ERCOT Monthly Operational Overview
(November 2022)

ERCOT Public
December 15, 2022

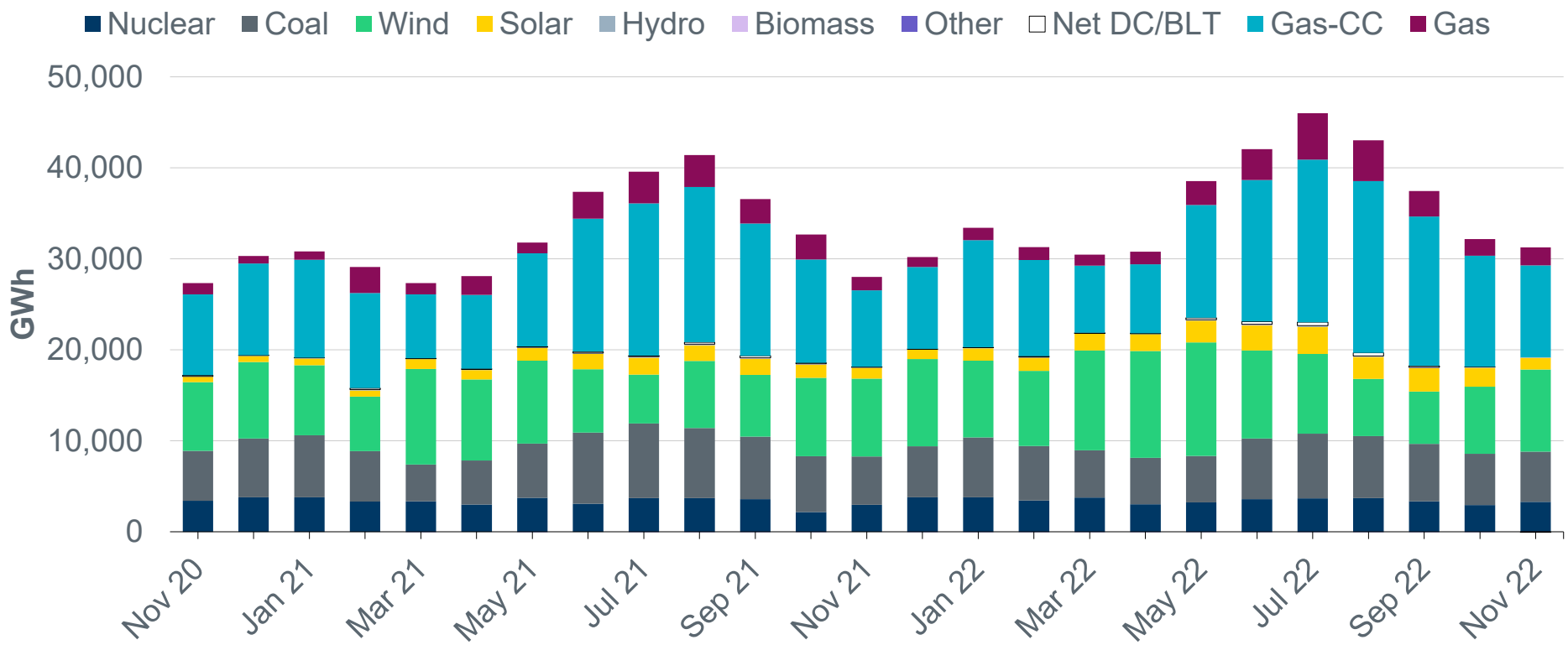
Highlights, Records and Notifications

- ERCOT's maximum peak demand for the month of November was 53,308 MW*; this was 3,138 MW less than the record of 56,446 MW set on 11/12/2019, but 4,325 MW more than the November 2021 demand of 48,983 MW.

- ERCOT issued 5 notifications:
  - 2 DC Tie Curtailments Notices for the DC_R due to forced or unplanned outages.
  - 1 OCN issued for taking manual action on the WESTEX IROL due to topology change.
  - 1 AAN issued for possible future emergency condition.
  - 1 Advisory issued due to the unavailability of the Voltage Security Assessment tool.

* Preliminary value from December release of Demand and Energy 2022 report.

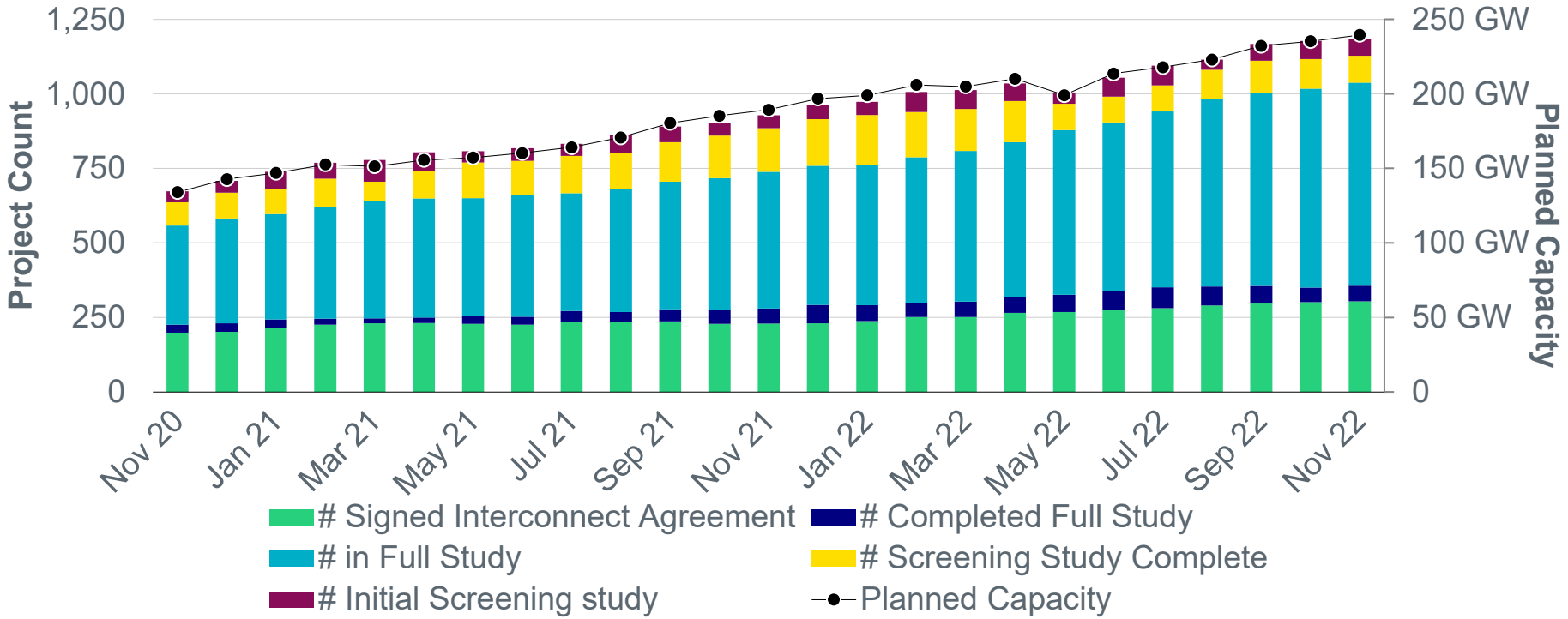
Monthly energy generation increased by 11% year-over-year to 31,204 GWh in November 2022, compared to 27,996 GWh in November 2021



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)

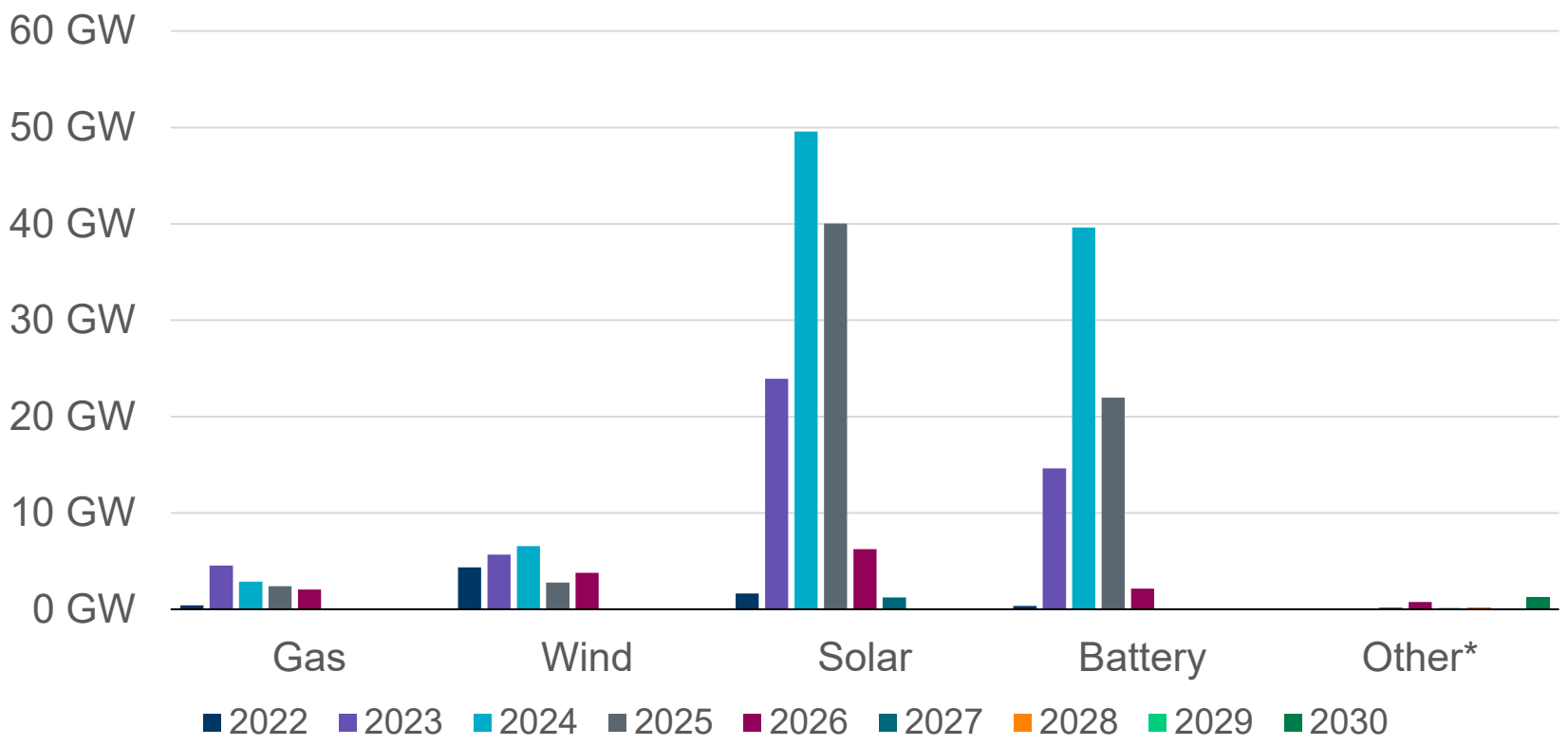


- There are an additional 8 “Small Generator” projects totaling 77 MW that are going through the simplified interconnection process.

