of the pivotal supplier test would tend to trigger mitigation of offer prices when there is no potential for the exercise of system market power.

Import Competition

Limiting the application of a pivotal supplier test and mitigation to the CAISO balancing area would be consistent with constraining the exercise of system market power by suppliers within the CAISO, while avoiding the potential for the limitations of the pivotal supplier test to routinely application of system market power mitigation to energy limited resources located outside the CAISO.

Time Frame for Mitigation

The CAISO Conceptual Design Proposal envisions initially only applying system market power mitigation in the real-time market. Hence, system market power mitigation would not be applied in the CAISO day-ahead market (IFM).

- Resources would continue to be subject to the application of local market power mitigation (LMPM) in the day-ahead market.
- In addition, long start resources would continue to be subject to a 125% hard cap on commitment cost offers in both the IFM and in RUC.[1]
- Our understanding is that the CAISO envisions that resources having start times short enough to be committed in STUC would be subject to mitigation for system as well as local market power in STUC and RTPD, as well as in FMM and RTD.

1. CCDEB Tariff sections 30.4.4.1, 30.7.9 e and 30.7.10 2a.

Time Frame for Mitigation

Local and system market power mitigation can potentially be applied in at last three time frames, the day-ahead market, intra-day unit commitment and the real-time market (FMM and RTD).

- The application of mitigation to prevent the exercise of material ex ante market power will only be fully effective if it is applied in the context of the day-ahead market, intra-day unit commitment decisions and the real-time dispatch.
- This is the approach taken in the application of local market power mitigation in the CAISO, which is applied in the timeframe of the IFM, STUC and RTPD, and in FMM and RTD.

Time Frame for Mitigation

The application of system market power mitigation only in real-time, in combination with the existing hard caps on commitment cost bids, the ability of load serving entities to submit price capped load bids, the ability of virtual traders to submit virtual supply bids, and the RUC process will limit the market impact of attempts to exercise of system market power in the day-ahead market.

While these factors would constrain the exercise of system market power, there are reasons to anticipate that they would not be sufficient, even in combination, to completely eliminate market impacts if there is a potential for the economic withholding of a substantial amount of supply in the day-ahead market.

Time Frame for Mitigation

Attempts to exercise market power in the IFM would incent virtual suppliers to submit supply offers and incent load serving entities to submit price capped load bids, both reflecting the expected level of real-time prices given the application of market power mitigation in real-time. However:

- Virtual supply offers would be submitted at a level that is expected to provide virtual traders a sufficient margin over expected real-time prices to recover the cost of analyzing real-time conditions, bearing the risk of large losses as a result of unexpected system conditions, and bearing the transaction costs applied to virtual supply offers (collateral costs, uplift allocations etc.).
- Price capped load bids would similarly incorporate a sufficient margin relative to expected real-time prices to reflect the risks incurred in deferring power purchases to real time.

Time Frame for Mitigation

Suppliers possessing system market power in the day-ahead market could attempt to exercise market power by offering long-start resources into the IFM with inflated commitment costs.

- However, long start resources that did not clear in the IFM could be committed in the RUC process if their capacity was needed to reliably meet CAISO load.
- Moreover, the hard cap on commitment cost offers would constrain the extent to which suppliers possessing material system market power could submit inflated commitment cost offers on long starting resources in the day-ahead market.

However, neither the RUC process nor the hard cap on commitment cost offers would completely eliminate the potential suppliers possessing system market power to exercise system market power that would be reflected in excess uplift payments on long-start resources rather than being reflected in inflated energy prices.

Time Frame for Mitigation

While RUC would ensure that sufficient resources were available to meet the CAISO's day-ahead load forecast of real-time load without regard to the level of physical load and generation that cleared in the day-ahead market, the RUC commitment process is not as efficient as the IFM.

- Suppliers scheduled in RUC would not have financial schedules to support the purchase and scheduling of gas.
- Instead of financially binding schedules, long start resources and interchange transactions scheduled in RUC would have bid cost guarantees with their real-time output settled at the great or as bid (mitigated) costs or real-time prices.
- The RUC objective function is intended to maintain reliability at least cost, it is not designed to take over responsibility for meeting load at least cost from load serving entities.
- Reliance on the CAISO's load forecast to commit generation in RUC potentially foregoes benefits from the commitment of generation based on the load forecasts of LSEs and virtual traders.

Time Frame for Mitigation

If there were a potential for substantial economic withholding of supply in the day-ahead market in order to exercise system market power, it is unlikely that real-time market power mitigation alone would be completely effective in eliminating any potential adverse market impact from that economic withholding.

- On the other hand, it is uncertain whether such a potential for the material exercise of system market power will develop, or how different market conditions and the resource mix will be in the time frame in which it might develop.
- As discussed above, it is also unclear whether the CAISO's 3 pivotal supplier test design would be the ideal long-run design were there a potential for the exercise of material system market power.