ERCOT Monthly Operational Overview
(November 2021)

ERCOT Public
December 17, 2021

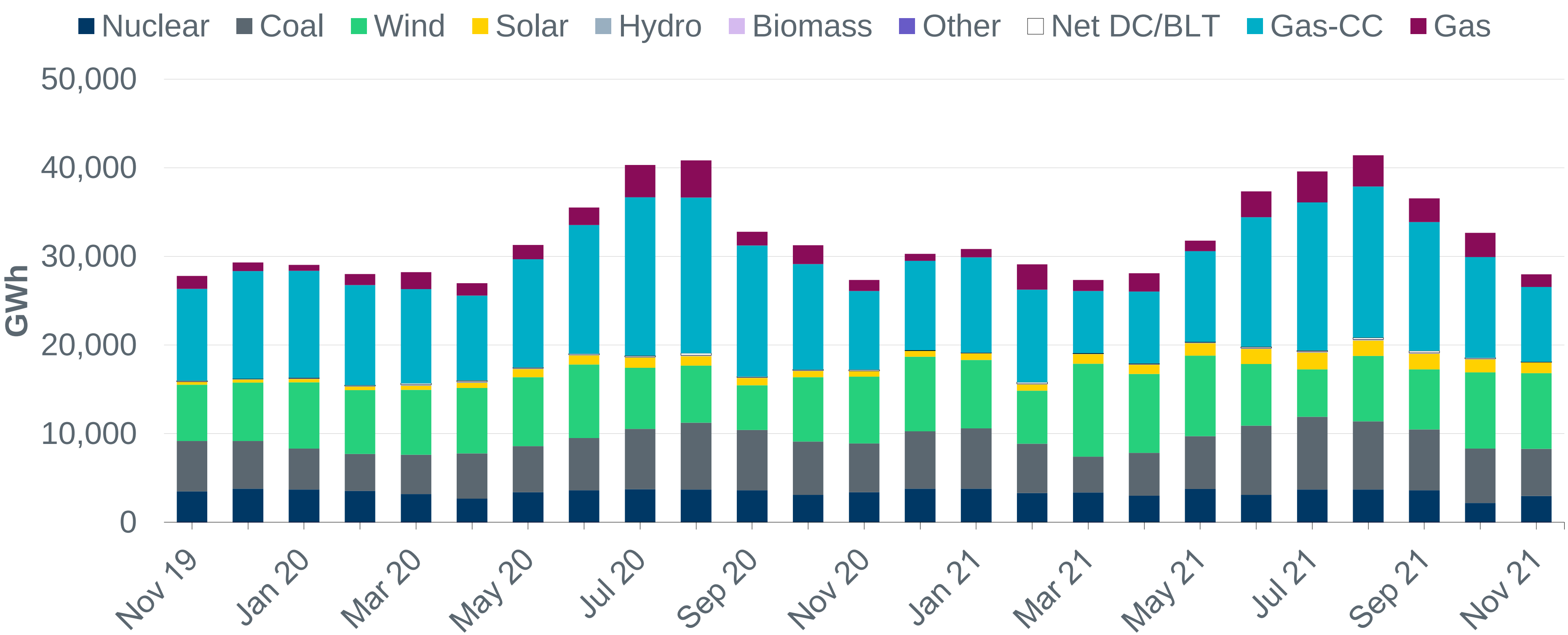
Notifications and Records

- ERCOT set a maximum peak demand of 48,966 MW* for the month of November, which is 54 MW less than the November 2020 demand of 49,020 MW.

- ERCOT issued 7 notifications:
  - 2 DC Tie Curtailment Notices for DC_L (Laredo VFT) DC Tie due to a planned or unplanned outage.
  - 1 Advisory for delay in clearing DAM and posting of DAM Solution.
  - 1 Advisory for Geomagnetic Disturbance (GMD) alert of magnitude k-7.
  - 1 OCN for ERCOT taking manual actions using Panhandle Generic Transmission Constraint to pre-posture for Panhandle area outage.
  - 1 OCN due to ERCOT modifying the Panhandle Generic Transmission Constraint due to the current transmission outage topology.
  - 1 Transmission emergency notice for the TNMP area due to forced outage in Texas City area.

* Preliminary value from December release of Demand and Energy 2021 report.

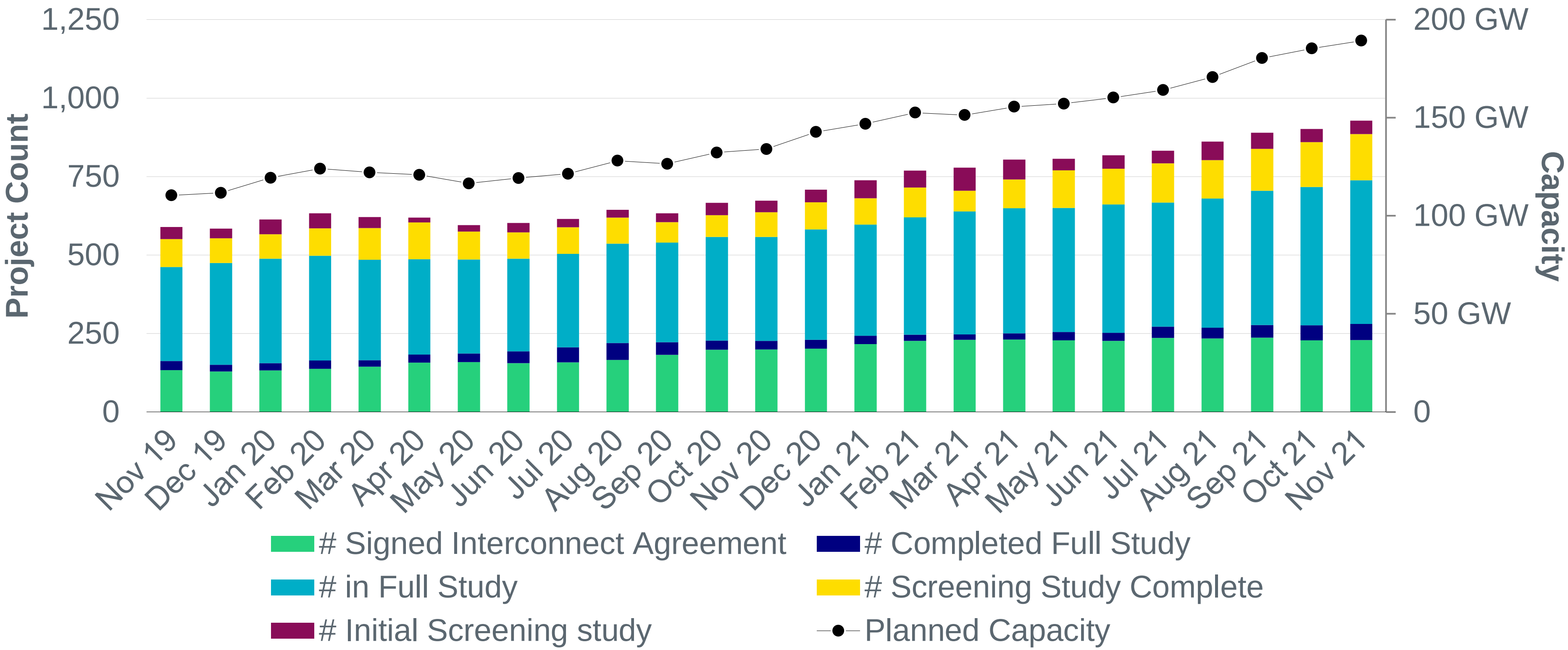
Monthly energy generation increased by 2.4% year-over-year to 27,985 GWh in November 2021, compared to 27,335 GWh in November 2020



Data for latest two months are based on preliminary settlements.