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 123 GW (51.2%), Wind 23 GW (9.7%), Gas 12 GW (5.1%), Battery 79 GW (32.9%)
(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 1,214 active generation interconnection requests totaling 239,466 MW as of November 30. This includes 122,705 MW of solar, 23,198 MW of wind, 78,746 MW of battery, and 12,277 MW of gas projects; 81 projects were categorized as inactive, up from 62 inactive projects in October 2022.

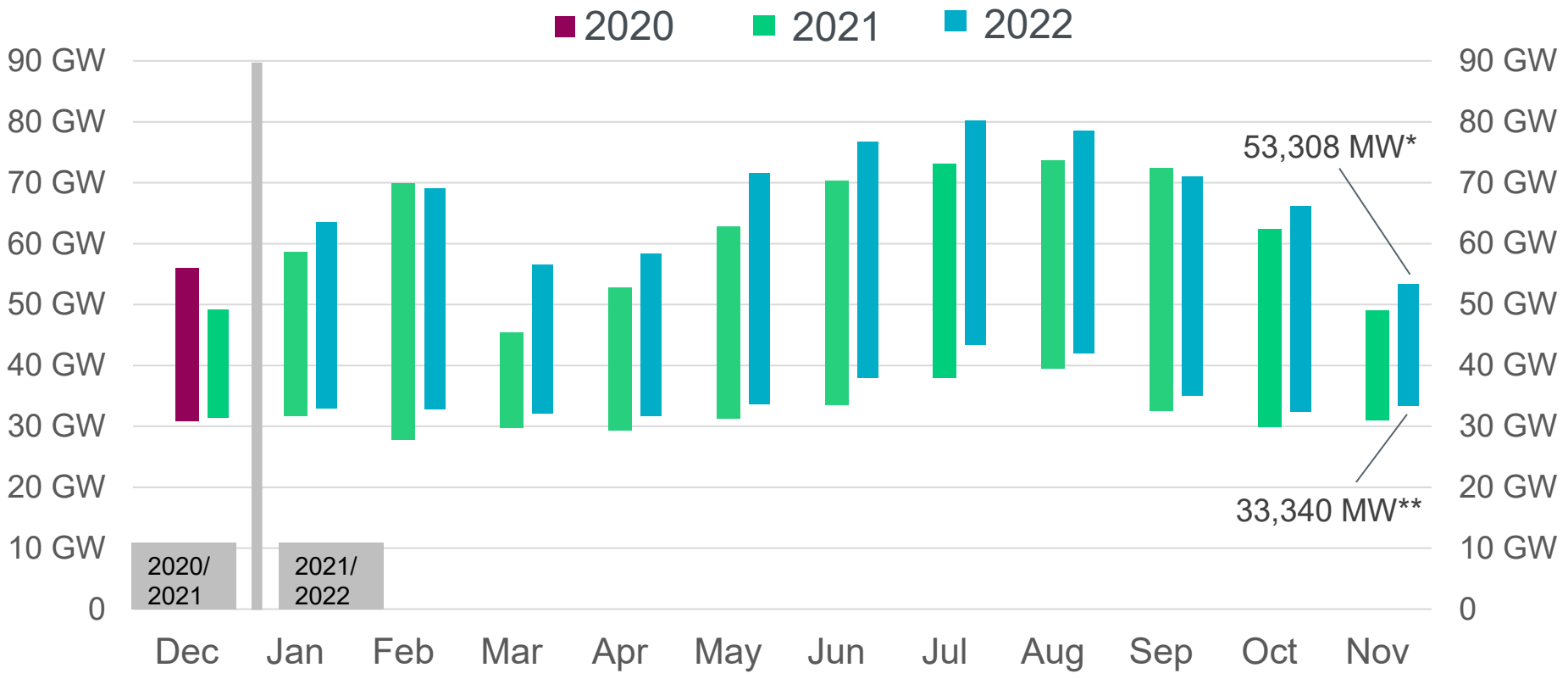
- ERCOT is currently reviewing proposed transmission improvements with a total estimated cost of $347.95 million as of November 30, 2022.

- Transmission Projects endorsed in 2022 total $2.957 billion as of November 30, 2022.

- All projects (in engineering, routing, licensing and construction) total approximately $11.093 billion as of October 1, 2022.

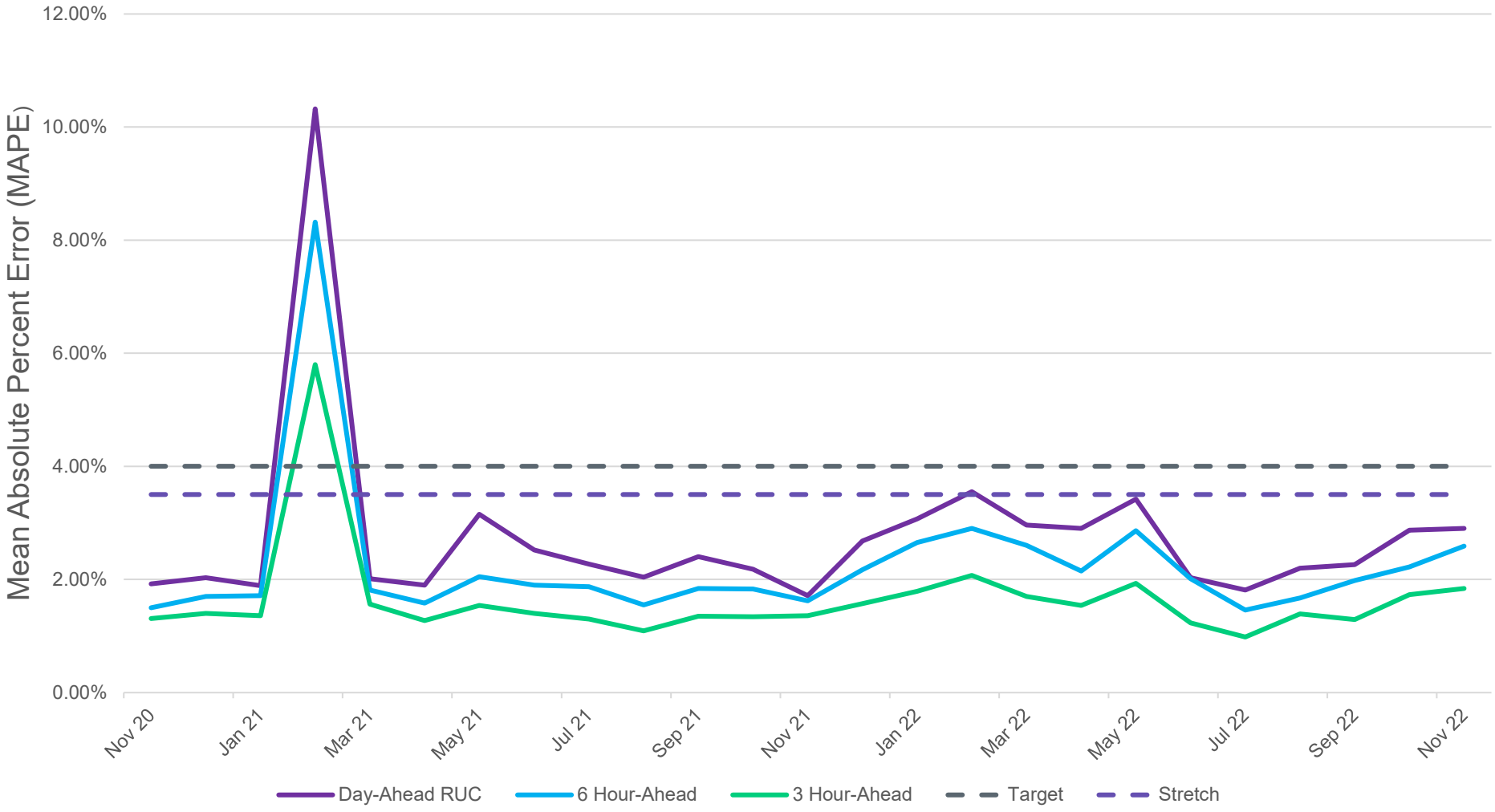
- Transmission Projects energized in 2022 total about $1.198 billion as of October 1, 2022.

ERCOT's maximum peak demand for the month of November was 53,308 MW*. This is 4,325 MW more than the November 2021 demand of 48,983 MW.



