

# Hot Weather Markets Review

## June 22–26, 2025

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Market Implementation Committee  
July 7, 2025

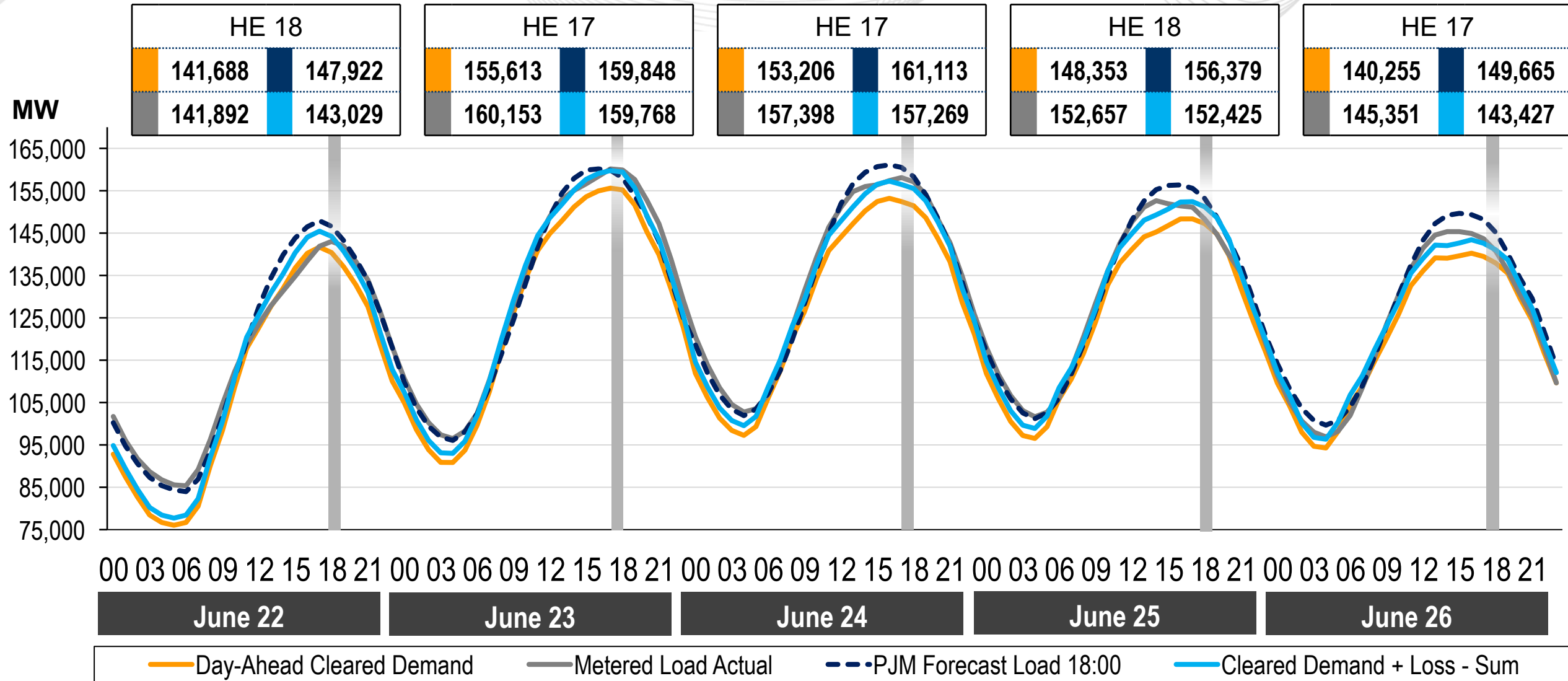
**Day-ahead demand was high due to hot weather and was reflected in energy / reserve pricing.**

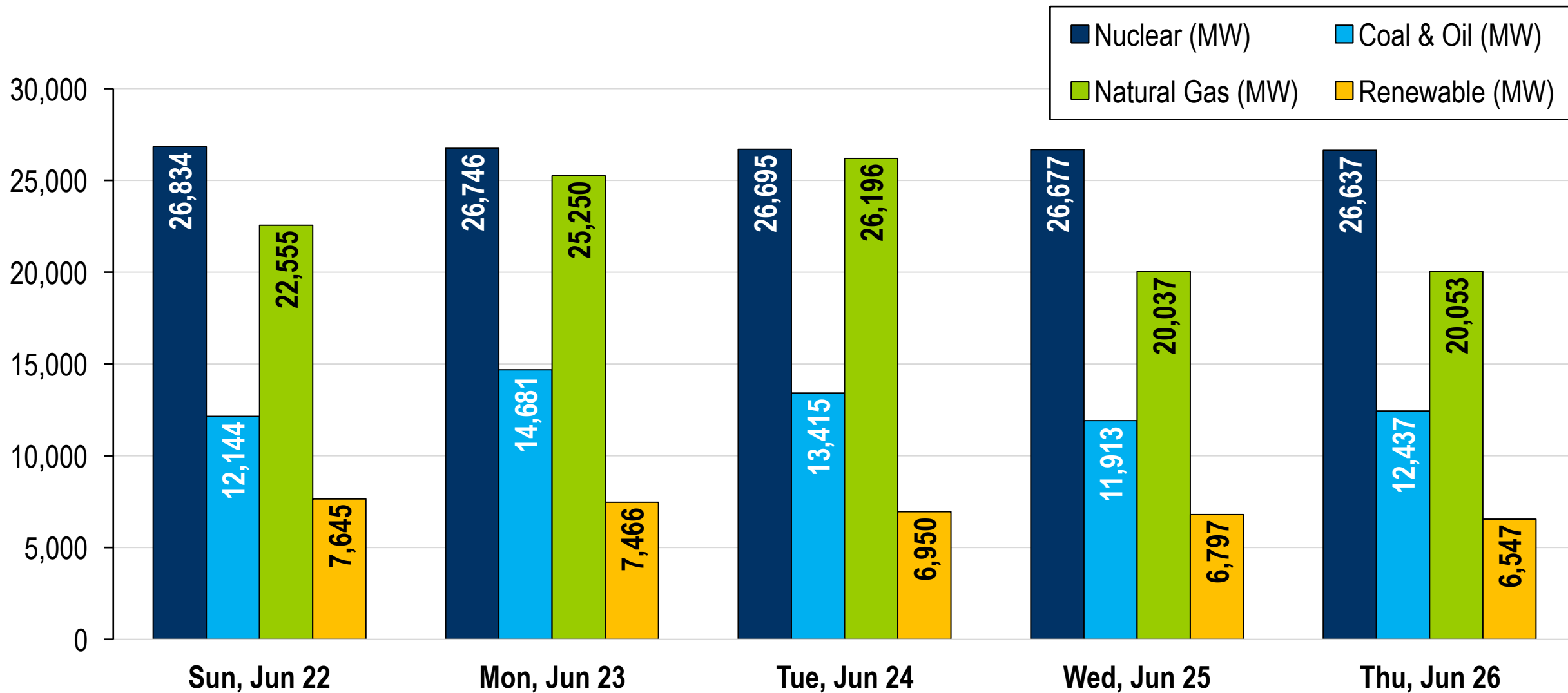
**Only a small number of units were scheduled in advance of the Day-Ahead Market for transmission constraints.**

**Congestion did not play a major role in the Day-ahead Market.**

2025		Day-Ahead Cleared Demand	Metered Load Actual	PJM Forecast Load 18:00	Loss MW + Cleared Demand	DA Loss MW	DA Exports
Sun-22-Jun	HE 18	141,688	141,892	147,922	145,455	3,767	-5508
Mon-23-Jun	HE 17	155,613	160,158	159,848	159,768	4,155	-3227
Tue-24-Jun	HE 17	153,206	157,398	161,113	157,269	4,063	-6138
Wed-25-Jun	HE 18	148,353	151,112	155,573	152,425	4,072	-4,416
Thu-26-Jun	HE 17	140,255	144,904	149,348	143,427	3,172	-4,731

# Day-Ahead Demand, Demand w Losses, Forecast, Metered Load

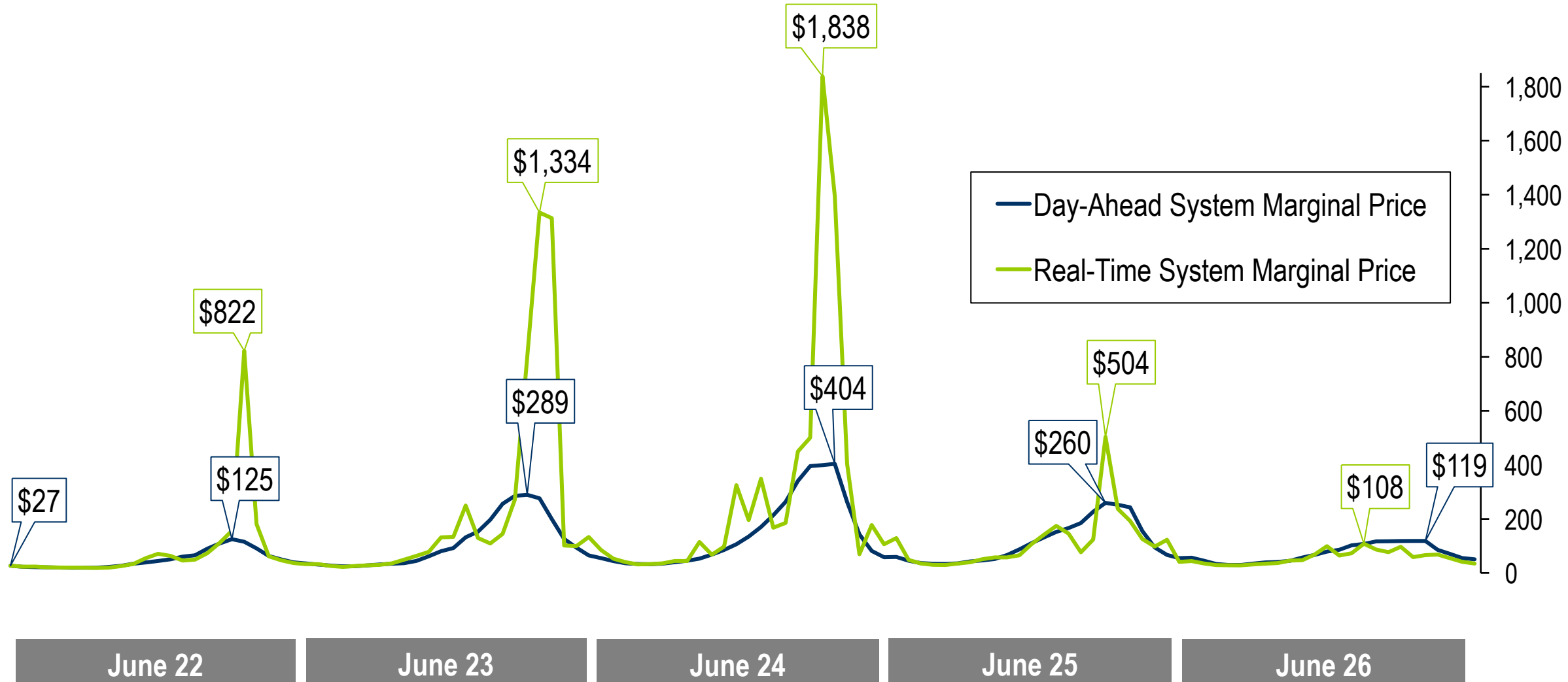




2025	Nuclear		Coal Oil		Natural Gas		Renewable		Total (MW)
Sun-22-Jun	26,834	39%	12,144	18%	22,555	33%	7,645	11%	69,177
Mon-23-Jun	26,746	36%	14,681	20%	25,250	34%	7,466	10%	74,143
Tue-24-Jun	26,695	36%	13,415	18%	26,196	36%	6,950	9%	73,257
Wed-25-Jun	26,677	41%	11,913	18%	20,037	31%	6,797	10%	65,424
Thu-26-Jun	26,637	41%	12,437	19%	20,053	31%	6,547	10%	65,673