Generation Interconnection activity by project phase

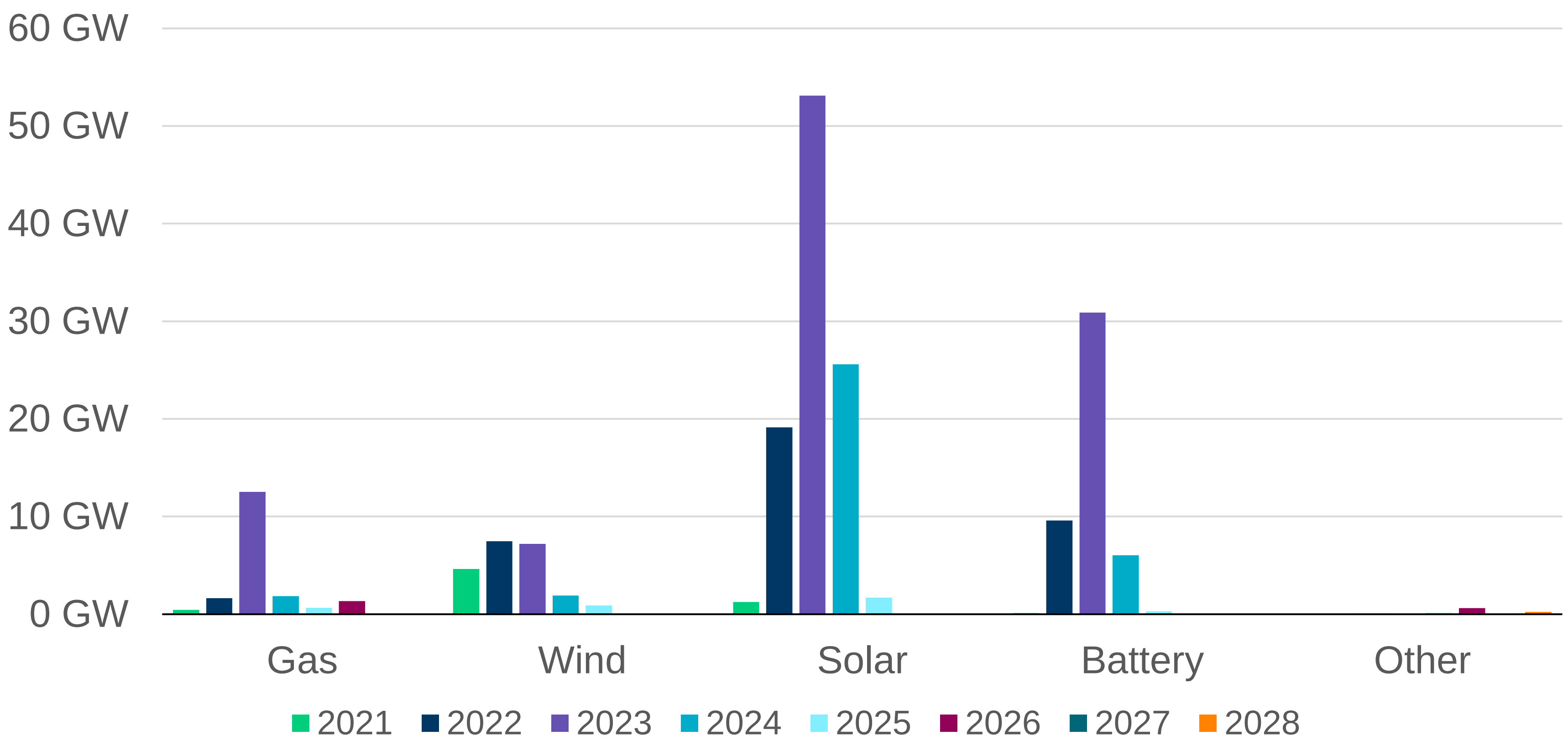
(Excludes capacity associated with Projects designated as Inactive per Planning Guide Section 5.7.6)



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 101 GW (53.2%), Wind 22 GW (11.7%), Gas 18 GW (9.7%), Battery 47 GW (24.8%)
(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

Planning Summary

- ERCOT was tracking 928 active generation interconnection requests totaling 189,306 MW as of November 30. This includes 100,784 MW of solar, 22,091 MW of wind, 46,946 MW of battery, and 18,450 MW of gas projects; 60 projects were categorized as inactive, up from 59 inactive projects in October.

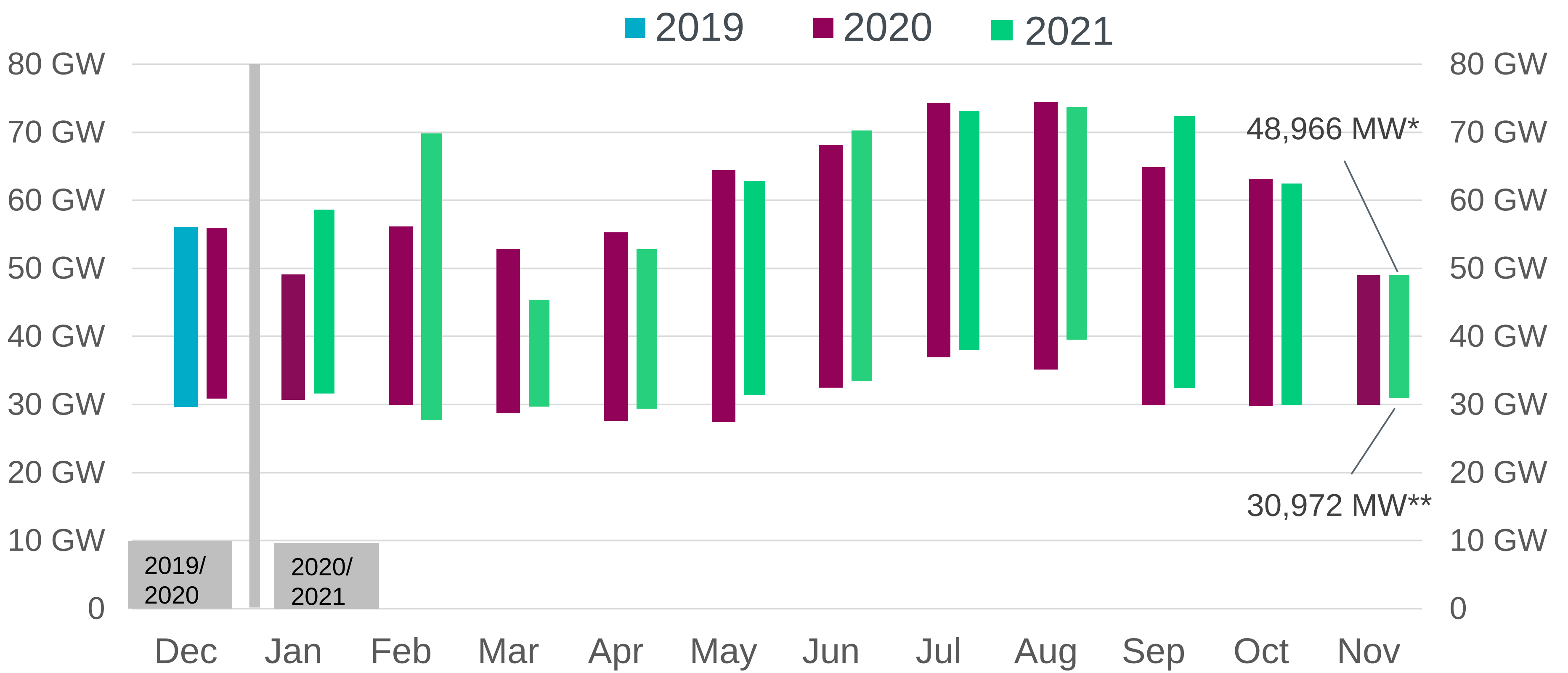
- ERCOT is currently reviewing proposed transmission improvements with a total estimated cost of $1,543.31 Million as of November 30, 2021.

- Transmission Projects endorsed in 2021 total $1,014.4 Million as of November 30, 2021.

- All projects (in engineering, routing, licensing and construction) total approximately $8.00 Billion as of October 1, 2021.

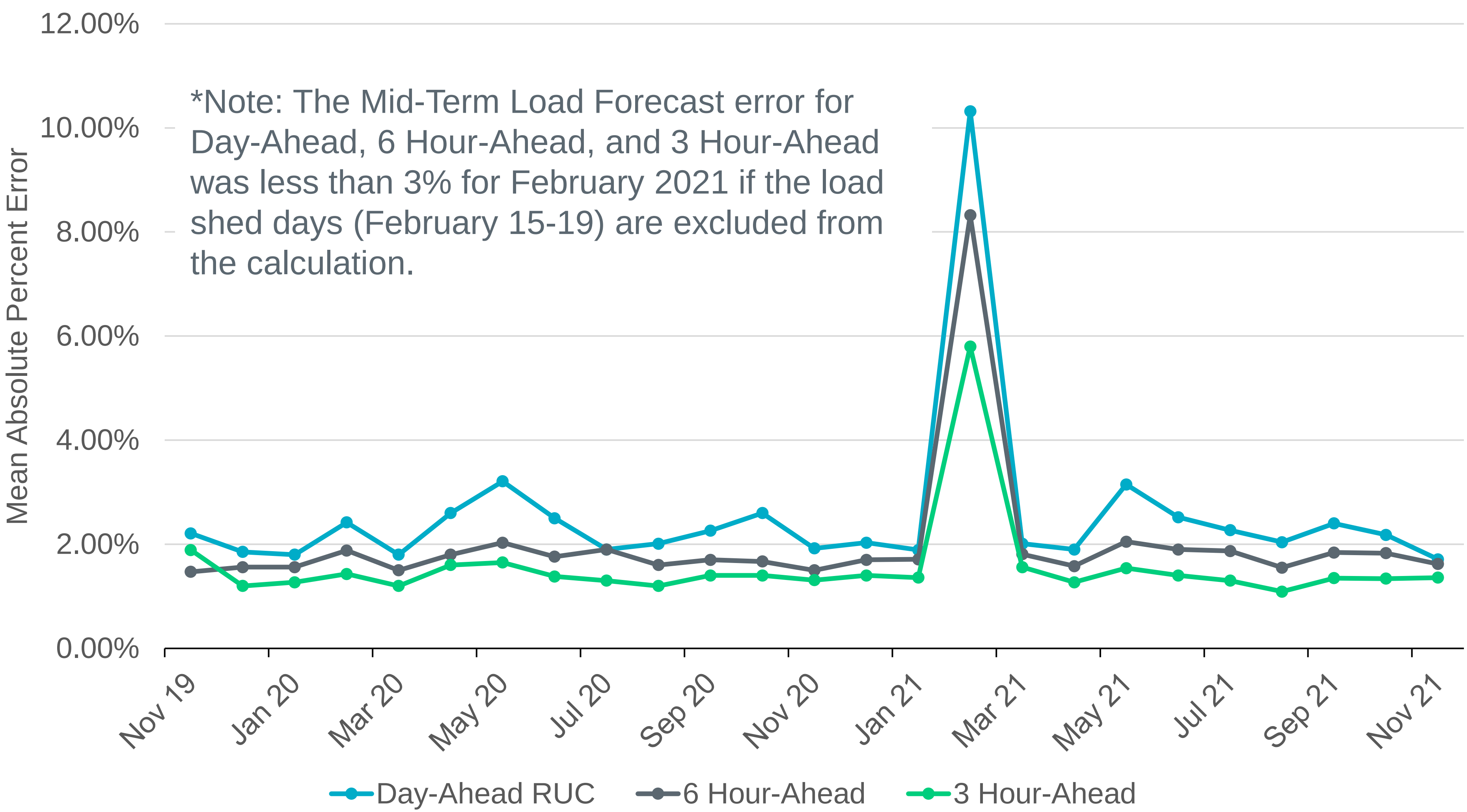
- Transmission Projects energized in 2021 total about $1.438 Billion as of October 1, 2021.

