



## **Item 7.3 Commercial Markets Update**

*Kenan Ögelman*

Vice President, Commercial Operations

Reliability and Markets Committee Meeting

ERCOT Public

June 19, 2023

# Overview

- **Purpose**

- Update the Committee on Aggregate Distributed Energy Resource (ADER) Pilot
- Follow up on Demand Response During Winter Storm Elliot

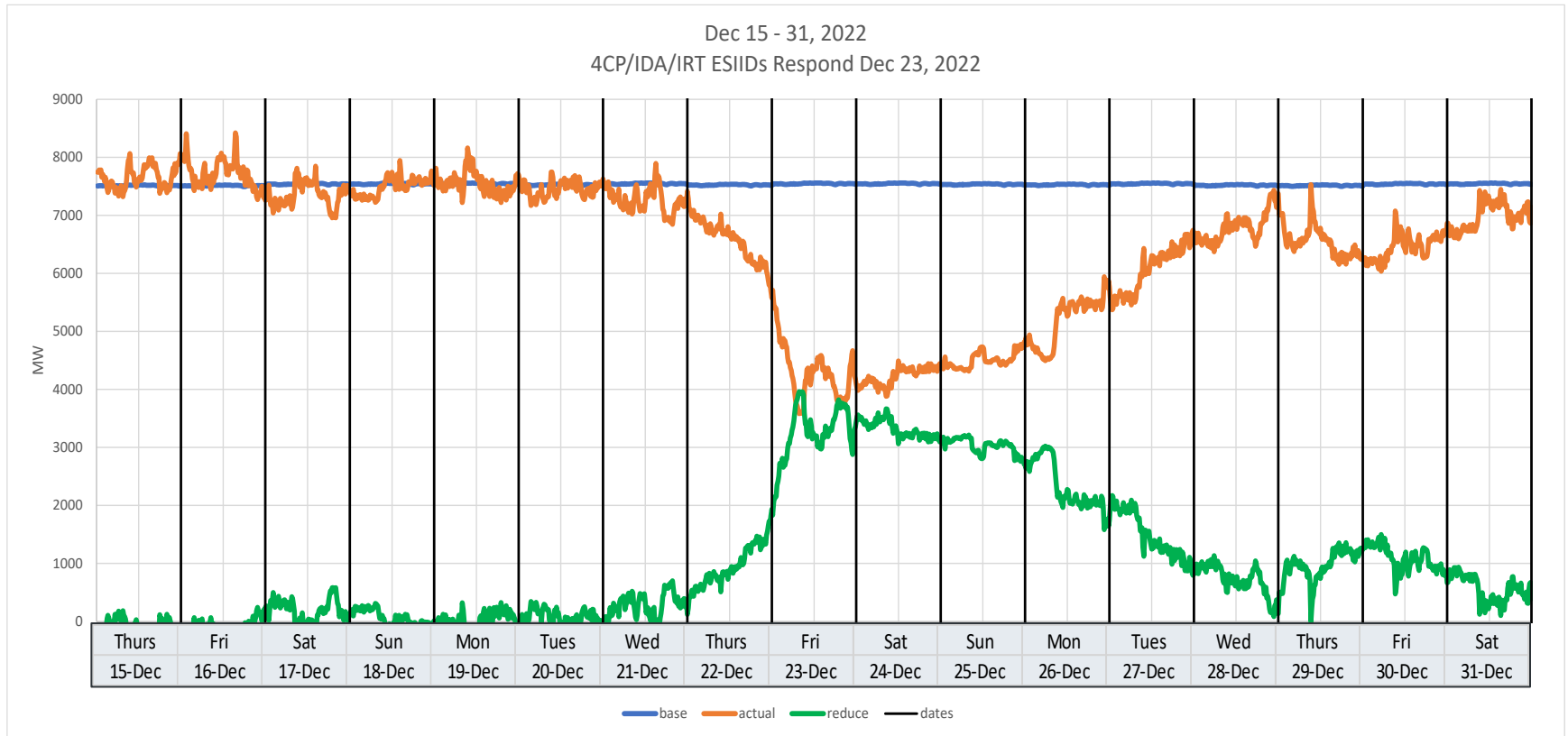
- **Voting Items / Requests**

No action is requested of the R&M Committee or Board; for discussion only

- **Key Takeaways**

- Currently no ADERs are fully qualified
- There was notable, but estimated, price responsive demand during Winter Storm Elliott

# Price Responsive Demand During Elliott

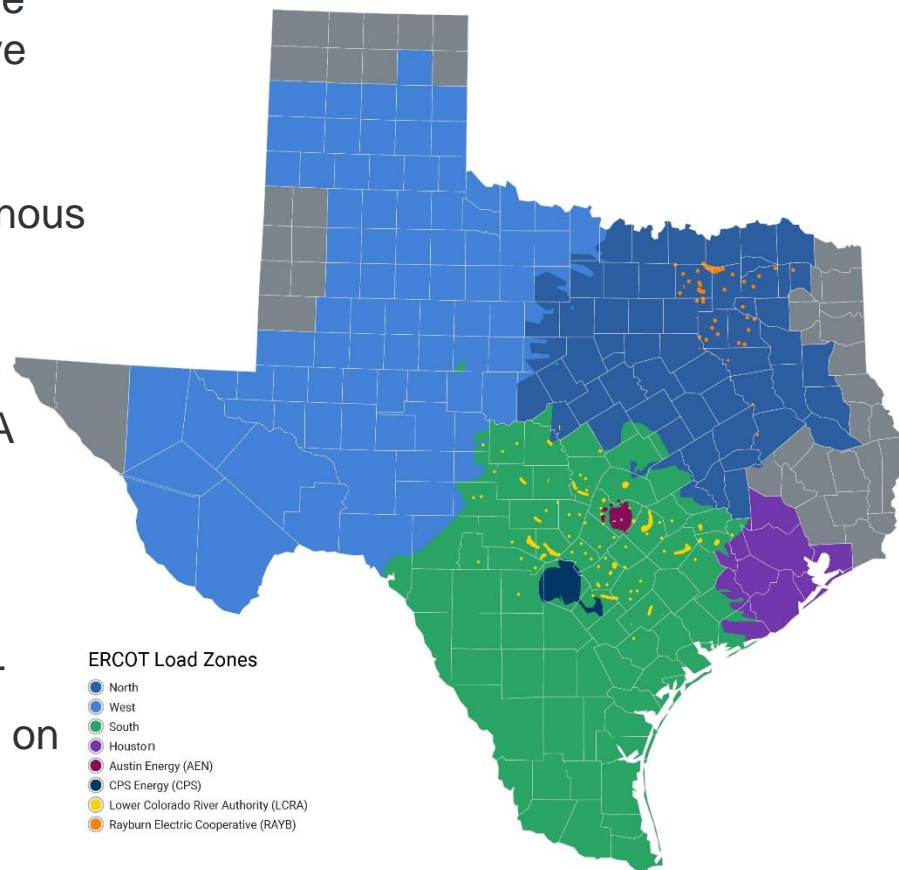


- Down Ramp:
  - Started Dec 21 at interval 66, load reduction increased to 300 MW by interval 96.
  - Dec 22, Interval 96 reduction 2,000 MW.
- Dec 24: Average reduction 3,300 MW.
- Dec 25: Average reduction 3,000 MW.



# Aggregate Distribution Energy Resource (ADER) pilot participation as of June 7, 2023

- Prospective participants continue to engage with end-use customers, Distribution Service Providers (DSPs), and ERCOT staff to set up ADERs.
- ERCOT has accepted seven Details of the Aggregation (DOTA) forms and there have been some updates to aggregation populations:
  - Aggregated devices include synchronous generators, stationary batteries, and HVAC systems.
  - All ADERs intend to provide some amount of Non-Spin, based on DOTA submissions.
  - ERCOT-Wide Energy: 10.1 MW
  - ERCOT-Wide Non-Spin: 3.3 MW
- The first 5 ADERs are now in the ERCOT Network Model, with participants focused on setting up Real-Time telemetry.