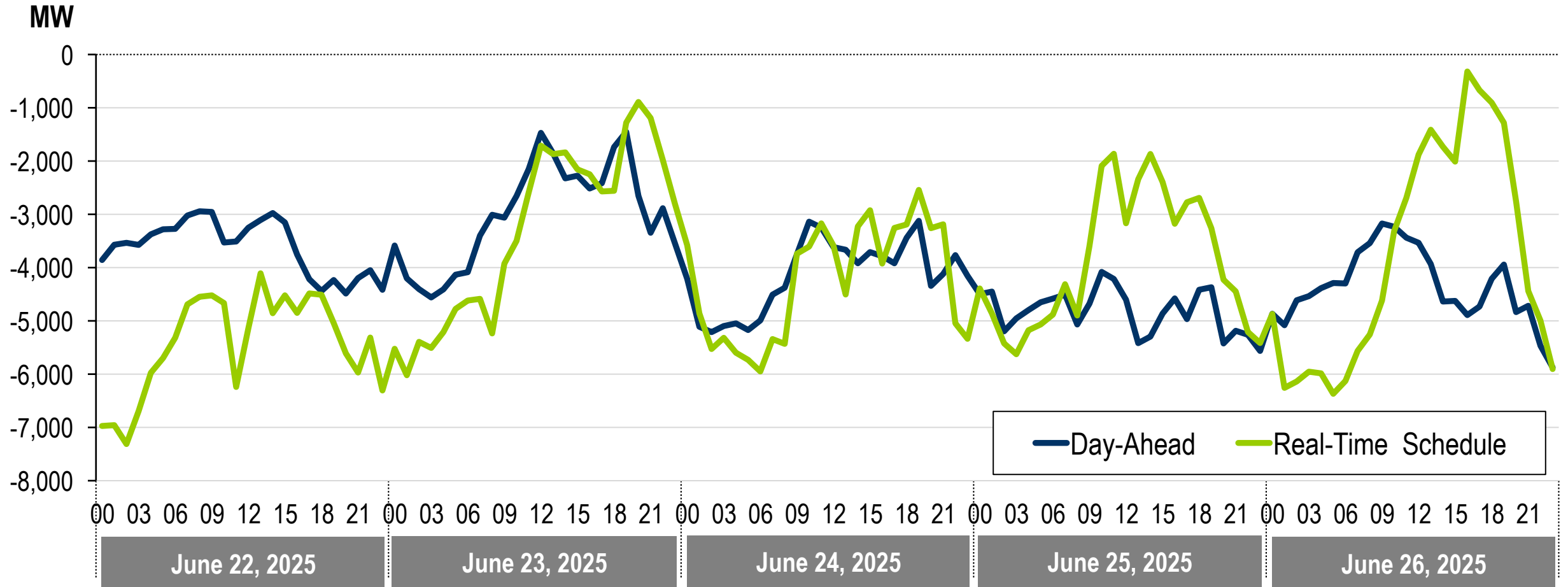
	Sun-22	Mon-23	Tue-24	Wed-25	Thu-26
	HE 18	HE 17	HE 17	HE 18	HE 17
<b>Total LMP</b>	\$128.25	\$287.53	\$393.00	\$253.60	\$115.62
<b>Energy LMP</b>	\$125.16	\$285.55	\$395.65	\$252.47	\$118.34
<b>Congestion LMP</b>	\$2.91	\$2.13	(\$2.53)	\$0.19	(\$3.33)
<b>Loss LMP</b>	\$0.18	(\$0.15)	(\$0.12)	\$0.94	\$0.61