ERCOT set a maximum peak demand of 48,966 MW* for the month of November, which is 54 MW less than the November 2020 demand of 49,020 MW.



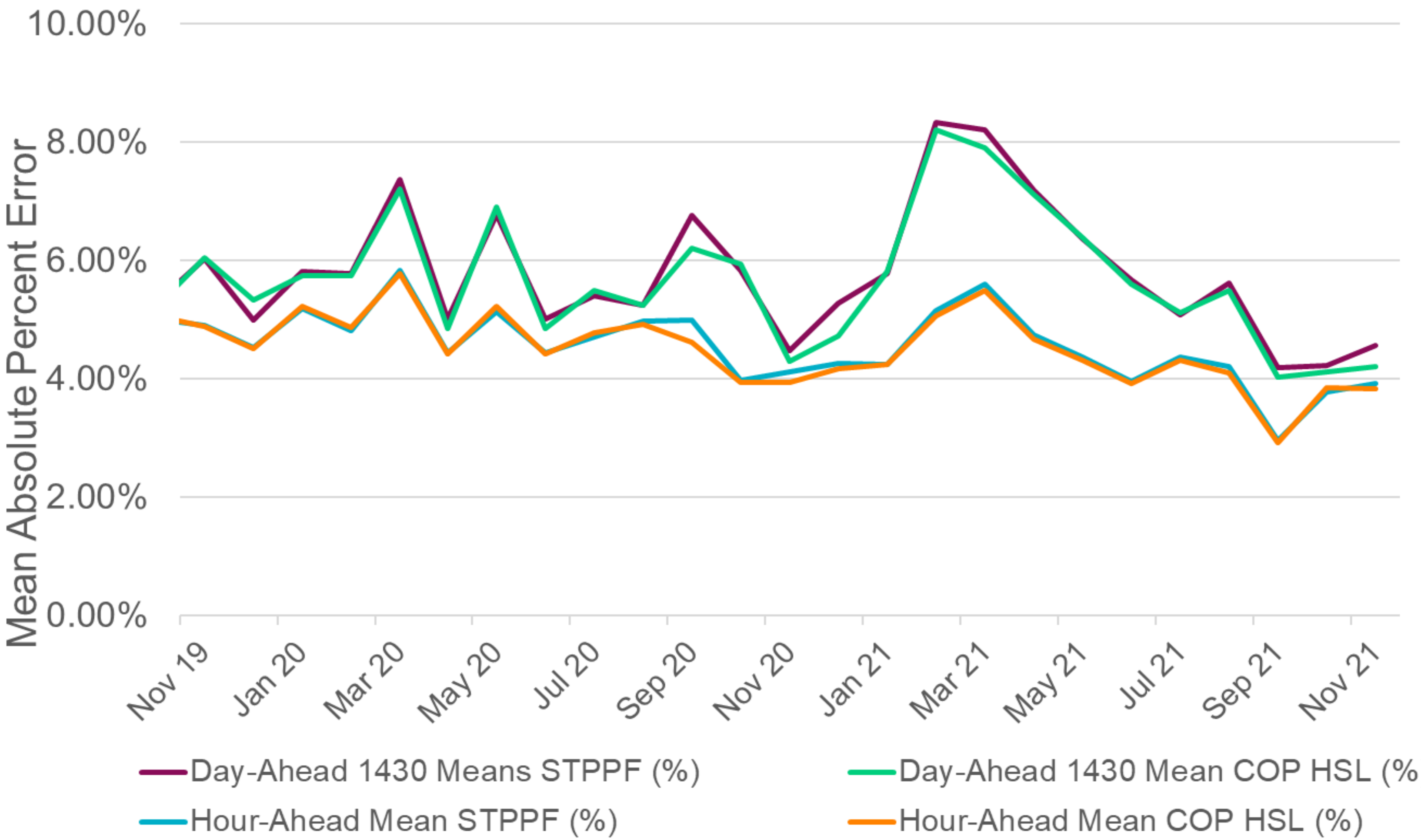
*Based on the maximum net system hourly value from December release of Demand and Energy 2021 report.
**Based on the minimum net system 15-minute interval value from December release of Demand and Energy 2021 report.
Data for latest two months are based on preliminary settlements.

Mid-Term Load Forecast Performance



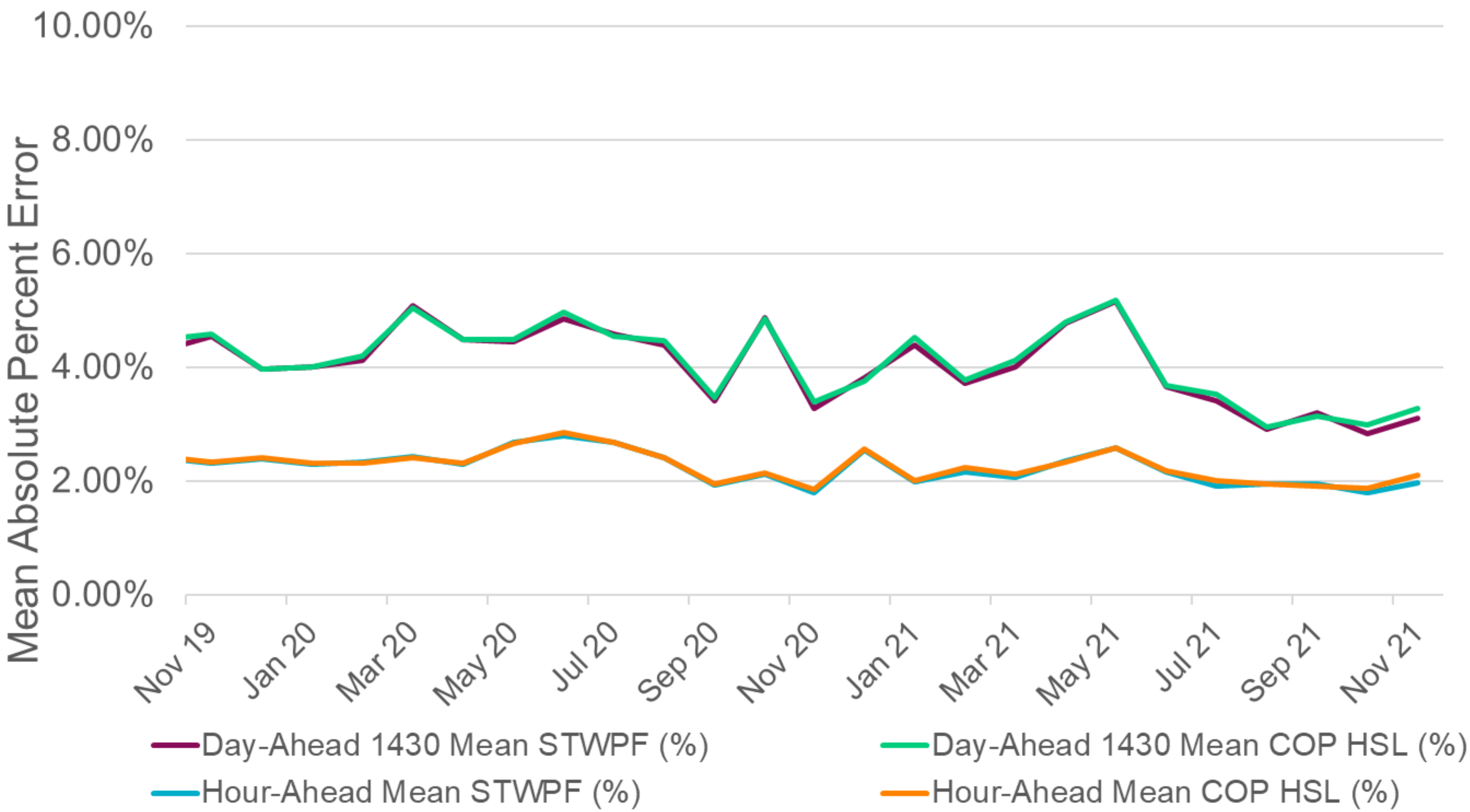
The Mid-Term Load Forecast is an hourly forecast that looks 7 days into the future

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.

