Notes from June 25, 2019 meeting

Plan is to send questionnaire to three ISOs (MISO, PJM, SPP) so they can reply to all questions below as applicable, and then present on the key items in the presentation outline. Where possible, ERCOT and stakeholder welcome references/link to reference materials and presentations on these concepts.

**Outline of each ISO presentation (30-45 minutes)**

**Brief Overview of ISO market design**

* High-level overview of forward markets, day-ahead, intra-day, real-time (3 slides or less)

**Co-optimization details of ISO market design:**

* What A/S products do you have?
* What A/S and Energy products are co-optimized?
* Any products not co-optimized in Real-Time? (example: Load resources on UFR, Combined-Cycle capacity that is not frequency responsive) What happens to excluded resources?
* Are there virtual offers for Ancillary Services?
* Are A/S demand curves part of the optimizations?
  + If yes, can you describe/compare the offer caps and AS demand curves? (or point to source documentation)
* Scarcity Pricing: Describe any Offer cap/floor (treatment of out-of-market capacity directed on by RUC or emergency dispatch). Describe any proxy offers for capacity that is online but no offer submitted.
* What was your most significant lesson learned?

**Implementation:**

* Describe when/why Real-Time Co-optimization implemented.
* Cost to implement (ISO and/or entire market) and any quantifiable benefits and methodology used.
* Any scope challenges along the way?
* Any market readiness preparation issues?
* Any issues that you had to address post-implementation (or still need to address)?
* Any Operational issues encountered and actions taken to address them?
* Any other tips/advice for ERCOT in implementing RTC?

**End presentation**

*Additional questions for questionnaire only:*

* Are there must offer requirement from capacity market obligation and revenue sufficiency make whole payments for DAM awards or RT ISO dispatch that deviates from DAM awards?
* Any uplift issues presented by Real-Time Co-optimization?
* How do you ensure adequate capacity available in real-time (RUC or other market tool)?
* Split of revenue stream between capacity market, energy market and ancillary service market or just min/max/avg clearing price of different product for last year (or state of market report reference).
* Has RTC had to be changed to adapt to renewables (wind, solar, battery)?
* Do you have locational ancillary services?
* What major design changes are under evaluation now and why?