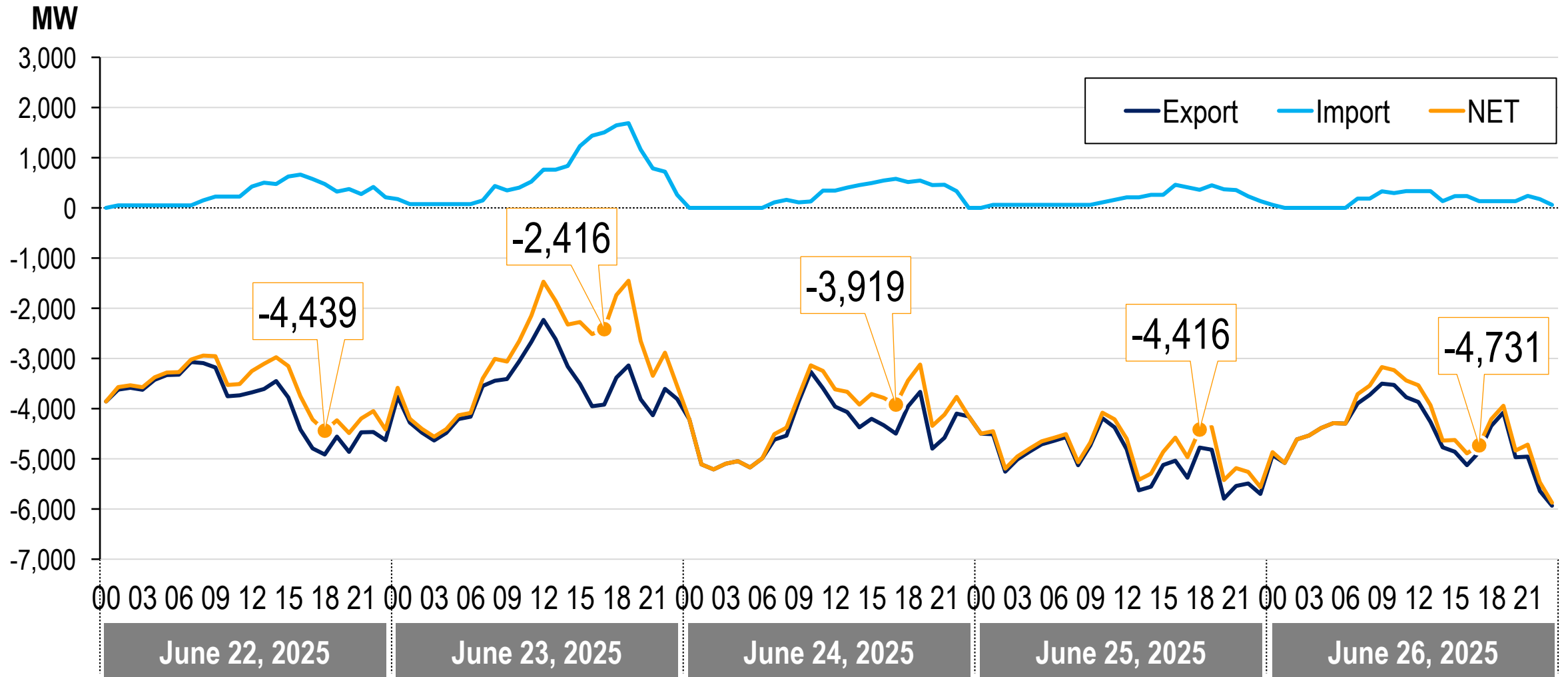
# Day-Ahead vs. Real-Time LMPs



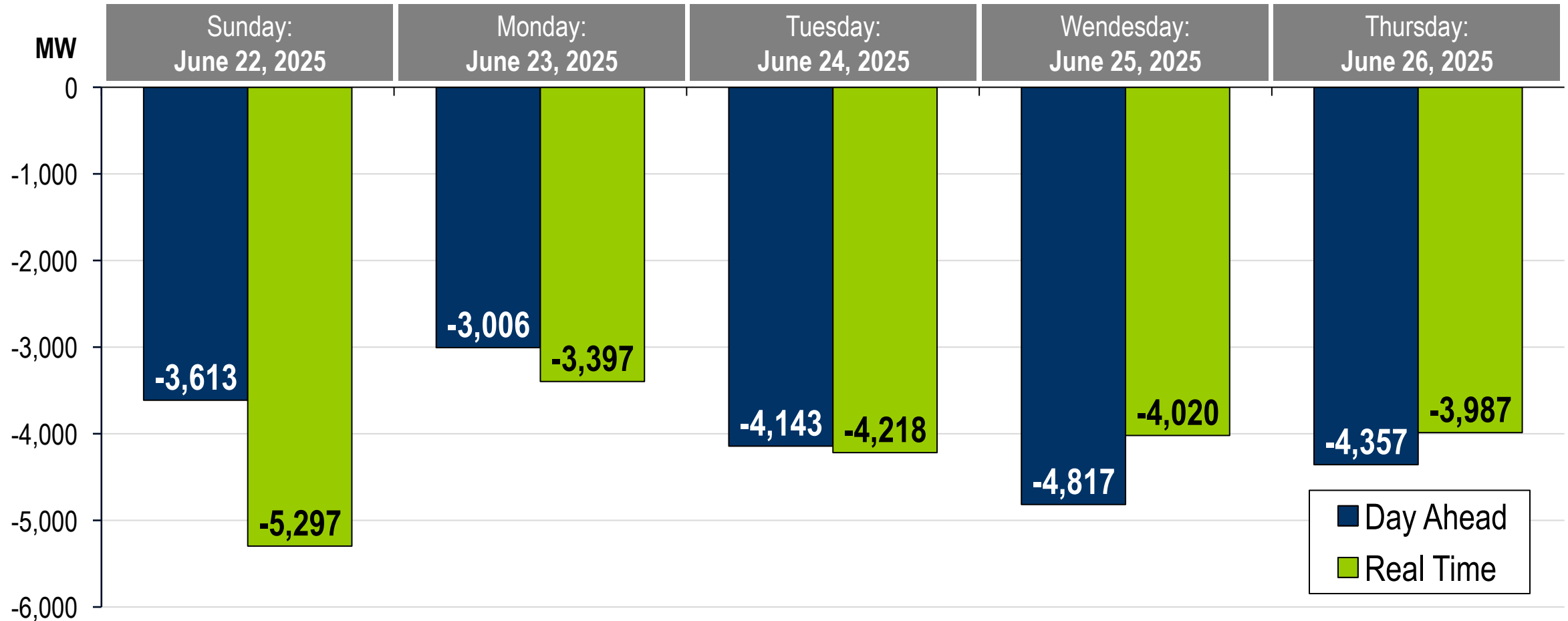


# Day-Ahead vs. Real-Time Interchange

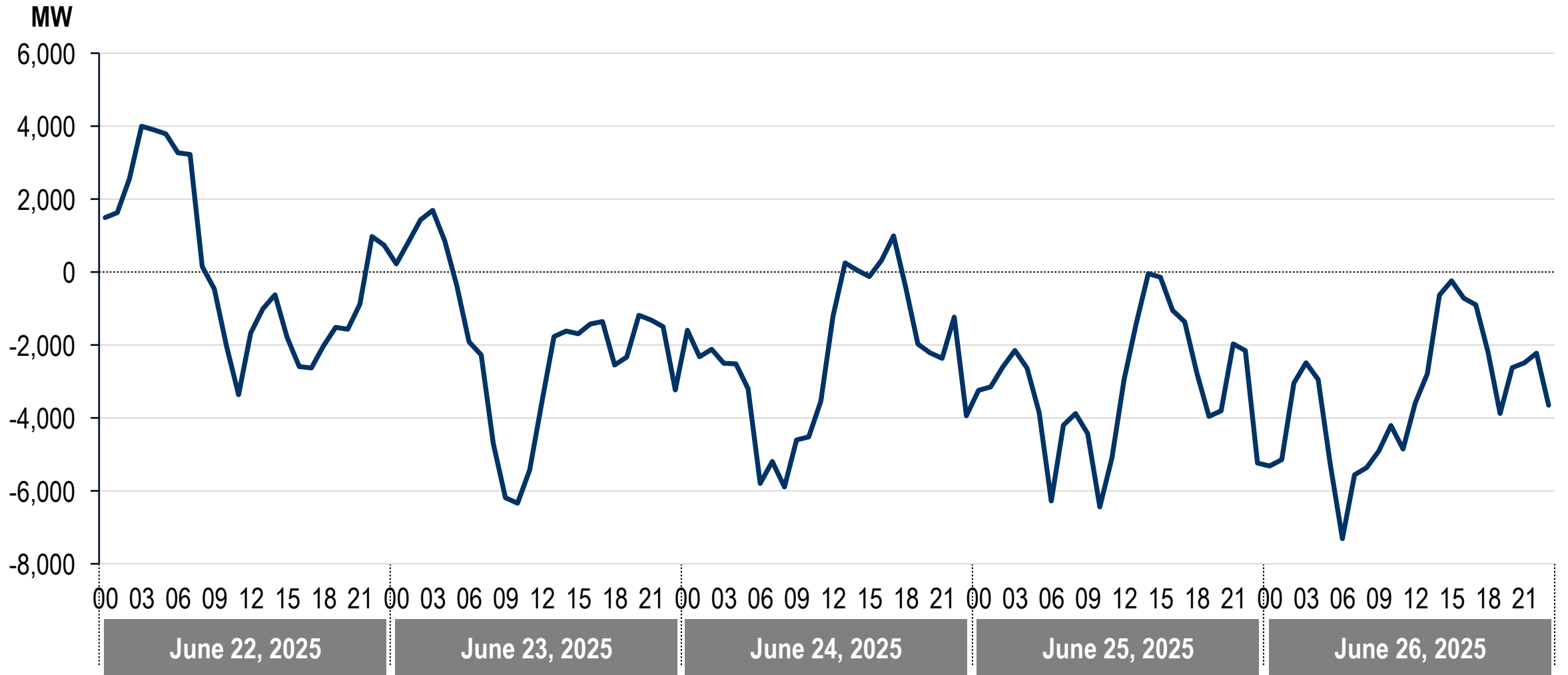




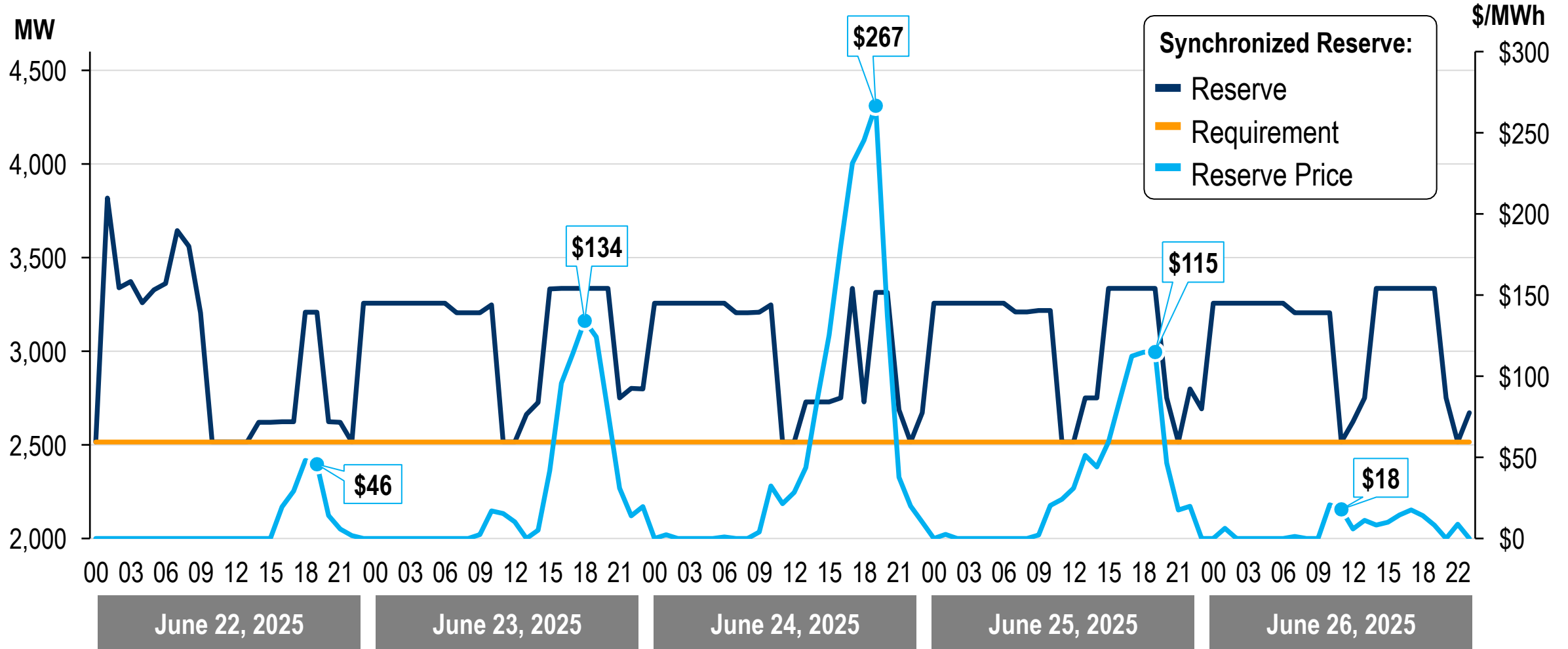
# Interchange Day-Ahead vs. Real-Time



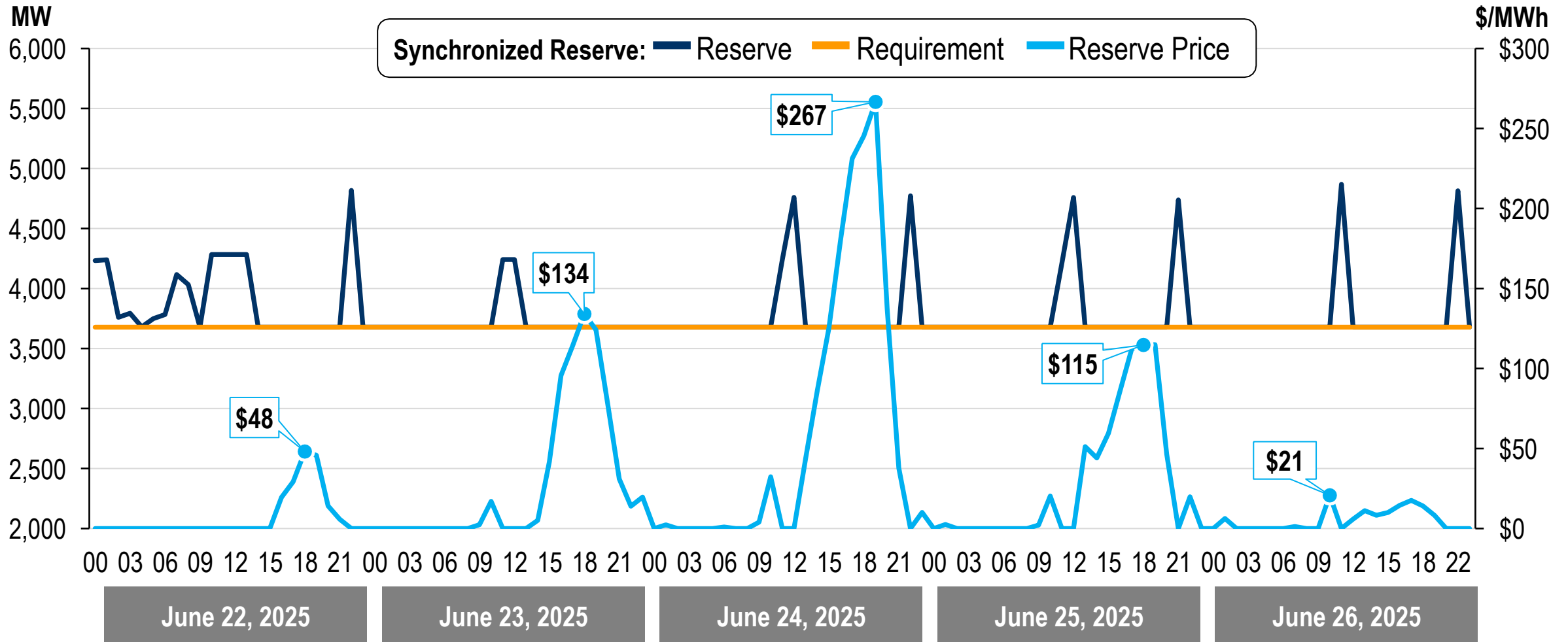
# Day-Ahead Hourly Net of Virtual Bids



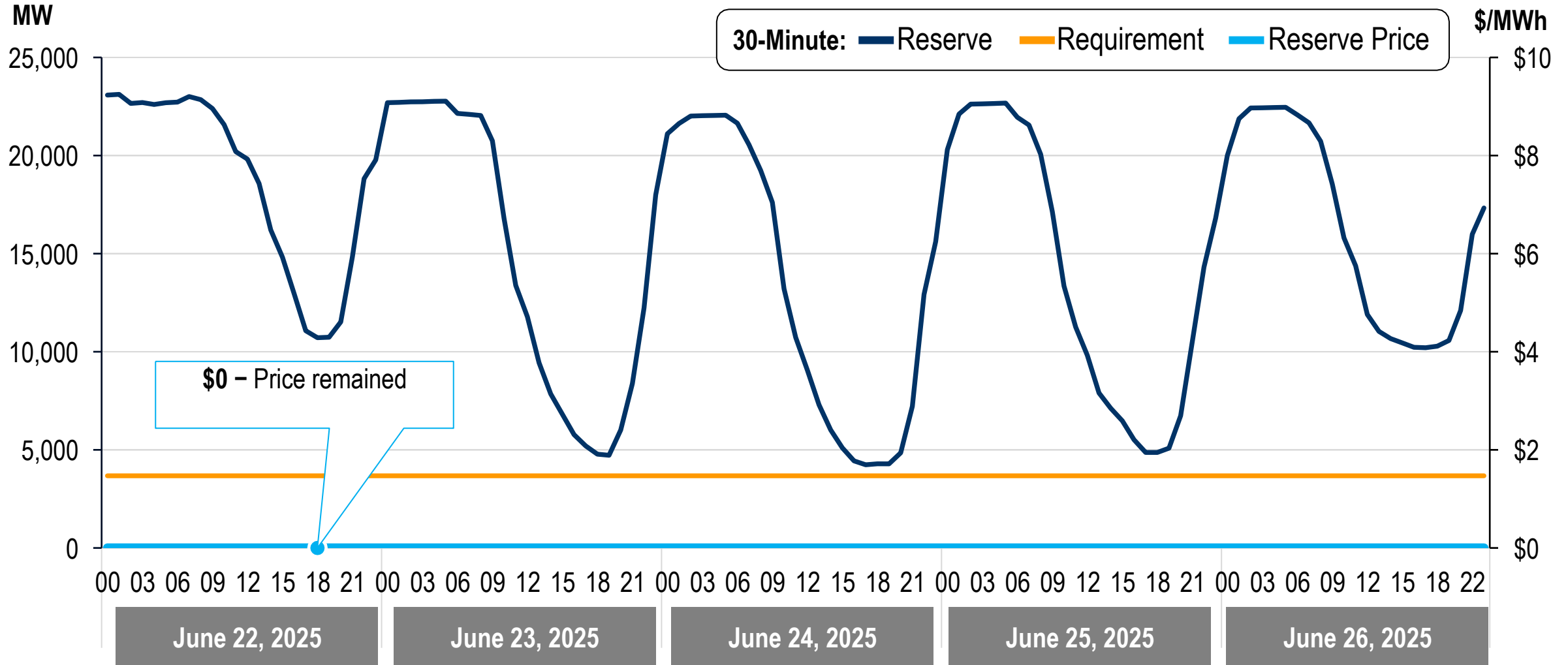
# Day-Ahead Synchronized Reserve Pricing



# Day-Ahead Non-Synchronized Reserve Pricing



# Day-Ahead Secondary Reserve Pricing



Real-time pricing peaked coincident with system conditions on Jun. 22–26, driven by net load, reserve shortages, and localized congestion.

SMP =

**\$3,700 @ Jun. 24, 19:00**

**\$2,358.36 @ Jun. 22, 19:40**

**\$3,011.96 @ Jun. 23, 20:20**

Localized congestion peaked hour 13, June 24:

- 12 out of 13 binding constraints in RT SCED bound at the \$2,000/MWh penalty factor

Ancillary services:

- Multiple reserve shortage cases approved throughout event
- One Synchronized Reserve event June 22 (<10 minutes)
- Increased Regulation Requirement throughout event

Demand Response:

- Pre-Emergency DR deployed for multiple zones
- 60 and 120 minute Capacity Performance DR deployed
- +3,200 total MWs

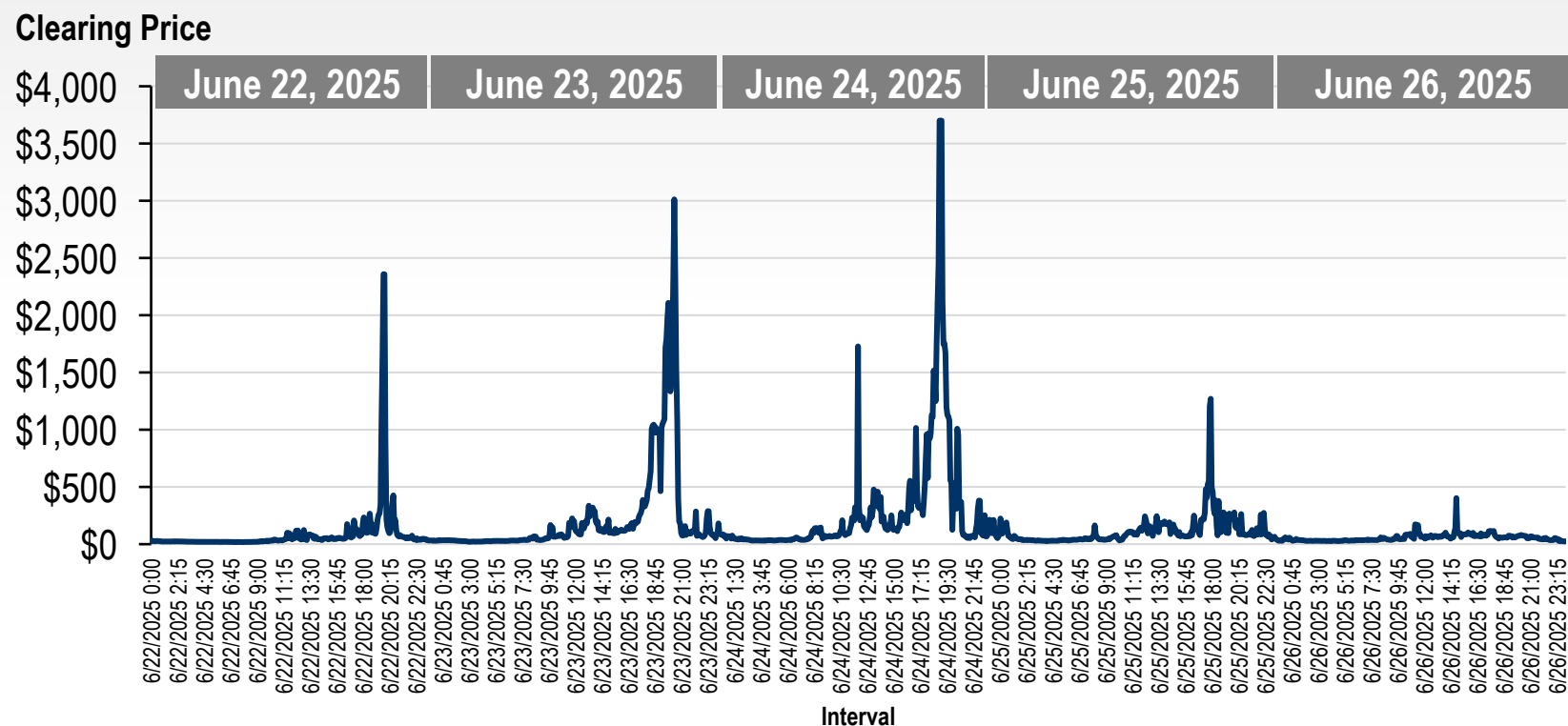


## System Marginal Price (SMP)

Incremental price of energy for the system, given the current dispatch, at the load weighted reference bus

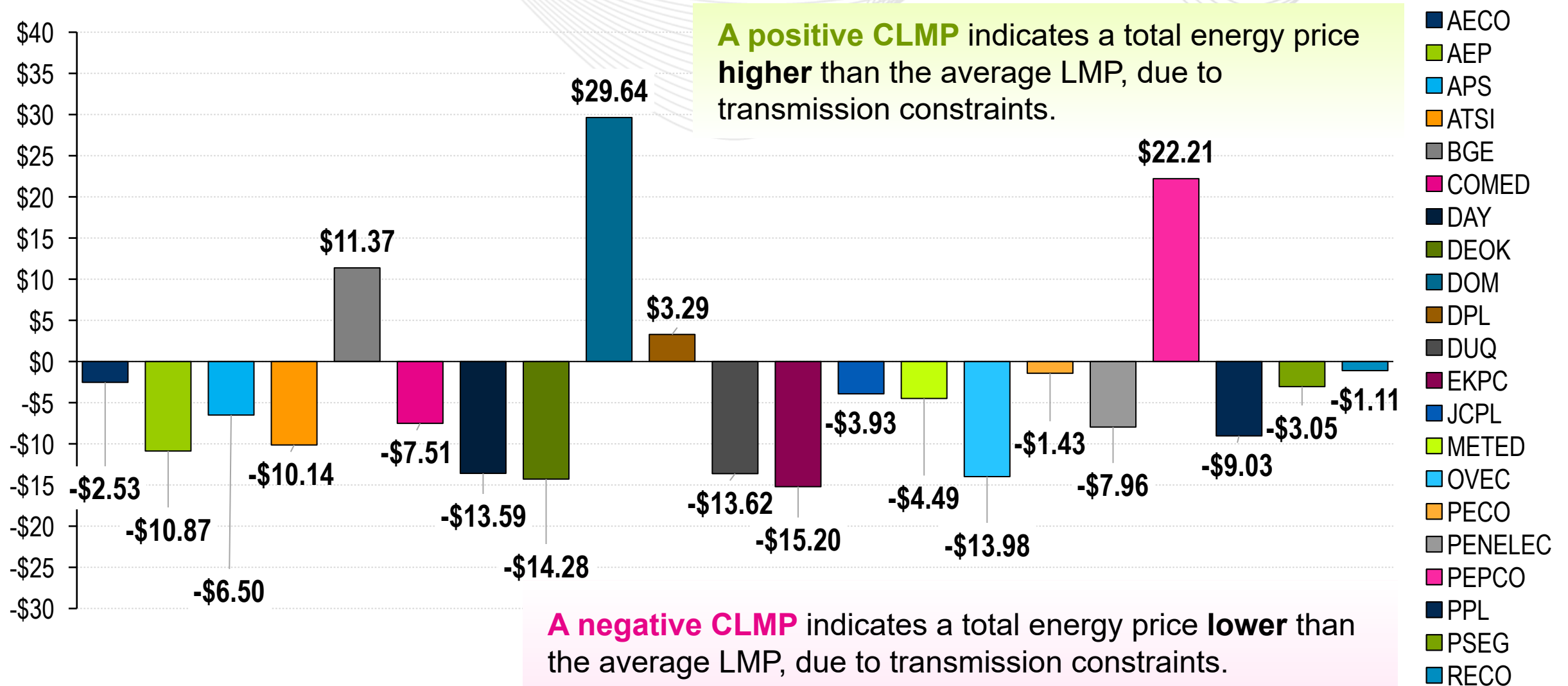
- Same price for every bus in PJM (no locational aspect)
- Calculated both in day ahead and real time

**Key takeaway:** System Marginal Price spikes in evenings on June 22-26, coincident with heavy evening load, congestion and solar drop out.



