Review of Existing FTR Construct

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Overview

- Path forward includes following discussions:
  - Is the FTR product functioning as intended?
  - Does the long-term product add value?
  - What value do financial participants add to the FTR market?

Topic of Presentation

- Discussions will be followed by a white paper and feedback loops for areas of concern and/or analysis requests

- **<u>Goal: inform and frame solution space for package design phase</u>**

Recap: FTR Intent

The original intent of the FTR product has been well established to serve as the financial equivalent of firm transmission service, and to ensure open access to firm transmission service by providing a congestion-hedging function

The existing construct has been successful in promoting load serving entity (LSE) and firm point-to-point customer participation, alongside financial participants, to efficiently value the transmission system and secure hedging mechanisms against congestion costs for up to three years in the future, while also providing a guarantee of a minimum hedge to firm transmission customers for ten years into the future

Recap: FTR Intent

"Finally, the Market Monitor and Joint State Commissions reiterate the proposal, as made in their earlier filings, that the Commission should support a market redesign to ensure loads receive all congestion revenues. ***We reject the arguments that the sole purpose of FTRs is to return congestion revenue to load, and the market should therefore be redesigned to accomplish that directive****. FTRs were designed to serve as the financial equivalent of firm transmission service and play a key role in ensuring open access to firm transmission service by providing a congestion-hedging function. The purpose of FTRs to serve as a congestion hedge has been well established. In the Energy Policy Act of 2005, Congress added section 217(b)(4) to the FPA, directing the Commission to exercise its authority to "enable load serving entities to secure firm transmission rights (or equivalent tradable or financial rights) on a long-term basis for long-term power supply arrangements made, or planned, to meet such needs." In Order No. 681, the Commission clearly emphasized the significance of FTRs in hedging congestion price risk."*

https://www.pjm.com/directory/etariff/FercOrders/2048/20170131-el16-6-002,%20003,er16-121-001.pdf

There are several metrics that can indicate how well FTRs are functioning as a hedge to future congestion price risk

- Revenue Adequacy
- Value of ARRs Allocated to Load
- How Well ARRs Align with Day-Ahead Congestion

- **Revenue adequacy restored**
  - Removal of balancing congestion in 2015 restored confidence in the market
  - Quantity of ARR MWs have increased

Planning Period	ARRs Allocated (MW)	FTR Revenue Adequacy	ARR Value ($ Millions)*
2015/2016	76,420	105%	483.7
2016/2017	80,620	110%	541.6
2017/2018	94,229	137%	660.0
2018/2019	97,787	**112%	715.0

*Utilizing 2018/2019 FTR Auction prices
**First Planning Period where surplus revenues are returned to ARR holders, not FTR holders.

- **Empirical data shows LSEs are efficiently hedged**
  - Congestion returned to load is an indicator of a healthy market but not the objective
  - Values vary depending on LSE decisions

Planning Period	Actual Percent Offset to Load	Percent Offset if 100% of ARRs Self Scheduled	Percent Offset if 0% of ARRs Self Scheduled	ARRs Allocated	Notes
2015/2016	78%	66%	88%	76,420	
2016/2017	93%	71%	109%	80,620	
2017/2018*	50%	61%	36%	94,229	Skewed by Polar Vortex
2018/2019	92%	82%	104%	97,787	Surplus allocated to load improves offset

