# ERCOT Monthly Operational Overview
(November 2019)

ERCOT Public
December 15, 2019

Monthly Highlights

- ERCOT set a maximum peak demand of 56,427 MW* in November 2019, which is 110 MW more than the November 2018 demand of 56,317 MW.

- ERCOT issued 3 notifications:
  - 1 Advisory issued for postponement of the DAM solution posting deadline due to long running solution.
  - 1 Watch due to failure of SCED.
  - 1 Transmission Emergency Notice issued for Far West Texas.

- ERCOT has observed significant congestion costs in West Texas in recent months, particularly near Odessa/Midland and in the Panhandle.

* Preliminary value from November release of Demand and Energy 2019 report.

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Monthly energy generation increased 3% year-over-year to 27,809 GWh in November 2019, compared to 27,128 GWh in November 2018

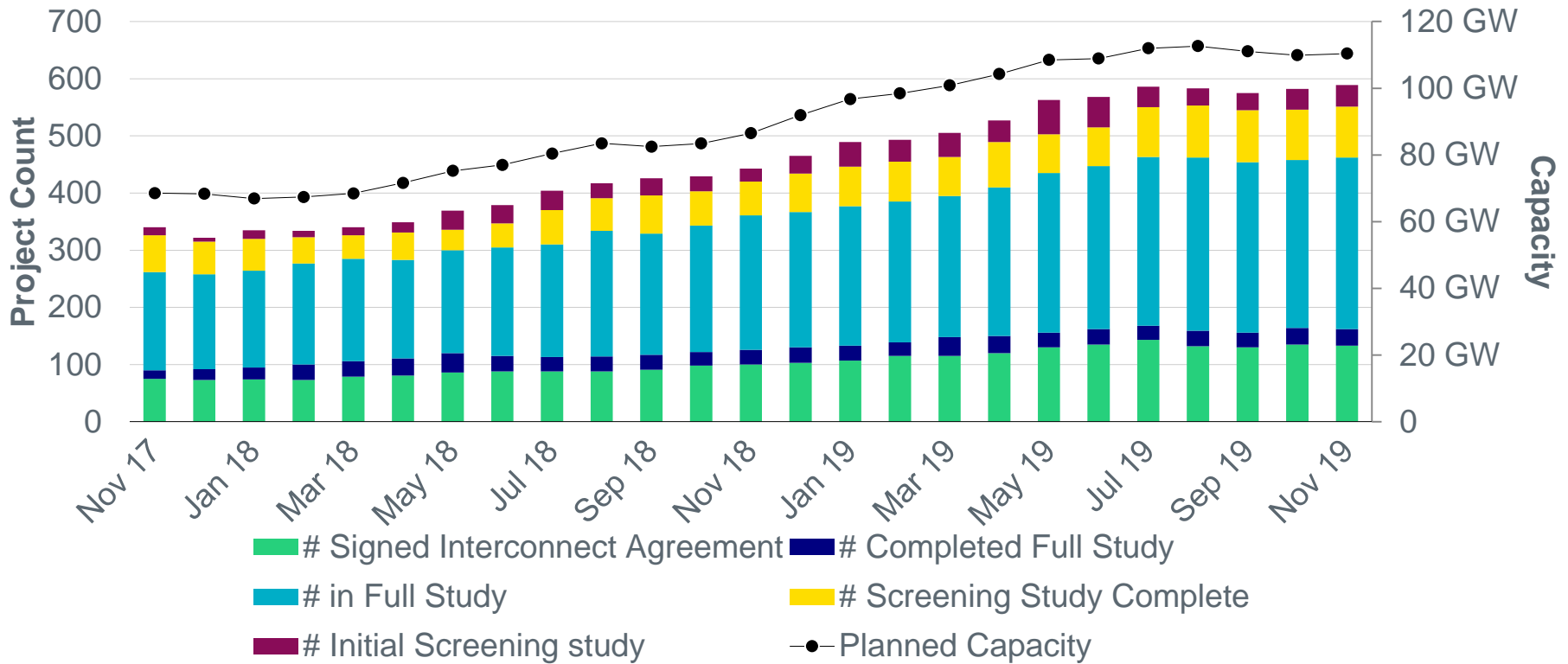Legend: ■ Nuclear ■ Coal ■ Wind ■ Solar ■ Hydro ■ Biomass ■ Other □ Net DC/BLT ■ Gas-CC ■ Gas
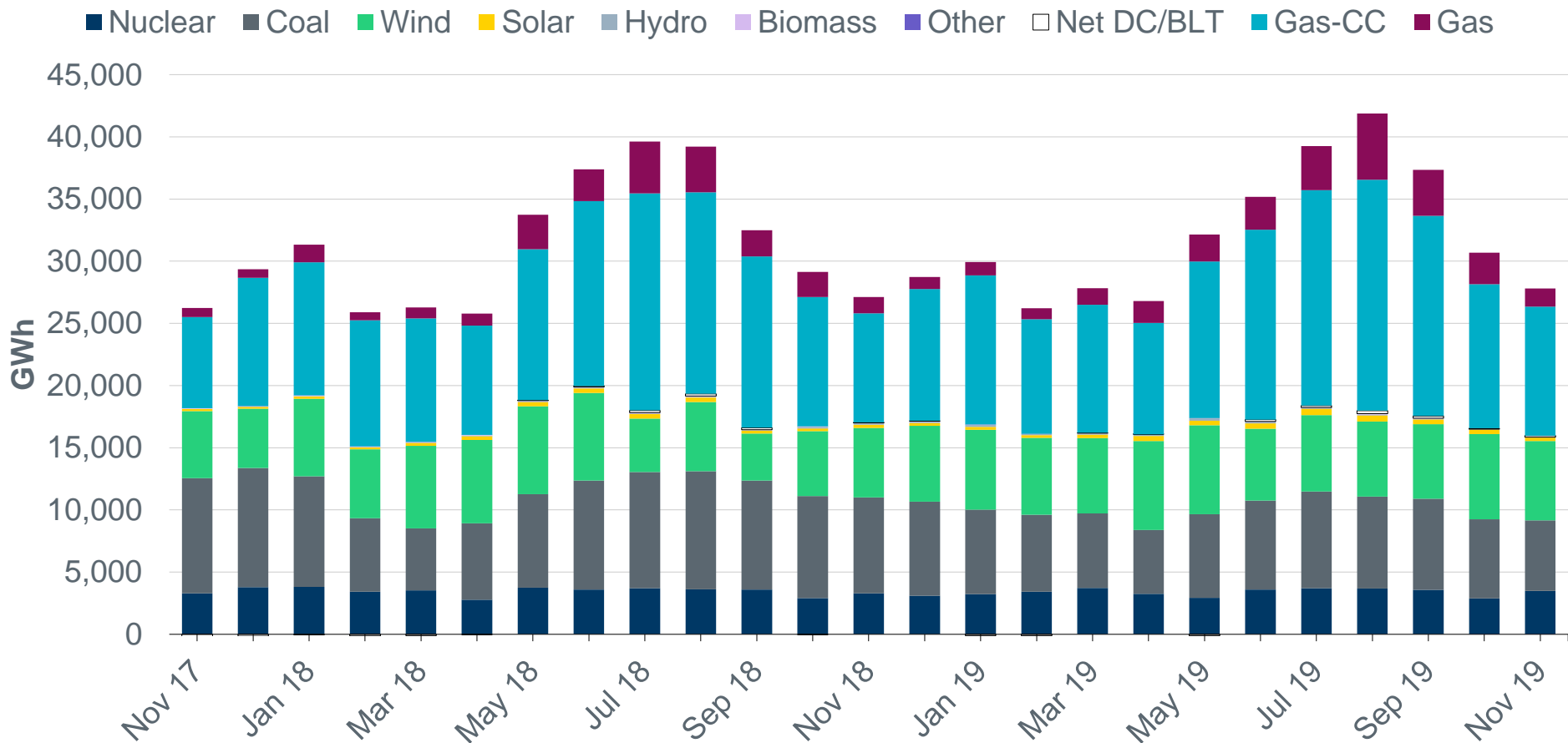
Data for latest two months are based on preliminary settlements.