# Average Zonal Congestion Impacts

Represents Jun. 22–26 Average 5-minute CLMP



# Reserve Market Clearing Prices

Reserve clearing prices spike around net load evening peaks

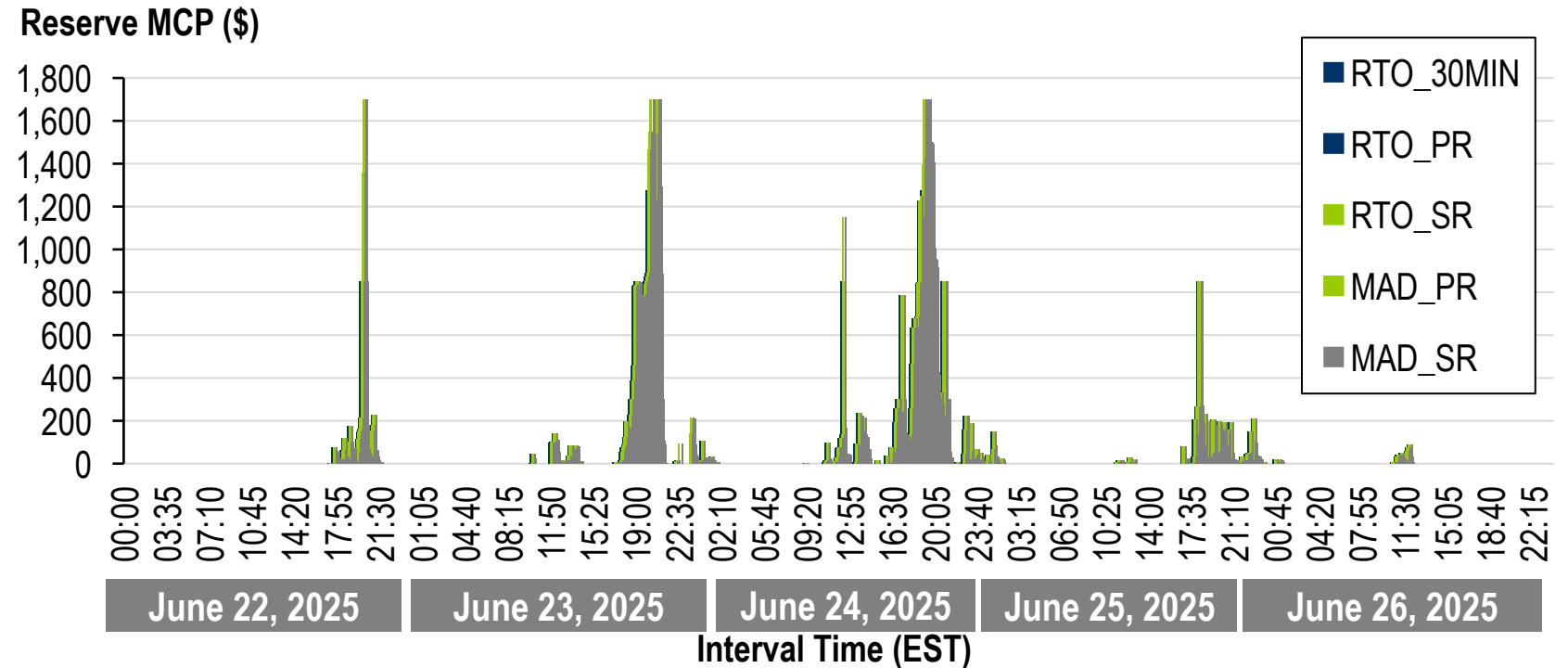
Indicates insufficient 10-minute and 30-minute ramp capability to meet SR, PR, 30-minute reserve requirements

RTO PR maximum shortage amount of 2,060.2 MWs at June 24, 18:55

RTO PR Requirement = 3,677.6

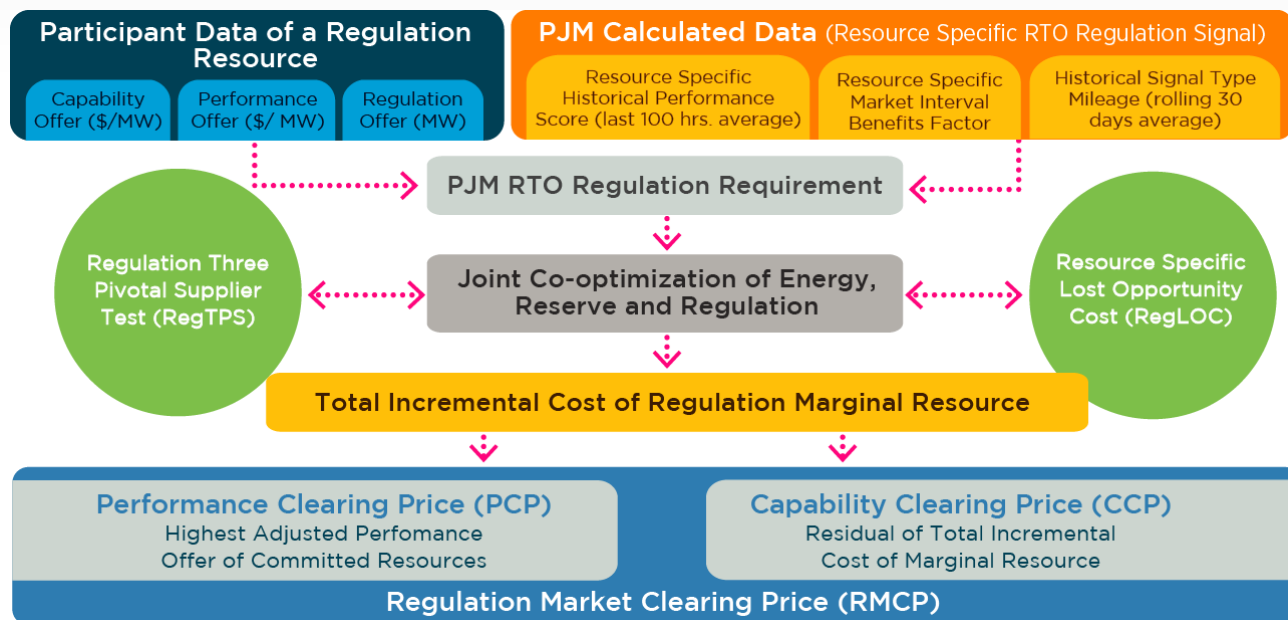
RTO SR Requirement = 2,515.1

RT Reserves MCP June 22–26



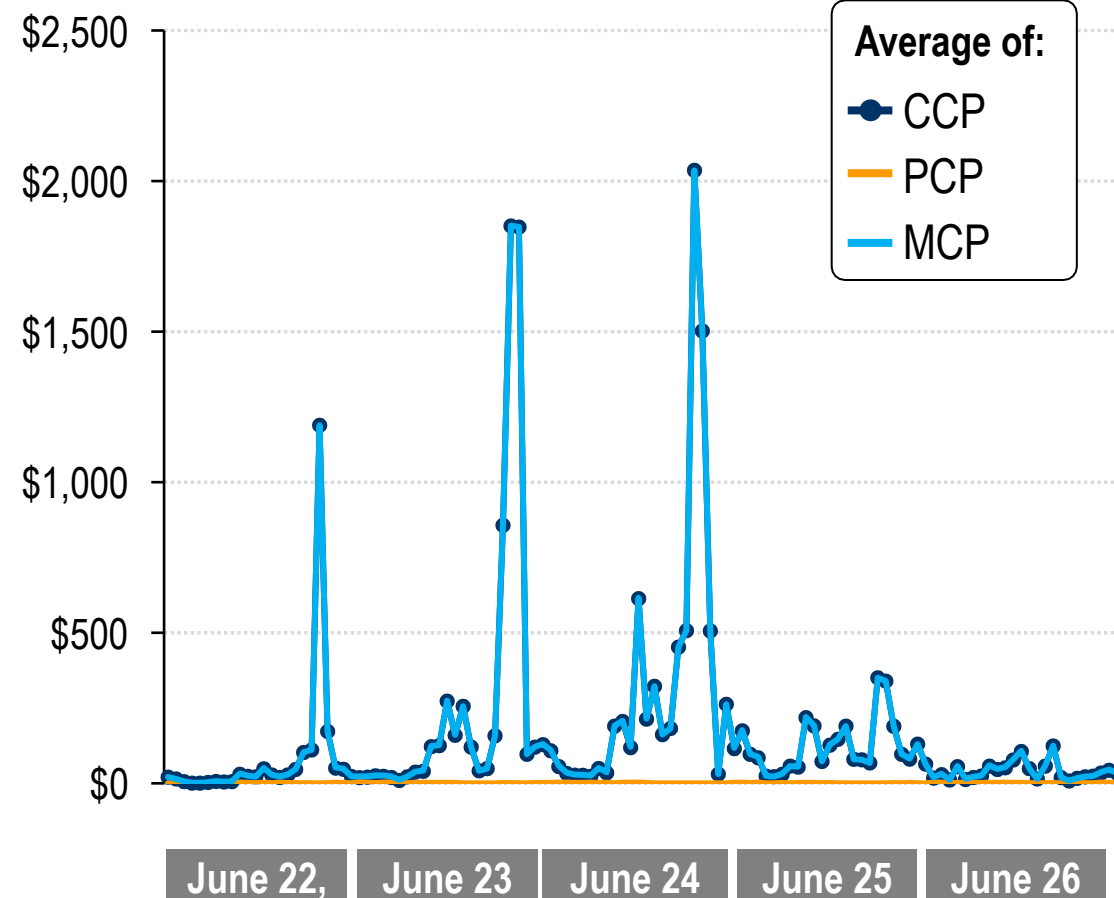
		Defined Administrative Price Cap (\$)	Intervals in Shortage in Heat Wave Period
Requirement:	MAD SR	1,700	3
	RTO SR	1,700	10
	MAD PR	1,275	5
	RTO PR	1,275	78
	RTO 30-Min.	850	23

- ASO engine clears Regulation commitment 60-minutes prior to target time.
- LPC prices Regulation based on fixed commitment, system conditions.