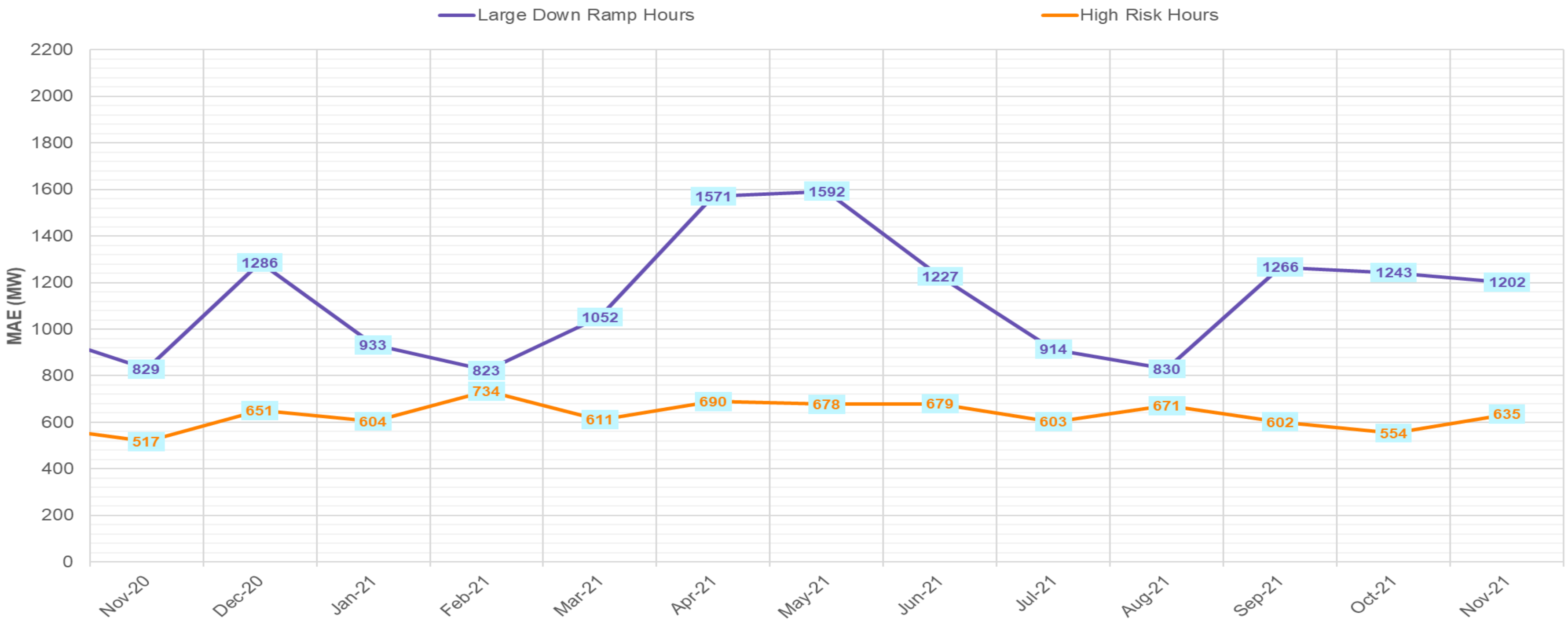
Wind Forecast Performance



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

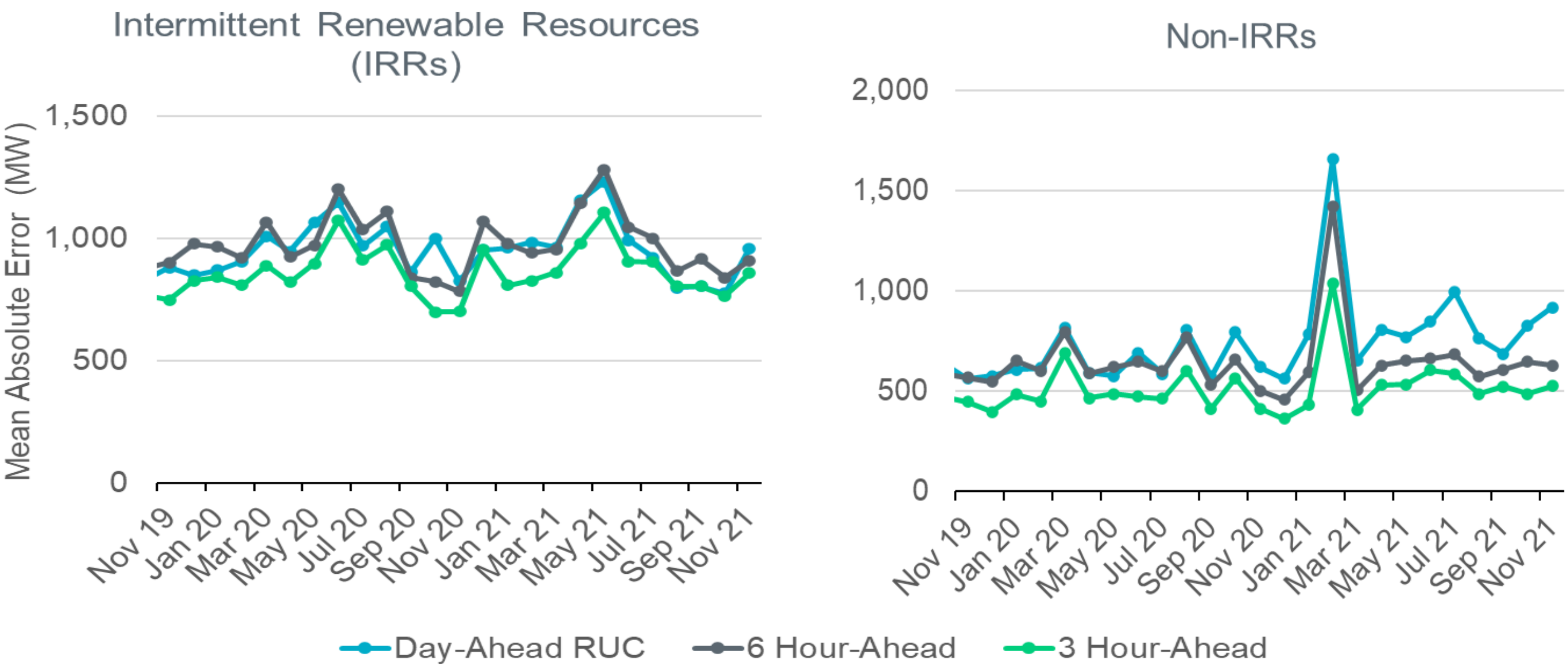
Hour-Ahead Mean Absolute Error (MAE) During Large Down Ramp (> 2000 MW) and High Risk Hours*



**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.*

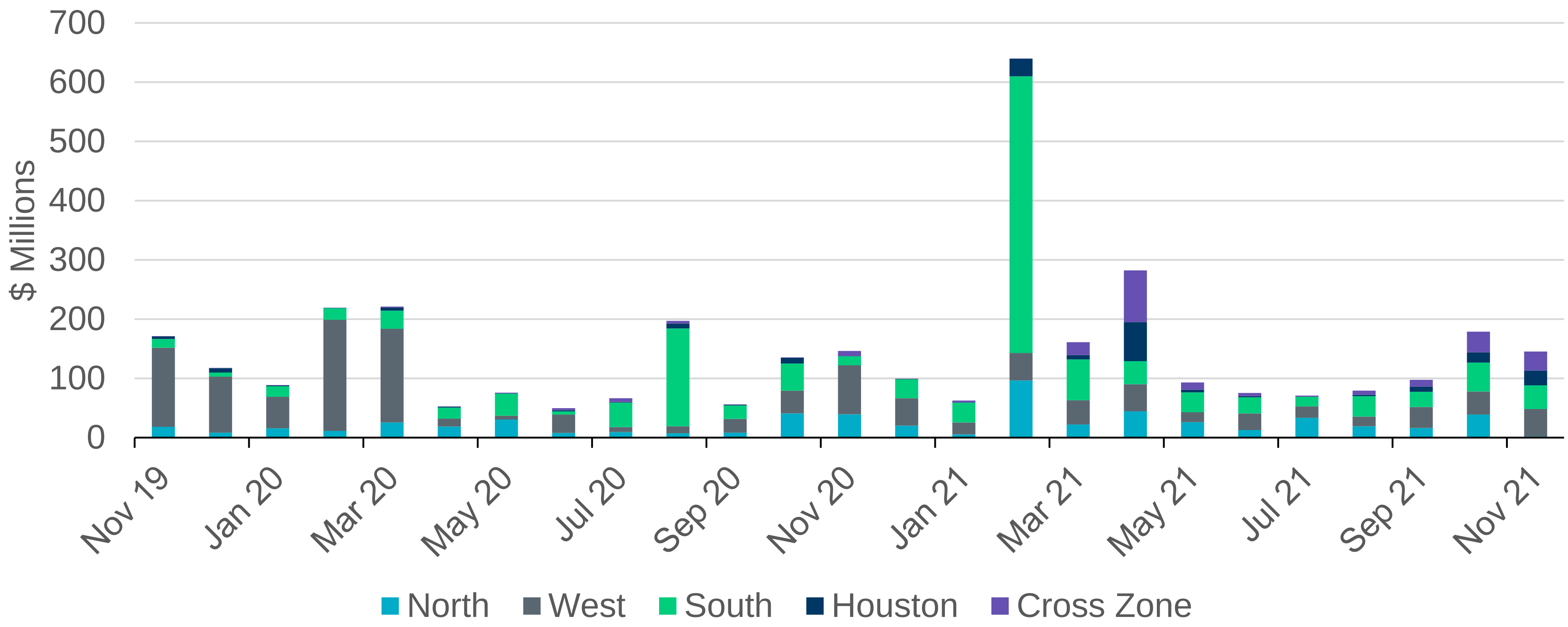
Forecast performance during large down ramp (wind ramp > 2000 MW) hours and high risk hours (historic risk of load ramping up and wind ramping down is high) is focused upon. Note that for the purposes of forecast performance measurement every hour in a month is classified as either a large down ramp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



