Item 5.3: Commercial Markets Update

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Vice President, Commercial Operations

Board of Directors Meeting

ERCOT Public
April 7-8, 2025

Overview

- **Purpose**
  Share updates on the development of a new Residential Demand Response product as well as an NPRR to change the Estimated Aggregate Liability (EAL) formula. Additionally, review notable outcomes during February's winter weather event.

- **Voting Items / Requests**
  No action is requested of the ERCOT Board; for discussion only.

- **Key Takeaway(s)**
  - ERCOT will consult with stakeholders on a program to incentivize Demand Response capacity from existing residential smart devices
  - ERCOT will file a new NPRR to amend the EAL Formula Changes and address over-collateralization and volatility.
  - The ERCOT market efficiently supported reliability and performed as expected during February's winter weather event.

Developing a new Residential DR Program

- With the anticipated growth in load, additional capacity, particularly at times of high net load is critical. Residential Demand Response (DR) represents a source of capacity that is not fully realized/enabled today.
  - This includes increasing DR capacity from 'smart' devices (i.e. thermostats, EV chargers, batteries, water heaters and pool pump switches) that are already installed.
- Expanding residential DR is a key corporate priority for ERCOT in 2025
- ERCOT will develop a residential DR program that provides an incentive payment to Retail Electric Providers (and potentially Non-Opt-In-Entities) based on Residential Demand Response performance at times of highest net load.
  - ERCOT will begin consulting with stakeholders on a Residential DR program over the course of Q2 and Q3 and file supporting program documentation once the design has been developed.
- The intent of the program characteristics will be that it is:
  - ✓ **Quick to develop; Simple to administer; Popular to join; Cost-effective**

Key Takeaway: ERCOT will consult with stakeholders on a program to incentivize Demand Response capacity from existing residential smart devices

Estimated Aggregate Liability (EAL) Formula Changes

- ERCOT will be submitting a new NPRR related to collateral requirements for Counter-Parties.
- The final proposal is a result of extensive analysis and discussion taking place at CFSG between April 2023 and November 2024.
- The concept and purpose of the NPRR was reviewed with the Reliability and Markets Committee in February 2025 and the Technical Advisory Committee in January 2025.
- A draft of the NPRR was presented to the Credit Finance Sub Group (CFSG) for review at their February meeting.
  - The focus of this NPRR is to address instances of unreasonably high collateralization requirements and volatility relative to underlying Counter-Party exposure.
  - These instances are a result of formula mechanics in the Estimated Aggregate Liability (EAL) credit formula, and do not properly reflect anticipated exposure.
- CFSG approved the final proposal through a formal vote at the December 2024 meeting.

Key Takeaway: ERCOT will file a new NPRR to amend the EAL Formula Changes and address over-collateralization and volatility.

Market Outcomes Supported Reliability Needs during Winter Weather in February (19th-21st)

Pricing

- Both day-ahead prices and real-time prices were very high during the morning and evening peak hours for all days. In the day-ahead, the morning peak prices were particularly pronounced.
  - The highest hourly Hub Average Settlement Point Price (SPP) in the Day-Ahead Market occurred during the morning peak at HE8 for February 20th with a price of $813.12/MWh.
  - The highest Real-Time Hub Average SPP occurred during the evening peak at Interval Ending 20:45 on February 19th with a price of $435.62/MWh.

Firm Fuel Supply Service (FFSS)

- A total of 470 MW in aggregate capacity from 4 Resources was deployed from Firm Fuel Supply Service.

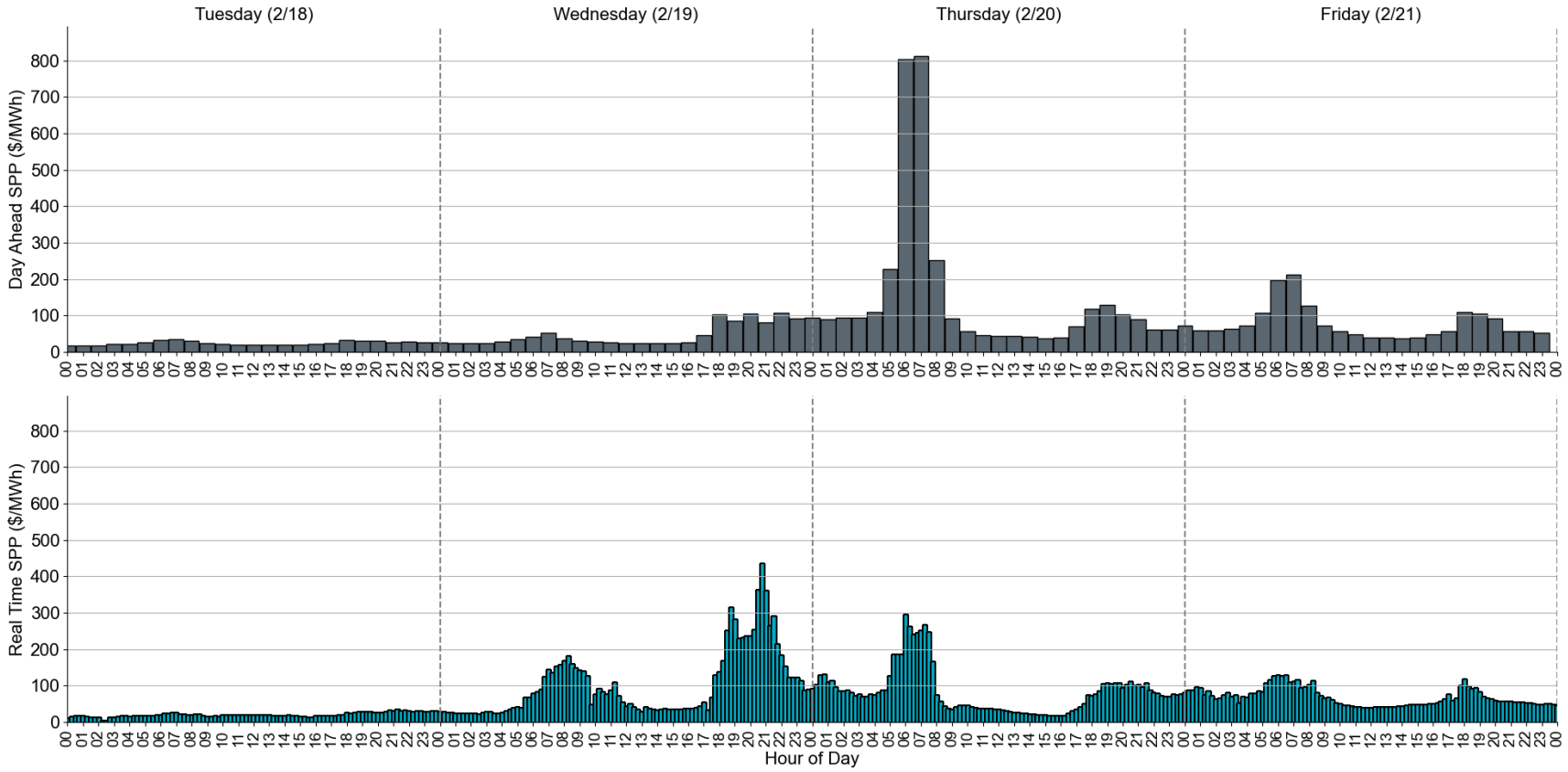
Reliability Unit Commitment (RUC)

- 25 unique Resources were committed via RUC or Verbal Dispatch Instruction (VDI) during the event, with RUC events occurring primarily on February 19th and 21st.

Congestion

- DAM Congestion Rent was highest on February 20th ($52M), though overall DAM congestion rent was comparable to Winter Storm Heather in 2024. RTM congestion rent was most significant on February 19th ($180M) and led to the highest monthly congestion rent since August 2023.