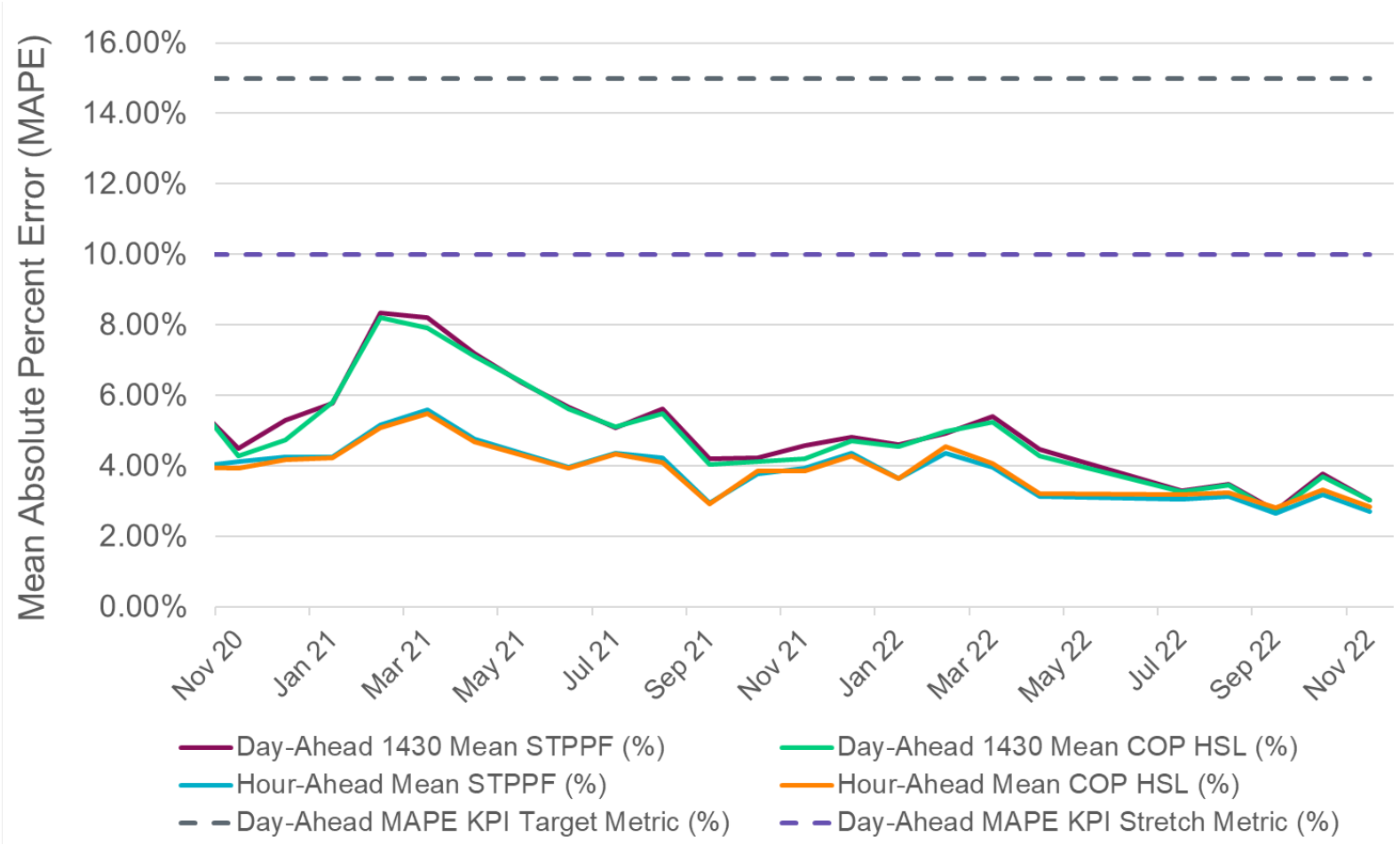
*Based on the maximum net system hourly value from December release of Demand and Energy 2022 report.
**Based on the minimum net system 15-minute interval value from December release of Demand and Energy 2022 report.
Data for latest two months are based on preliminary settlements.

Mid-Term Load Forecast Performance



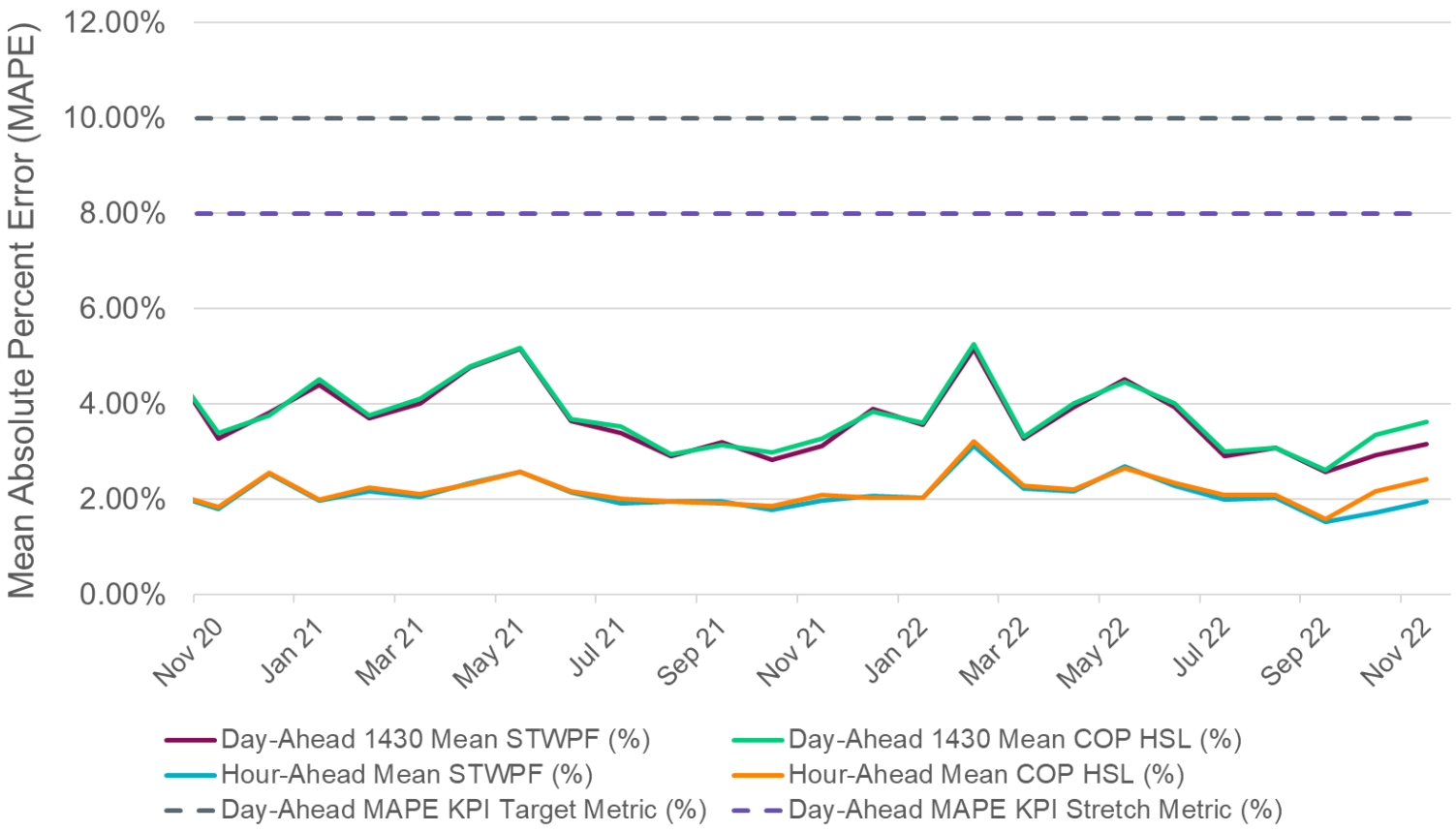
The Mid-Term Load Forecast is an hourly forecast that looks 7 days into the future

Solar Forecast Performance



The Short-Term Photovoltaic Power Forecast (STPPF) is an ERCOT-produced hourly 50% probability of exceedance forecast of the generation in MWh per hour from each PVGR.

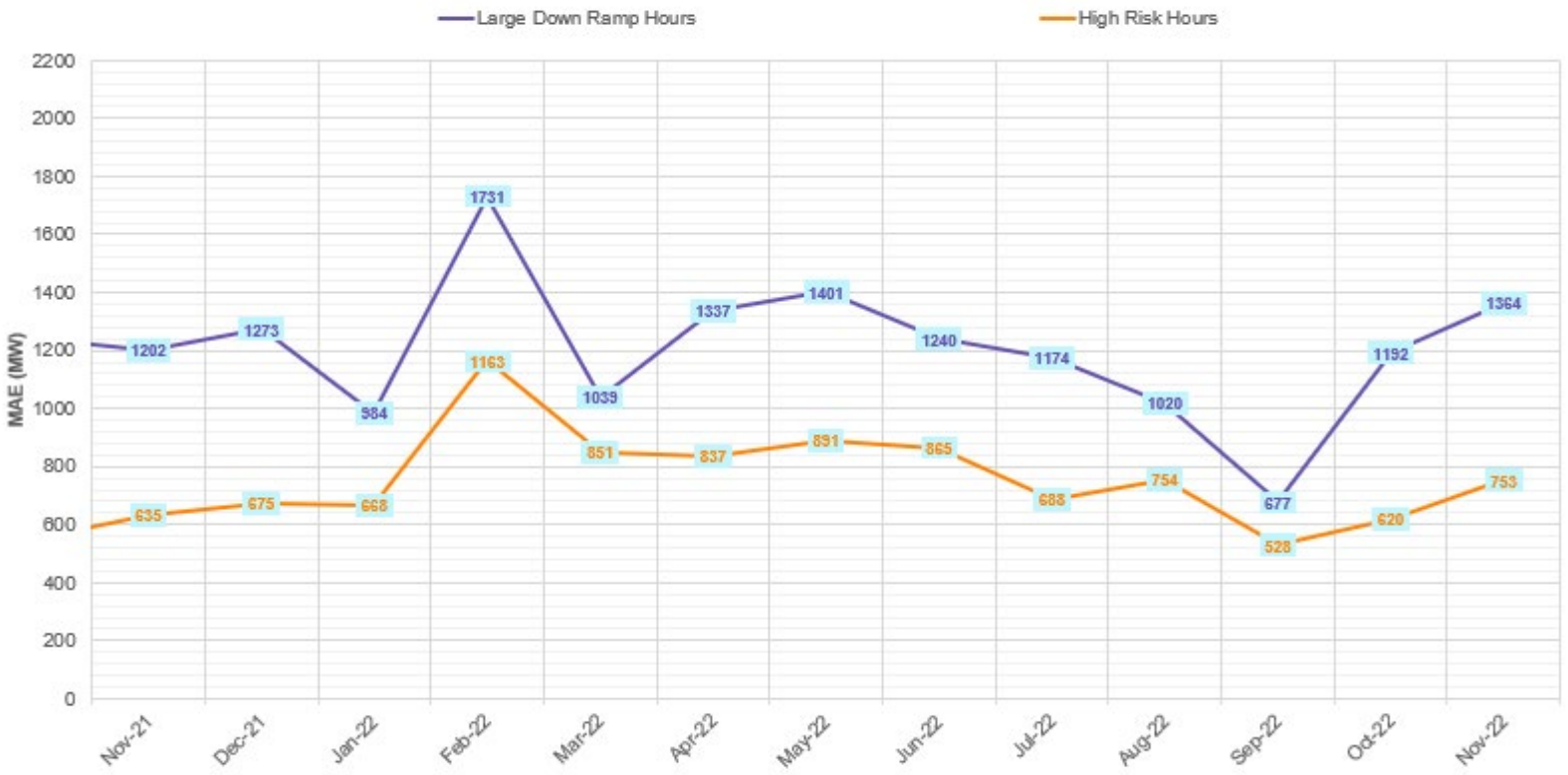
Wind Forecast Performance



The Short-Term Wind Power Forecast (STWPF) is an ERCOT produced hourly 50% probability of exceedance forecast of the generation in MWh per hour from each Wind Generation Resource.