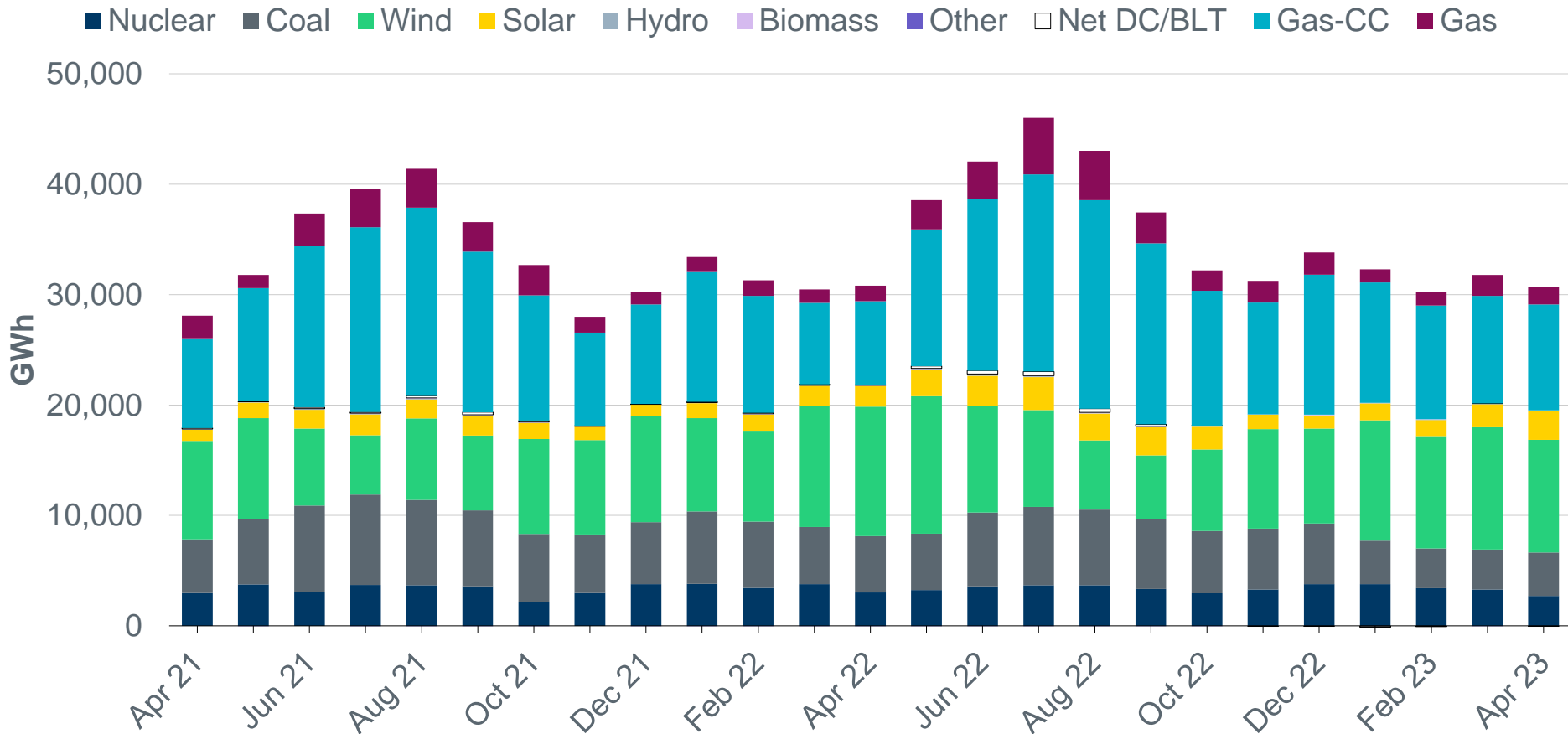
# Appendix

# Highlights, Records and Notifications

- ERCOT set a new all-time record of 60,922 MW\* for the month of April on 4/3/2023; this was 2,503 MW more than the previous record of 58,419 MW set on 4/5/2022.
- ERCOT issued 7 notifications:
  - 1 DC Tie Curtailment Notice for the DC\_R due to a planned or unplanned outage.
  - 2 AAN's issued for possible future emergency condition.
  - 1 OCN issued for forecasted large hail, damaging winds and isolated tornados.
  - 1 Advisory issued for a geomagnetic disturbance Alert of K-7.
  - 1 Watch issued due to the failure of SCED.
  - 1 Watch issued due to the HRUC failure.

\* Preliminary value from May release of Demand and Energy 2023 report.

# Monthly energy generation decreased by 0.4% year-over-year to 30,666 GWh in April 2023, compared to 30,790 GWh in April 2022

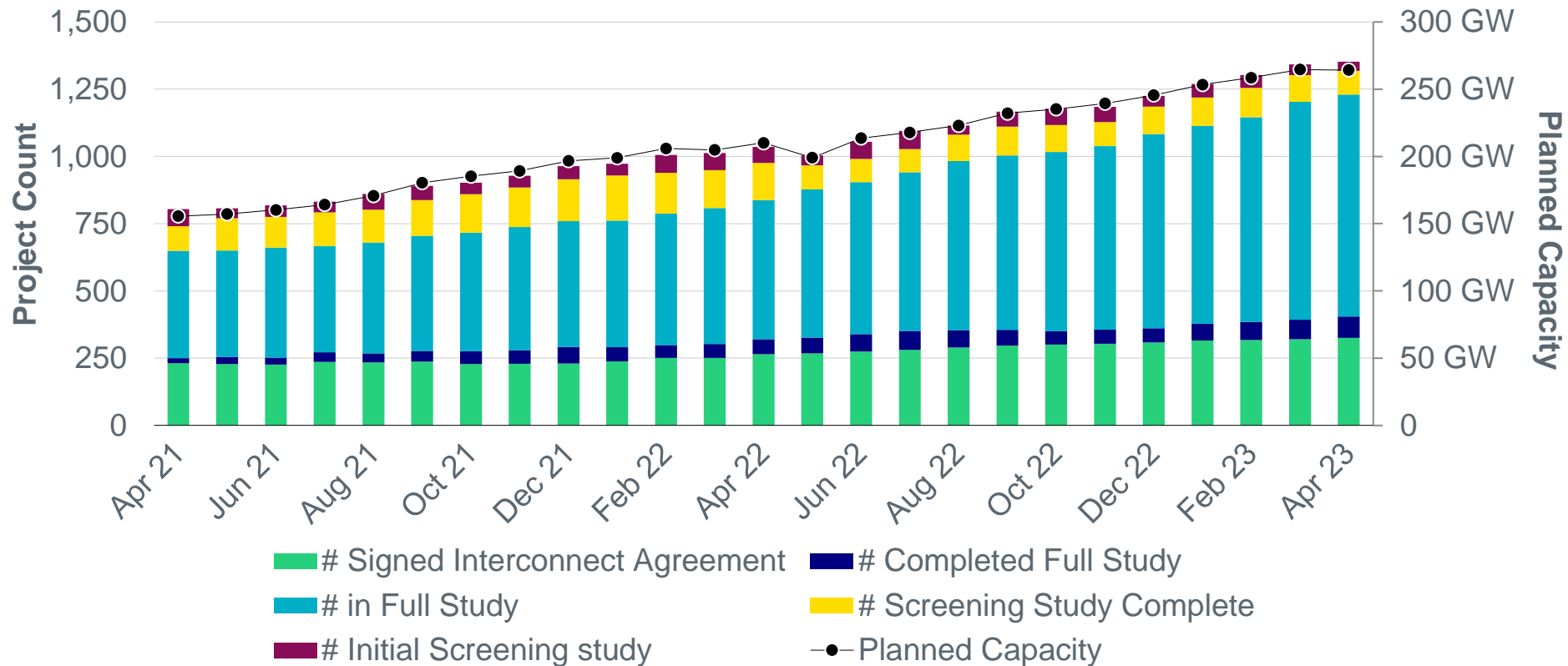


Data for latest two months are based on preliminary settlements.



# Generation Interconnection activity by project phase

(Excludes capacity associated with projects designated as Inactive per Planning Guide Section 5.7.6)



- There are an additional 18 “Small Generator” projects totaling 170 MW that are going through the simplified interconnection process.

