Capacity Obligations for Forecasted Large Load Additions

Issues Caused by Large, Concentrated New Load

Added Example and Diagram

Josh Burkholder, AEP

Jim Davis, Dominion

Markets Implementation Committee

9/6/2023

Capacity **O**bligations for **L**oad **A**dditions

Summary

- New data centers, and other emerging large-load industries, are driving significant forecasted load growth in certain areas of PJM.
  - Unique aspects of such large load additions are the magnitude, in the 1,000's of MWs, and the geographic concentration, occurring within the territory of one or a small number of Load Serving Entities (LSE) within the broader zone.
  - These forecasted large load additions are incremental to the PJM Load Forecast

- These forecasted large load additions are leading to **an issue with the assignment of capacity obligations within a zone for future delivery years**.
  - Under the existing process, the capacity obligation is spread across all the LSEs within the zone.
  - This can create a misalignment in the capacity obligations and associated cost impacts of the forecasted load addition.

- AEP and Dominion are sponsoring a Problem Statement and Issue Charge **to narrowly examine more accurately assigning the capacity obligation** for forecasted large, geographically concentrated load additions.

- This matter is not intended to consider changes or otherwise impact any aspects of load forecasting or other elements of the capacity construct.

PJM's Current Process

Load Forecasting:

- Large load shifts (either positive or negative) are reported to PJM by Electric Distribution Companies (EDC) and included by PJM in the peak load forecast by zone in the annual Load Forecast Report; as defined in PJM Manual 19, Section 3.2 and Attachment B.

Capacity Obligations for Load Serving Entities:

- For purposes of assigning capacity obligations for an upcoming delivery year to LSEs within a zone, such large load shifts are allocated among all LSEs within a zone based on steps defined in the Reliability Assurance Agreement (RAA).

- ***As a simplified description***, the large load shifts are used to calculate a Zonal Scaling Factor and the capacity obligation for each LSE is set as follows (Schedule 8 of the RAA and Section 7 of Manual 18):

    - Zonal Scaling Factor = (Zonal Peak Load Forecast for Upcoming Delivery Year) / (Actual Weather-Normalized Zonal Peak Load from Applicable Prior to Delivery Year)

    - Zonal Capacity Obligation = (Actual Zonal Peak Load * Zonal Scaling Factor * Forecast Pool Requirement)

    - Zonal Capacity Obligation is allocated among the LSEs within the zone based on historical peak load contributions to determine each LSE's capacity obligation

- This issue only occurs during the "forecast period" (when the load addition is not yet online and forecast for a future delivery year). Once a forecasted load addition comes online, it becomes part of the actual peak load of the applicable LSE and is no longer allocated to other LSEs across the zone.

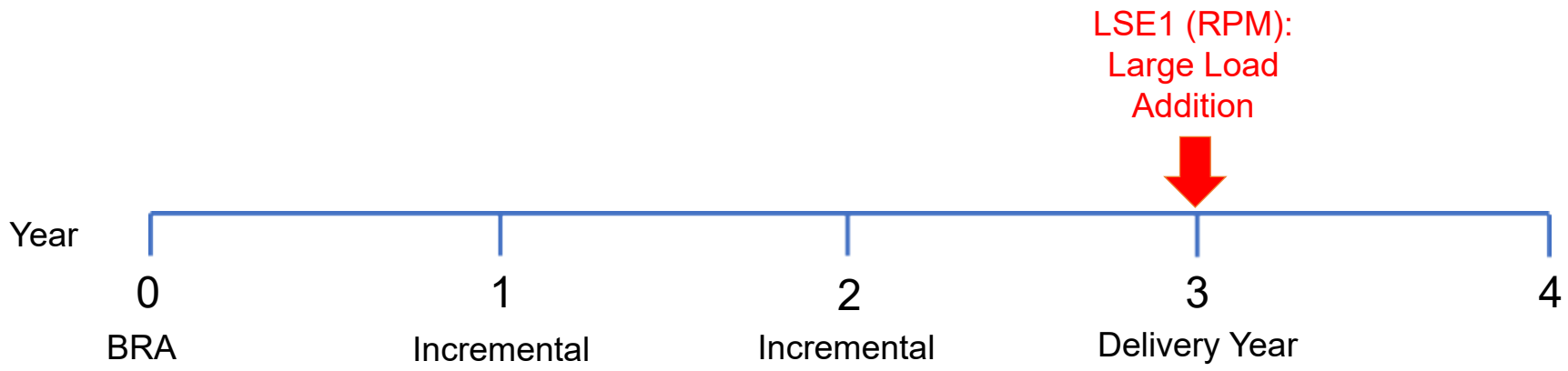
- The calculation and impact of the Zonal Scaling Factor is substantially similar for FRR entities, as defined in Schedule 8.1 of the RAA.