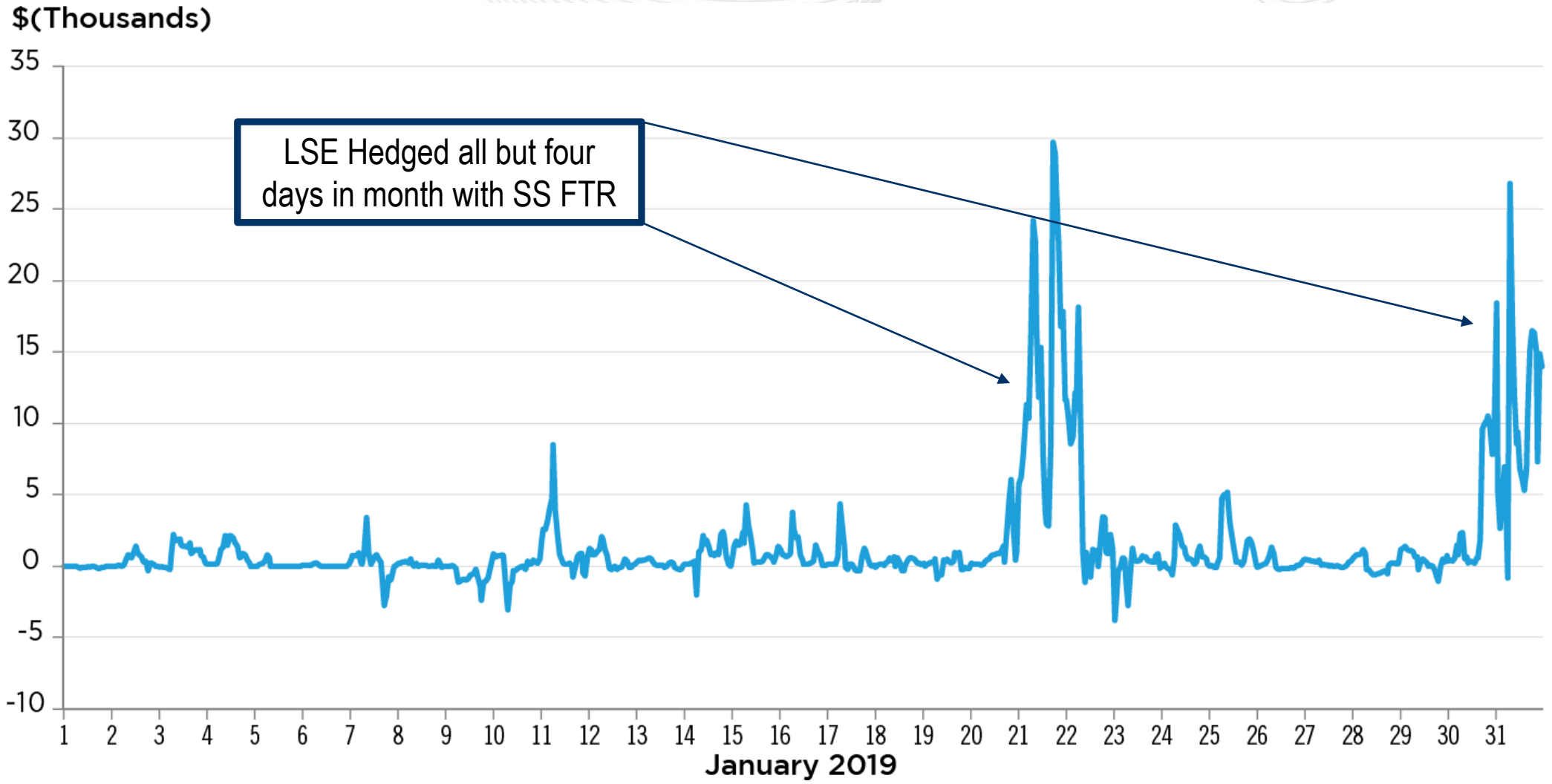
*Skewed due to extremely high congestion on specific paths for a very concentrated timeframe. Actual percent offset is 69 percent if January 2018 excluded.
Note: Actual Percent Offset to Load from table 13-20 of SOM Q3 2019 report