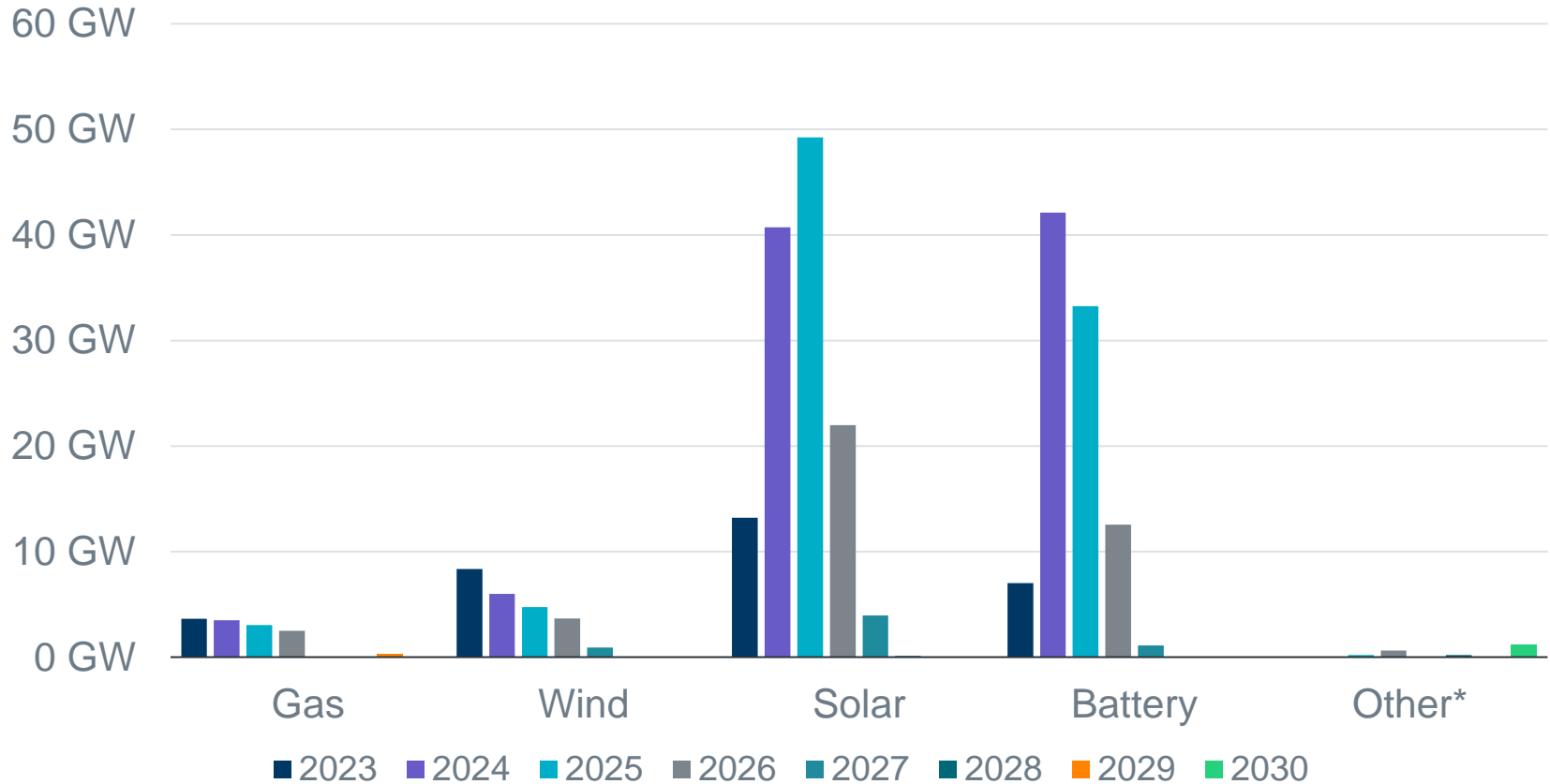
A break-out by fuel type can be found in the monthly Generator Interconnection Status (GIS) reports available on the ERCOT Resource Adequacy Page: <http://www.ercot.com/gridinfo/resource>





# Interconnection Queue Capacity by Fuel Type

Queue totals: Solar 129 GW (48.9%), Wind 24 GW (9.0%), Gas 13 GW (4.9%), Battery 96 GW (36.4%)  
(Excludes capacity associated with projects designated as Inactive per Planning Guide Section 5.7.6)



A break-out by zone can be found in the monthly Generator Interconnection Status (GIS) reports available on the ERCOT Resource Adequacy Page: <http://www.ercot.com/gridinfo/resource>

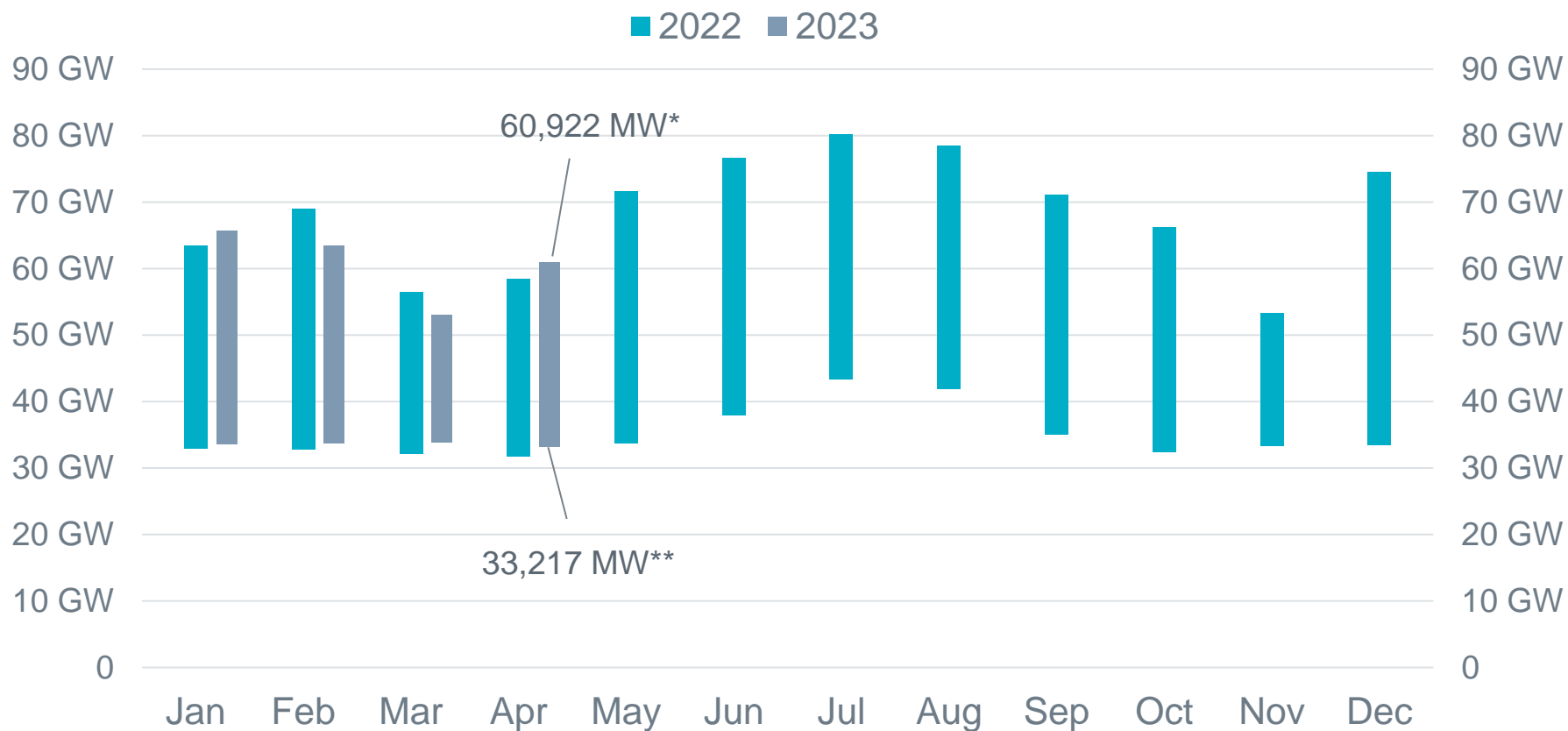
\* Other includes petroleum coke (pet coke), hydroelectric, fuel oil, geothermal energy, other miscellaneous fuels reported by developers, and fuel cells that use fuels other than natural gas.



# Planning Summary

- ERCOT is tracking 1,385 active generation interconnection requests totaling 264,291 MW as of April 30. This includes 129,237 MW of solar, 23,703 MW of wind, 96,078 MW of battery, and 12,985 MW of gas projects; 66 projects were categorized as inactive, up from 61 inactive projects in March 2023.
- ERCOT is currently reviewing proposed transmission improvements with a total estimated cost of \$527.00 million as of April 30, 2023.
- Transmission Projects endorsed in 2023 total \$555.15 million as of April 30, 2023.
- All projects (in engineering, routing, licensing and construction) total approximately \$11.643 billion as of February 1, 2023.
- Transmission Projects energized in 2023 total about \$149 million as of February 1, 2023.

**ERCOT set a new all-time record of 60,922 MW\* for the month of April on 4/3/2023; this was 2,503 MW more than the previous record of 58,419 MW set on 4/5/2022.**



\*Based on the maximum net system hourly value from May release of Demand and Energy 2023 report.