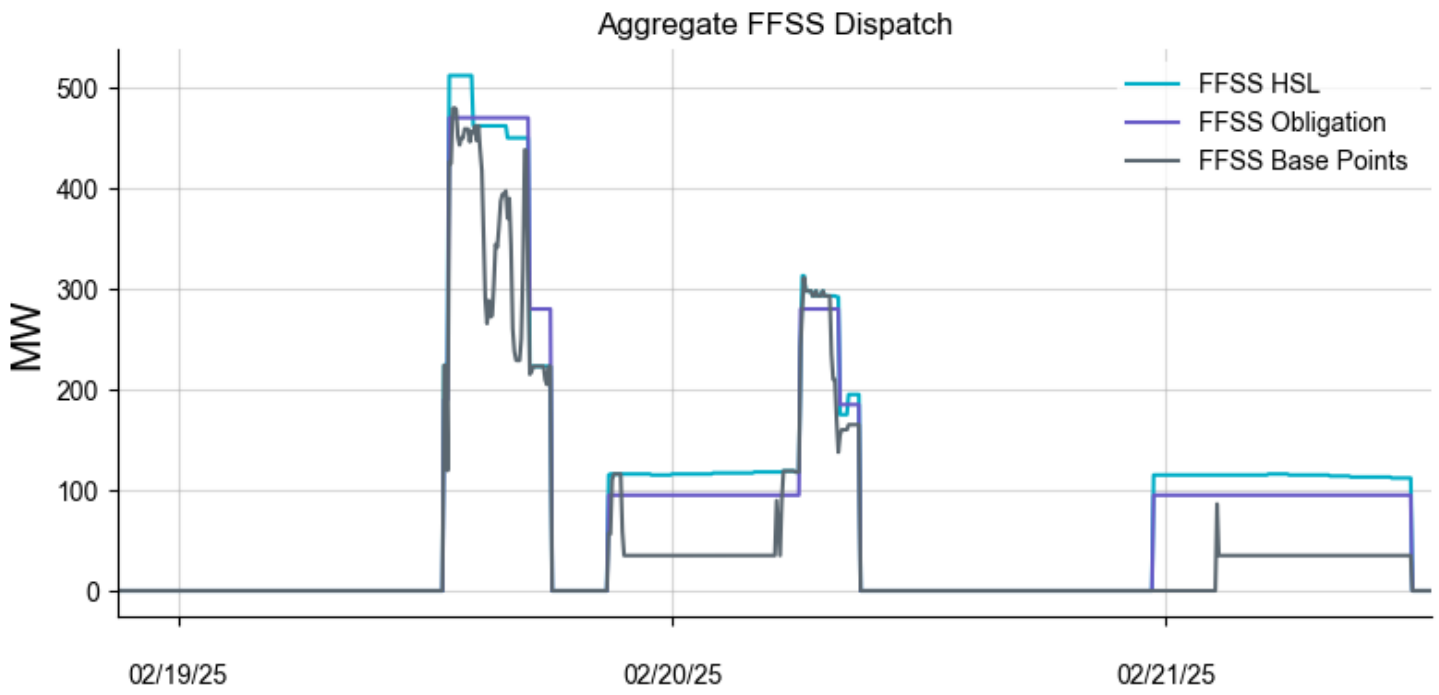
Day-Ahead Prices and Real-Time Prices Peaked During Morning and Evening Ramp Periods



Key Takeaway: Peak Day-Ahead SPP of $813.12/MWh occurred on February 20th and Peak Real-Time SPP $435.62/MWh occurred on February 19th.

Note: Real-Time SPPs are 15-minute values, whereas they are hourly for the DAM.

FFSS Deployment Performance

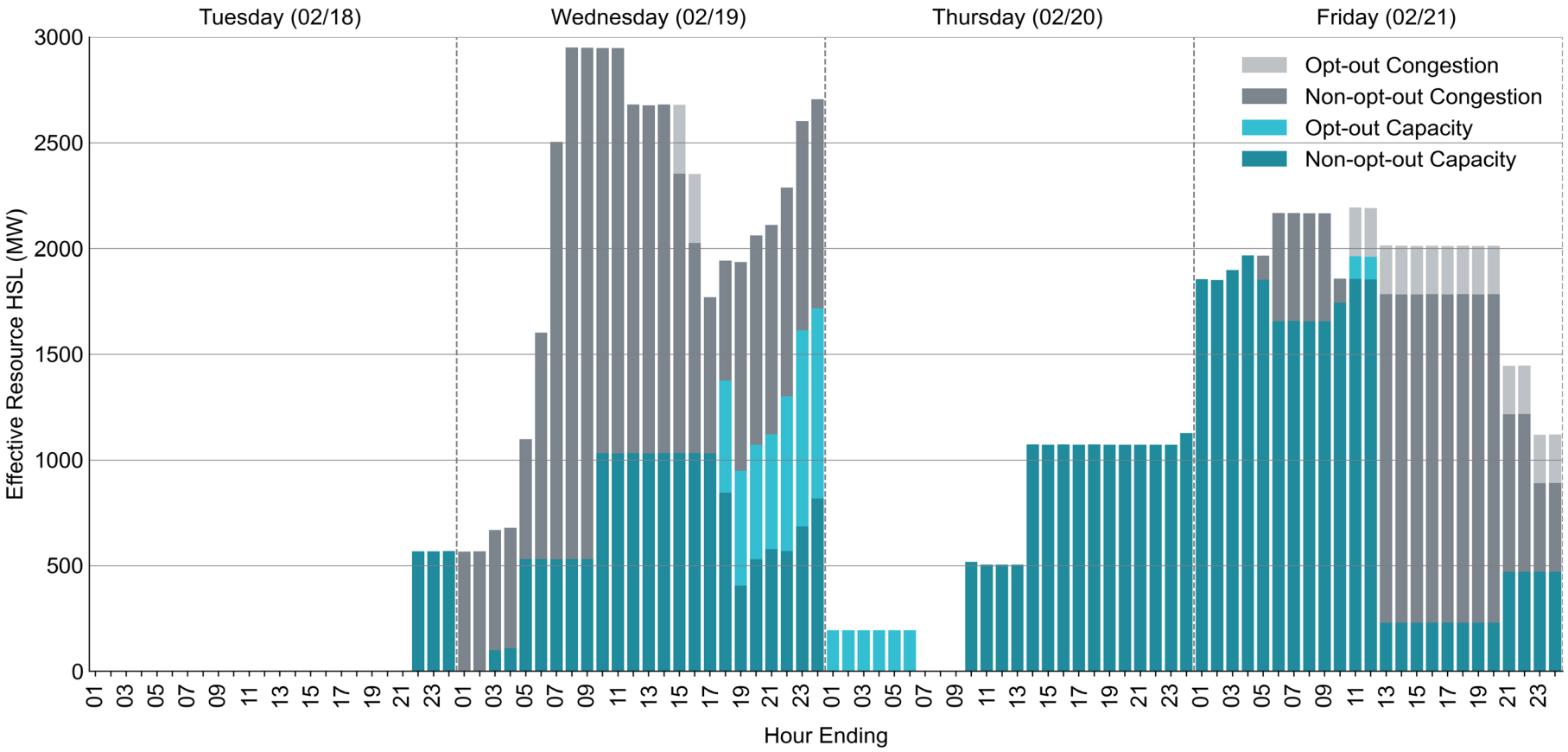


Resources Deployed	Maximum FFSS Capacity Obligation	Maximum Total HSL	Maximum Total Base Point
4	470 MW	512 MW	479.9 MW

- We are currently evaluating how well the resources performed during the event.

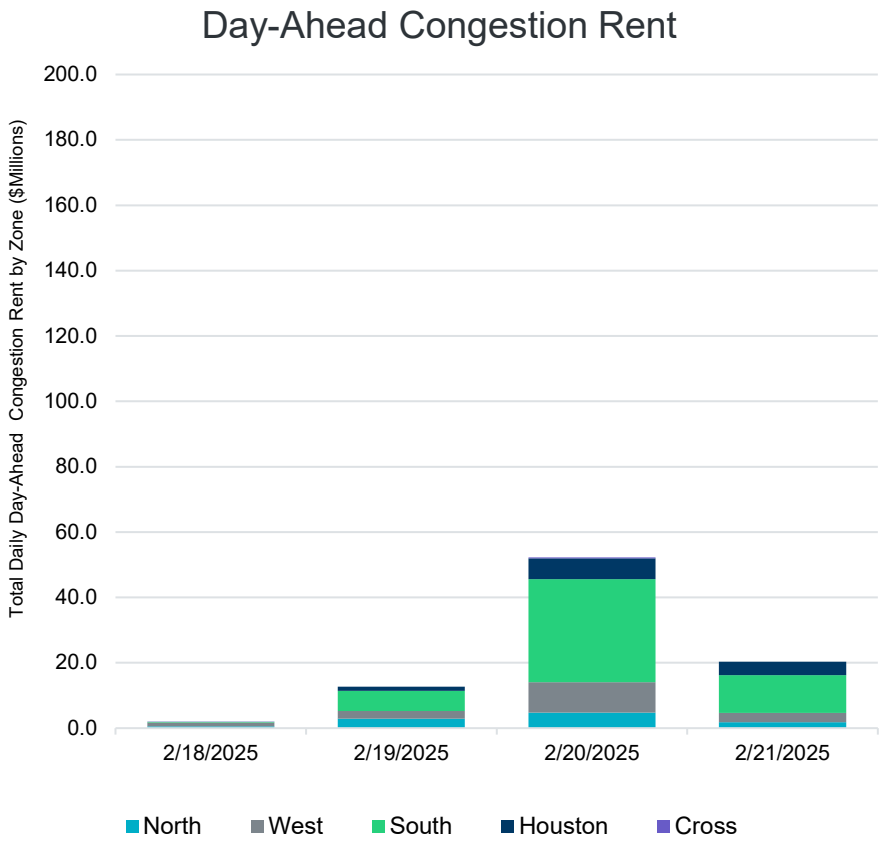
Key Takeaway: 470MW of FFSS was deployed during the event. Performance evaluation is underway to determine whether FFSS obligations were met.