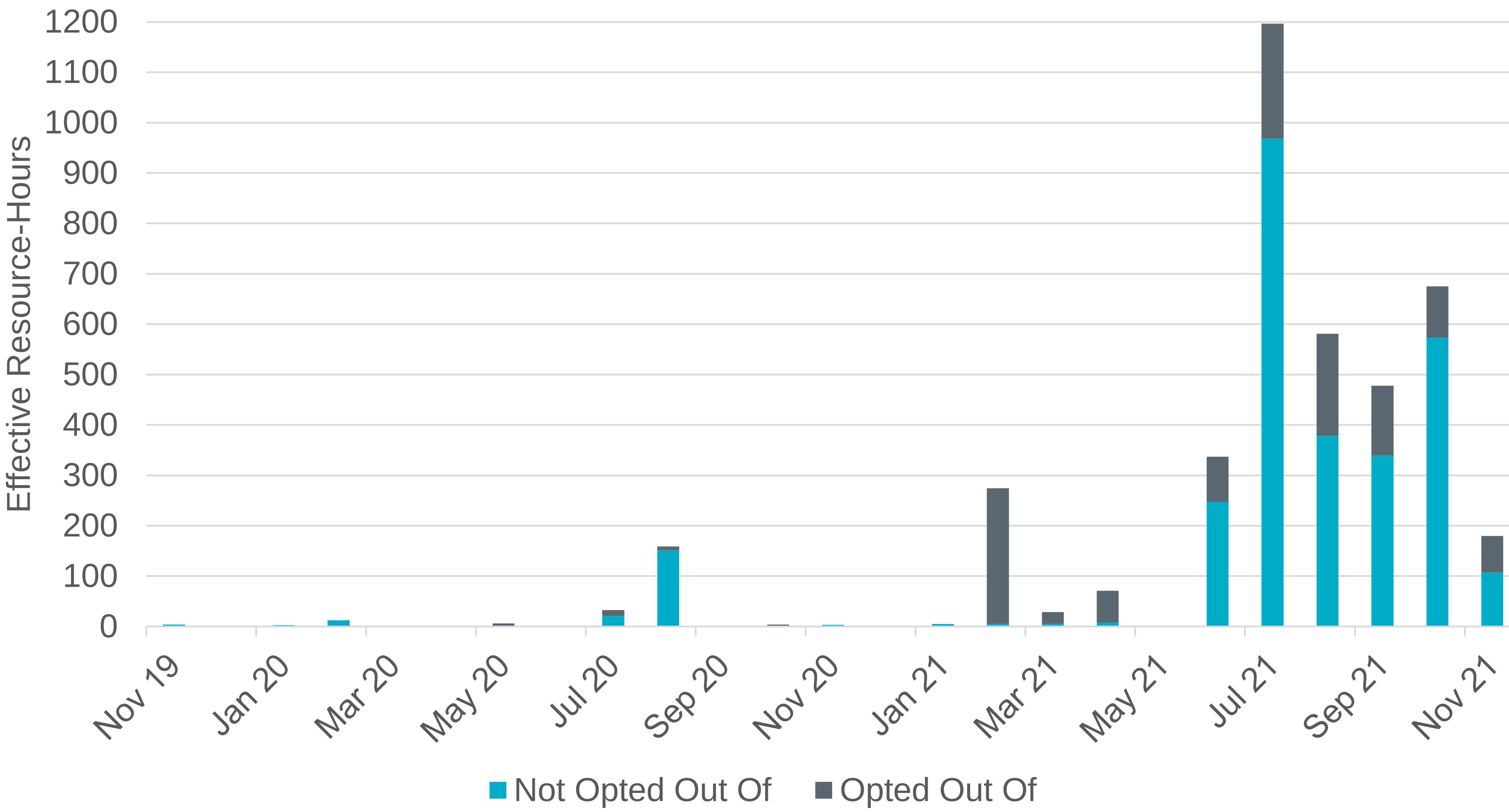
- COPs for IRRs are derived from wind and solar forecasts from ERCOT with any adjustments from Qualified Scheduling Entities.
- The installed capacity of approved Wind Units is 33,871 MW (as of November 30, 2021).
- The installed capacity of approved Solar Units is 8,973 MW (as of November 30, 2021).

Real-Time Congestion Rent by Zone



- Congestion rent in the West Zone and Houston Zone increased in November when compared to October. The most significant constraints for November were BASE CASE: PNHNDL in the West Zone and BASE CASE: WESTEX in the Cross 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.
- The "Cross Zone" category consists of cases in which the substations on either end of the constraint are in different zones.

Sixteen Resources were Committed in November for Capacity



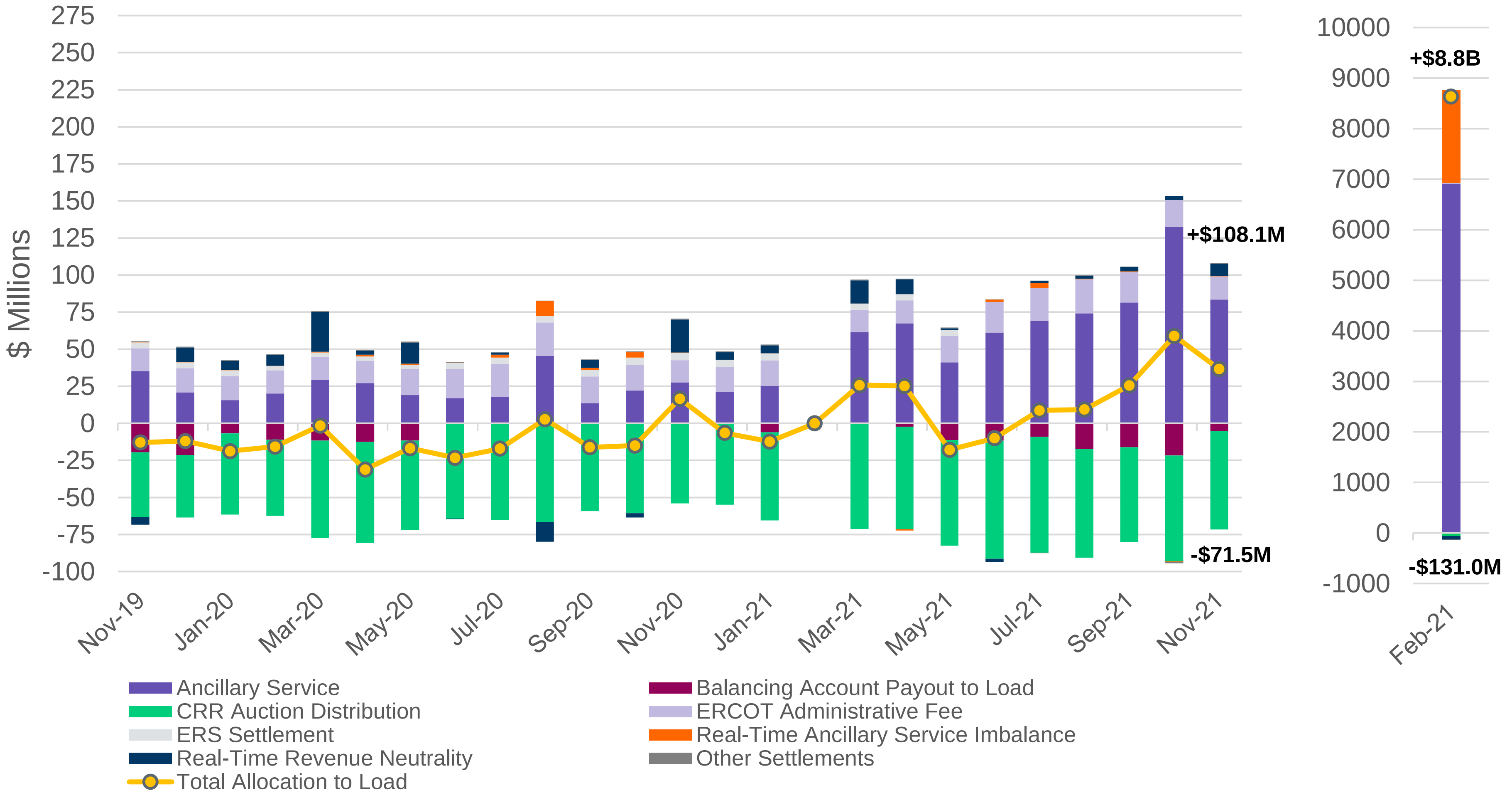
"Effective Resource-Hours" excludes any period during a Reliability Unit Commitment hour when the RUC-committed Resource was starting up, shutting down, off-line, or otherwise not available for dispatch by SCED.

Sixteen Resources were Committed through RUC/VDI in November for Capacity

Resource #	Effective Resource-hours	Non Opt Out (Effective Hours)	Opt Out (Effective Hours)
1	6.0	0.0	6.0
2	8.0	0.0	8.0
3	8.0	0.0	8.0
4	5.0	0.0	5.0
5	5.0	0.0	5.0
6	2.0	2.0	0.0
7	17.0	17.0	0.0
8	13.0	8.0	5.0
9	0.0	0.0	0.0
10	13.0	0.0	13.0
11	60.0	49.0	11.0
12	8.0	0.0	8.0
13	16.0	12.0	4.0
14	0.0	0.0	0.0
15	6.8	6.8	0.0
16	12.0	12.0	0.0

“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. A value of zero for the “Effective Resource-hours” column indicates the Resource was not available for dispatch by SCED for the instructed hours during the month.

