

## Energy Price Formation

### Problem Statement

See attached

### Issue Source

PJM

### Stakeholder Group Assignment

This work will be assigned to a new senior task force reporting to the Markets and Reliability Committee (MRC), provided that the reliability-related aspects of real-time secondary reserves product will be assigned to the Operating Committee (OC).

### Key Work Activities

The group is expected to:

1. Provide education on topics including, but not limited to:
  - a. How energy and reserve prices are currently determined in PJM.
  - b. Factors that impact price formation such as resource eligibility, offer levels, operating parameters, interchange, self-scheduling, congestion, losses, and others that are identified.
  - c. Alternative energy pricing frameworks that have been applied and/or discussed in other regions.
  - d. How the current and alternative pricing frameworks influence bid/offer behavior.
  - e. The current PJM shortage pricing mechanism and Operating Reserve Demand Curves (ORDC).
  - f. How hedging is used by participants to mitigate risk, the impact of uplift on hedging, and how changes to pricing rules impact forward and financial markets and existing bi-lateral contracts.
  - g. The interdependencies between primary reserves and secondary reserves, and the reliability basis for real-time reserves.
2. Identify additional design criteria to guide the selection of energy market and shortage pricing design alternatives that should be considered in addition to the price formation goal of maximizing the social welfare objective (maximizing market surplus for consumers and suppliers).

3. Given the identified design criteria, evaluate gaps and opportunities to enhance PJM's current energy market and shortage pricing designs.
4. Given the identified gaps and opportunities, develop alternatives for enhancing PJM's energy market and shortage pricing designs (which enhancements may include new products).
5. Provide an initial assessment of other changes to PJM market rules that while out of scope for this effort, may be relevant for further discussion in other forums if recommended market design alternatives will be implemented.
6. Develop market rules as necessary to implement any recommended enhancements.
7. Develop a transition mechanism for the Energy & Ancillary Service offset for time periods for which capacity auctions have already cleared prior to any proposals being implemented and other applicable transition mechanisms as determined necessary by the group.
8. Where feasible, analyses evaluating the potential impact of proposals.
9. Develop a real-time secondary reserve product that addresses the real-time primary and secondary reserve requirements, taking into account the impact of operational variability.

### Expected Deliverables

As necessary, deliverables include the following:

1. A recommendation to the MRC on proposed market rule changes to enhance PJM's energy and reserve price formation and/or shortage pricing mechanism. This includes, but is not limited to revisions to rules on offers, offer limits and mitigation which are necessitated by the proposal, as needed.
2. Revisions to the Operating Agreement, Open Access Transmission Tariff, and manuals to implement the recommended enhancements.

### Out of Scope Items

The intent of this group is to focus on enhancements to how energy and reserve prices are formed. Therefore, the following items are out-of-scope beyond an initial assessment of whether changes may be warranted if the recommended energy market and/or shortage pricing design enhancements will be implemented.

1. The methodology used to determine the Energy and Ancillary Services offset used in the capacity market (excluding a transition mechanism and the potential inclusion of revenues from new products identified pursuant to Key Work Activity #4).
2. The methodology used to determine the Installed Reserve Margin.

3. The Regulation Market design, except for education and analysis on the impact of proposed changes to regulation pricing.
4. Discussion regarding changes to the determination of Fuel Cost and Variable Operating and Maintenance.
5. Changes to capacity market design.

### **Expected Overall Duration of Work**

The activities of the group are expected to be completed by the end of the 3rd quarter 2018. This timeline will be reviewed and extended as necessary.

### **Decision-Making Method**

Tier 2 decision making will be used.