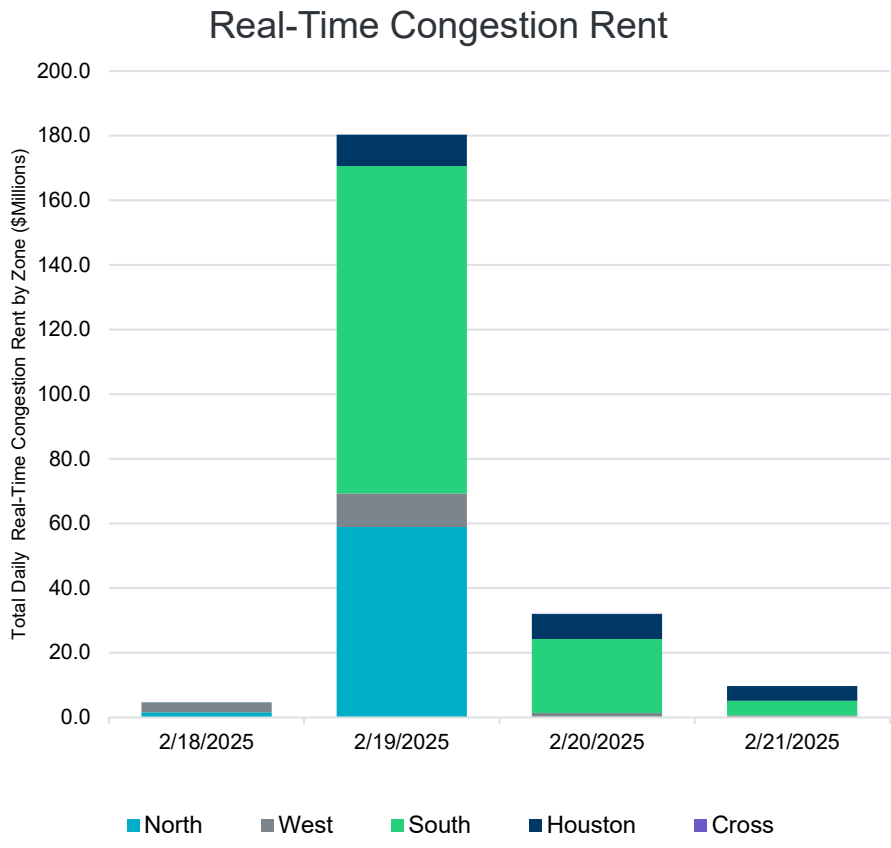
Resources Committed Through RUC



Key Takeaway: 25 unique resources were committed via RUC or VDI during the event and provided a maximum total hourly effective HSL of 2951 MW.

Day-Ahead and Real-Time Congestion Rent by Zone

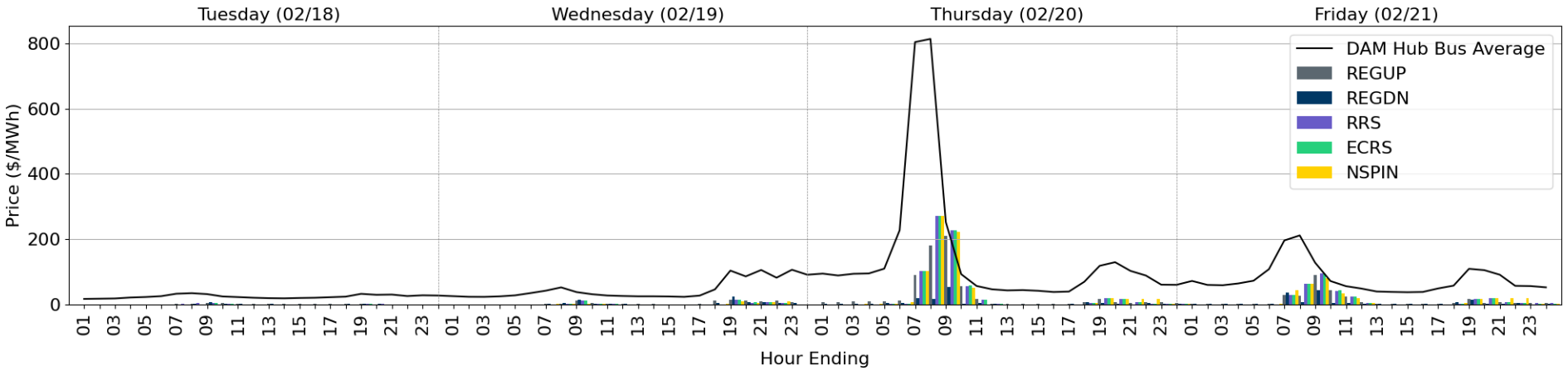


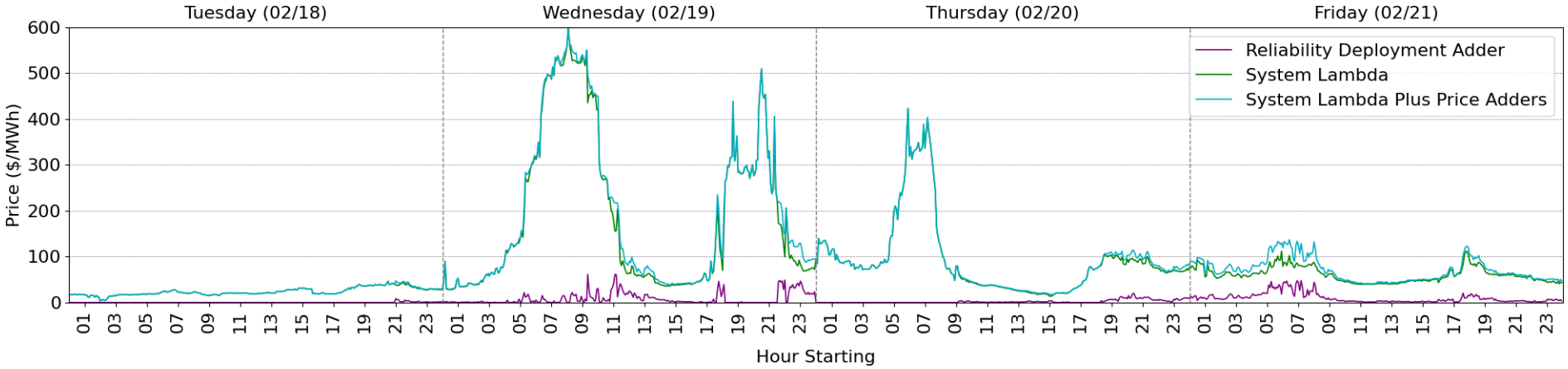


Key Takeaway: Day-Ahead Market congestion rent was highest on February 20th, with total congestion rent comparable to Winter Storm Heather in 2024. Real-Time Congestion Rent was most significant on February 19th and led to highest monthly congestion rent since August 2023.

Appendix

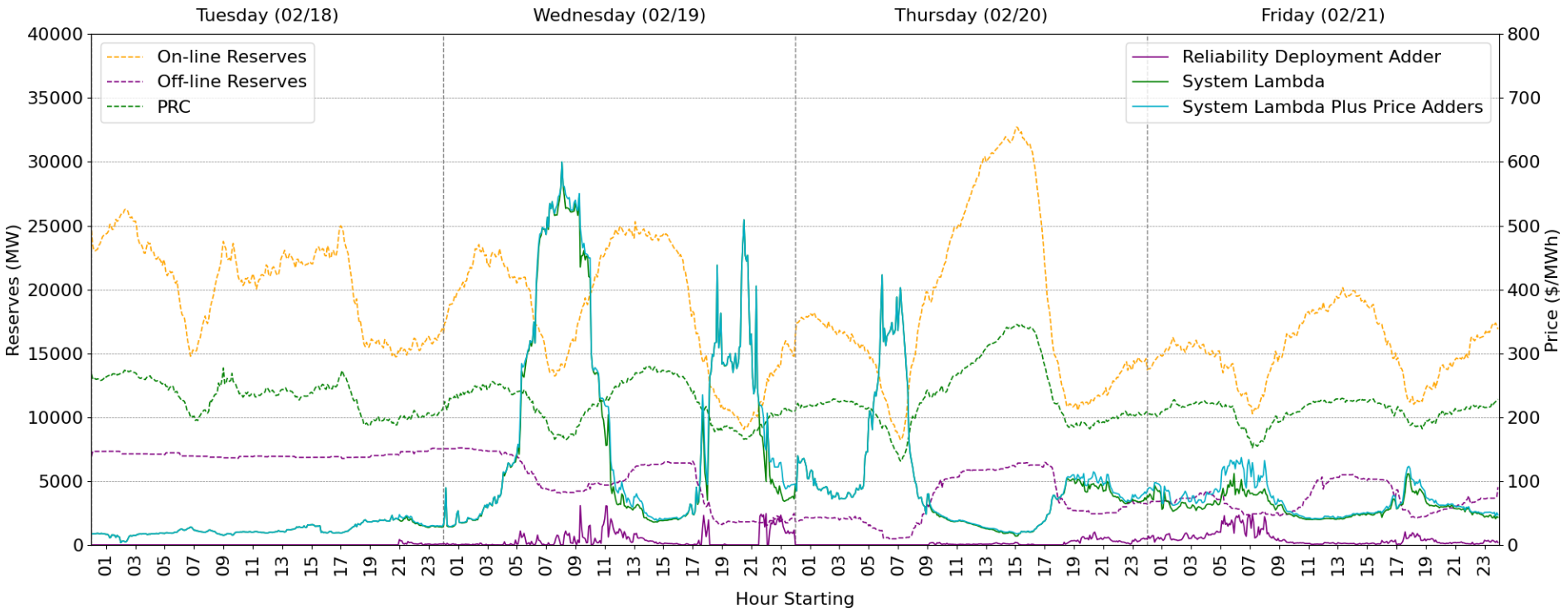
Feb 18-21: Day-Ahead and Real-Time Energy and Ancillary Service Prices