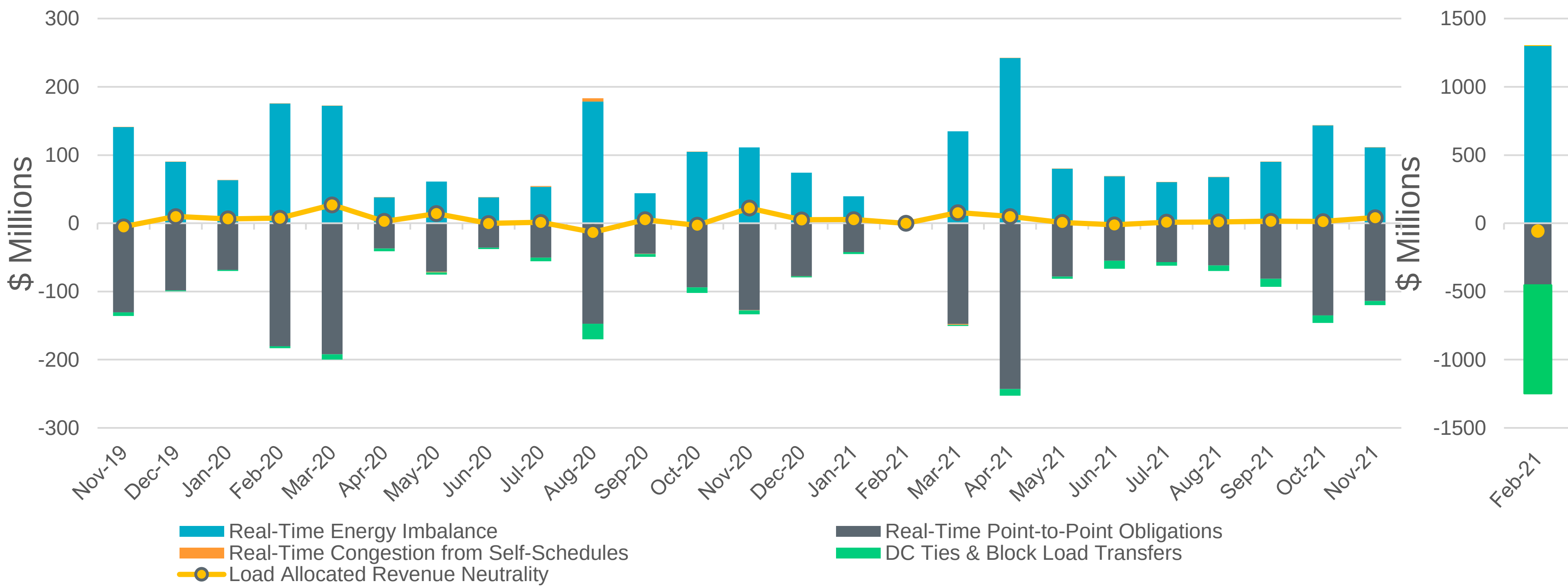
Net Allocation to Load in November 2021 was $36.6 Million



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.

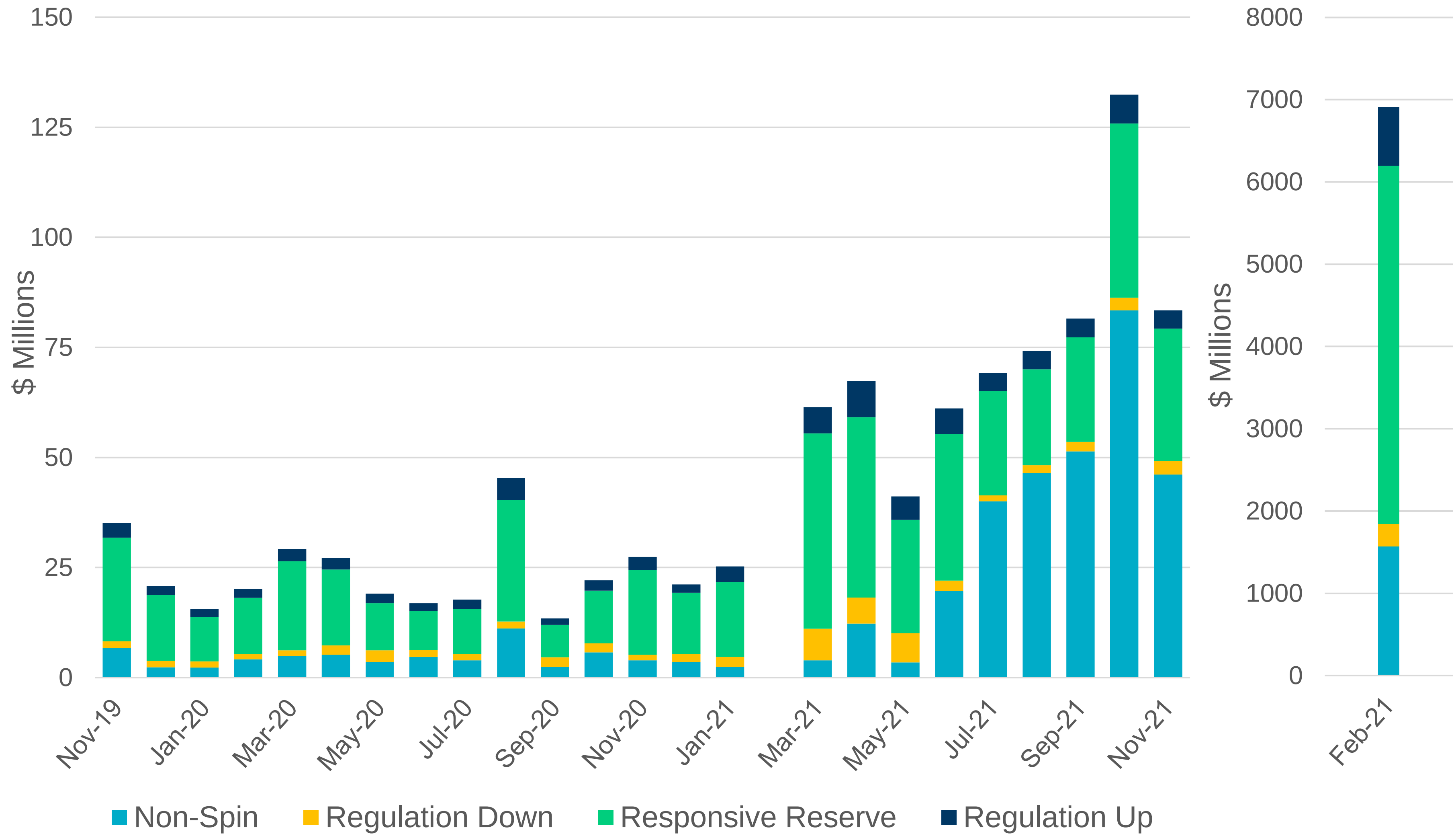
Real-Time Revenue Neutrality Allocated to Load was $8.36M for November 2021



	November 2021 ($M)
Real-Time Energy Imbalance	$111.14
Real-Time Point-to-Point Obligation	($113.94)
Real-Time Congestion from Self-Schedules	$0.42
DC Tie & Block Load Transfer	($5.98)
Load Allocated Revenue Neutrality	**$8.36**

