Calibrating the Demand Curve for Imbalance Reserves

Jim Bushnell
Member, California ISO Market Surveillance Committee
March 10, 2023

This Topic is Important

- The addition of a demand curve was motivated by concerns over potential excessive costs of IBR
  - But a procurement curve excessively high penalty prices isn't much better
- WPTF and others have raised concerns that IBR purchases will crowd out AS procurement
  - Higher penalty prices for IBR would play a role in that
- The co-optimization of IBR and energy means that IBR purchases influence prices of energy as well as IBR
- IBR costs have implications for the EDAM RSE as well
- Relatively low penalty prices, at least initially, could provide insurance against unexpected problems in implementation

Logic of ISO Proposal

- CAISO proposal is to relax procurement based upon tiers of uncertainty percentiles.
  - Maximum of $1000, up to 10 intervals at 10% of procurement target.
  - CAISO expressed flexibility for changing this, wants stakeholder input
- By setting the first tier at $1000(2000) the implied logic is that a real-time realization of a positive net demand shock would definitely result in scarcity prices in real-time
  - But a shortfall of IBR is *not* the same thing as a real time shortfall of energy.
  - Assume IFM energy demand is met at price of $950/MWh, does it make sense to *not* procure energy in order to buy extra IRB?

What are the implications of an IBR shortfall?

- Does an IBR shortfall mean we face real-time scarcity?
- When net load rises above the amount of IBR procured it means there is not enough DA committed capacity.
- This *might* mean there is not enough real-time capacity, but ..
  - There could be capacity/energy available that wasn't procured in the DA (happens a lot today)
  - IBR requires 15 minute ramp, if short fall can be met with a longer ramp, there would likely be more capacity available

Demand Curve and Deployment Scenarios

- Our understanding is that IBR procurement would be reduced at specific nodes when that node's LMPs rise above the demand curve level
  - Overall IBR quantity would be reduced
- A variation of this would be to use lower penalty values for relaxing transmission constraints in the deployment phase (Scott Harvey's Option 5)
  - This would result in substituting IBR in one location with more from another location
  - Would reflect that fact that the difference of IBR value from one location to another is not precisely known

Summary

- Interpreting the cost of a shortfall in IBR as the probability weighted cost of real-time scarcity likely overstates the value of IBR
  - Yet this is what the currently proposed procurement curve is doing.
- Empirical analysis of the relationship between DA procured capacity (including RUC) and real-time net load could help inform this question
  - But role of load conformance complicates such comparisons
- Starting with a lower penalty price scheme, at least initially, would help guard against the largest unforeseen market impacts