Hour-Ahead Wind Forecast Performance

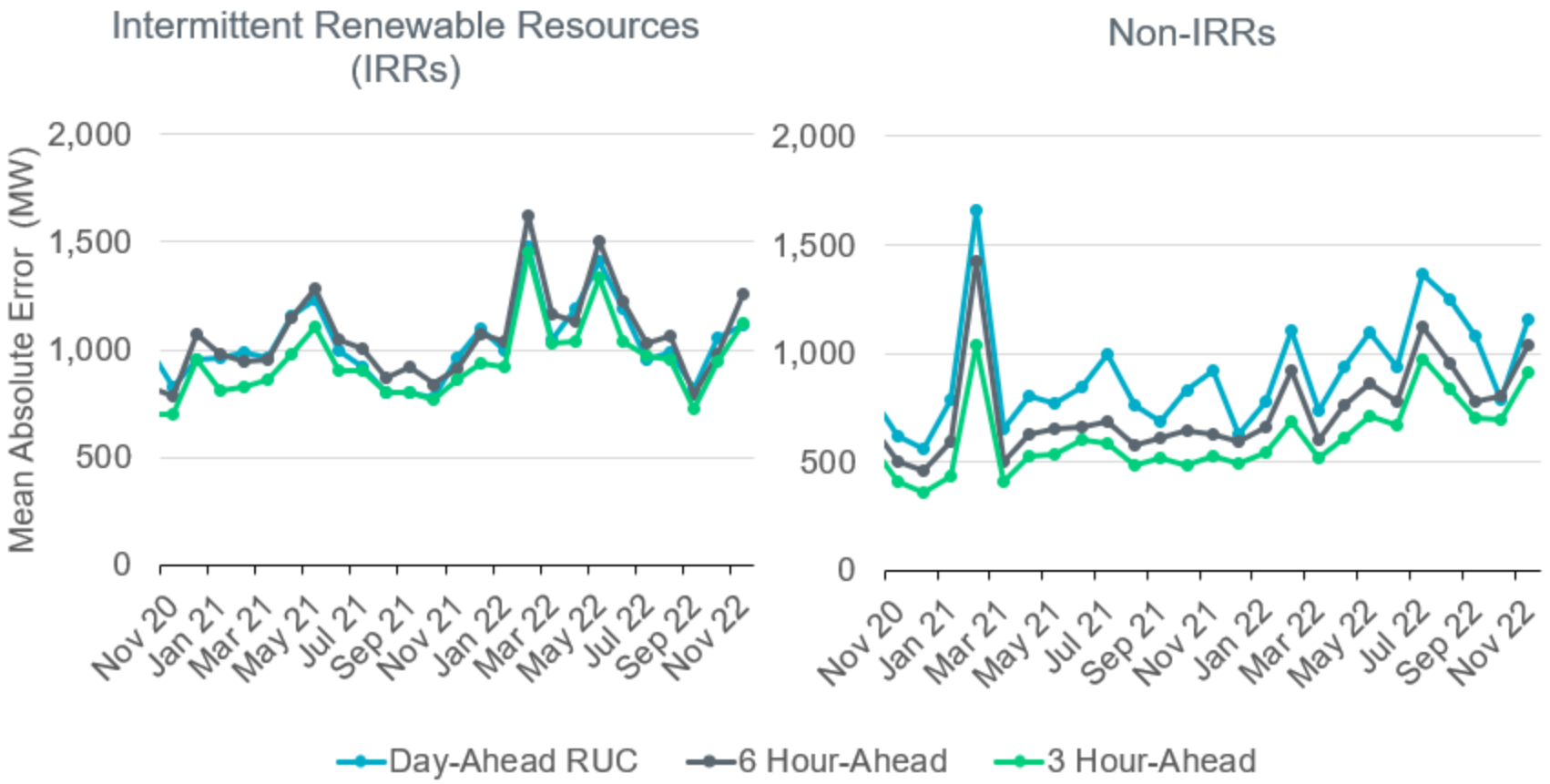
Hour-Ahead Mean Absolute Error (MAE) During Large Down Ramp (> 2000 MW) and High Risk Hours*



**ERCOT's performance-based payment structure for Wind Forecasts with both vendors incentivizes improvements in forecast performance during hours that are of more importance to operational reliability. This approach is a paradigm shift from the "traditional" methodology of measuring wind forecast performance as a singular monthly average metric.*

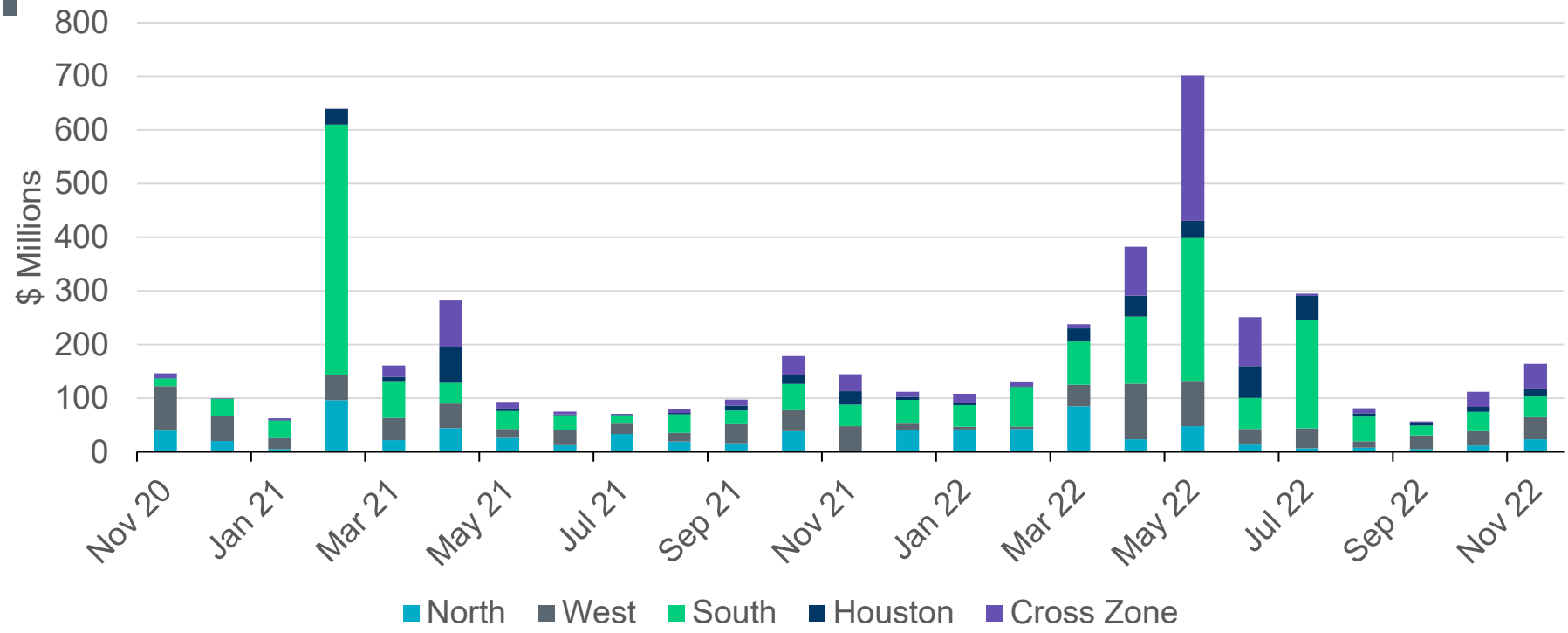
Forecast performance during large down ramp (wind ramp > 2000 MW) hours and high risk hours (historic risk of load ramping up and wind ramping down is high) is focused upon. Note that for the purposes of forecast performance measurement every hour in a month is classified as either a large down ramp hour or a high risk hour or something else. Any hour that is a high risk hour wherein a large down ramp was experienced will be tracked as a large down ramp hour.