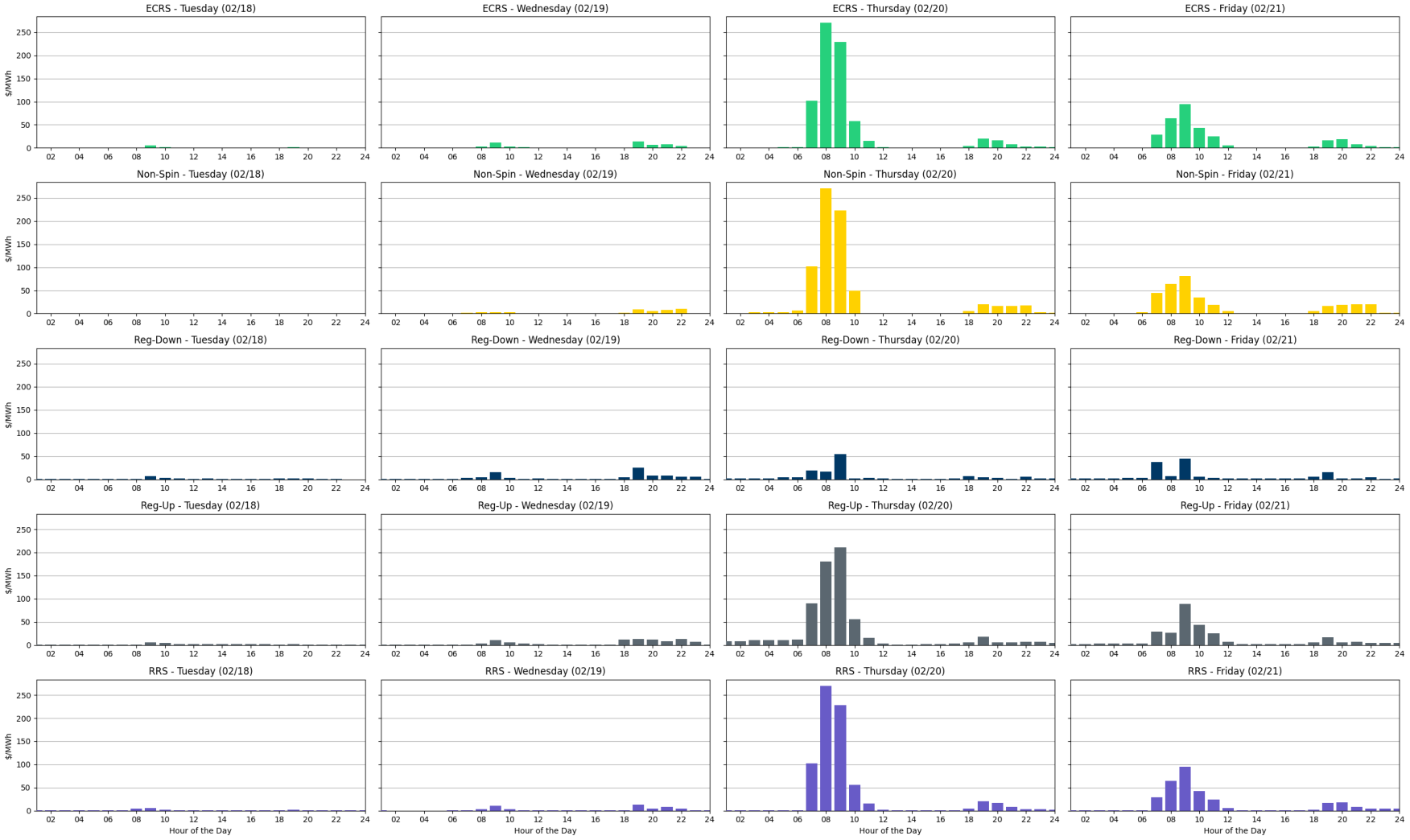
Key Takeaway: Highest prices were observed during the morning and evening peaks on 2/19.

Feb 18-21: Real-Time Reserves and Prices



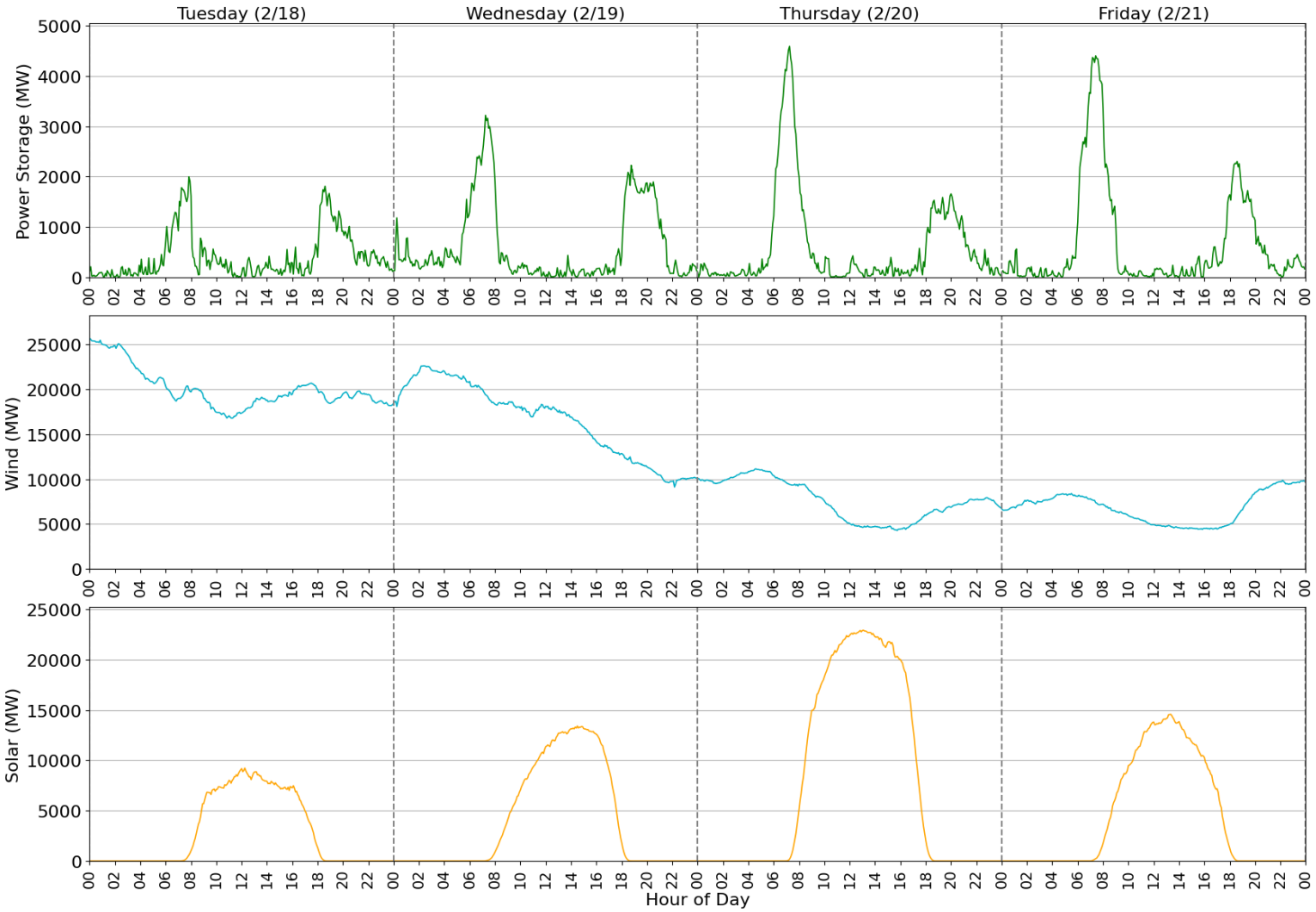
Key Takeaway: Lowest On-line and Off-line Reserves occurred on the morning of 02/20.