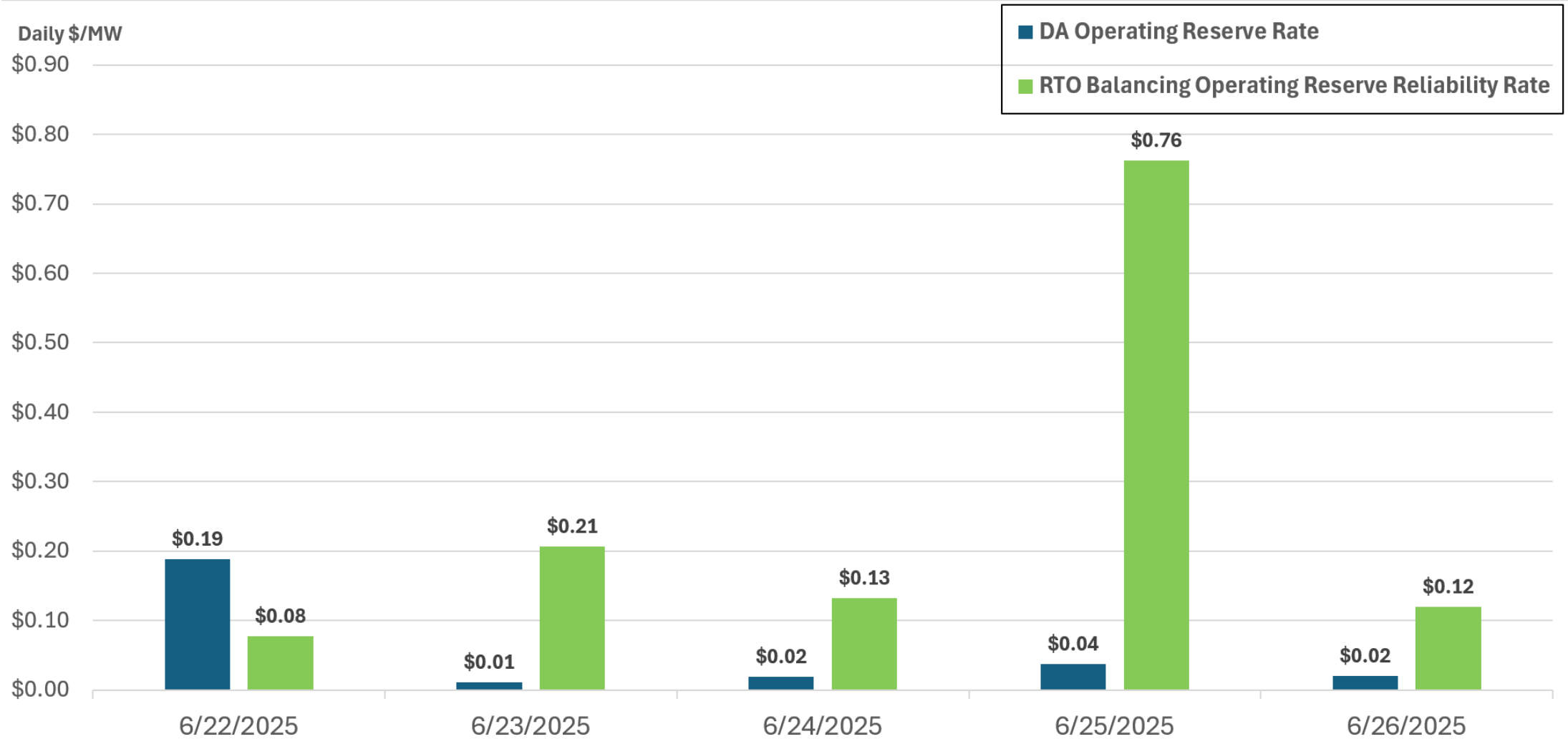
CCP, PCP, & MCP Hourly Average June 22-26

## Clearing Price



Operating Reserve Credit			
June 2025	Day Ahead	Balancing	Total Uplift
Sunday: June 22	578,800	1,931,000	2,509,800
Monday: June 23	37,600	1,390,000	1,427,600
Tuesday: June 24	66,800	1,993,000	2,059,800
Wednesday: June 25	125,700	4,480,000	4,605,700
Thursday: June 26	65,000	2,208,000	2,273,000
<b>Total</b>	<b>893,900</b>	<b>12,002,000</b>	<b>12,875,900</b>

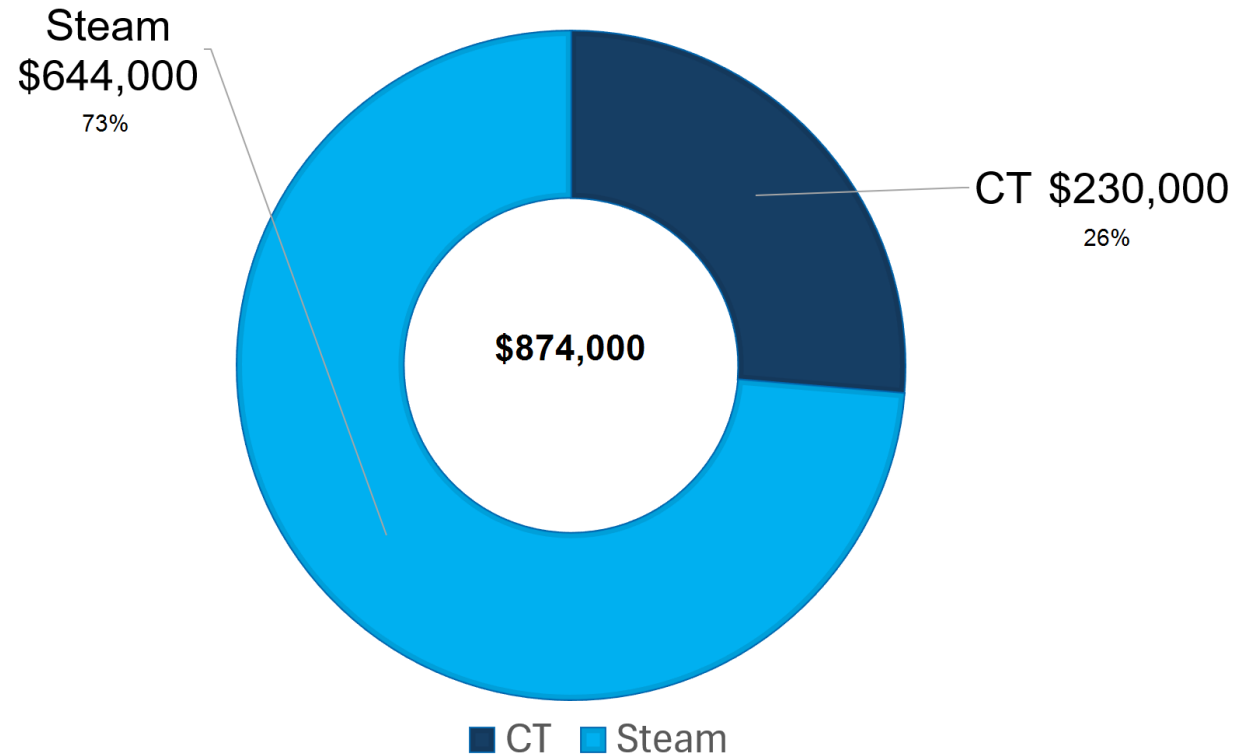
*Includes Make-Whole Credits and Lost Opportunity Cost Credits*



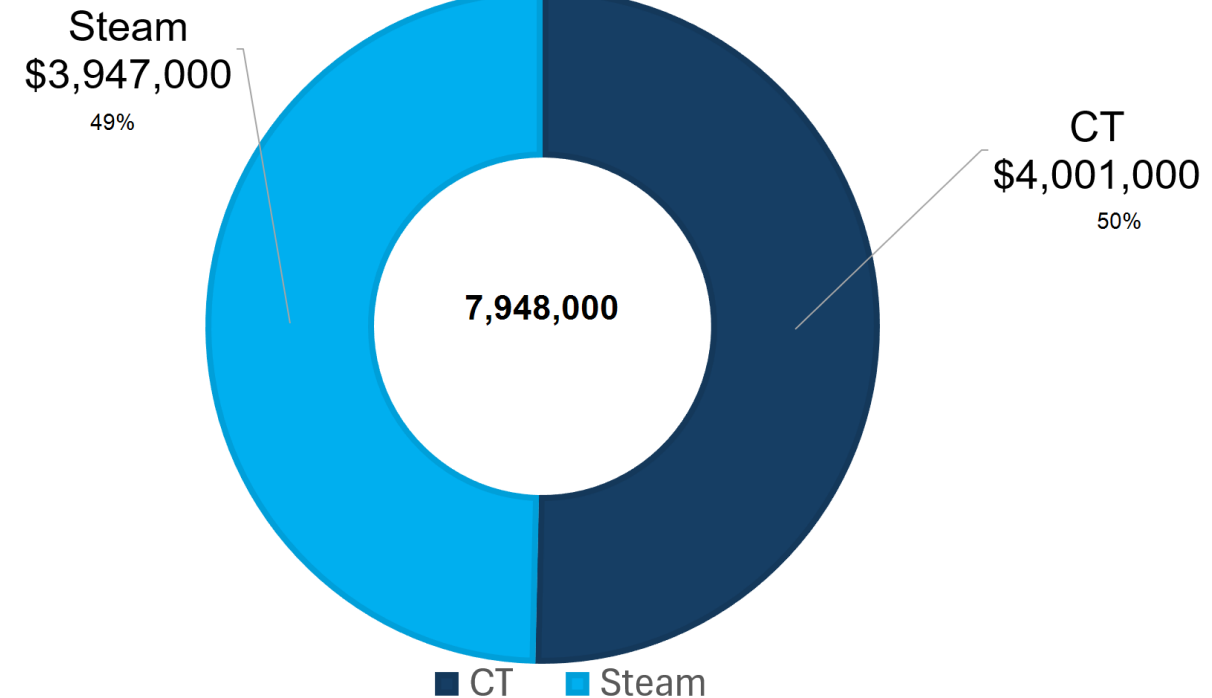
# Operating Reserve Credits by Unit Type

## Sunday, June 22, to Thursday, June 26

DAY-AHEAD OPERATING RESERVE CREDIT



BALANCING OPERATING RESERVE CREDIT (MAKE WHOLE ONLY)

