



XO Energy’s EMUSTF Phase 3 Executive Summary

Accurate price formation can only occur when ISOs are as locationally granular as possible. There should be a discrete marginal price for energy, congestion and losses at each substation that is part of the bulk transmission system. All transactions should be financially settled and biddable at the nodal level. This includes the expansion of the financial market to mirror every available substation that is part of the current network model. This “granular expansion” will facilitate market efficiency, transparency, and price formation. ISOs that restrict transactions to only zonal locations dilute the locational price of power on the nodal level.

PJM’s whitepaper, *Virtual Transactions in the PJM Energy Markets*, states:

*Overall, virtual trading benefits the efficient operation of the PJM energy markets. It can assist in **attaining efficient market outcomes and improve commitment and price convergence** between the Day-Ahead and Real-Time Markets. The participation of financial traders alongside physical asset owners and load-serving entities provides enhanced competition and liquidity to support hedging. Virtual trading generally assists in **achieving efficient market outcomes**, i.e. Day-Ahead Market outcomes that **commit those generation resources that will in fact be needed to serve load** in real time.*

One of the benefits of the UTC product is to facilitate the alignment, or pre-positioning, of the Day-Ahead Market with the Real-Time Market, including transmitting the proper price signals across each node in the system to affect “commitment convergence” (i.e., accurate scheduling of generation in the DAM). Ideally, the goal of the UTC product is to financially incent transmission flow to replicate DAM congestion on constraints that occur in the RTM. Restricting UTC’s to only source and sink at a Zone or Hub inhibits the ability to align transmission flow on specific constraints in the DAM. This should be logical based on simple powerflow analysis.

For example, if the *Glenarm - Windy Edge* constraint is binding in the RTM and not in the DAM, under the PJM proposal and absent any other existing flow, 2,500 MWh would need to flow from the PECO Zone to the BGE Zone in order for it to bind in the DAM. This transaction has the highest powerflow impact on the constraint with a 6% distribution factor. If all nodes were available, one would be able to achieve the same outcome with only 166 MWh between two load nodes. This transaction has a 90% distribution factor. As a result of the 2,500 MWh transaction from PECO to BGE, 145 other transmission elements would be overloaded in the DAM before flowing across *Glenarm - Windy Edge*. **This results in improper price formation and divergence, as only *Glenarm - Windy Edge* would still be binding in the RTM, and none of the overloaded DAM constraint would exist in the RTM.**

XO Energy performed the same powerflow analysis for every real-time constraint that occurred in 2016 and summarized the results below. It can easily be seen the dramatic different under various proposals.

Description	MWh Required to Bind RTM Constraints	Overloaded Elements in DAM Before RTM Constraint	Credit Required (Per Hour)
PJM Recommendation	6,605,075	115,480	\$6,538,382
Status Quo	1,508,995	19,933	\$1,083,911
All Nodes	533,661	2,555	\$224,133