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 2021 totaled $83.45M

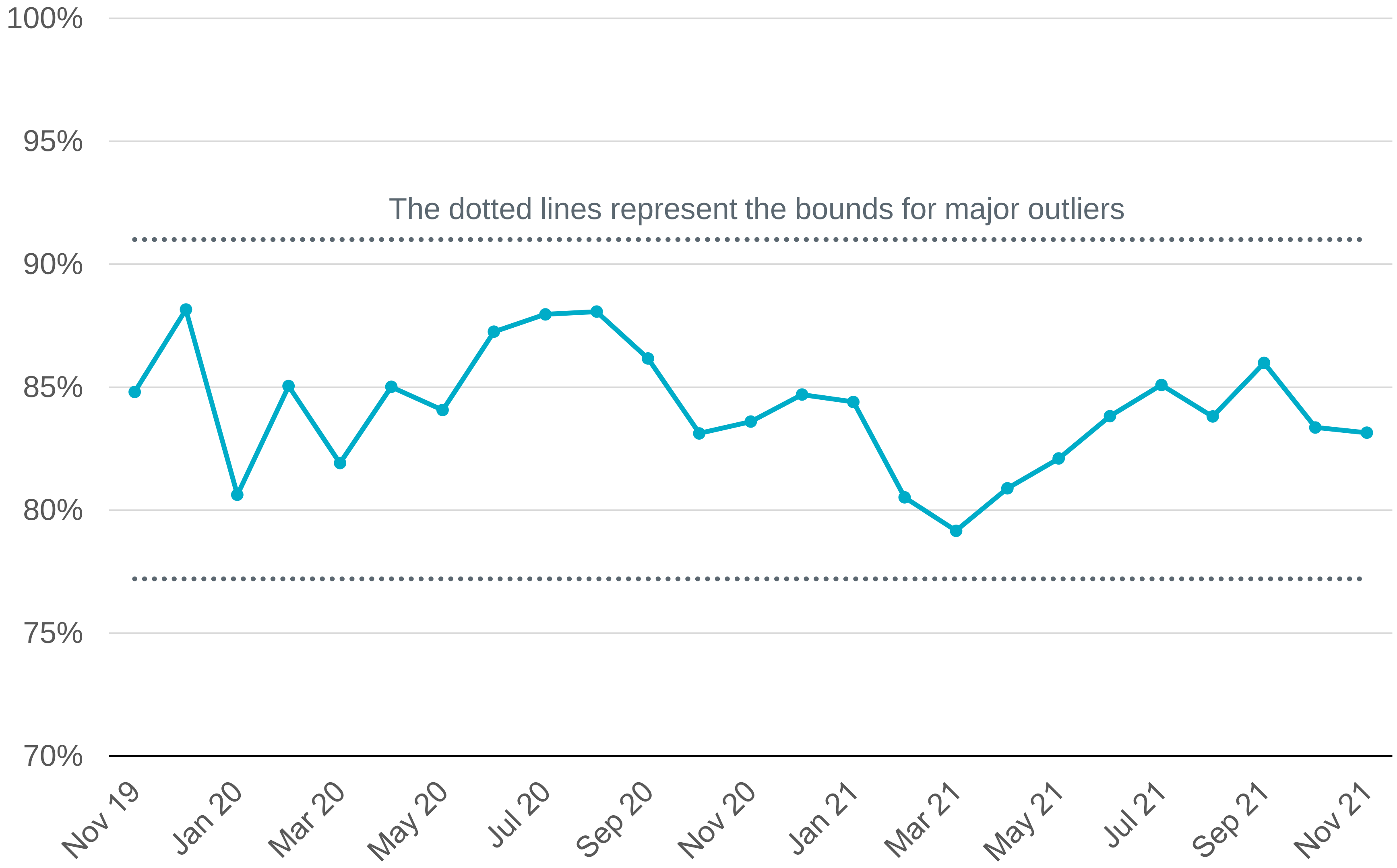


Note: For visual purposes, February 2021 has been separated into its own graph with different scaling. The legend applies for both graphs.

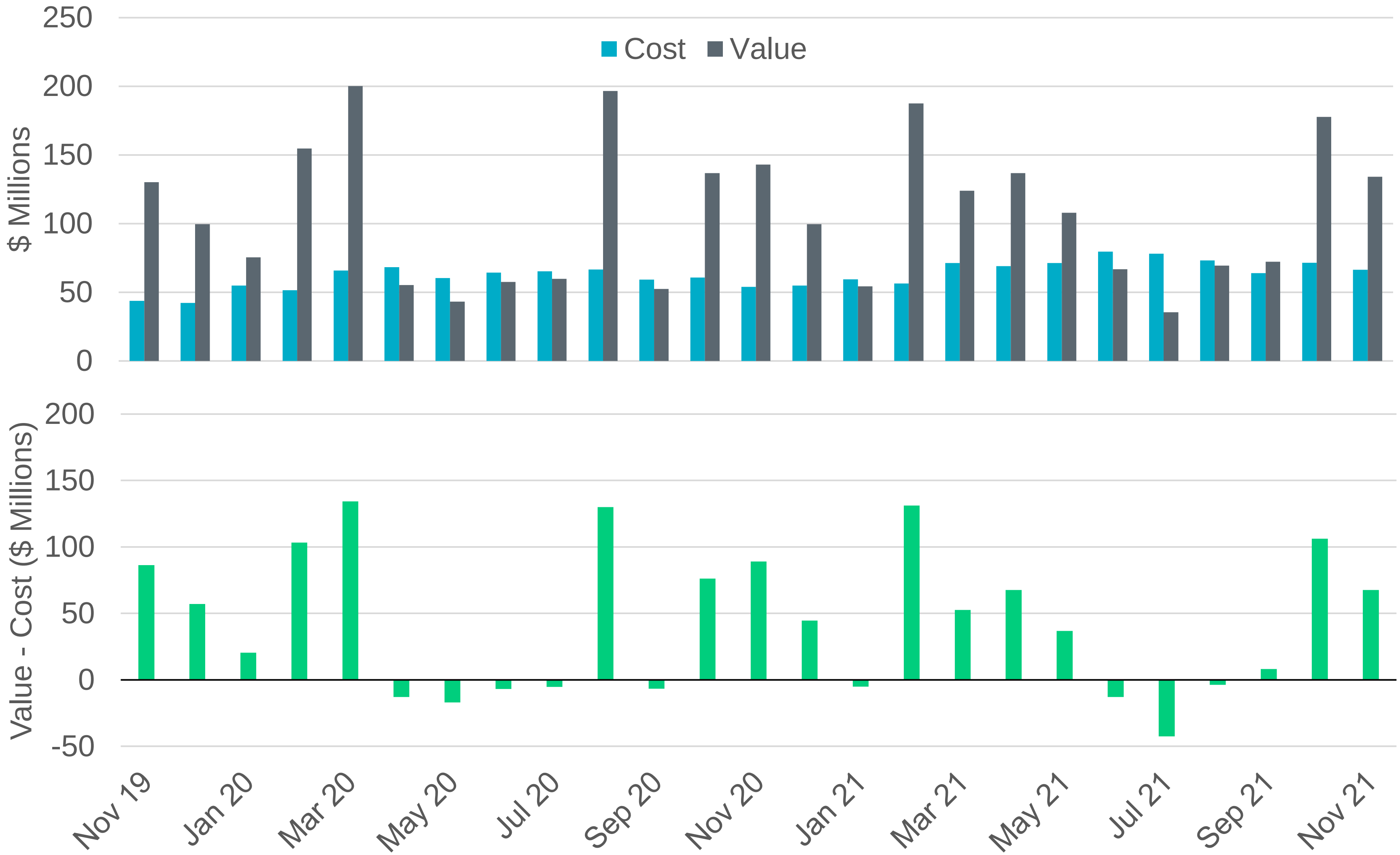
Day-Ahead and Real-Time Market Price Differences

*Averages are weighted by Real-Time Market Load

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



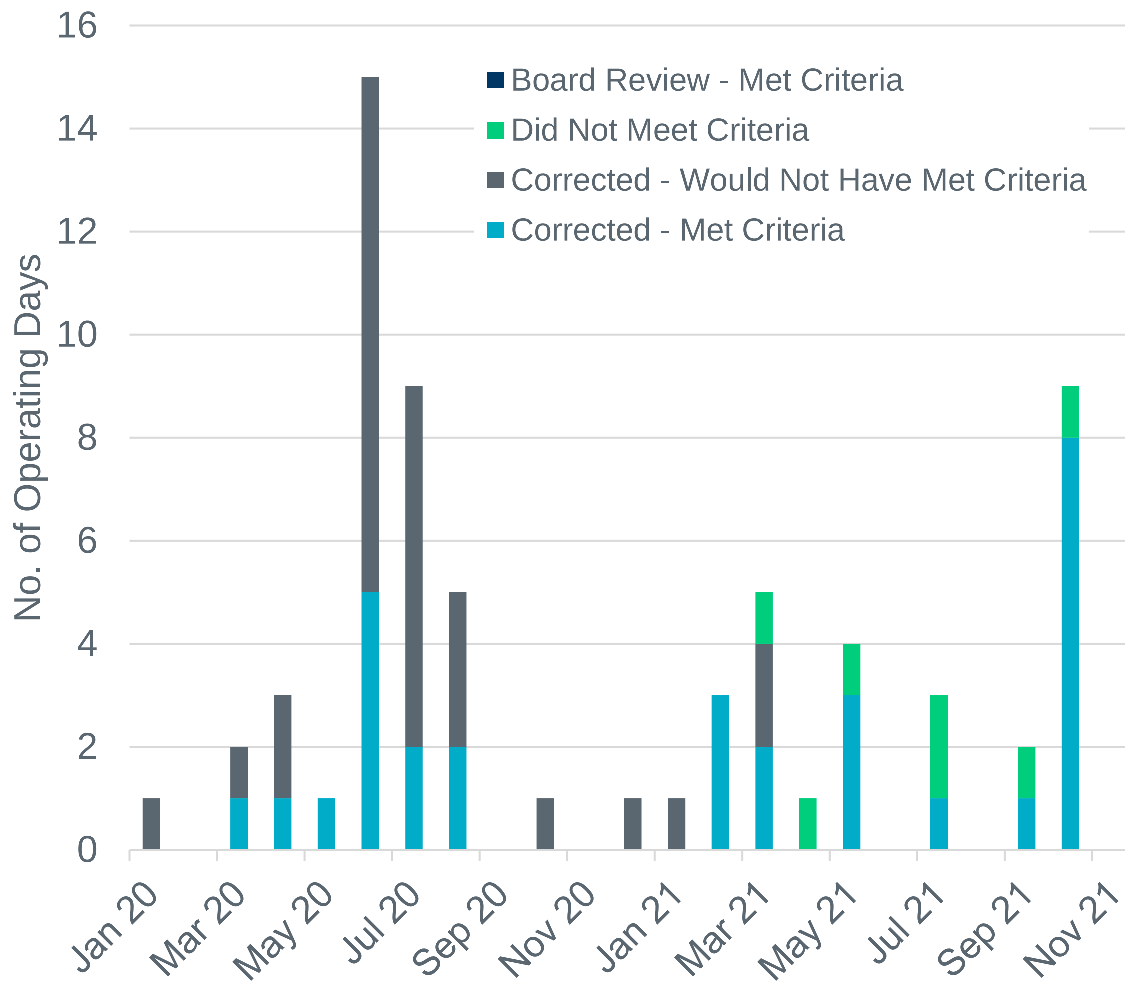
CRR Value and Cost Differences



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 four 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;
- Days that were not corrected because they did not meet the criteria for “significance” under NPRR1024; and
- Days that met the criteria for “significance” under NPRR1024 and are pending Board review.