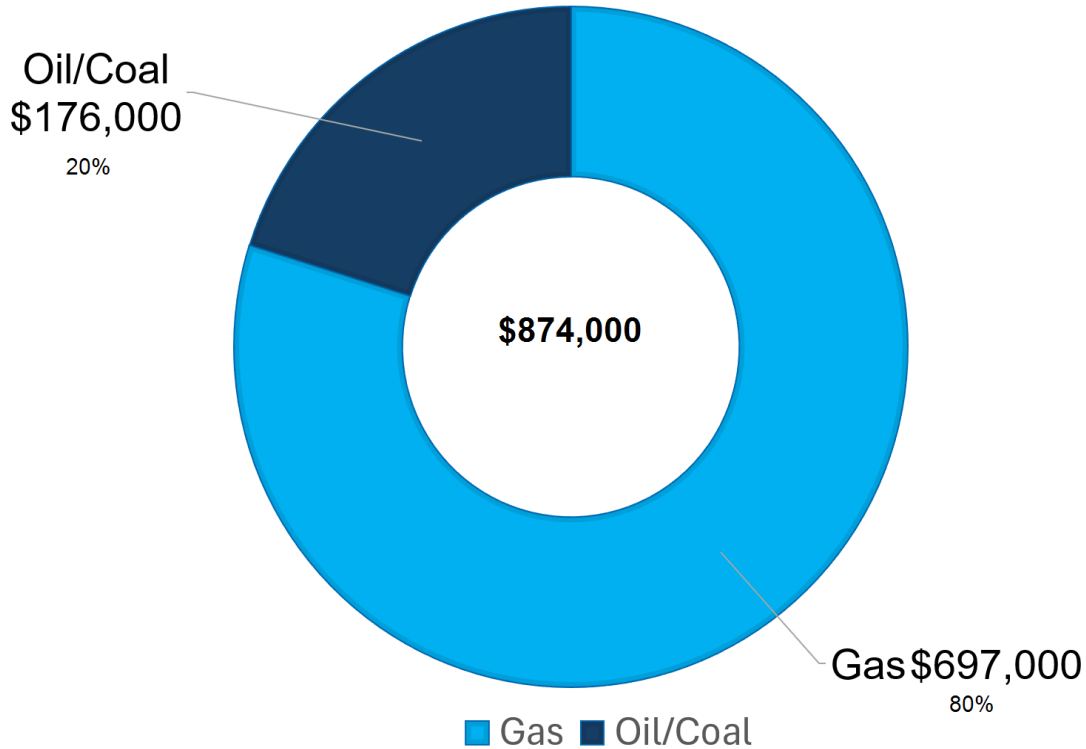




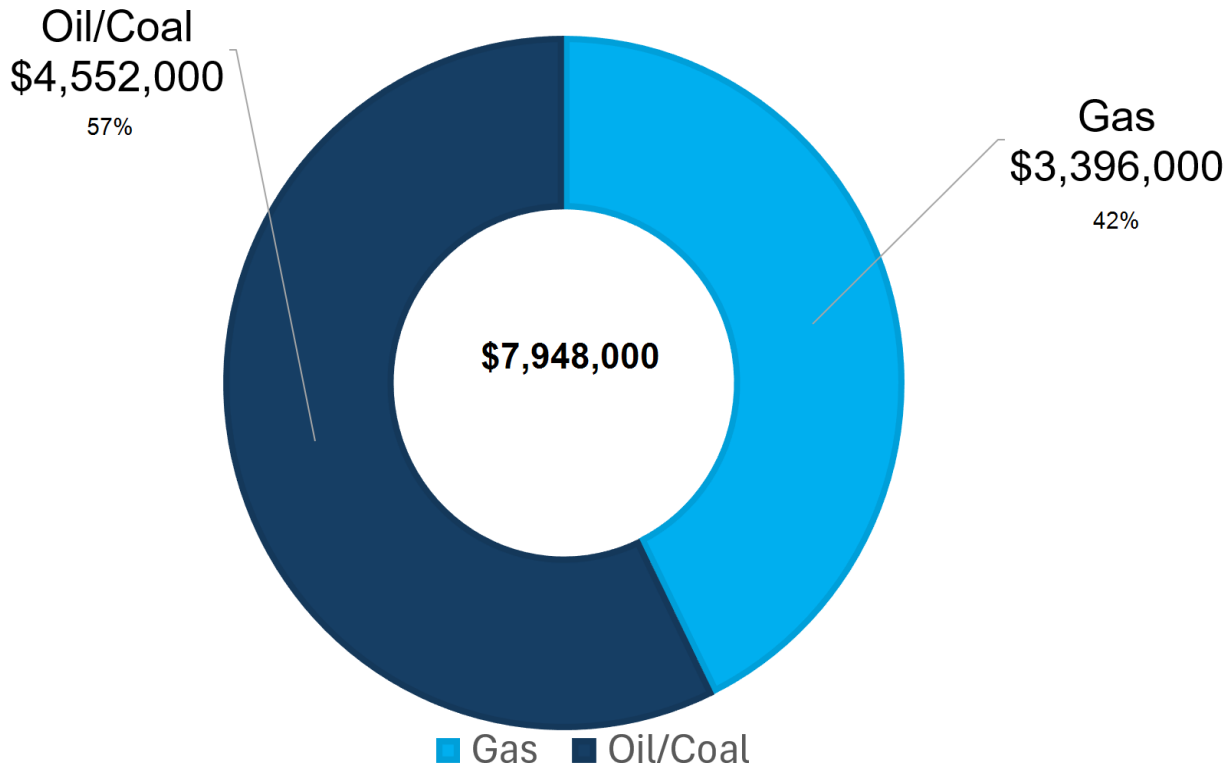
# Operating Reserve Credits by Fuel Type

## Sunday, June 22, to Thursday, June 26

DAY-AHEAD OPERATING RESERVE CREDIT



BALANCING OPERATING RESERVE CREDIT (MAKE WHOLE ONLY)



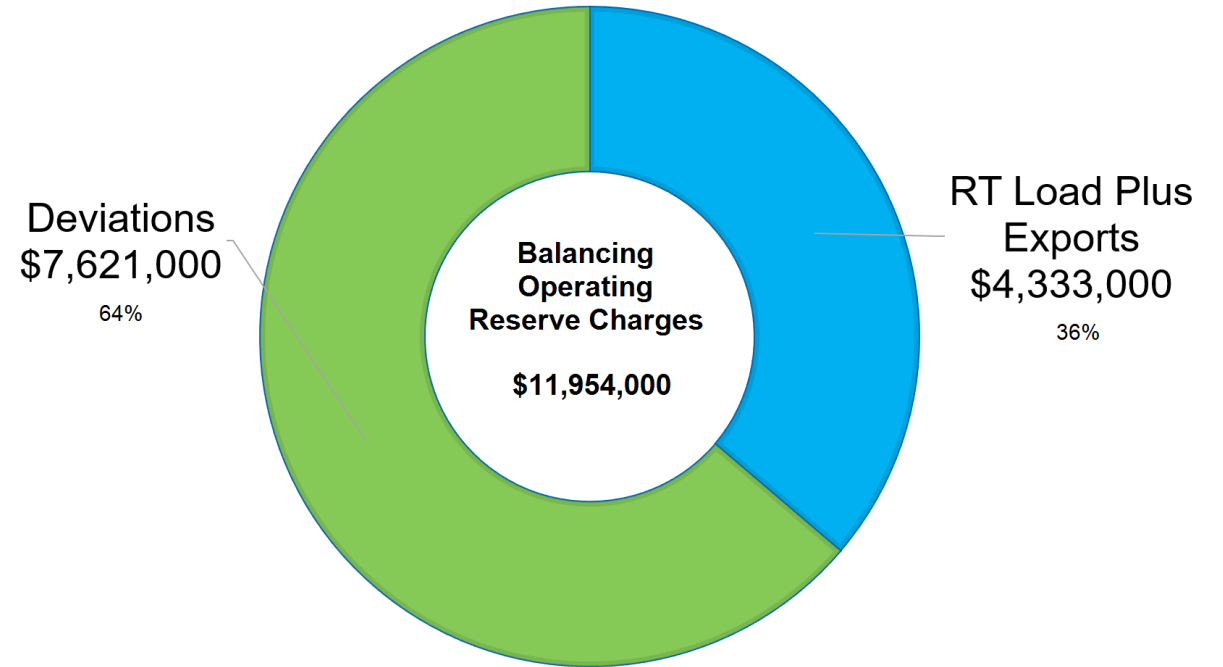
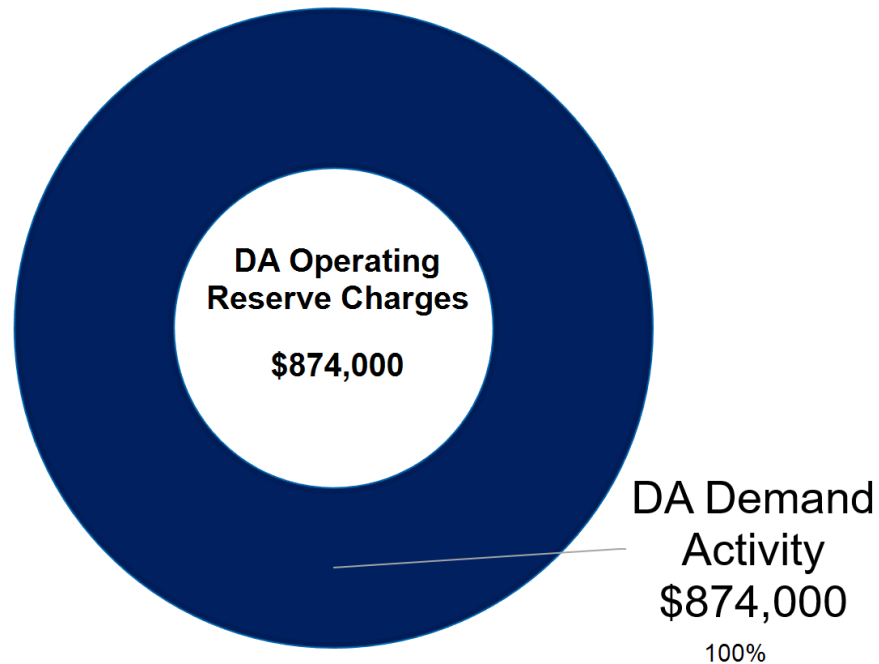


# Operating Reserve Charge Allocations

## Sunday, June 22, to Thursday, June 26

Day-Ahead Operating Reserves are charged to  
DA Demand Activity  
(DA Demand + Dec bids + UTCs + Exports)

Balancing Operating Reserves are charged to either  
RT Load plus Exports or Deviations based on the  
Balancing Operating Reserve Cost Analysis



# Appendix

## Congestion Component of LMP (CLMP)

- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"><li>• <b>Represents price of congestion for binding constraints</b><br/>Calculated using the Shadow Price</li></ul> | <ul style="list-style-type: none"><li>• <b>Will be zero if no constraints (unconstrained system)</b><br/>Will vary by location if system is constrained</li></ul> | <ul style="list-style-type: none"><li>• <b>Used to price congestion</b><ul style="list-style-type: none"><li>– Load pays Congestion Price.</li><li>– Generation is paid Congestion Price.</li></ul></li><li>• <b>Calculated both in day ahead and real time</b></li></ul> |
|---|---|---|