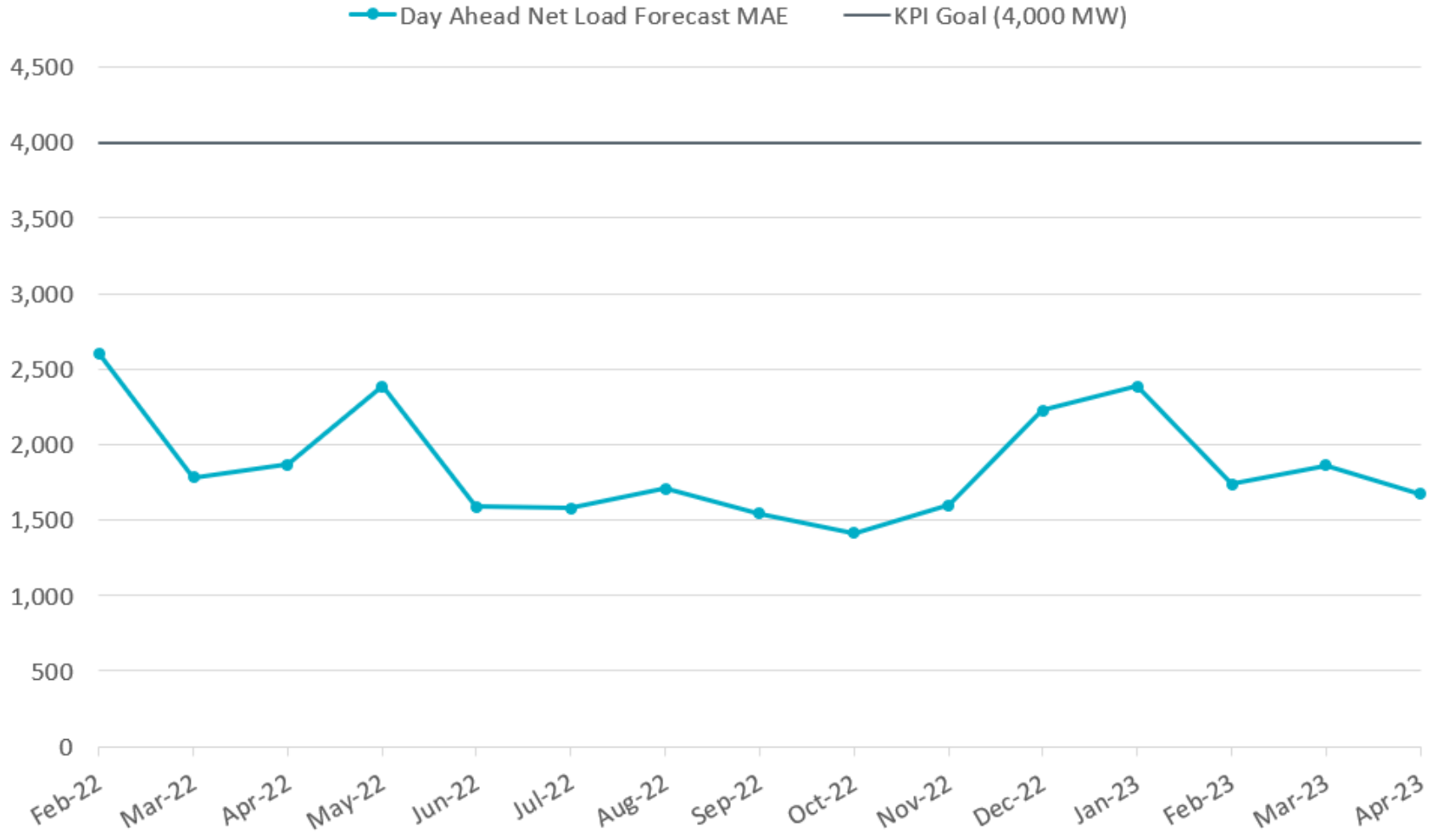
\*\*Based on the minimum net system 15-minute interval value from May release of Demand and Energy 2023 report.

Data for latest two months are based on preliminary settlements.