Current Operating Plan (COP) Performance



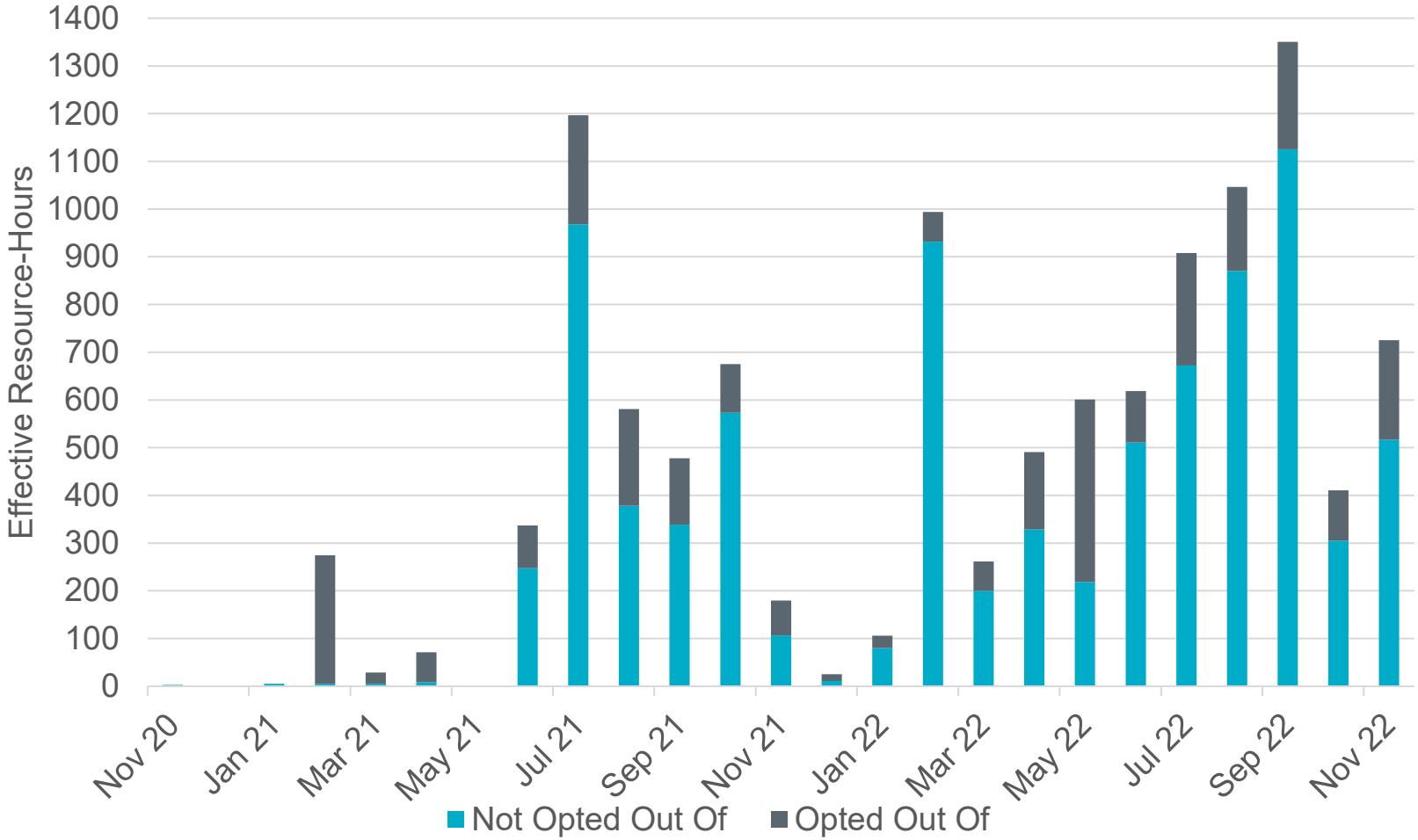
- COPs for IRRs are derived from wind and solar forecasts from ERCOT with any adjustments from Qualified Scheduling Entities.
- The installed capacity of approved Wind Units is 35,914 MW (as of November 30, 2022).
- The installed capacity of approved Solar Units is 13,711 MW (as of November 30, 2022).

Real-Time Congestion Rent by Zone



- Congestion rent increased in all zones in November 2022 compared to October 2022.
- The two zones with the highest congestion rent were the Cross and West Zones.
  - Congestion rent in the Cross Zone was primarily driven by the West Texas Export Generic Transmission Constraint.
  - Congestion rent in the West Zone was primarily driven by the Panhandle Export Generic Transmission Constraint.
- 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.

Thirty-eight Resources were Committed in November either for Capacity, Congestion, or Minimum Run Time



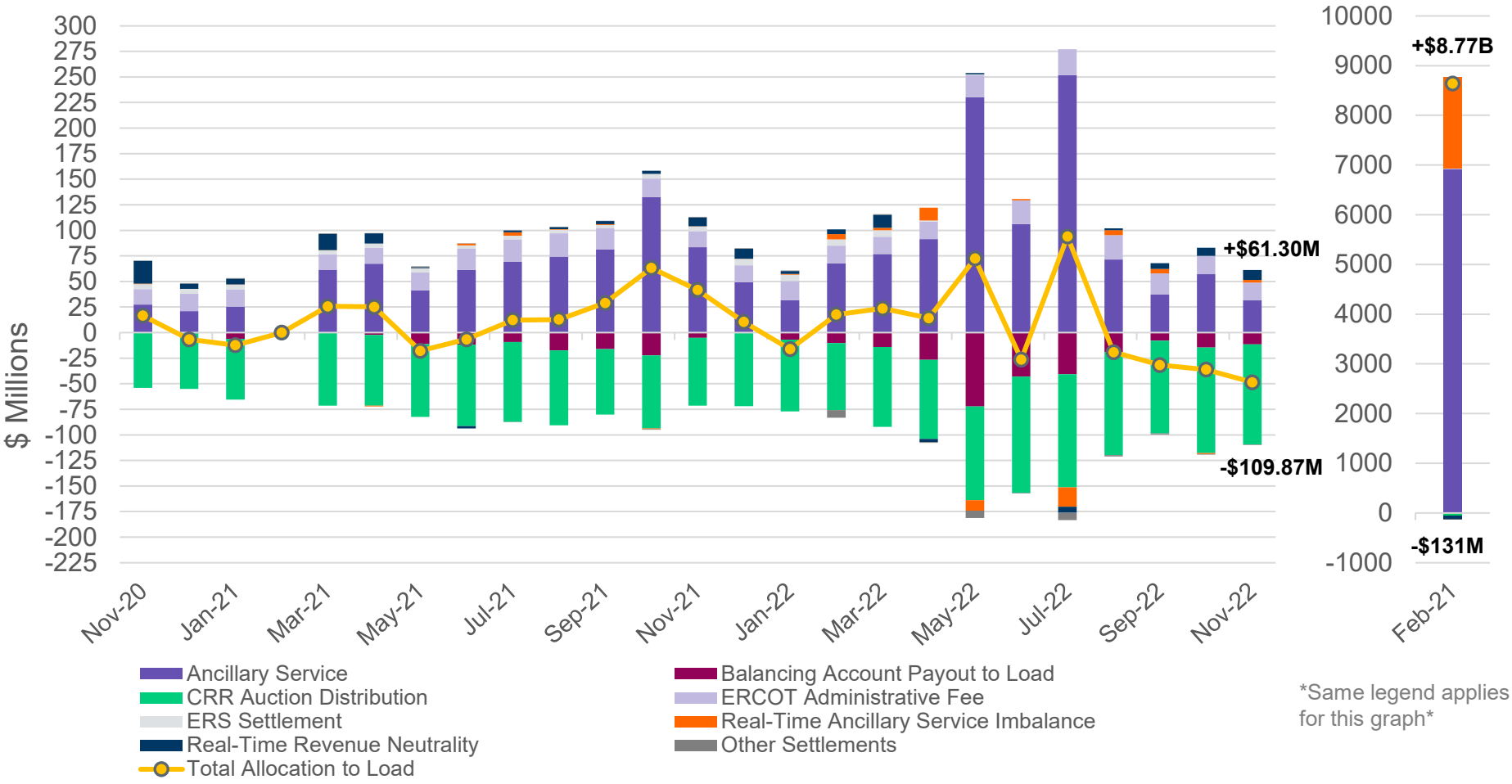
"Effective Resource-Hours" excludes any period during a Reliability Unit Commitment hour when the RUC-committed Resource was starting up, shutting down, off-line, or otherwise not available for dispatch by SCED.

Thirty-eight Resources were Committed in November either for Capacity, Congestion, or Minimum Run Time

Resource #	Effective Resource-hours	Non Opt Out (Effective Hours)	Opt Out (Effective Hours)
1	30.0	19.0	11.0
2	59.0	41.0	18.0
3	5.2	5.2	0.0
4	16.0	0.0	16.0
5	9.8	0.0	9.8
6	17.0	7.0	10.0
7	5.9	5.9	0.0
8	5.0	5.0	0.0
9	22.0	22.0	0.0
10	43.6	43.6	0.0
11	5.7	5.7	0.0
12	5.7	5.7	0.0
13	24.0	24.0	0.0
14	5.9	5.9	0.0
15	2.0	2.0	0.0
16	3.9	3.9	0.0
17	36.8	21.9	14.9
18	34.7	14.7	20.0
19	12.0	6.0	6.0

Resource #	Effective Resource-hours	Non Opt Out (Effective Hours)	Opt Out (Effective Hours)
20	7.8	7.8	0.0
21	25.7	25.7	0.0
22	17.7	17.7	0.0
23	30.7	30.7	0.0
24	11.0	0.0	11.0
25	12.0	12.0	0.0
26	1.0	0.0	1.0
27	1.0	0.0	1.0
28	18.0	14.0	4.0
29	37.7	17.2	20.6
30	75.5	55.5	20.0
31	8.9	0.0	8.9
32	9.5	0.0	9.5
33	3.6	3.6	0.0
34	3.0	3.0	0.0
35	28.3	28.3	0.0
36	29.7	24.7	5.0
37	35.8	25.8	10.1
38	23.9	11.9	12.0
Total	**725.5**	**516.7**	**208.8**