Feb 18-21: Day-Ahead Ancillary Service Prices by Type



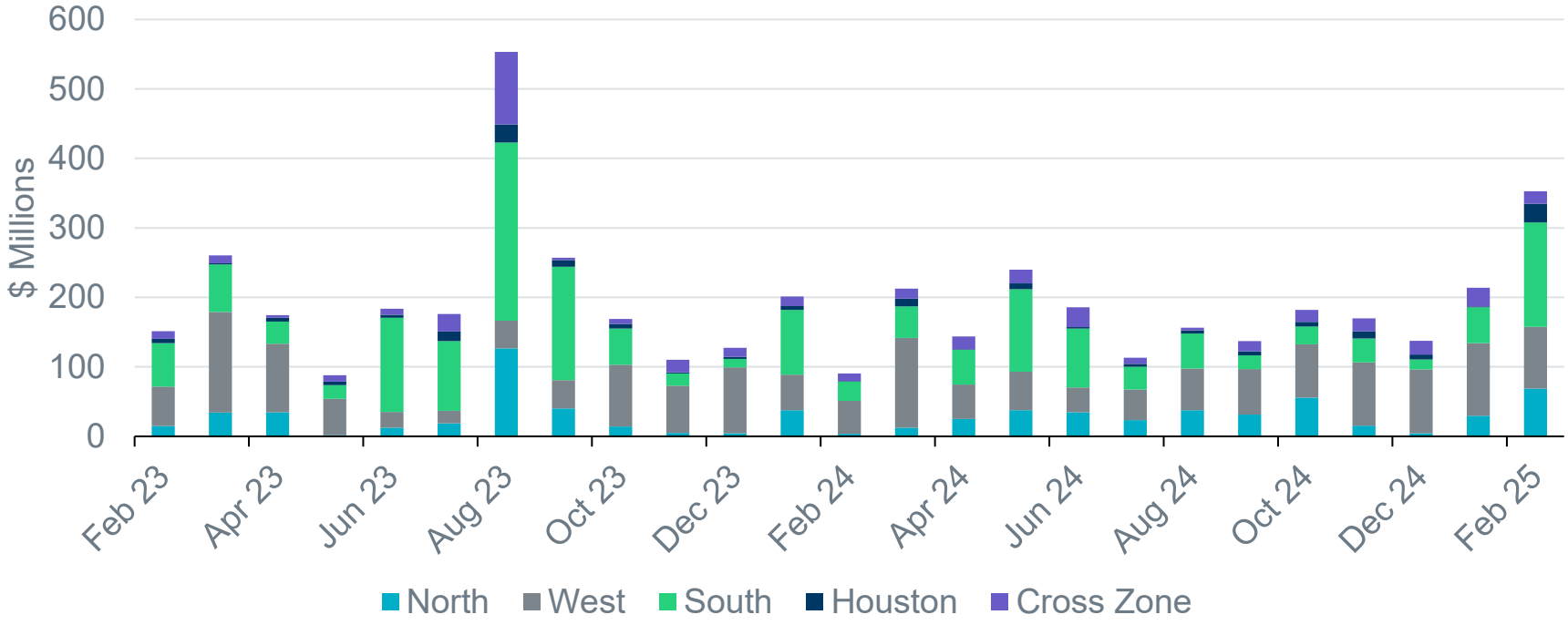
Key Takeaway: Peak day-ahead ancillary services occurred on the morning of 2/20 HE 8 and HE 9.

Feb 18-21 Wind, Solar & ESR Output



Key Takeaway: Peak solar (22915 MW) and ESR (4592 MW) output occurred on 2/20 and peak wind (25658 MW) occurred early in the monitoring period on 2/18.

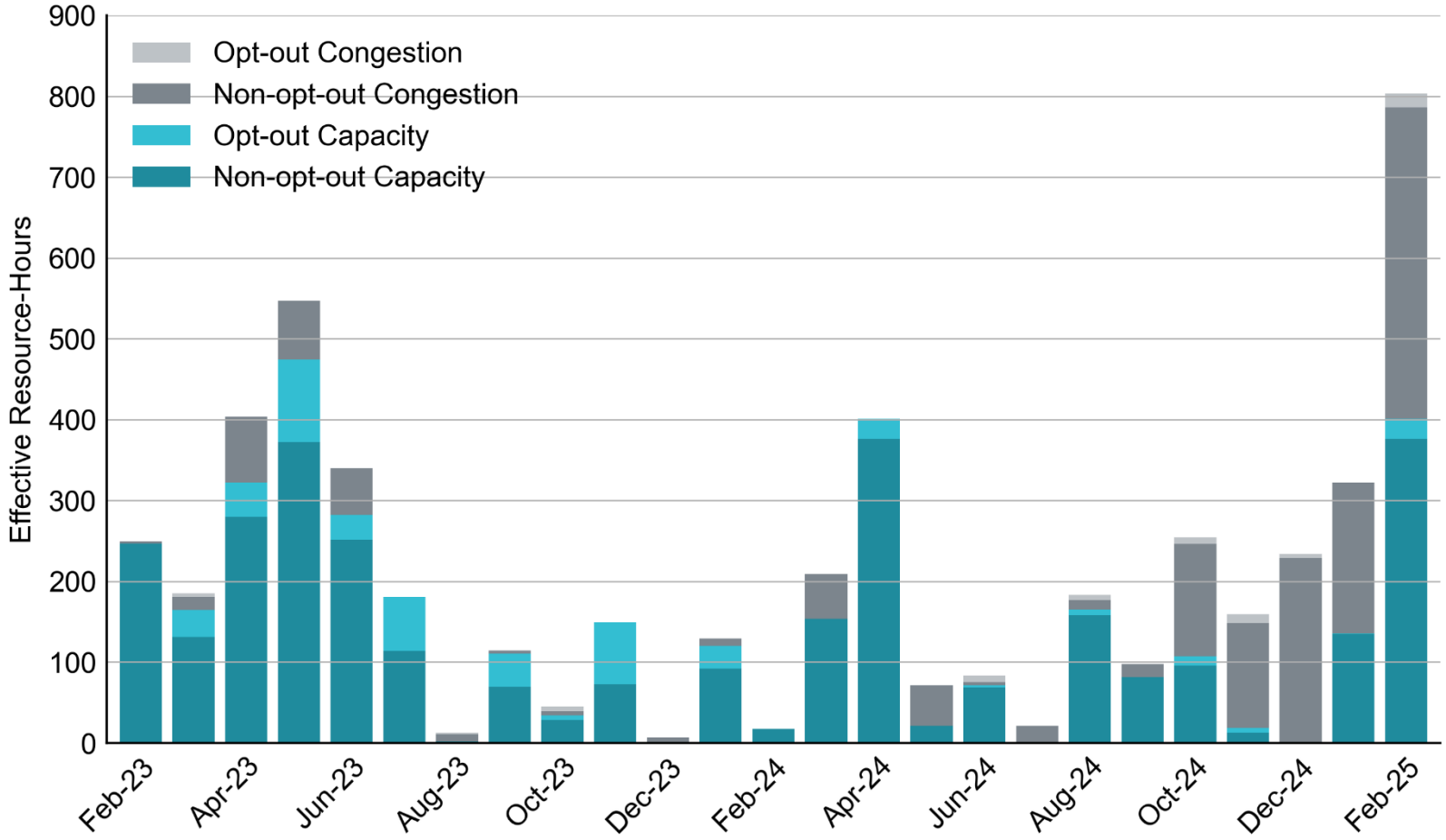
Real-Time Congestion Rent by Zone



- Congestion rent is determined using the shadow prices and MW flows for individual constraints in SCED as well as the length in time of SCED intervals.
- Total Real-Time congestion rent increased in February compared to January, with the highest congestion rent in the West and South Zones.
  - Congestion rent in the West Zone was primarily driven by the loss of the 345kV line from Wolf Switching Station to Meteor Switch and 345kV line from Wolf Switching Station to Odessa EHV Switch overloads the 138kV line from Odessa EHV to Yarbrough Sub
  - Congestion rent in the South Zone was primarily driven by the loss of the 345kV line from Temple Switch to Knob Creek Switch and the 138kV line Temple Switch to Bell County overloads the 138kV line from Georgetown South to Round Rock Westinghouse.

Note: The "Cross Zone" category consists of cases in which the substations on either end of the constraint are in different zones.