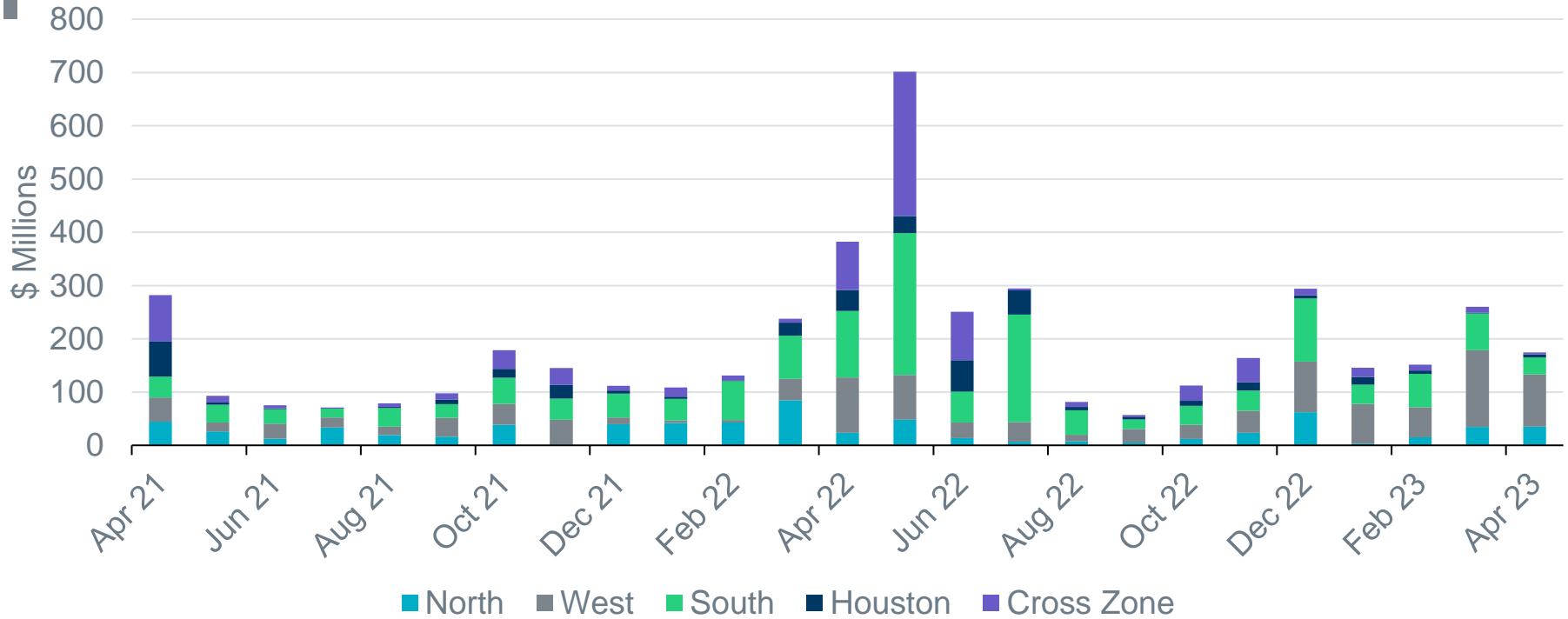


# Net Load Forecast Performance

Day Ahead Net Load Forecast - Mean Absolute Forecast Error



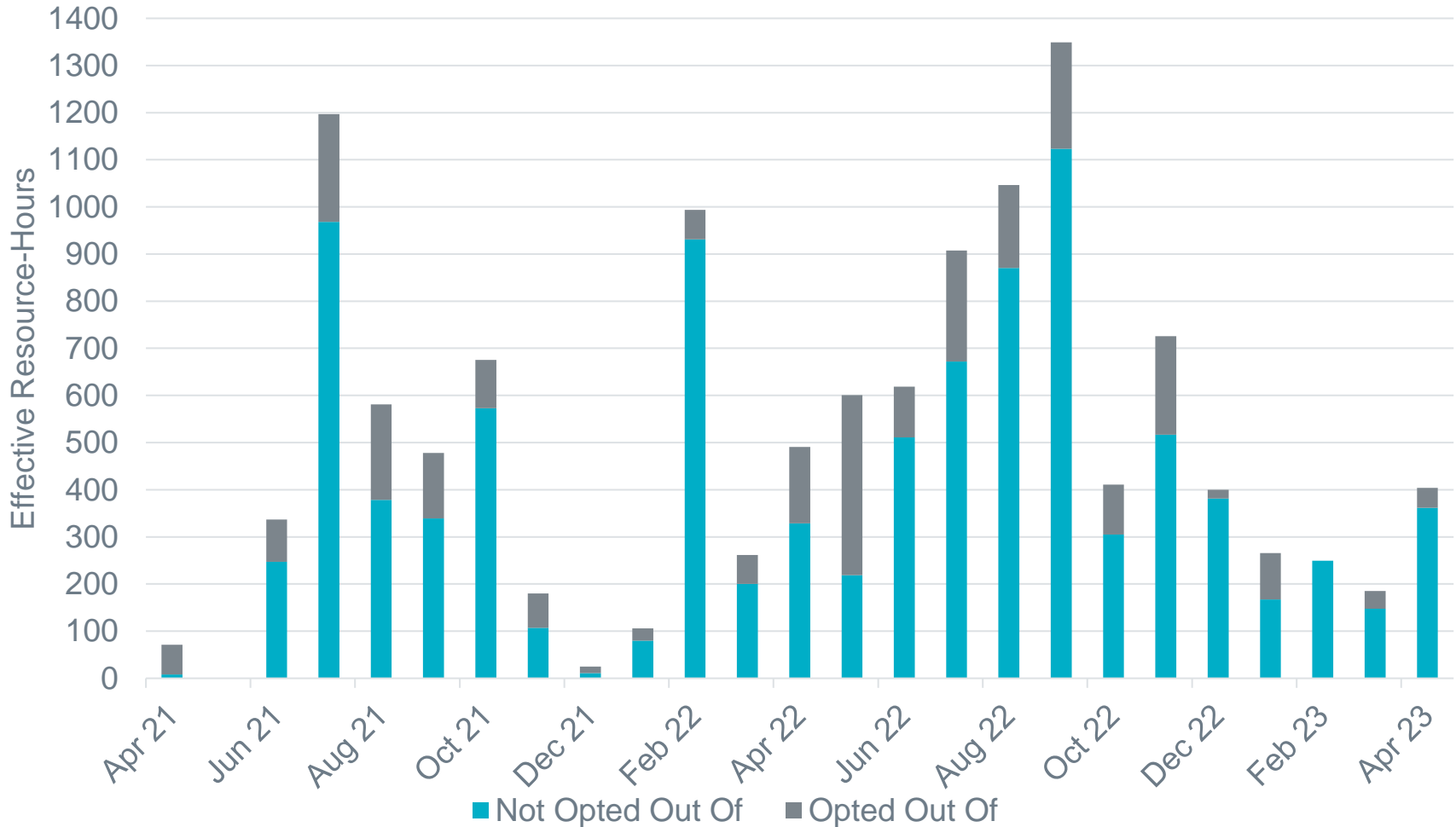
# Real-Time Congestion Rent by Zone



- System-wide congestion rent decreased in April compared to March.
- The two zones with the highest congestion rent were the West and North Zones.
  - Congestion rent in the West Zone was primarily driven by the loss of the double circuit 345 kV manual contingency from Morgan Creek to Quail Switch overloading the 138 kV transmission line from Morgan Creek to Forest Creek.
  - Congestion rent in the North Zone was primarily driven by the loss of the 345 kV transmission line from Carrollton Northwest to Lewisville Switch overloading the 138 kV transmission line from Ti Tnp to South Tnp.
- 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.
- The “Cross Zone” category consists of cases in which the substations on either end of the constraint are in different zones.



# Twenty-five Resources were Committed in April for Projected Capacity or Congestion Needs



“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.

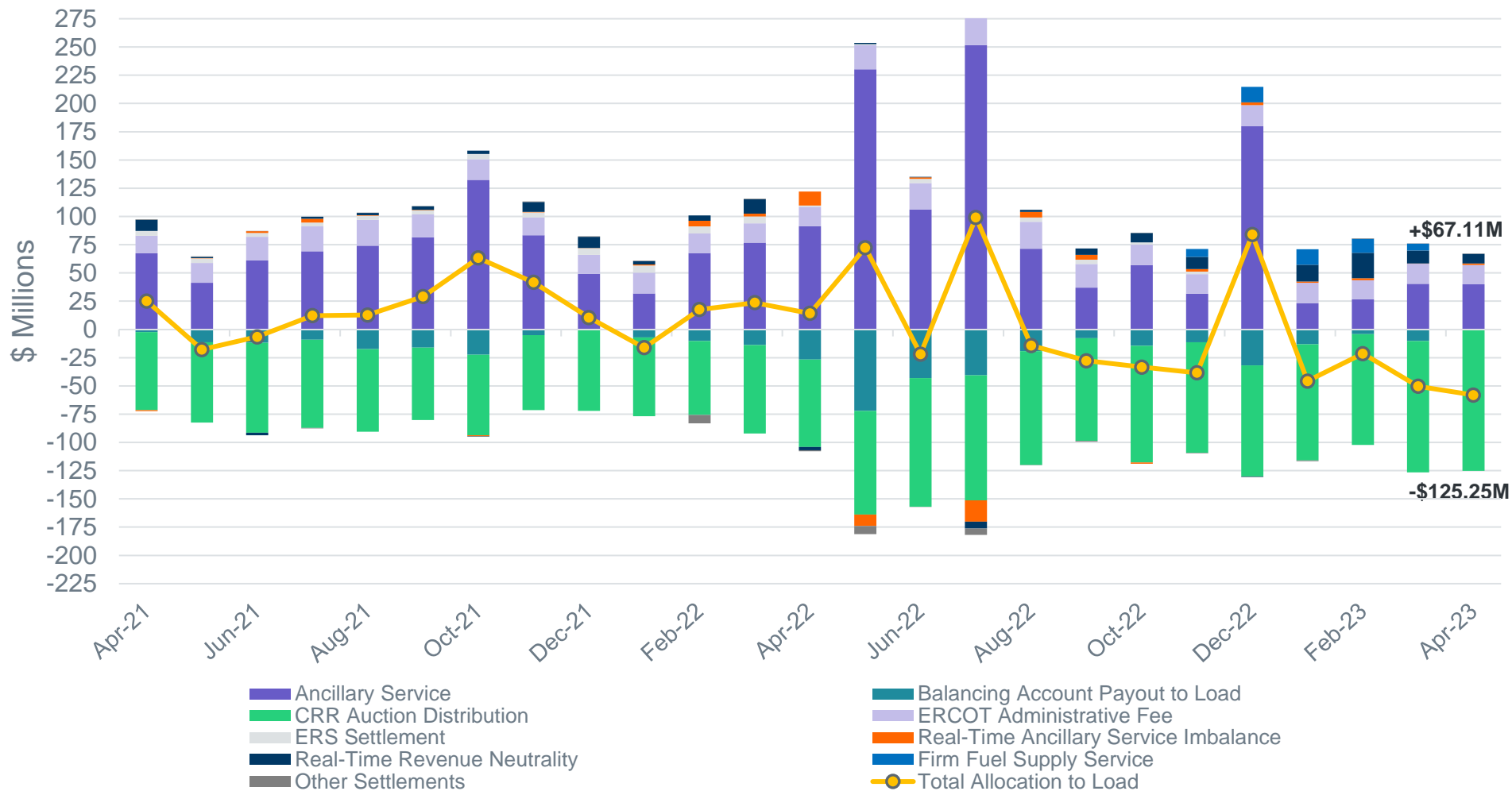


# Twenty-five Resources were Committed in April for Projected Capacity or Congestion Needs

Resource #	Effective Resource-hours	Non Opt Out (Effective Hours)	Opt Out (Effective Hours)
1	1.9	1.9	0.0
2	6.0	0.0	6.0
3	6.0	0.0	6.0
4	5.0	5.0	0.0
5	3.9	3.9	0.0
6	4.0	4.0	0.0
7	2.0	0.0	2.0
8	2.0	0.0	2.0
9	14.0	14.0	0.0
10	48.0	48.0	0.0
11	18.9	15.9	3.0
12	31.9	23.9	8.0
13	24.0	16.0	8.0
14	88.4	88.4	0.0
15	32.6	32.6	0.0
16	23.8	23.8	0.0
17	22.6	22.6	0.0
18	2.0	2.0	0.0
19	9.9	9.9	0.0
20	6.9	6.9	0.0
21	11.8	11.8	0.0
22	11.6	11.6	0.0
23	8.9	8.9	0.0
24	15.9	8.9	7.0
25	1.9	1.9	0.0
<b>Total</b>	<b>403.9</b>	<b>361.9</b>	<b>42.0</b>



# Net Allocation to Load in April 2023 was (\$58.14) Million

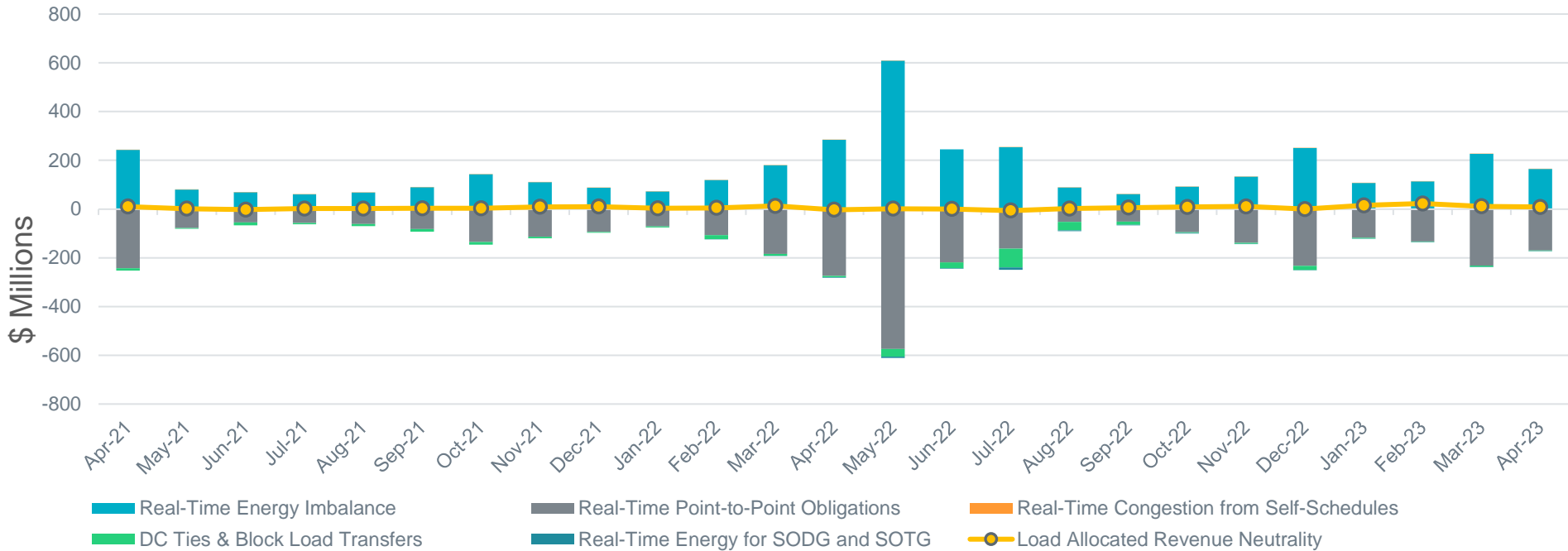


This information is available in tabular form in the Settlement Stability Report presented quarterly to the [Wholesale Market Subcommittee](#)