Addressing the Issue / Stakeholder Process

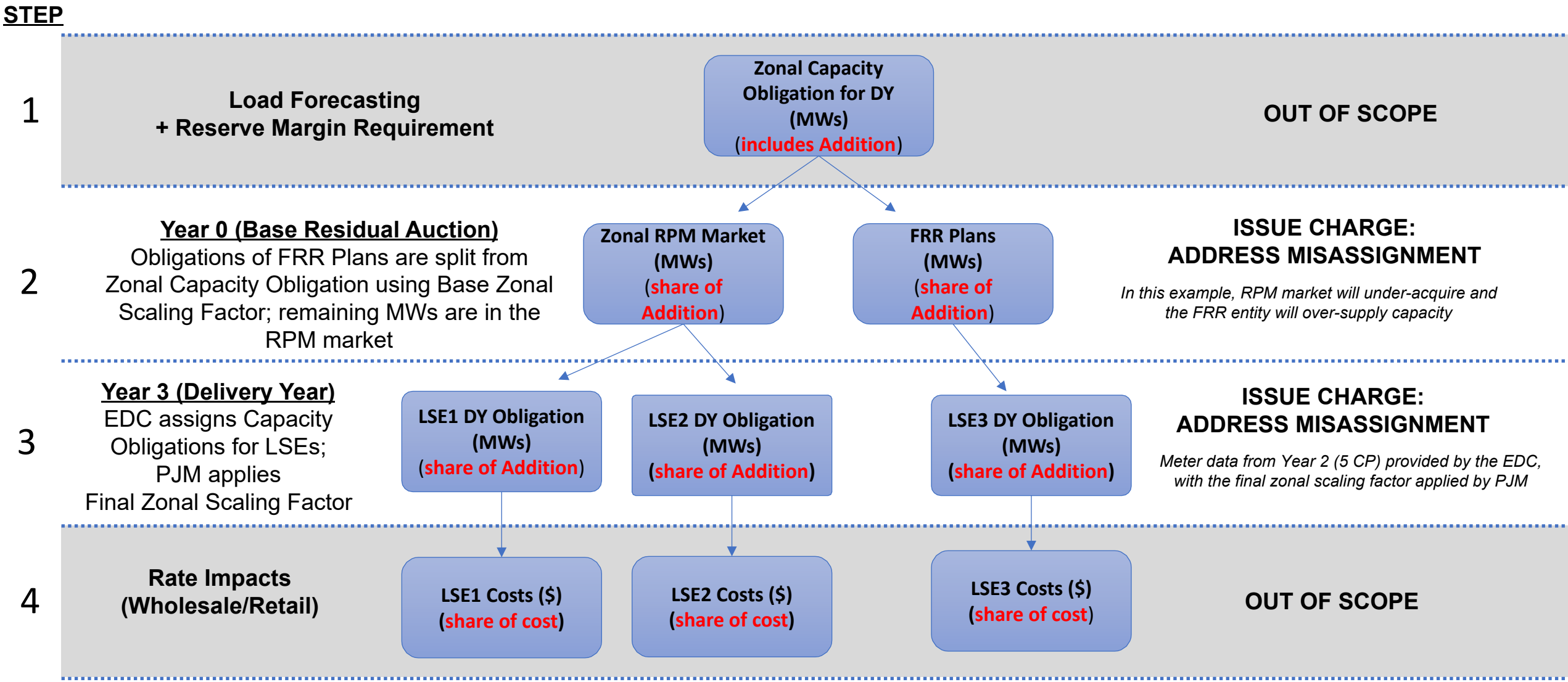
- To date, the current process has been efficient and avoids the unnecessarily complex task of forecasting load additions for each LSE within a zone.
    - For perspective, there are over 60 separate entities within the AEP zone that are allocated a capacity obligation.
    - The current process has worked historically with modest load growth that is generally spread across a zone.
- However, this process does not effectively handle large load increases that are geographically concentrated within a zone, such as with new data centers.
    - In such instances, spreading the forecasted large load increase misaligns the capacity obligation and associated cost impacts among all LSEs in the zone.
    - This impact is exacerbated when there are both RPM and FRR entities within the zone causing a misalignment between capacity accounted for in the market versus the FRR entities' obligations, which can cause overall market inefficiencies.
- Introducing a Problem Statement and Issue Charge to the Markets Implementation Committee to develop a solution to more accurately assign the capacity obligation during the forecast period.

Hypothetical Example

- Hypothetical Zone with Three LSEs
- LSE1 and LSE2 are RPM and LSE3 is FRR
- LSE1 is forecasting a Large Load Increase to come online in Year 3
- Delivery Year for this example is Year 3



Hypothetical Example - Conceptual Diagram



Issue resolves in Delivery Year 4 once the Addition becomes part of the actual peak load metered by the EDC

Hypothetical Example – Outcome

Hypothetical zone with 3 LSEs (2 RPM / 1 FRR)

Large load increase forecasted for LSE 1

Forecasted zonal peak used for Scaling Factor

Year 3 Forecasted Peak / Year 0 Actual Peak

RPM market under-procures and FRR entity over-supplies by 400 MWs

Example Year		0	1	2	3		
Actual Peak Load							
LSE 1 (RPM)		5,000					
LSE 2 (RPM)		1,000					
LSE 3 (FRR)		4,000					
Full Zone		10,000					
Forecasted Cumulative Load Additions (Table B-9)							
LSE 1 (RPM)	**LSE DATA**		0	0	1,000		
LSE 2 (RPM)	**NOT REPORTED IN**		0	0	0		
LSE 3 (FRR)	**PJM LOAD REPORT**		0	0	0		
Full Zone			0	0	1,000		
Forecasted Peak Load (Table B-10)							
LSE 1 (RPM)	**LSE DATA**		5,000	5,000	6,000		
LSE 2 (RPM)	**NOT REPORTED IN**		1,000	1,000	1,000		
LSE 3 (FRR)	**PJM LOAD REPORT**		4,000	4,000	4,000		
Full Zone			10,000	10,000	11,000		
For Year 3 Delivery Year							
Base Zonal Scaling Factor					1.1000		
Capacity Obligation (Before Forecast Pool Requirement)						**Misalignment**	
LSE 1 (RPM)					5,500	(500)	
LSE 2 (RPM)					1,100	100	
LSE 3 (FRR)					4,400	400	
Full Zone					11,000		

Contact Information

Josh Burkholder
Jburkholder@aep.com
614-769-2203

Jim Davis
james.g.davis@dominionenergy.com
804-393-3271