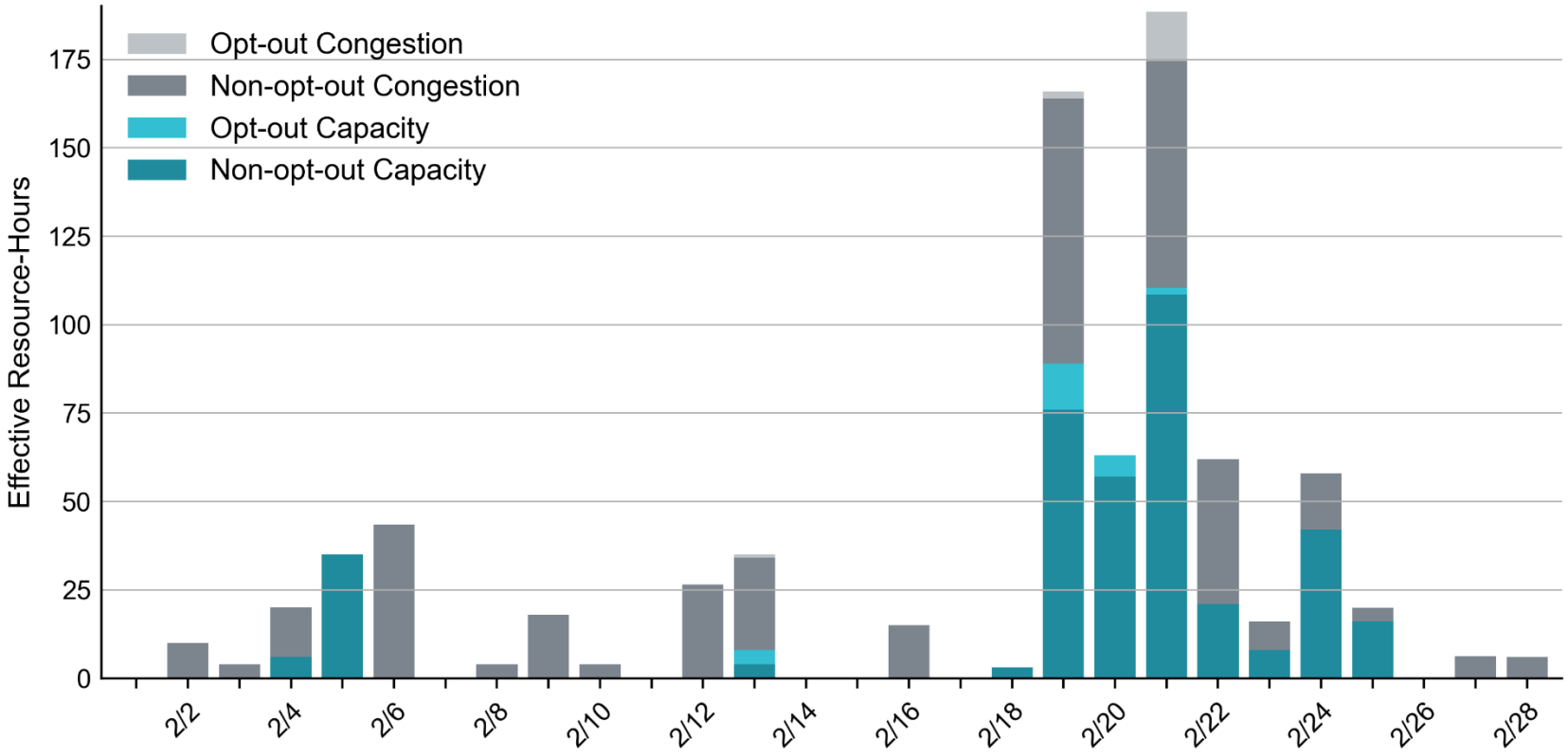
Elevated RUC Activity Continues, Providing Capacity and Managing Congestion



"Effective Resource-Hours" excludes any period during a Reliability Unit Commitment hour when the RUC-committed Resource was starting up, shutting down, off-line, or otherwise not available for dispatch by SCED.

RUC Instruction Reasons in February 2025

- 803.3 RUC effective Resource-hours.
  - 402.1 hours (50%) for congestion.



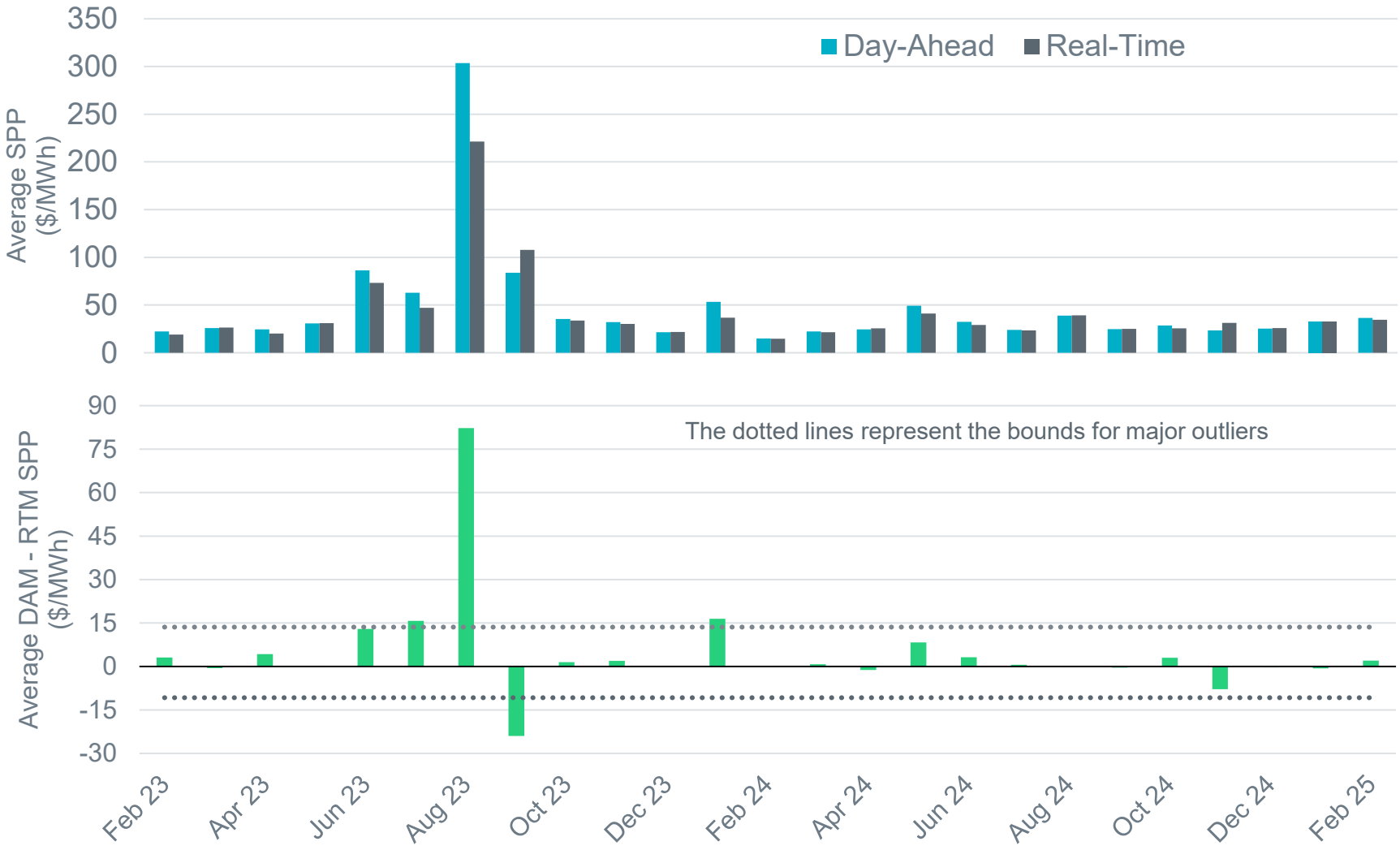
Fifty-one Resources were Committed in February to Manage Congestion and Provide Capacity

Resource #	Effective Resource-Hours	For Congestion		For Capacity	
		Opt-Out	Non-Opt-Out	Opt-Out	Non-Opt-Out
1	1.7	0.0	0.0	0.0	1.7
2	8.0	0.0	0.0	2.0	6.0
3	7.4	0.0	0.0	6.0	1.4
4	12.0	0.0	0.0	0.0	12.0
5	3.6	0.0	3.6	0.0	0.0
6	18.0	0.0	18.0	0.0	0.0
7	26.0	14.0	5.0	0.0	7.0
8	8.0	0.0	8.0	0.0	0.0
9	27.0	0.0	0.0	0.0	27.0
10	10.0	0.0	10.0	0.0	0.0
11	6.7	0.0	6.7	0.0	0.0
12	12.0	0.0	4.0	0.0	8.0
13	4.0	0.0	4.0	0.0	0.0
14	4.0	0.0	4.0	0.0	0.0
15	5.9	0.0	5.9	0.0	0.0
16	7.8	0.0	7.8	0.0	0.0
17	29.0	0.0	25.0	0.0	4.0
18	6.0	0.0	0.0	0.0	6.0
19	1.0	0.0	0.0	0.0	1.0
20	6.0	0.0	0.0	0.0	6.0
21	6.0	0.0	0.0	0.0	6.0
22	2.0	1.0	1.0	0.0	0.0
23	6.0	0.0	6.0	0.0	0.0
24	29.0	1.0	27.0	0.0	1.0
25	17.0	1.0	16.0	0.0	0.0
26	7.0	0.0	0.0	0.0	7.0

Fifty-one Resources were Committed in February to Manage Congestion and Provide Capacity