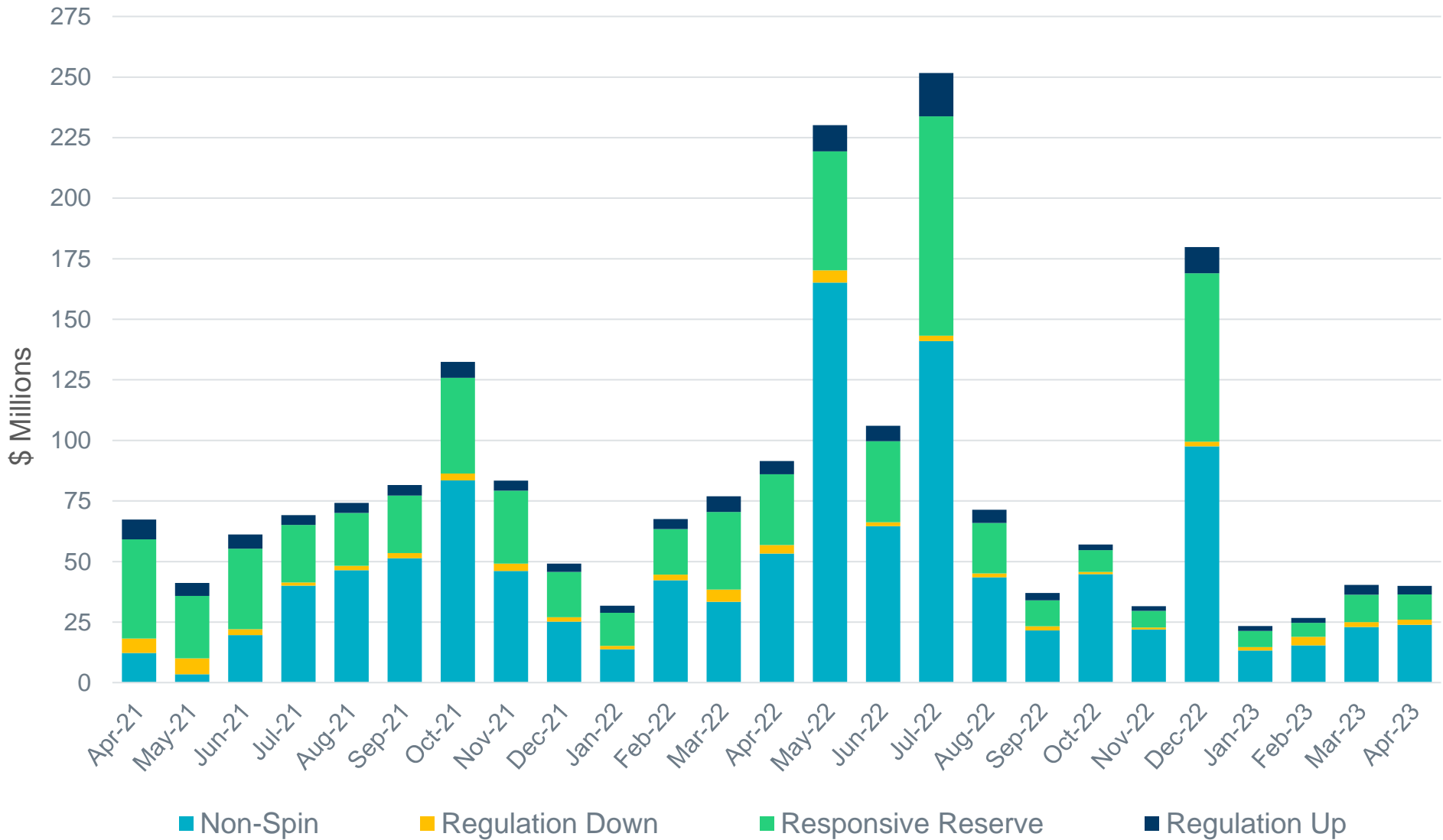
# Real-Time Revenue Neutrality Allocated to Load was \$8.51M for April 2023



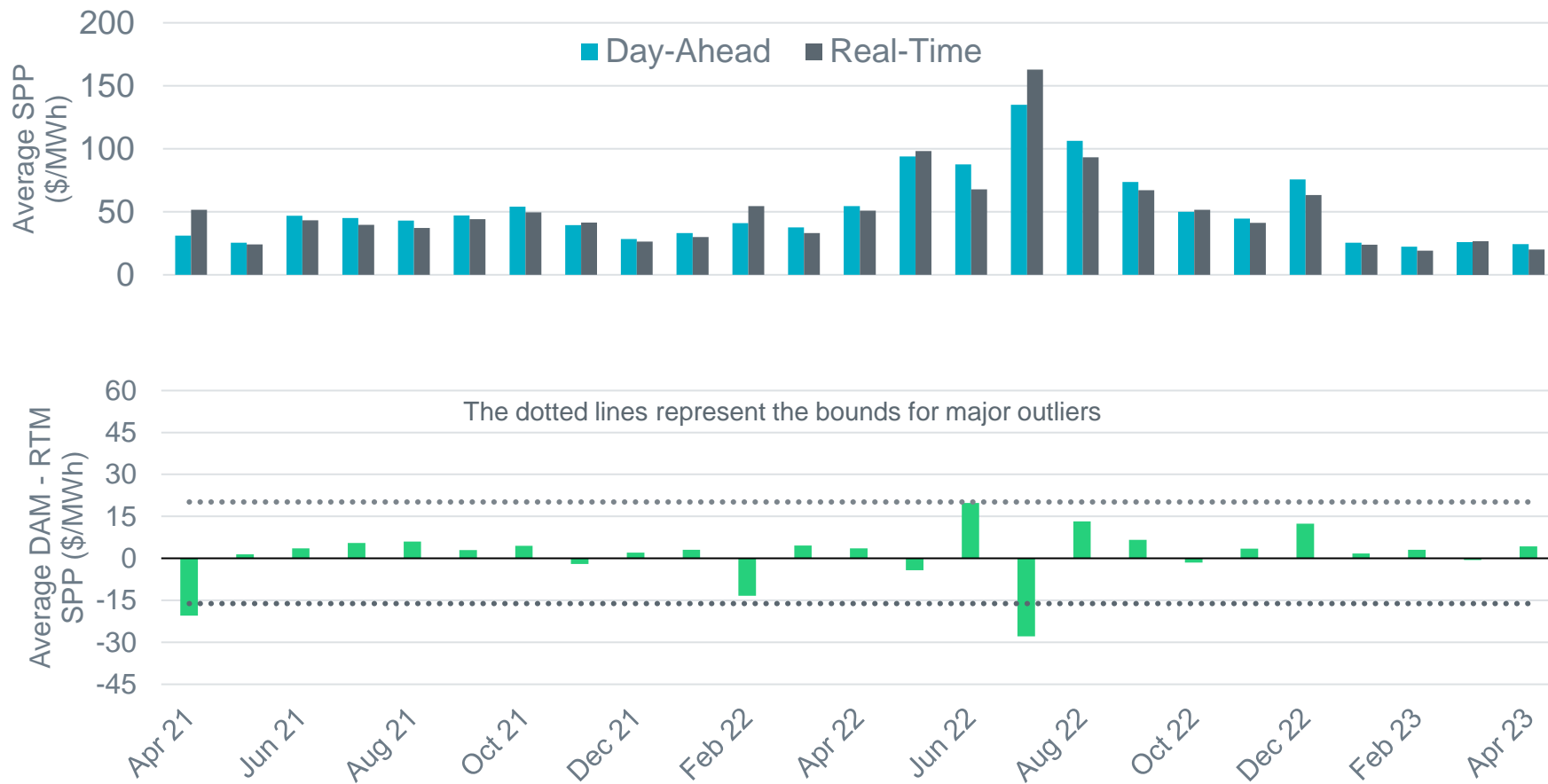
	April 2023 (\$M)
Real-Time Energy Imbalance	\$164.16
Real-Time Point-to-Point Obligation	(\$169.38)
Real-Time Congestion from Self-Schedules	\$0.16
DC Tie & Block Load Transfer	(\$2.91)
Real-Time Energy for SODG and SOTG	(\$0.53)
<b>Load Allocated Revenue Neutrality</b>	<b>\$8.51</b>



