Consideration of Price Impact in the Assessment on Non-Competitive Paths  
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SCE provides these comments as a starting point for discussing a straw proposal to determine non-competitive paths which considers price impacts as well as the pivotal nature of suppliers. Due to the complexity of this issue, this document should be viewed only representing our thinking at this time for this working group, and should not be viewed as SCE’s final proposal. Any proposal will likely benefit from a more detailed vetting of the details.

SCE believes that simply testing a path to see if a single supplier is pivotal is a wholly inadequate method for determining competitiveness. Rather, the impact a supplier has on price, as well as possible outcomes based on joint actions must be considered. This is particularly true in light of the July 1, 2005 FERC decision indicating that CAISO energy bid caps will be set at $500/MWh on day-one of MRTU operations.¹

Discussion

As part of PJM-like local market power mitigation, conceptually approved for MRTU by FERC on 7/1/05, the CAISO must make an assessment of which paths will be treated as “non-competitive” in their LMP optimization. During discussions the CAISO has presented four methodologies for making the non-competitive assessment: PJM, the MISO, the CAISO initially proposed “RSI” test, and the more recently discussed CAISO “Feasibility Solution” test.

Residual Demand

Conceptually, SCE believes a determination of non-competitive paths should, ideally, consider the impact that a supplier, or suppliers acting jointly, can have on market prices. The test must go beyond simply testing if a supplier is unilaterally pivotal. During discussion at the recent MSC meeting on 7/7/05, the MSC spent considerable time discussing the concept of “Residual Demand”. Residual Demand represents the demand curve a supplier faces after subtracting the supply of all other suppliers from the total demand curve. Relative to an unconstrained transmission system, the degree to which the “slope” of the Residual Demand increases as transmission constraints are considered reflects the amount of market power, or here the non-competitiveness of a path, a supplier acquires as a result of adding the transmission constraint. In theory, one could look at the Residual Demand faced by all suppliers in an unconstrained transmission system, and then individually add transmission constraints back to the system. If at any time the slope of the Residual Demand increased by a certain amount for any supplier, the added constraint would be deemed non-competitive. One could then repeat this process for

¹ Moreover, FERC has explicitly addressed concerns related to “over-mitigation” through the provision of PJM-like mechanisms such as the “$40 bid adder” for Frequently Mitigated Units, and three different options, including a negotiated rate, to determine the level of mitigated energy bids.
every transmission path grid, comparing unconstrained Residual Demand to the Residual Demand after sequentially adding back every constraint.

Although SCE finds this concept to have many attractive features, largely because it looks at the ability of a supplier to impact price rather than simply looking to see if a supplier is pivotal, the methodology has shortcomings. First, simply adding one constraint at a time to the system will likely not capture the reality of the grid and the impact on Residual Demand when multiple simultaneous constraints (i.e. reality) are introduced. If instead more than one constraint is considered, the sequence in which the constraints are added may have a significant impact on the results. Second, the procedure only captures the impact on Residual Demand for that single supplier and does not capture the response of other suppliers. In fact, the actions of a single supplier may dramatically impact the Residual Demand for other suppliers throughout the grid. Thus although this procedure would provide insight into the ability/incentives a single supplier may have to exercise unilateral market power, the methodology does not yield insight into the full impact that such an exercise of market power may have on other suppliers, or the response of those suppliers.2 Finally, the method described only looks at the actions of a unilateral exercise of market power and does not consider the impact of joint actions3.

Because of these shortcomings, and the apparent computational complexity, SCE does not think that an assessment based solely on Residual Demand is practical. However, the attractive features of Residual Demand should be incorporated to the maximum extent possible any final solution.

CAISO “Feasible Solution” Test
On the July 6, 2005 conference call, the CAISO presented a new methodology which I refer to as the “Feasible Solution” test. Under this methodology, the CAISO would, relative to a base-line dispatch, remove the supply of a given supplier. They would then relax constraints on the paths to be tested for competitiveness by assigning high penalty prices once the original constraints are exceeded. Next, they would redispact the system and hopefully obtain a new “feasible” solution. The CAISO would then compare the flows on the “relaxed” systems to the actual transmission constraints enforced in base-line dispatch. Any path flows that violated the original constraints would be deemed non-competitive, basically because a single supplier exercising unilateral market power would be pivotal.

This solution appears to be the simplest of all the proposed options; however SCE sees several shortcomings. First, the methodology only tests to see if a supplier is pivotal. Unlike the Residual Demand approach, it does nothing to show how much market power a supplier has (i.e. how non-competitive a path is) if the supplier is not pivotal. Second,

2 It might be possible to consider some form of Nash equilibrium where the Residual Demand for each supplier included an expectation of withholding from all other suppliers. However, the MSC did not discuss this possibility.

3 SCE notes that this methodology can be modified to consider joint actions among explicitly identified sellers.
because multiple constraints are relaxed simultaneously, the test will most likely fail to identify all non-competitive paths (i.e. all paths over which the supplier is pivotal). Finally, as proposed the test fails to consider the impact of joint actions.

Thus this test alone fails to identify non-competitive paths when a supplier has significant market power but is not pivotal, and this test alone may not identify all non-competitive paths even when a supplier is pivotal.

**SCE’s Straw Recommendation**

If possible, the test for competitive paths should consider the impact a participant can have on price, not simply test if the party is pivotal. The Residual Demand approach directly addresses this issue for a set of suppliers, but still does not fully capture the full impact on buyers of the exercise of market power in the presence of a non-competitive path. Moreover, developing Residual Demand for every supplier, and perhaps joint suppliers, for every constraint may be too computationally cumbersome to be practical. In contrast the “Feasible Solution” test offers administrative convenience, but does not properly consider the impact to price and rather only considers a subset of paths when a supplier becomes pivotal. Moreover, SCE believes that joint actions must also be considered in any test.

As a proxy for a complete Residual Demand test, SCE offers the following straw proposal

1) Begin with the CAISO’s “Feasible Solution” test
2) To make up for the shortcomings in the test, do what PJM does and perform the test with three suppliers acting jointly to identify the paths that violate their baseline constraints. The use of three pivotal suppliers captures the fact that a) suppliers may act jointly, and b) that the test does not identify all paths that are non-competitive because multiple constraints are simultaneously relaxed.
3) Next, for the paths that do not violate the “Feasibility Test”, perform a Residual Demand test on all suppliers for each of these paths. We would have to define an index to perform a “pass/fail” test based on the impact on the Residual Demand. If any supplier “fails” the Residual Demand test, the path would be considered non-competitive. If all suppliers “pass” the Residual Demand test, the CAISO would consider the path competitive.

Due to the complexity of this proposal, and all the others, this proposal will likely benefit from additional discussion.