Net Allocation to Load in November 2022 was ($48.57) Million

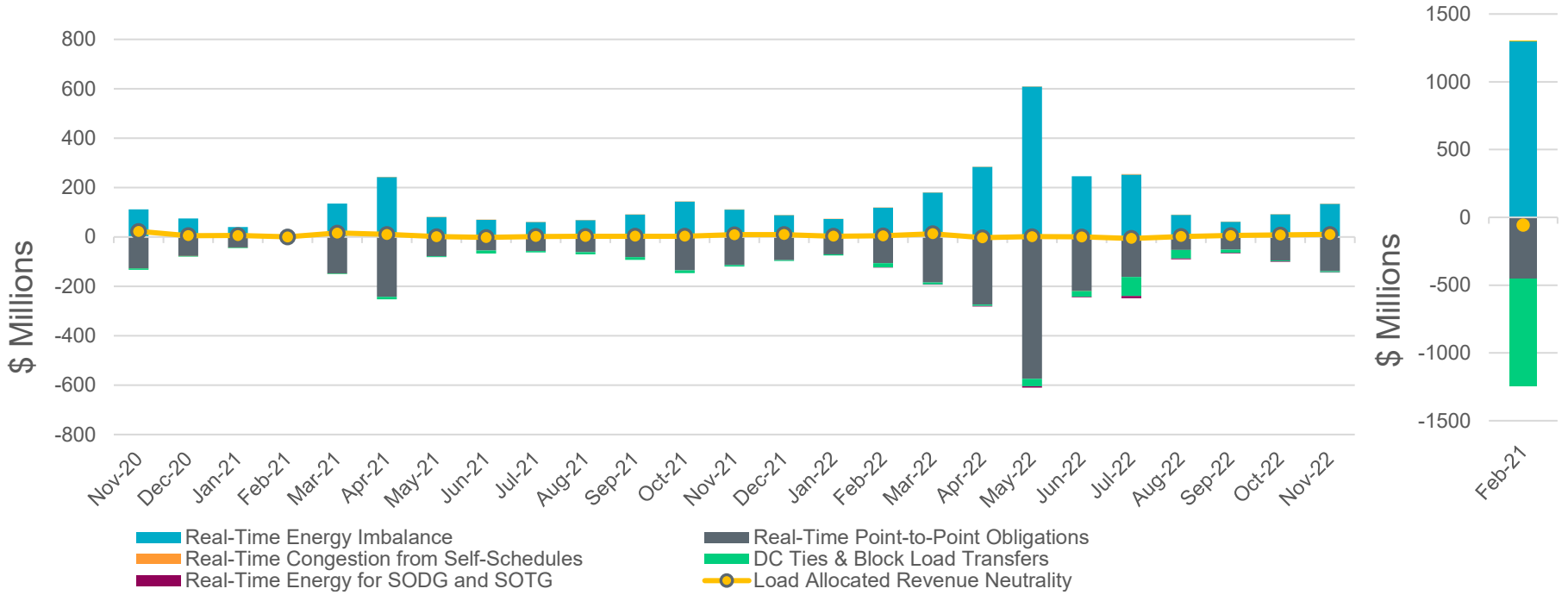


Same legend applies for this graph

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

Note: For visual purposes, February 2021 has been separated into its own graph with different scaling. The legend applies for both graphs.

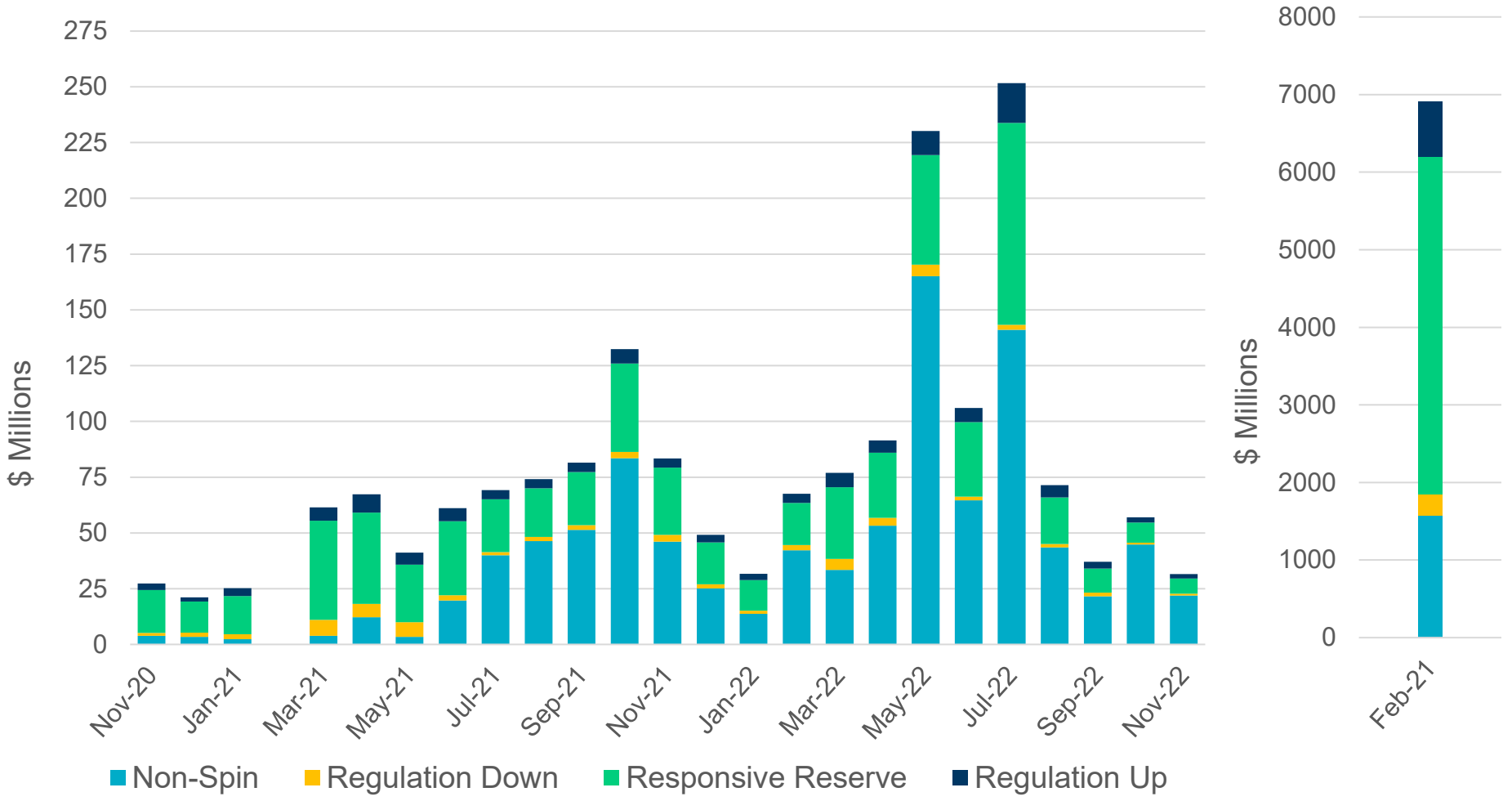
Real-Time Revenue Neutrality Allocated to Load was $9.93M for November 2022



	November 2022 ($M)
Real-Time Energy Imbalance	$133.60
Real-Time Point-to-Point Obligation	($138.66)
Real-Time Congestion from Self-Schedules	$0.34
DC Tie & Block Load Transfer	($4.35)
Real-Time Energy for SODG and SOTG	($0.86)
Load Allocated Revenue Neutrality	**$9.93**

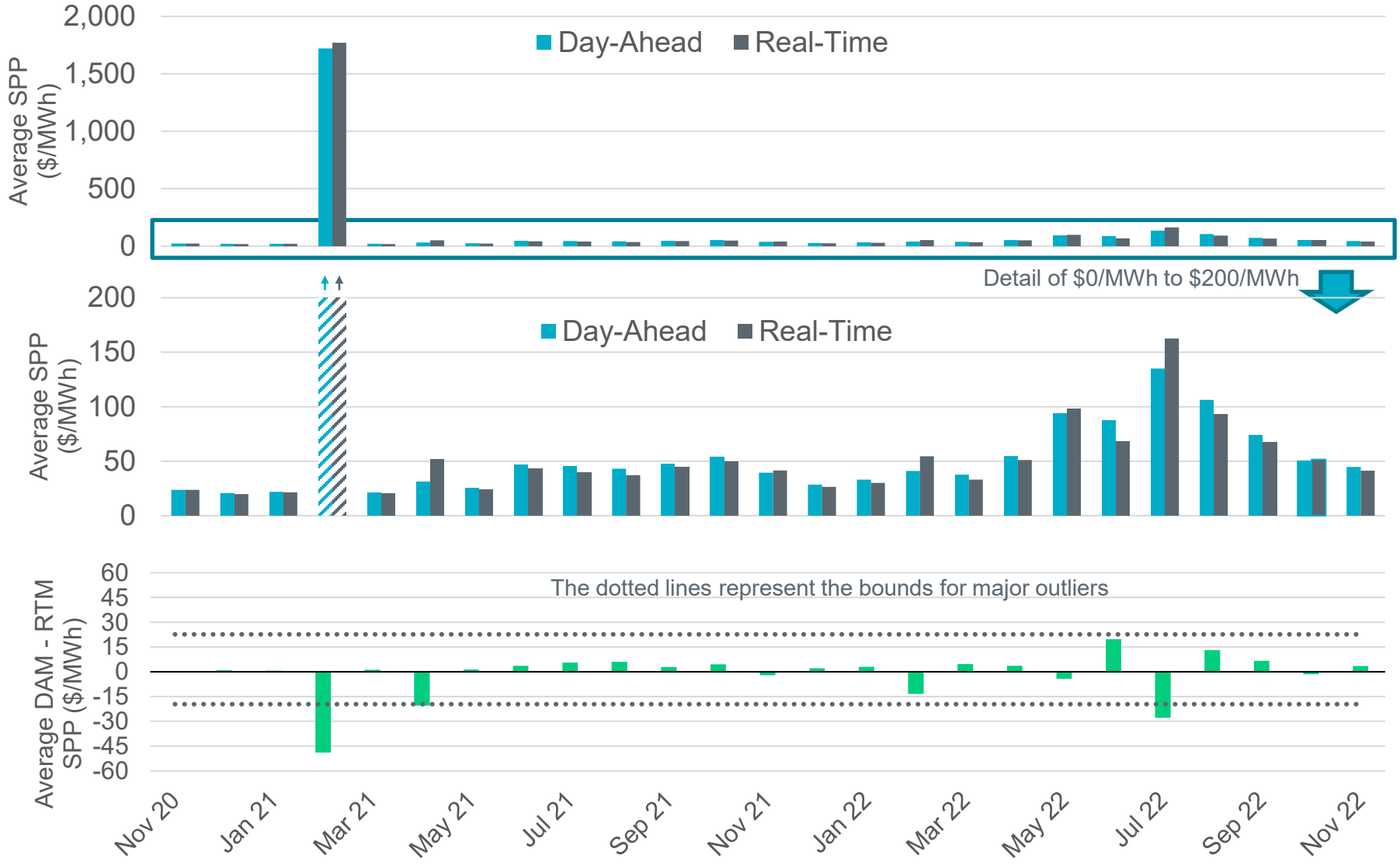
Note: For visual purposes, February 2021 has been separated into its own graph with different scaling. The legend applies for both graphs.