Real Examples of LSE Hedging Efficiency

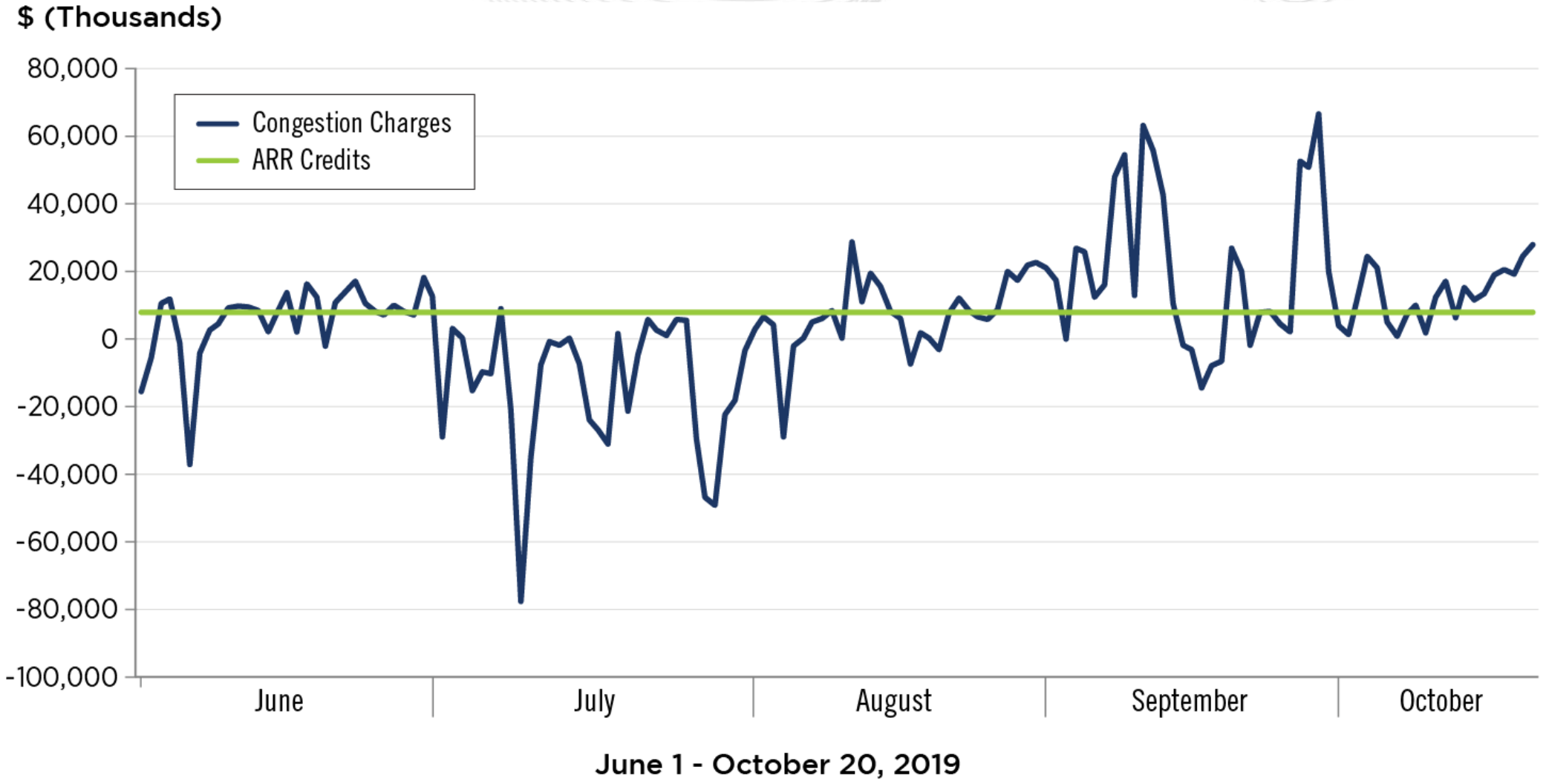
- FTR market provides valuable hedging mechanisms to actual LSEs via the **current point-to-point definition**

- As anecdotal evidence to demonstrate whether the FTR market provides valuable hedging mechanisms to actual LSEs via the current point-to-point definition, PJM examined two specific participants' portfolios over similar time horizons
  - By comparing DA transaction data (injections, withdrawals, IBTs) to ARR/FTR portfolios over the same time
  - Both entities are sufficiently hedged from DA congestion costs for time horizon

Example of 2019 Hourly Congestion Exposure for PJM Load Serving Entity Utilizing Self-Scheduled FTRs



PJM Load Serving Entity ARR Versus Day-Ahead Congestion Charges for PJM Load Serving Entity That Retains ARR Credits



Areas to Explore

- IMM investigation at a zonal level revealed that allocation of rights do not align well with the actual congestion returned to load for some zones for the 18/19 planning period
  - This is an important investigation, because although the data shows from a system-wide perspective that congestion returned to load may be appropriate under the existing construct, the actual alignment within zones may be unbalanced

- PJM and the IMM are currently exploring root causes for this misalignment
  - Topology modeling assumptions (outages, loop flow, reactive interface limits, etc.)
  - ARR source points
  - Seasonal congestion patterns