# Ancillary Services for April 2023 totaled \$39.98M



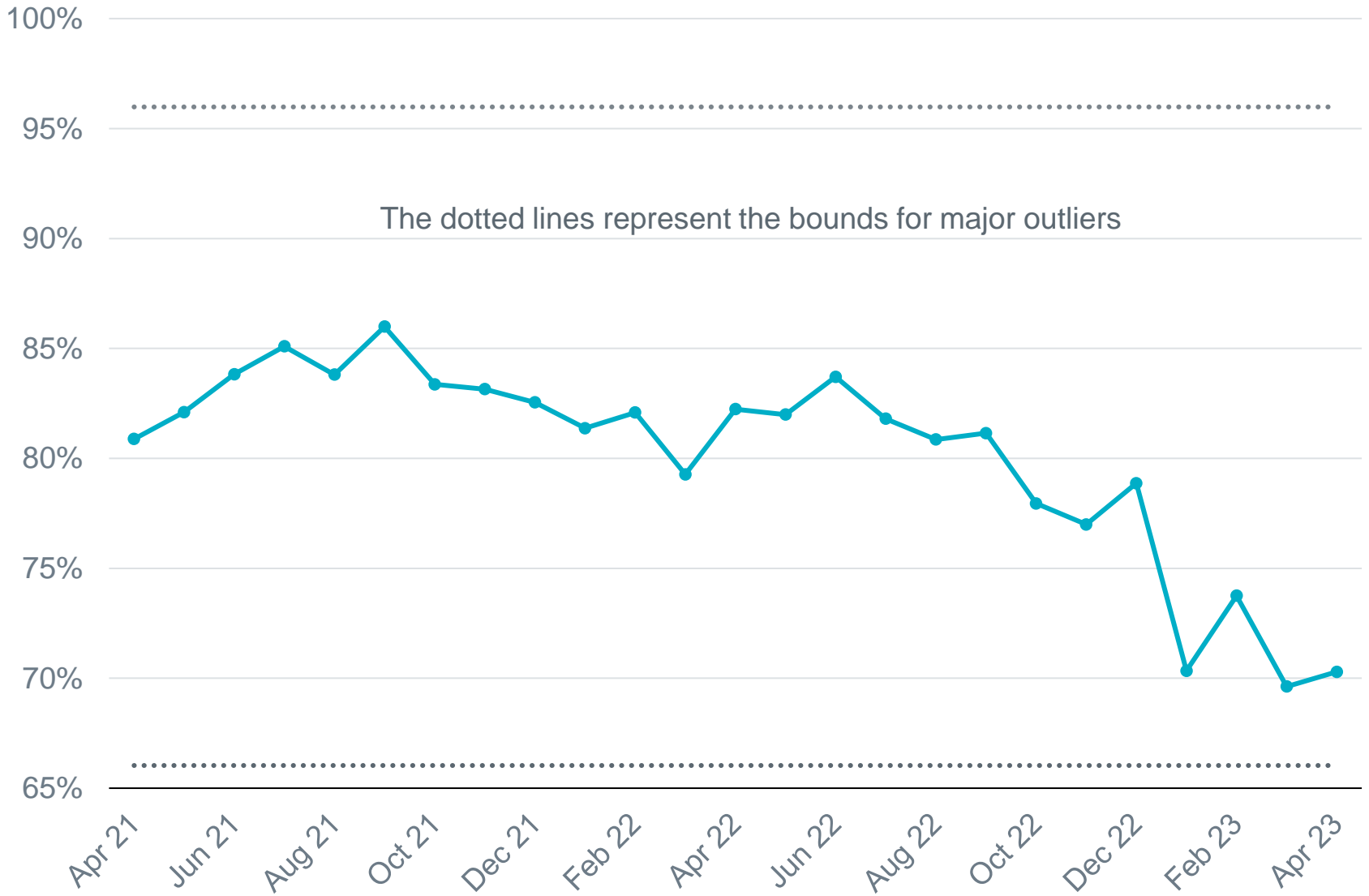
# Day-Ahead and Real-Time Market Price Convergence



\*Averages are weighted by Real-Time Market Load



# Percentage of Real-Time Load Transacted in the Day-Ahead Market



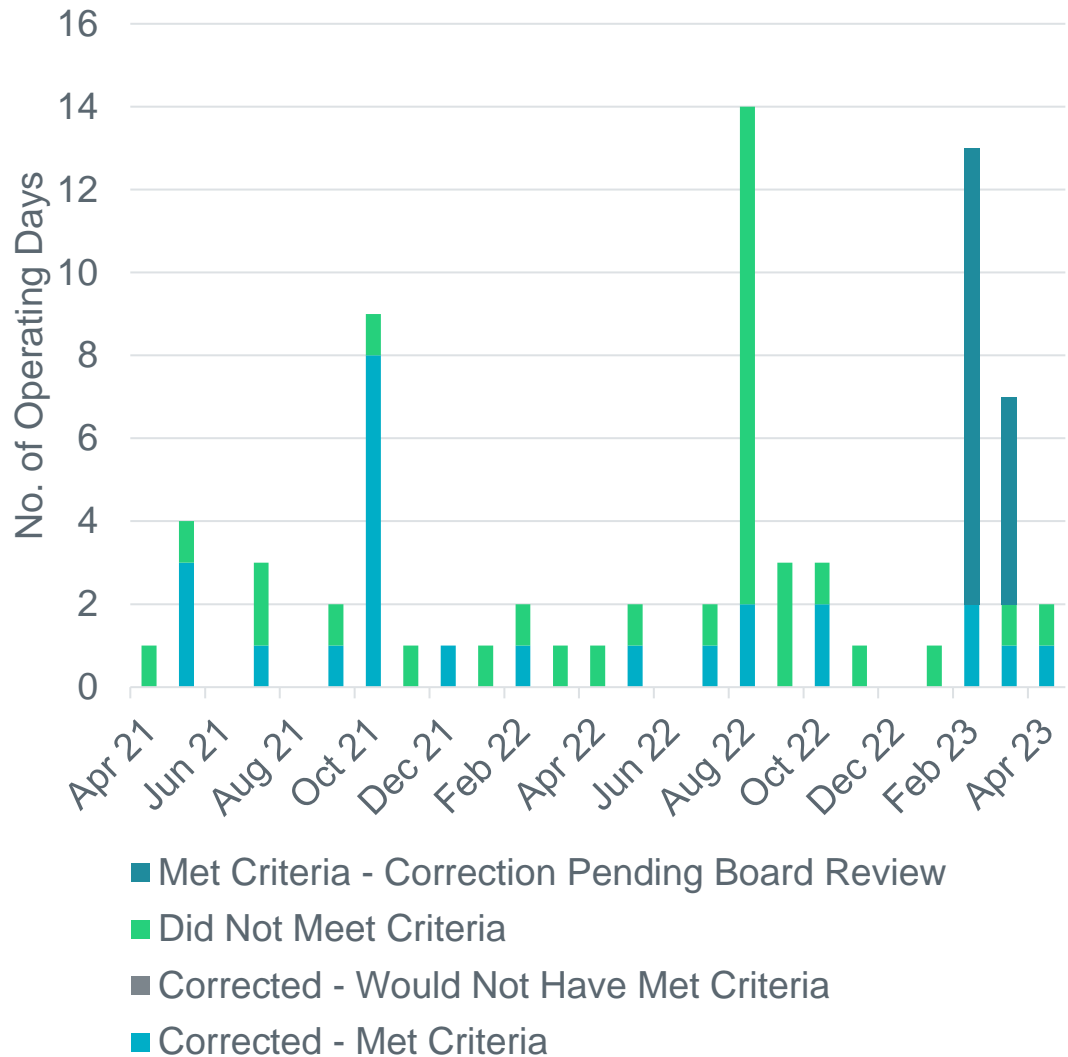
# CRR Value and Cost Convergence



# 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 would not have met the criteria for “significance” under NPRR1024, but were corrected because NPRR1024 was not yet in place; and
- Days that were not corrected because they did not meet the criteria for “significance” under NPRR1024.



# Details for Price Corrections Reviews

## Operating Day Not Meeting Significance Criteria

- On April 5, 2023, after the weekly network model load, the new model was found to contain two different electrical buses with the same name. This resulted in one of the buses having two shift-factors and the other having zero shift-factors. After correcting the issue and completing impact analysis, ERCOT found it did not meet criteria for price correction.