Ancillary Services for November 2022 totaled $31.62M



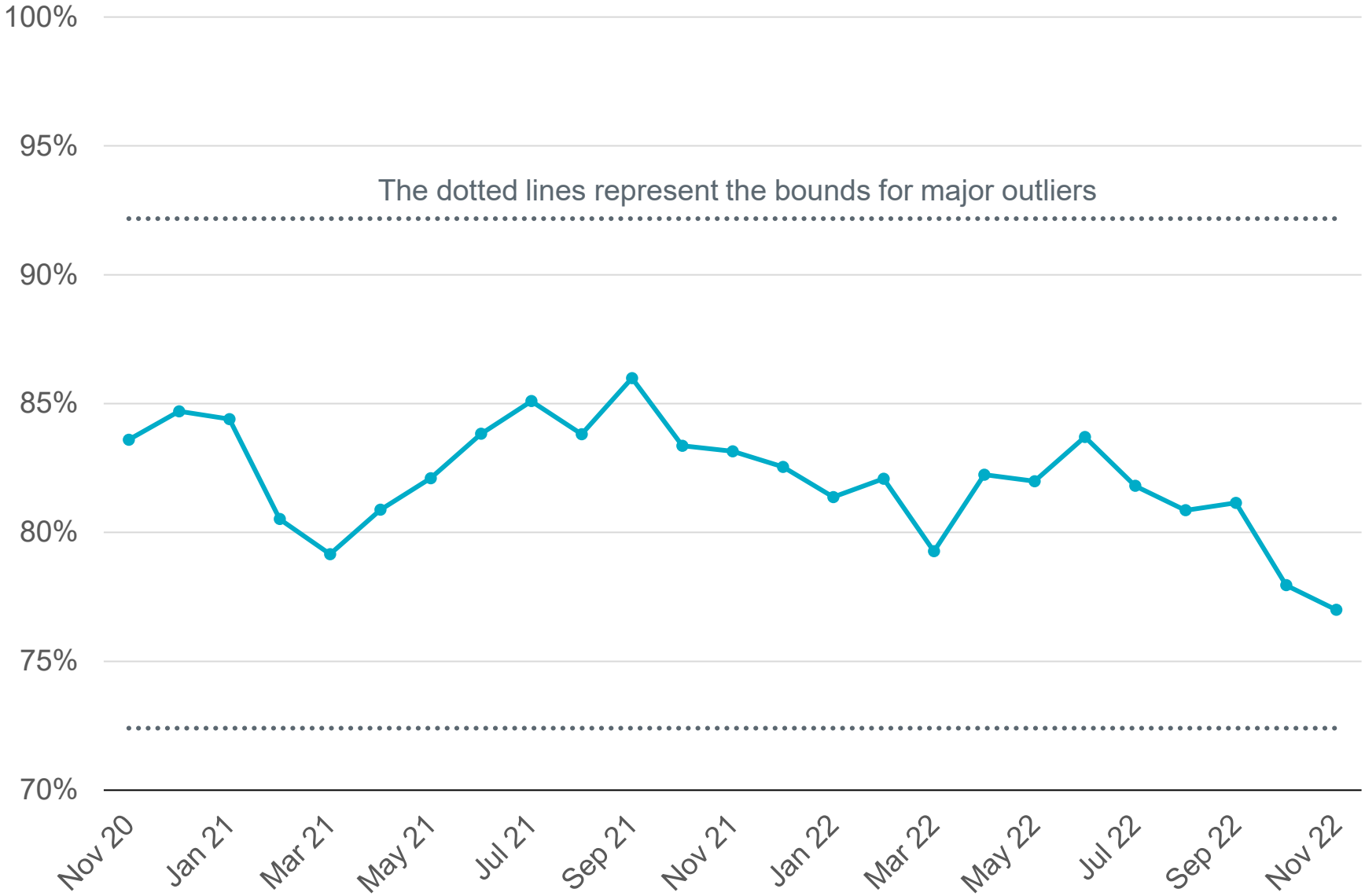
Note: For visual purposes, February 2021 has been separated into its own graph with different scaling. The legend applies for both graphs.

Day-Ahead and Real-Time Market Price Differences

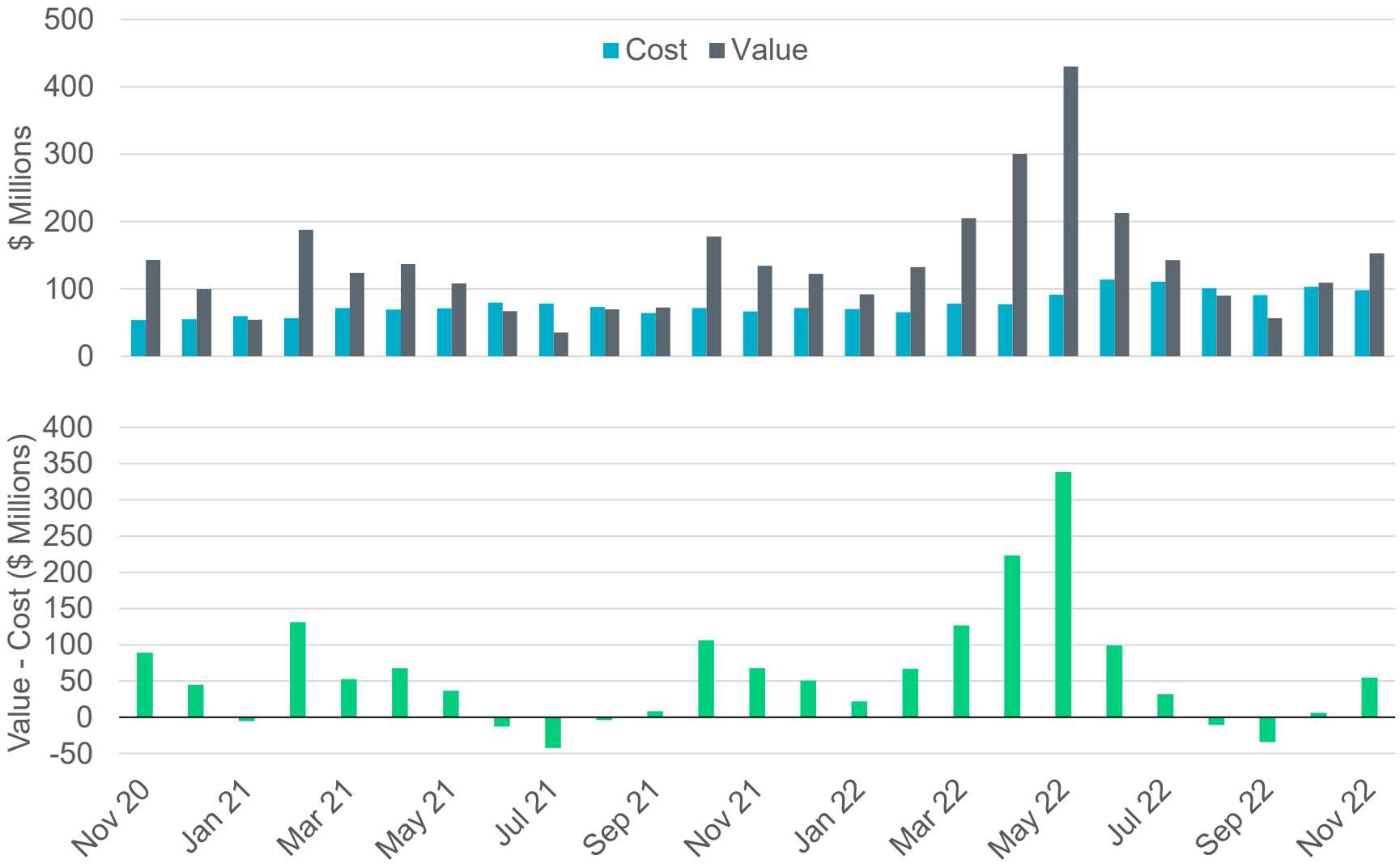


*Averages are weighted by Real-Time Market Load

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



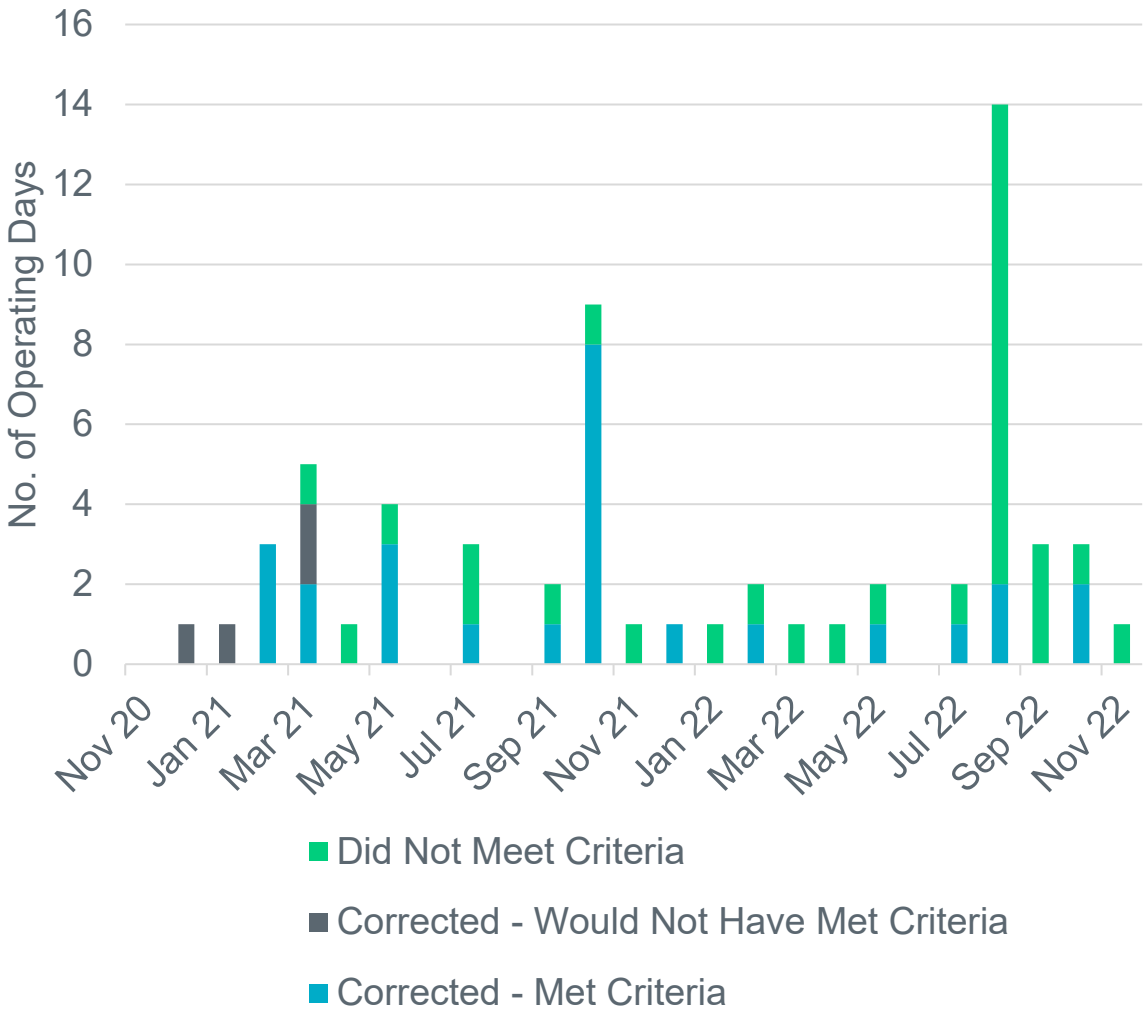
CRR Value and Cost Differences



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.