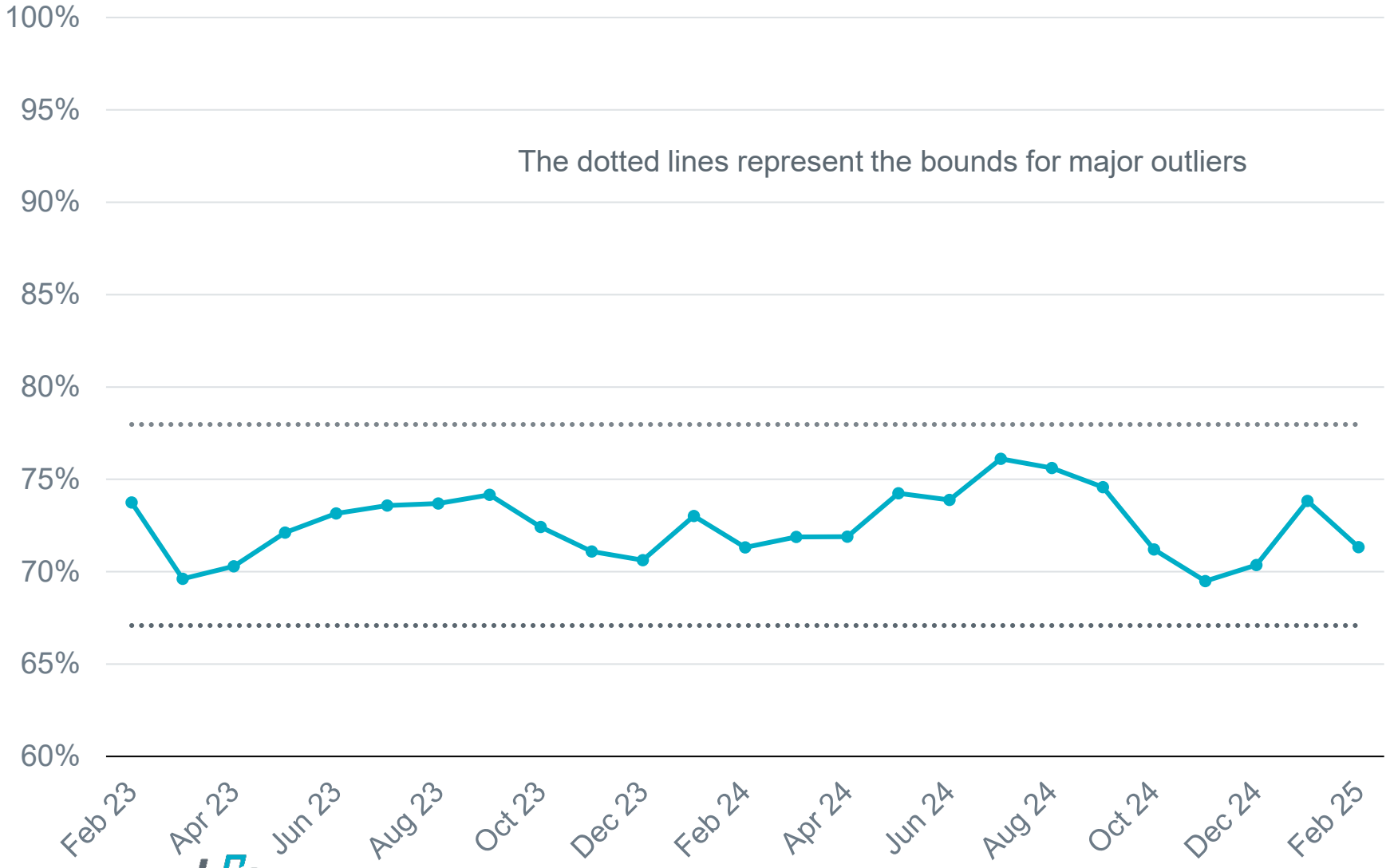
Resource #	Effective Resource-Hours	For Congestion		For Capacity	
		Opt-Out	Non-Opt-Out	Opt-Out	Non-Opt-Out
27	62.0	0.0	16.0	0.0	46.0
28	139.0	0.0	68.0	0.0	71.0
29	32.0	0.0	16.0	0.0	16.0
30	32.0	0.0	16.0	0.0	16.0
31	66.0	0.0	40.0	0.0	26.0
32	6.0	0.0	6.0	0.0	0.0
33	6.0	0.0	6.0	0.0	0.0
34	6.0	0.0	6.0	0.0	0.0
35	5.8	0.0	5.8	0.0	0.0
36	6.0	0.0	6.0	0.0	0.0
37	9.4	0.0	6.0	0.0	3.4
38	2.0	0.0	2.0	0.0	0.0
39	36.9	0.0	0.0	0.0	36.9
40	36.9	0.0	0.0	0.0	36.9
41	6.0	0.0	6.0	0.0	0.0
42	13.2	0.0	13.2	0.0	0.0
43	31.9	0.0	11.9	0.0	20.0
44	6.0	0.0	0.0	6.0	0.0
45	7.0	0.0	0.0	7.0	0.0
46	2.0	0.0	2.0	0.0	0.0
47	2.2	0.0	2.2	0.0	0.0
48	4.0	0.0	4.0	0.0	0.0
49	3.9	0.0	0.0	0.0	3.9
50	4.0	0.0	0.0	4.0	0.0
51	6.0	0.0	0.0	0.0	6.0
Total	**803.3**	**17.0**	**385.1**	**25.0**	**376.2**

Real-Time prices were aligned with Day-Ahead prices, on average, in February



*Averages are weighted by Real-Time Market Load

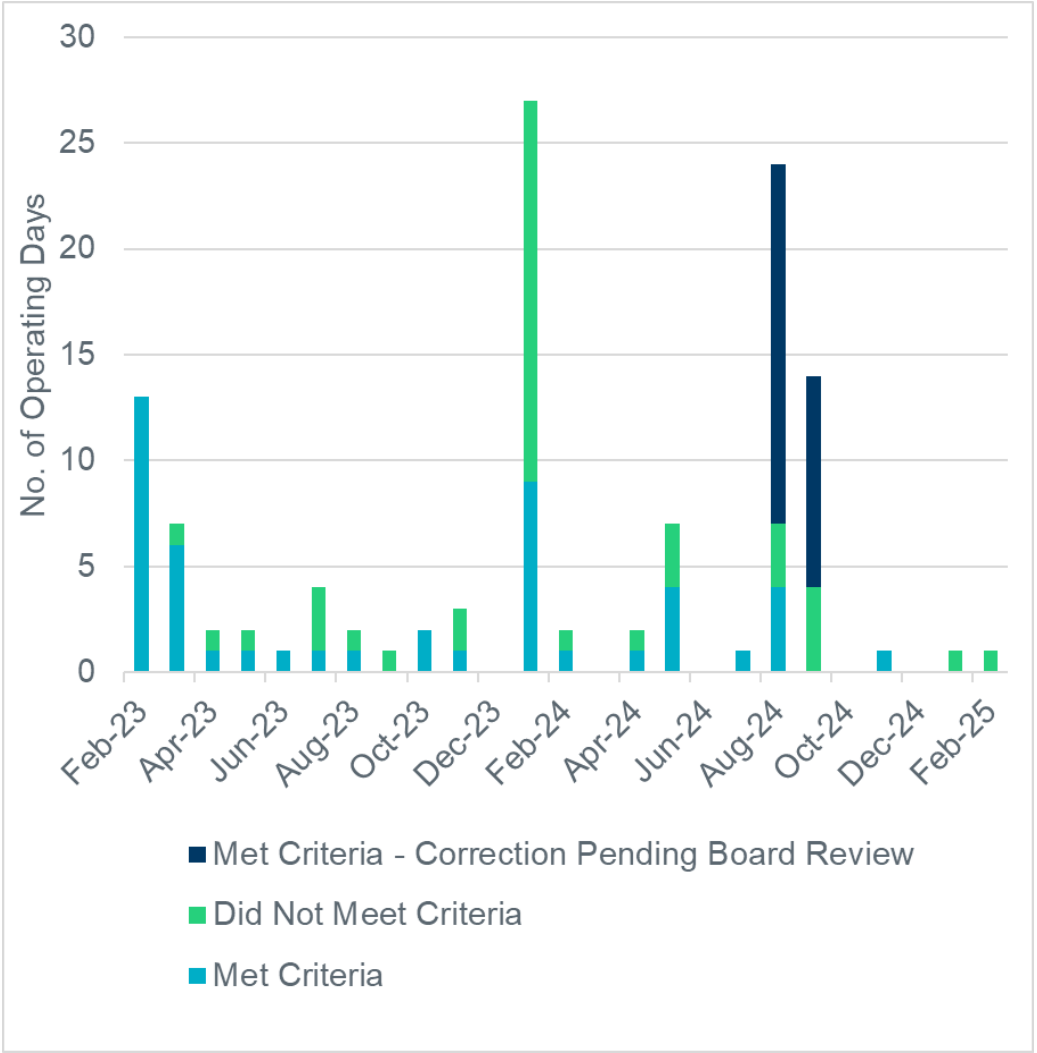
Percentage of Real-Time Load Transacted in the Day-Ahead Market decreased in February compared to January



Price Issues and the Impact of Nodal Protocol Revision Request (NPRR) 1024 on Price Corrections

This graph looks at the recent history of price issues in the RTM or DAM and breaks the impacted Operating Days into three categories:

- Days that met the criteria for "significance" under NPRR1024 and were corrected;
- Days that were not corrected because they did not meet the criteria for "significance" under NPRR1024; and
- Days that are currently undergoing analysis to determine if criteria for "significance" under NPRR1024 is met.