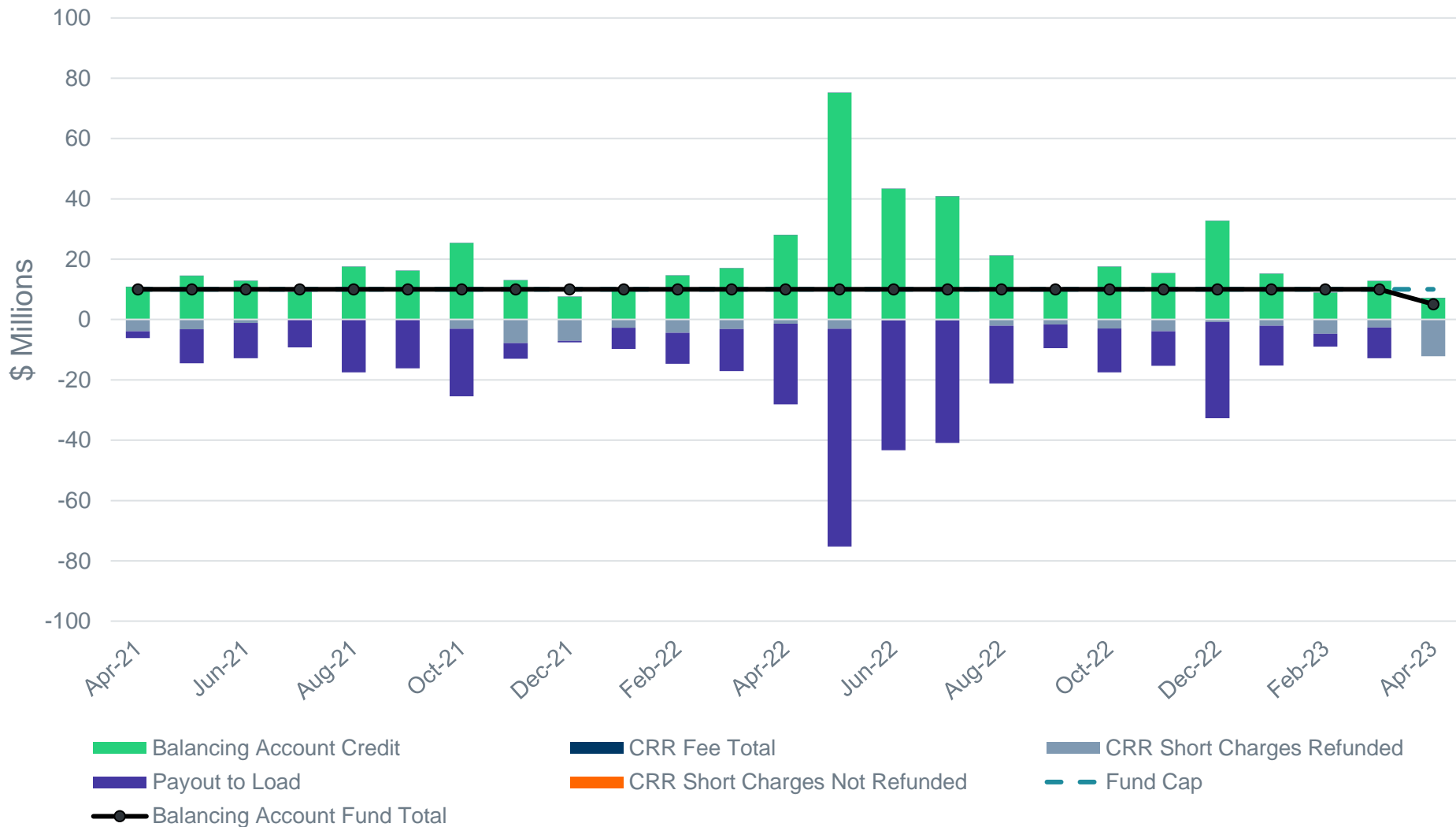
## Operating Day Meeting Significance Criteria

- On April 13, 2023, routine maintenance resulted in SCED failing to run for multiple intervals. For the impact analysis, the Locational Marginal Prices (LMPs) from the last valid SCED run were held for 15 minutes starting from the first valid SCED run following the SCED failure, in accordance with ERCOT Protocols section 6.5.9.2(2). The resulting analysis showed that criteria was met for price correction before prices became final.

## Pending ERCOT Board of Directors Approval

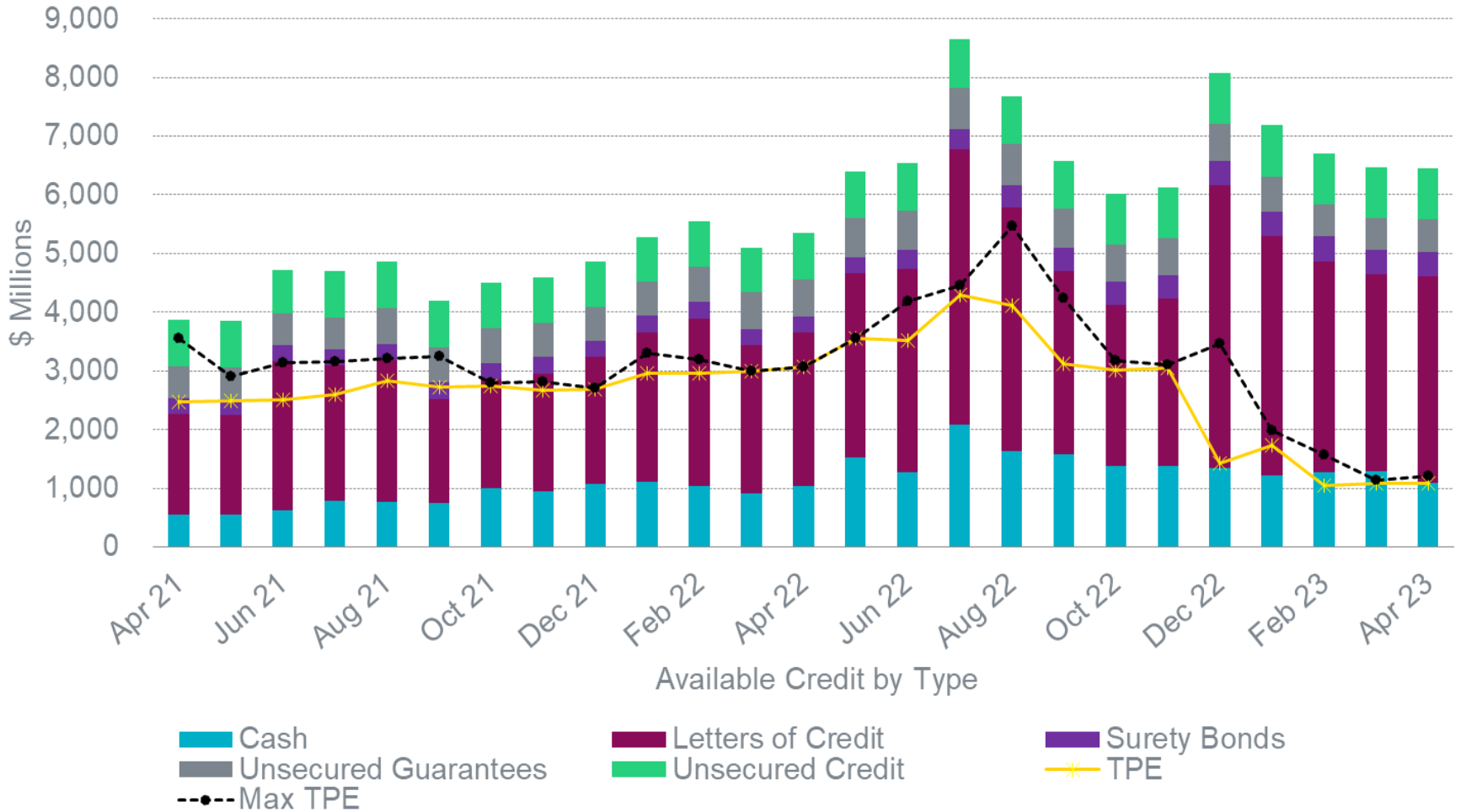
- On March 8th, 2023, ERCOT identified an error in the ERCOT Market Management System where Controllable Load Resources associated with Energy Storage Resources were being considered in Load Zone calculations. The results from the impact analysis show zero days from the Real-Time Market and sixteen days from the Day-Ahead Market that meet criteria. For detailed results, see Market Notice [M-C030923-02](#). ERCOT intends to seek an approval of correction to prices for the impacted Operating Days that met criteria at the Reliability and Market Committee on June 19, 2023, and the Board meeting on June 20, 2023.

**Congestion Revenue Rights Settlement payments were fully funded. No excess amounts remained to allocate to Load. The CRR Balancing Account fund balance is \$5.09M.**





# Available Credit by Type Compared to Total Potential Exposure (TPE)



\*Numbers are as of month end except for Max TPE



# Retail Transaction Volumes – Summary – April 2023

Transaction Type	Year-To-Date		Transactions Received	
	April 2023	April 2022	April 2023	April 2022
<b>Switches</b>	382,377	450,938	78,600	128,697
<b>Acquisitions</b>	0	0	0	0
<b>Move - Ins</b>	1,011,466	947,134	245,045	247,896
<b>Move - Outs</b>	436,554	415,638	107,304	109,452
<b>Continuous Service Agreements (CSA)</b>	142,616	198,926	35,897	46,895
<b>Mass Transitions</b>	0	0	0	0
<b>Total</b>	<b>1,973,013</b>	<b>2,012,636</b>	<b>466,846</b>	<b>532,940</b>