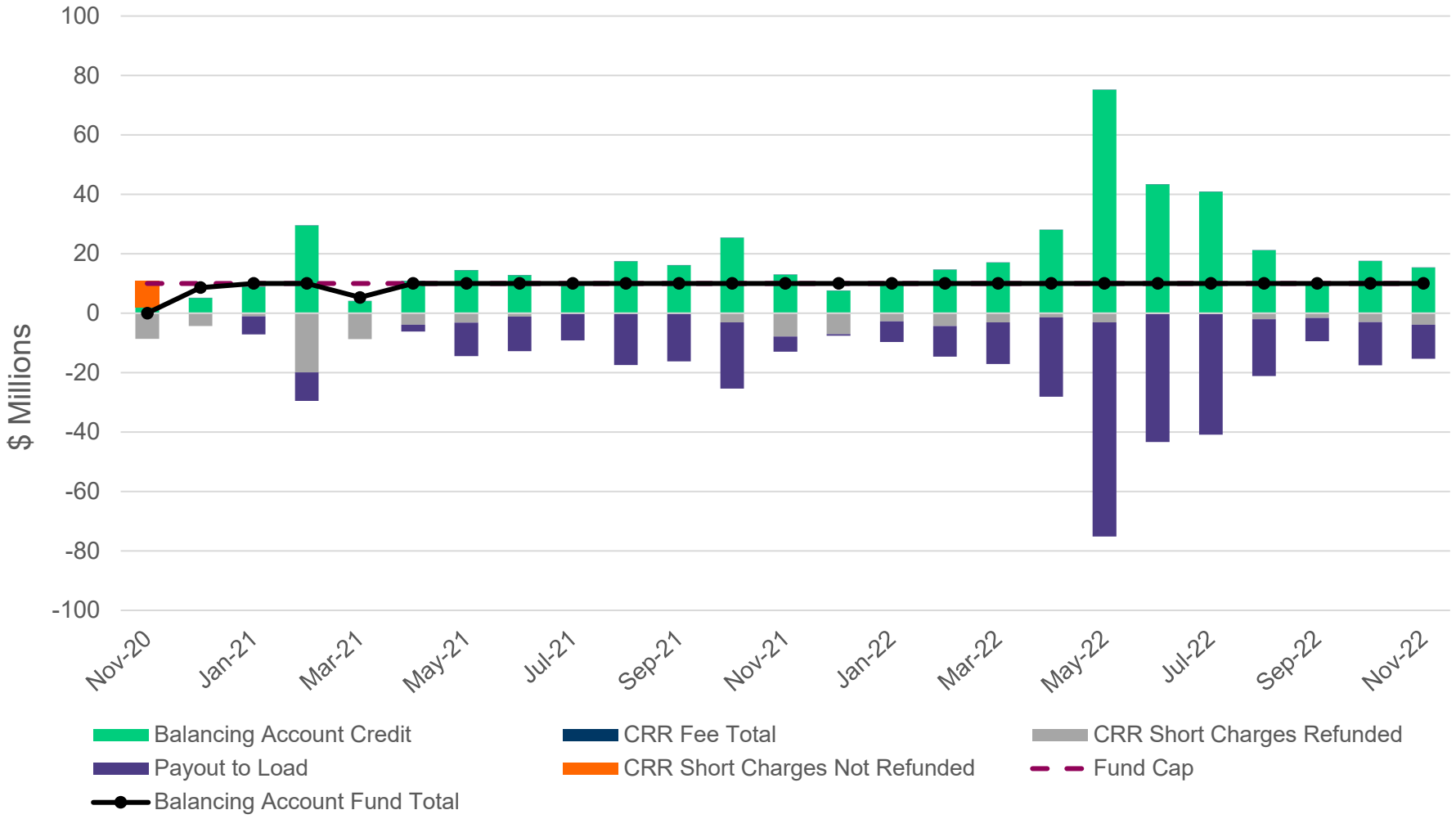


Price Issue for Operating Day November 7, 2022

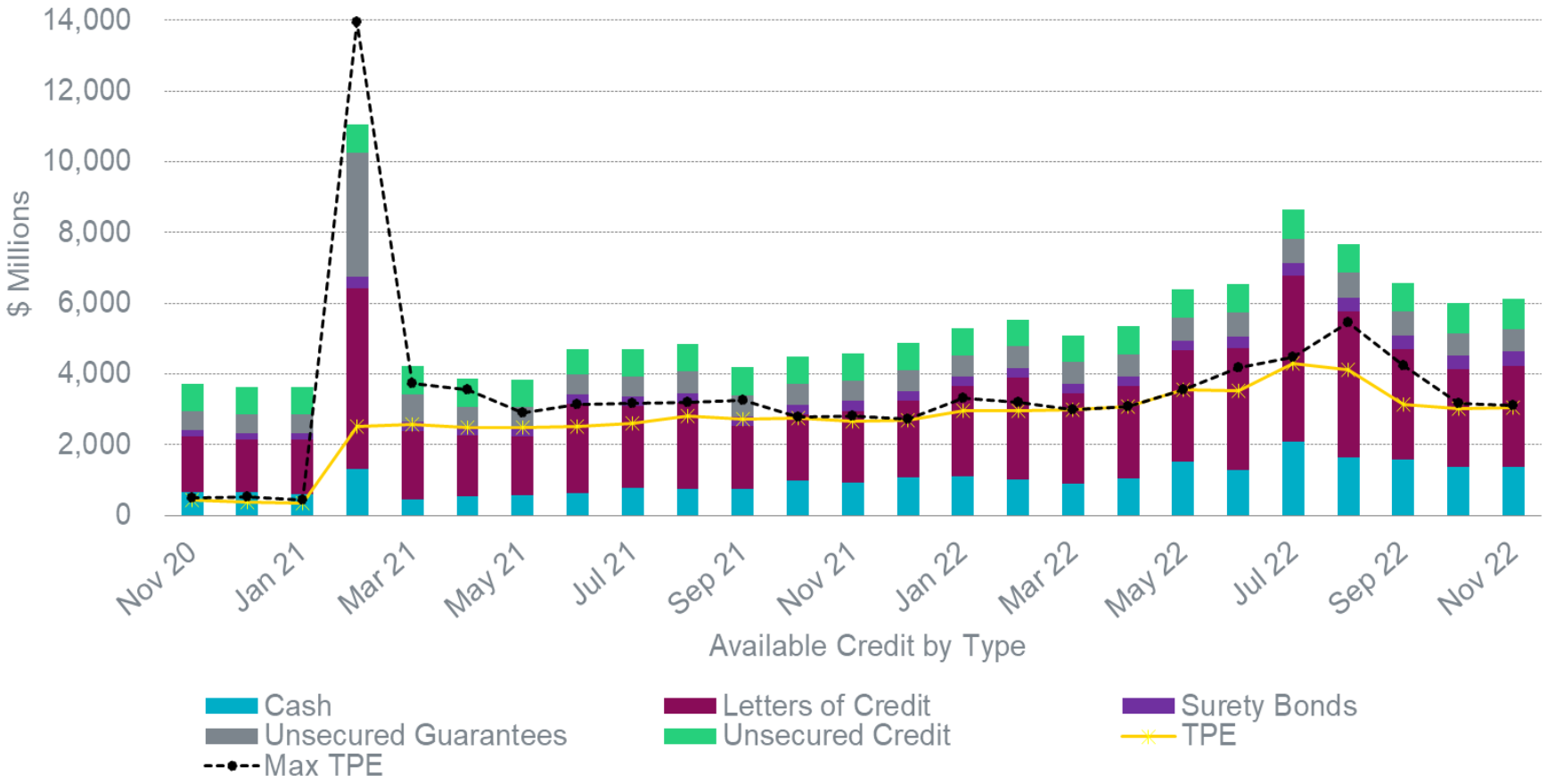
- On Operating Day November 7, 2022, during a planned site failover, there was a small transition period during which Real-Time meter prices and Resource instructions were not aligned.
  - This is common during routine maintenance activity and the pricing impact is evaluated in each instance to determine the need for a price correction.
- ERCOT completed its impact analysis of this period before 4pm of the second business day and determined that it did not meet the requirements for a price correction, in accordance with ERCOT Protocol Section 6.3(5).

Operating Day	Meter Prices Impacted	Estimated Total Dollar Impact
11/7/2022	213	$10.51

The CRR Balancing Account was fully-funded and excess amounts were allocated to Load



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



*Numbers are as of month end except for Max TPE

Retail Transaction Volumes – Summary – November 2022

	Year-To-Date		Transactions Received	
Transaction Type	November 2022	November 2021	November 2022	November 2021
Switches	1,111,972	1,471,548	70,446	356,986
Acquisitions	0	48,862	0	0
Move - Ins	2,865,233	2,569,802	231,597	215,282
Move - Outs	1,285,822	1,184,311	100,741	96,981
Continuous Service Agreements (CSA)	642,366	631,530	28,034	42,985
Mass Transitions	24,463	26,584	0	0
Total	5,929,856	5,932,637	430,818	712,234
				*High switch count - Approved MP initiated Acquisitions