Details for Price Corrections Review

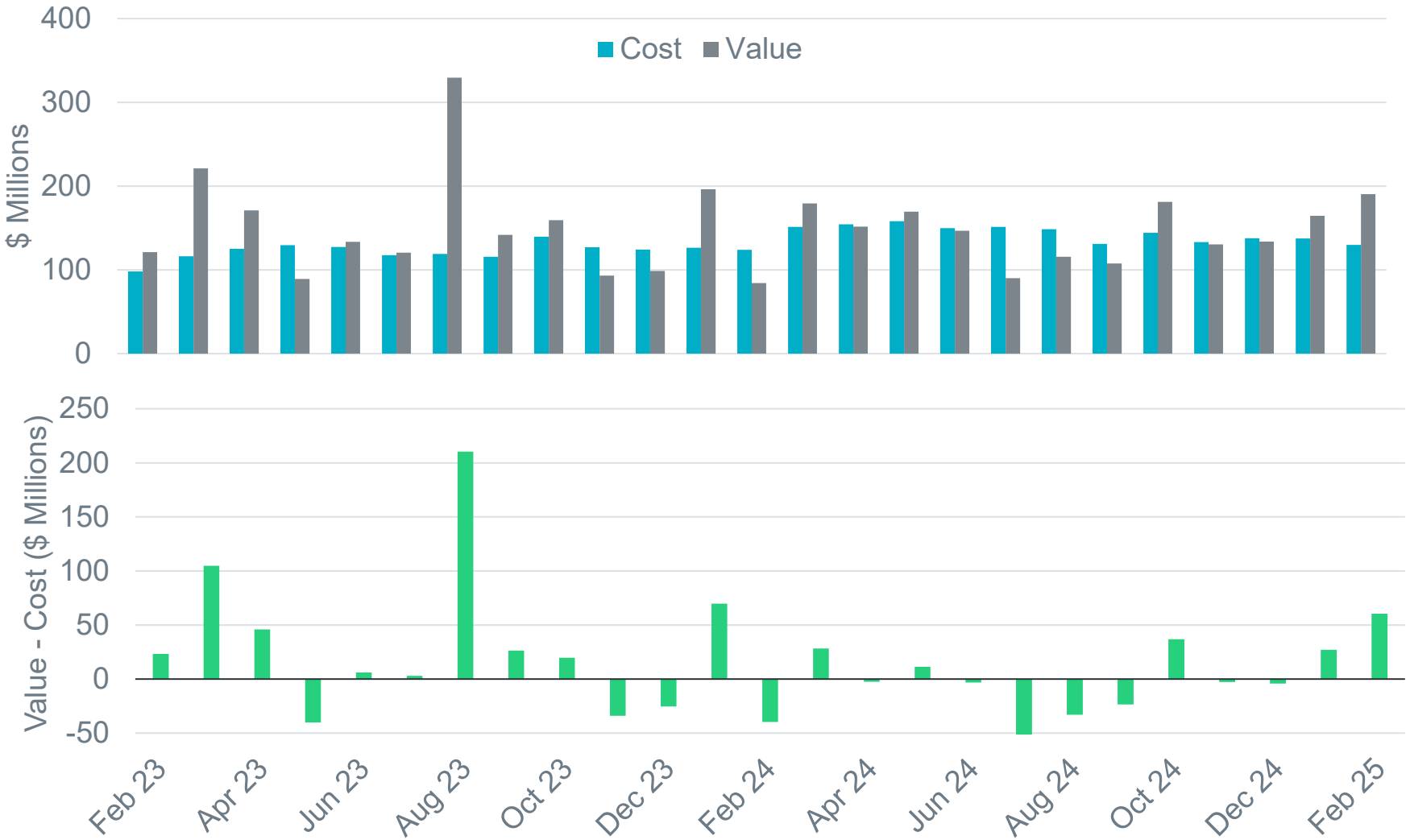
Pricing Impacts Not Meeting Criteria

On Operating Day February 11, 2025, the Emergency Basepoint flag was activated during an unannounced constant frequency control test. The flag was active for approximately 4 minutes, impacting meter prices for the real-time settlement interval 11:00. The total estimated dollar impact was approximately $30, not meeting the criteria of $500 for performing a price correction.

Update on Previous Price Impact Analysis

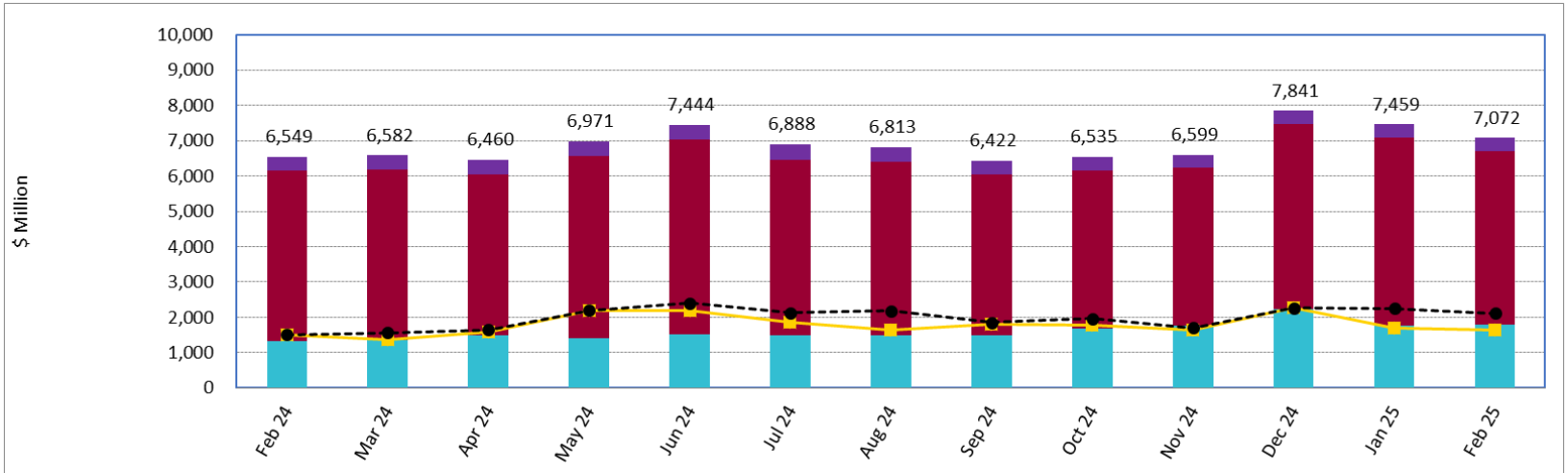
On September 5, 2024, ERCOT discovered a software defect that affected a Resource's megawatt (MW) value when its data quality was suspect. The MW value is used in the calculation of dispatch and prices (See Market Notice M-A091124-01). ERCOT has finished its impact analysis and found that 27 of the 31 days met criteria for pursuing ERCOT Board review for price correction. A more detailed review of the analysis results was presented at the TAC meeting on March 26, 2025 and was presented for approval at the ERCOT Board of Directors meeting on April 7, 2025.

Congestion Revenue Right (CRR) Value was Greater than Cost in February



Available Credit by Type Compared to Total Potential Exposure (TPE) Month-End February 2024 – February 2025

This shows TPE compared to the forms of collateral held.



	29-Feb-2024	31-Mar-2024	30-Apr-2024	31-May-2024	30-Jun-2024	31-Jul-2024	31-Aug-2024	30-Sep-2024	31-Oct-2024	30-Nov-2024	31-Dec-2024	31-Jan-2025	28-Feb-2025
Total Credit Limit	6,549	6,582	6,460	6,971	7,444	6,888	6,813	6,422	6,535	6,599	7,841	7,459	7,072
Surety Bonds	396	391	406	406	406	426	416	376	376	376	376	376	374
Letters of Credit	4,821	4,832	4,572	5,164	5,511	4,963	4,900	4,545	4,474	4,471	5,244	5,329	4,918
Cash	1,332	1,358	1,482	1,400	1,527	1,499	1,496	1,500	1,685	1,752	2,221	1,754	1,780
TPE	1,505	1,365	1,574	2,202	2,187	1,854	1,651	1,794	1,778	1,629	2,262	1,684	1,631
Max TPE	1,505	1,558	1,651	2,202	2,398	2,121	2,183	1,848	1,965	1,699	2,262	2,252	2,108

- Numbers are as of month-end except for Max TPE
- Max TPE is the highest TPE for the corresponding month