**Locational aspect of load to constraints ultimately impacts pricing.**

### Transmission Constraint Penalty Factors

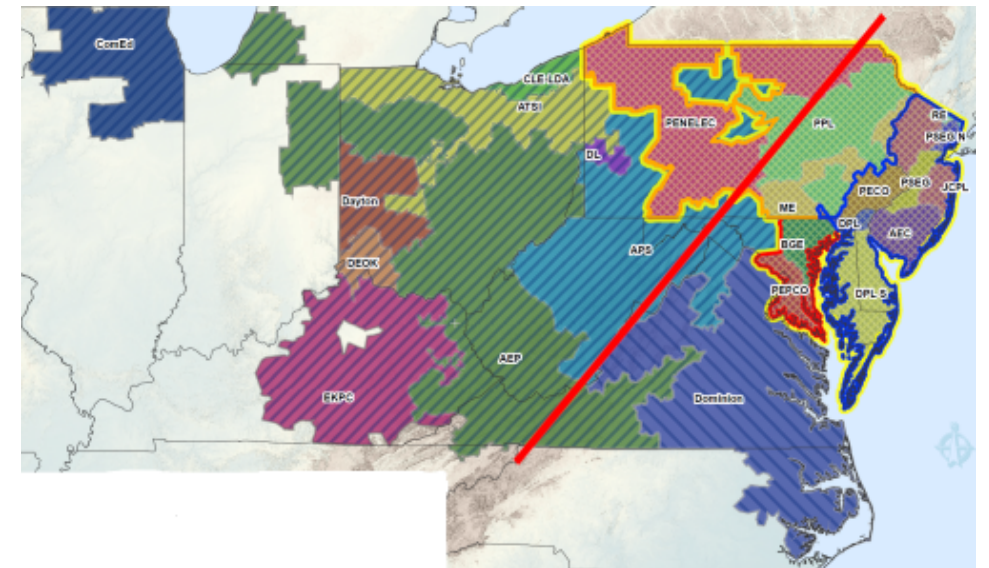
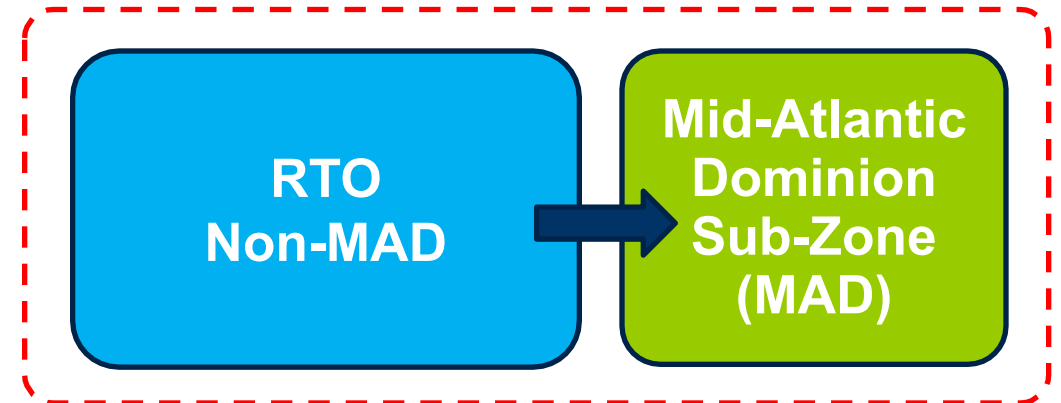
These are parameters used by the Security Constrained Economic Dispatch (SCED) applications to determine the maximum cost of the re-dispatch incurred to control a transmission constraint. Default is \$2,000/MWh.

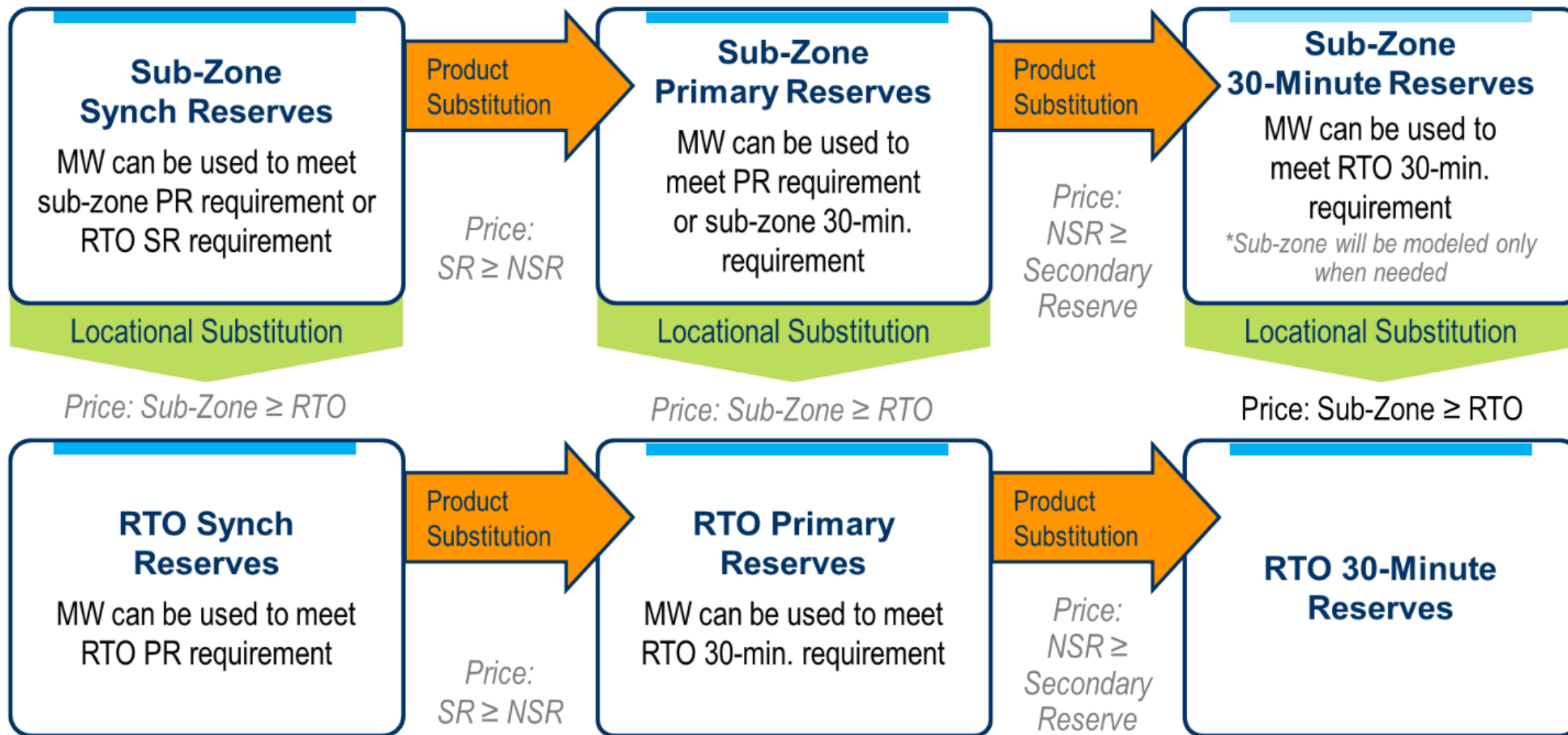
## RTO Reserve Zone

### Single reserve zone with a sub-zone: Mid-Atlantic Dominion (MAD)

Exists due to potential reserve deliverability issues

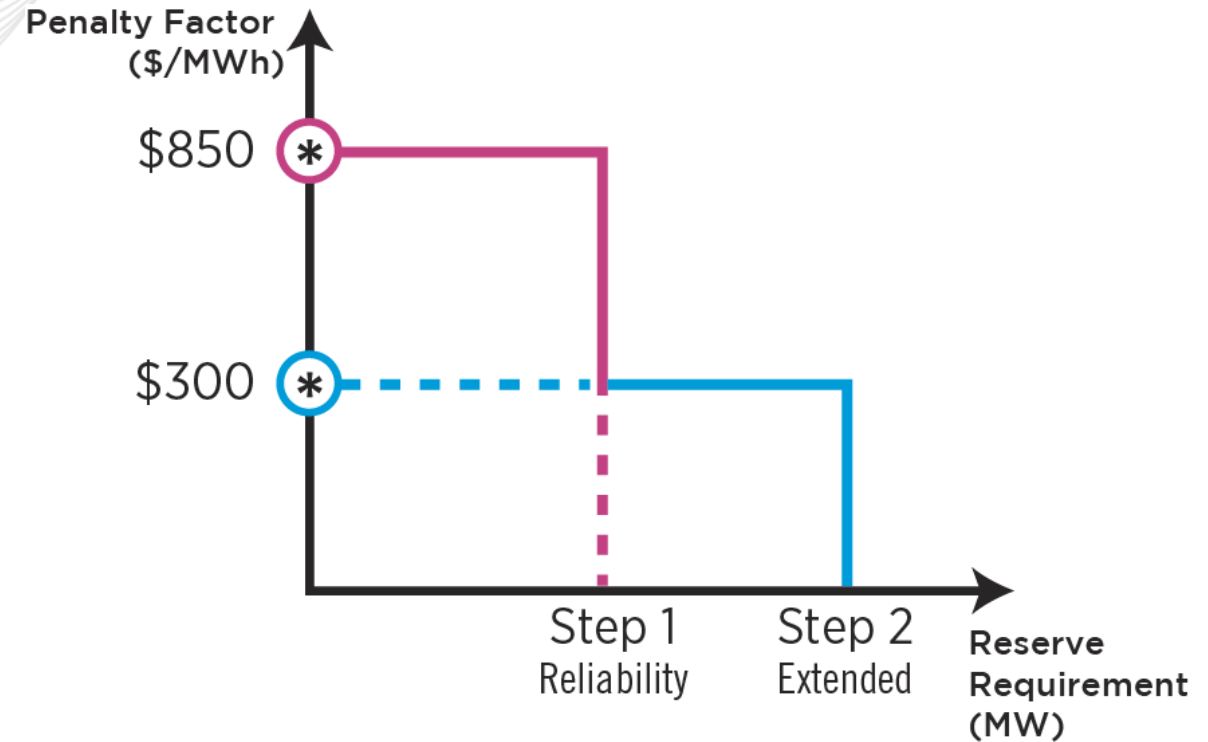
- The sub-zone is defined based on the most-limiting transfer interface.
- Resources with **3% or greater raise-help distribution factor** on the interface are included in the MAD sub-zone.
- Sub-zone can be dynamically changed based on system conditions.





	Reserve Service		
	Synchronized Reserve (SR)	Primary Reserve (PR)	30-Minute Reserve (30-Min)
Reliability Requirement	Largest Single Contingency	150% of Synchronized Reserve Reliability Requirement	Greater of (Primary Reserve Reliability Requirement, 3000 MW, or largest active gas contingency)
Reserve Requirement	SR Reliability Requirement + Extended Reserve Requirement	PR Reliability Requirement + Extended Reserve Requirement	30-Min Reliability Requirement + Extended Reserve Requirement

*\*30% adder to Reliability Requirement (RTO Only) still in effect.*



*\*Step 2 remained at +190 MW for duration of event.*



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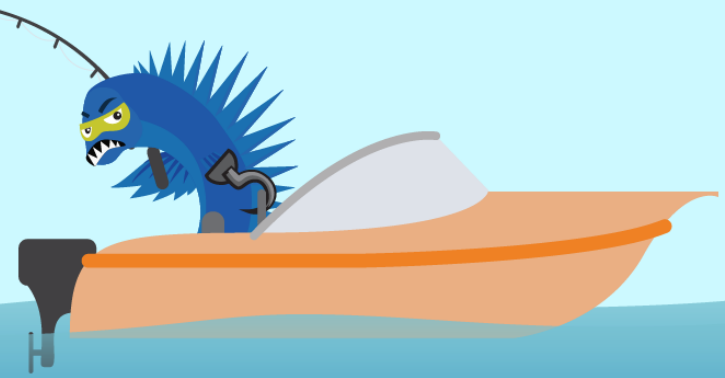
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