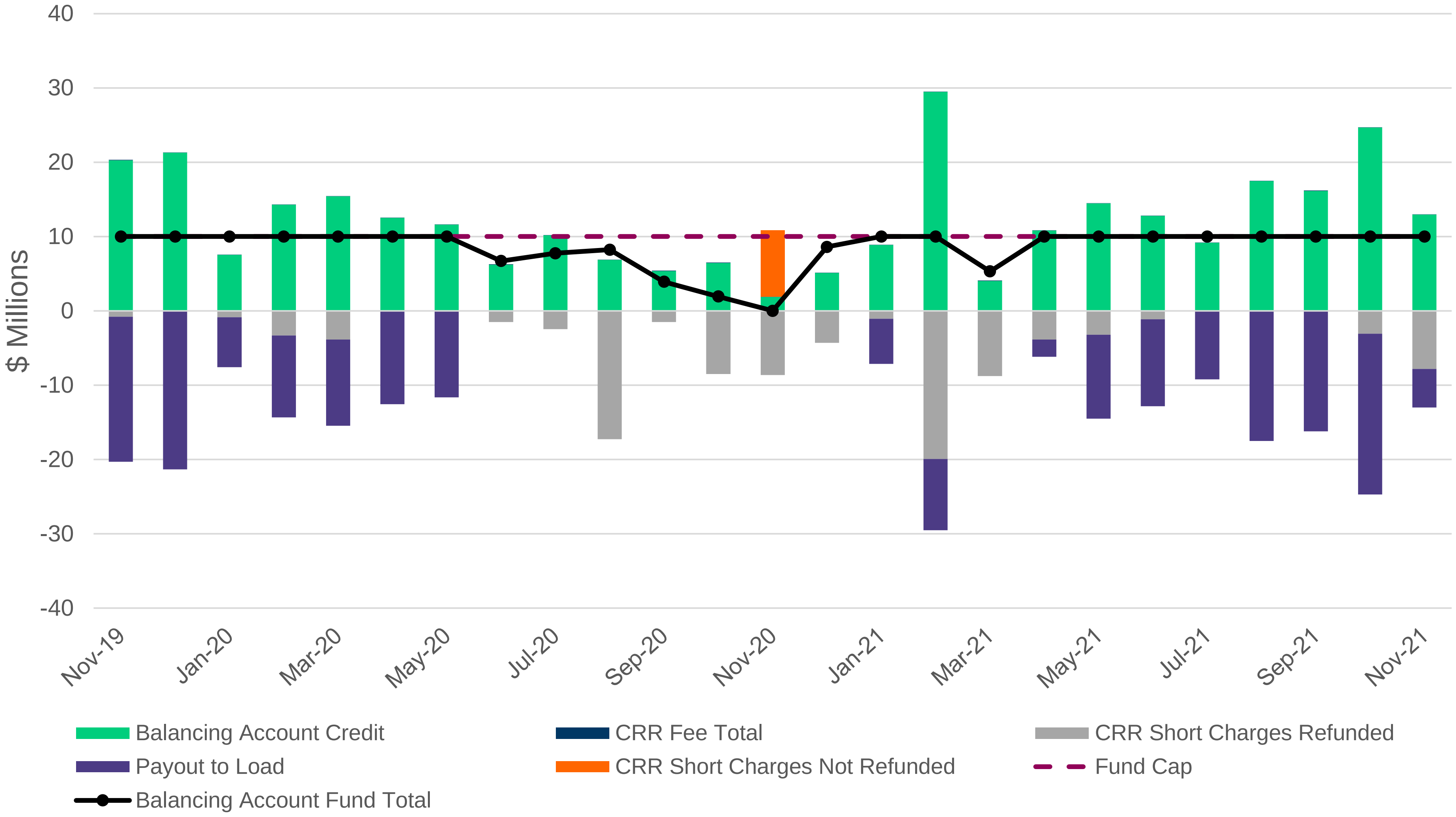


Update for September/October Price Corrections

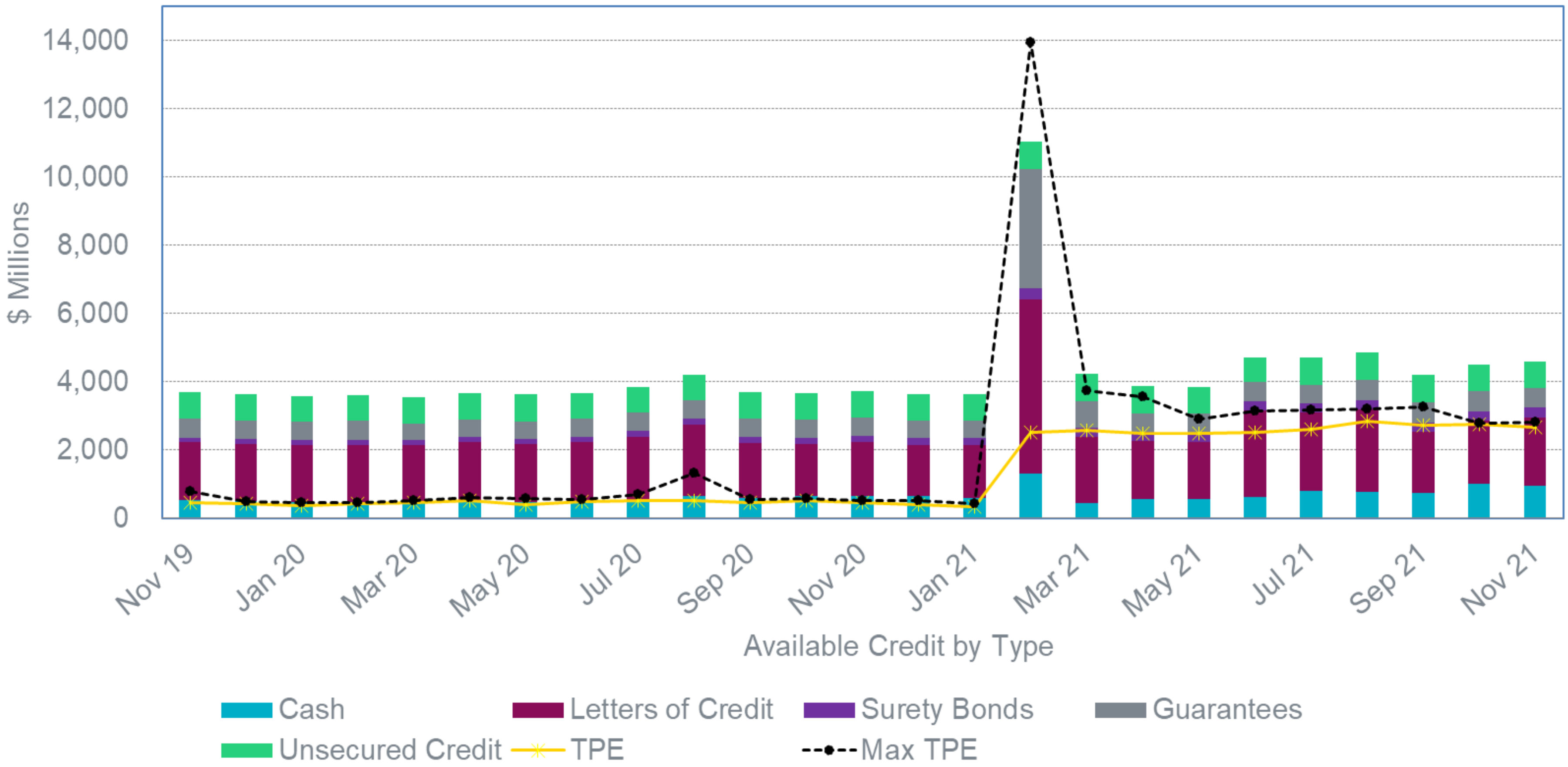
On December 10, 2021, the ERCOT Board reviewed and approved the price correction for Operating Days (ODs) September 30, 2021, and October 6 to 12, 2021, as the impacts of those ODs were considered “significant” under Protocol 4.5.3 (6)(b).

The graph on previous slide was updated to reflect the approved price correction, by changing the impacted ODs from “Board Review - Met Criteria” to “ Corrected - Met Criteria”.

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 2021

	Year-To-Date		Transactions Received	
Transaction Type	**November 2021**	**November 2020**	**November 2021**	**November 2020**
Switches	1,471,548	1,128,523	356,986	144,773
Acquisitions	48,862	0	0	0
Move - Ins	2,569,802	2,522,083	215,282	215,114
Move - Outs	1,184,311	1,215,342	96,981	99,890
Continuous Service Agreements (CSA)	631,530	460,684	42,985	47,330
Mass Transitions	26,584	0	0	0
Total	**5,932,637**	**5,326,632**	**712,234**	**507,107**