Generation Interconnection activity by project phase
(excludes Inactive capacities due to PGRR066)

Legend:
- # Signed Interconnect Agreement
- # Completed Full Study
- # in Full Study
- # Screening Study Complete
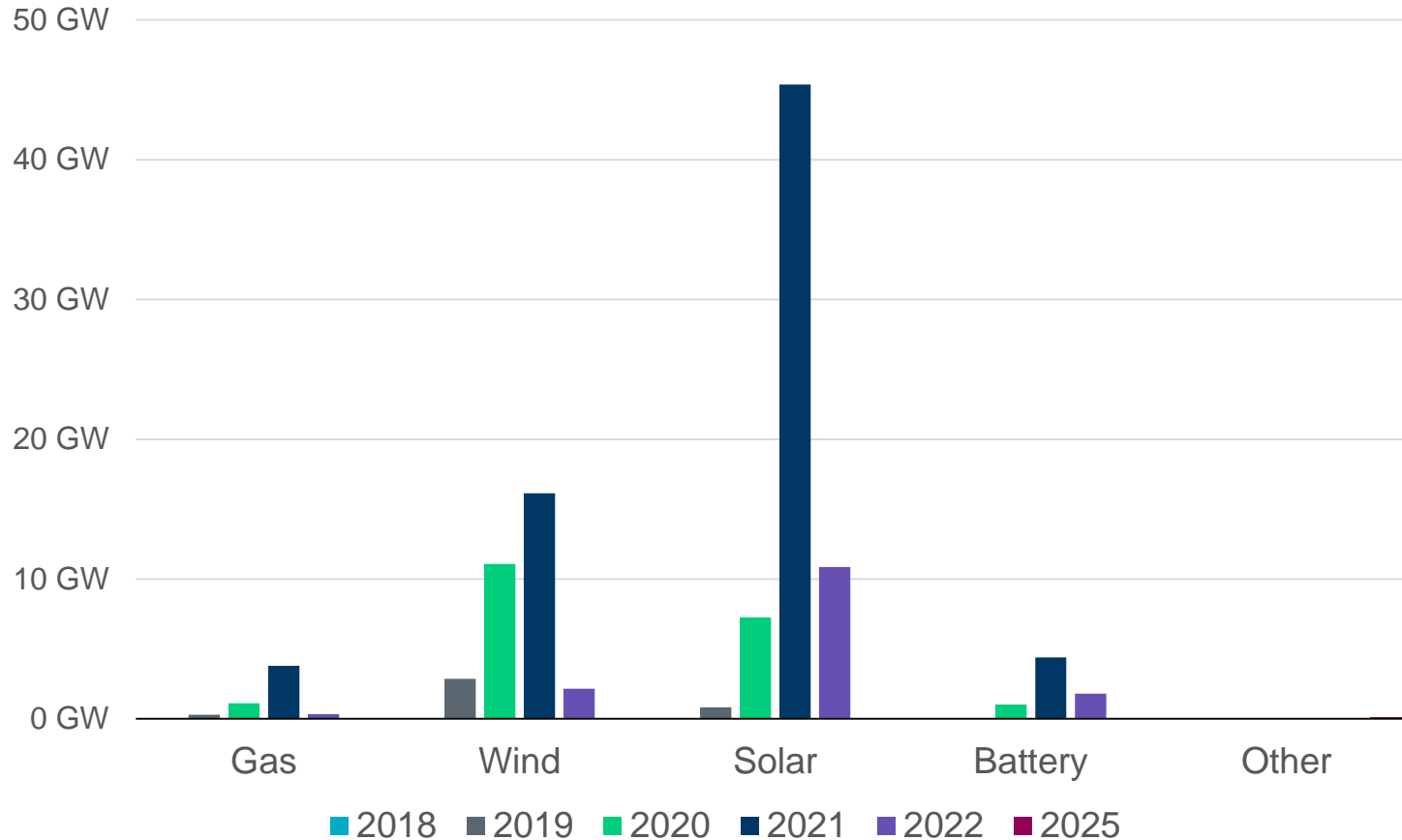- # Initial Screening study
- Planned Capacity

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 65 GW (59%), Wind 32 GW (29%), Gas 6 GW (5%), Battery 7 GW (7%) (excludes Inactive capacities due to PGRR066)


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 is currently tracking 589 active generation interconnection requests totaling 110,392 MW. This includes 64,664 MW of solar, 32,253 MW of wind, and 7,214 MW of battery projects as of November 30, 2019.

- ERCOT is currently reviewing proposed transmission improvements with a total estimated cost of $1,252.37 Million as of November 30, 2019.

- Transmission Projects endorsed in 2019 total $610.6 Million as of November 30, 2019.

- All projects (in engineering, routing, licensing and construction) total approximately $3.41 Billion as of October 1, 2019.

- Transmission Projects energized in 2019 total about $1.30 Billion as of October 1, 2019.

ERCOT set a maximum peak demand of 56,427 MW* in November 2019, which is 110 MW more than the November 2018 demand of 56,317 MW
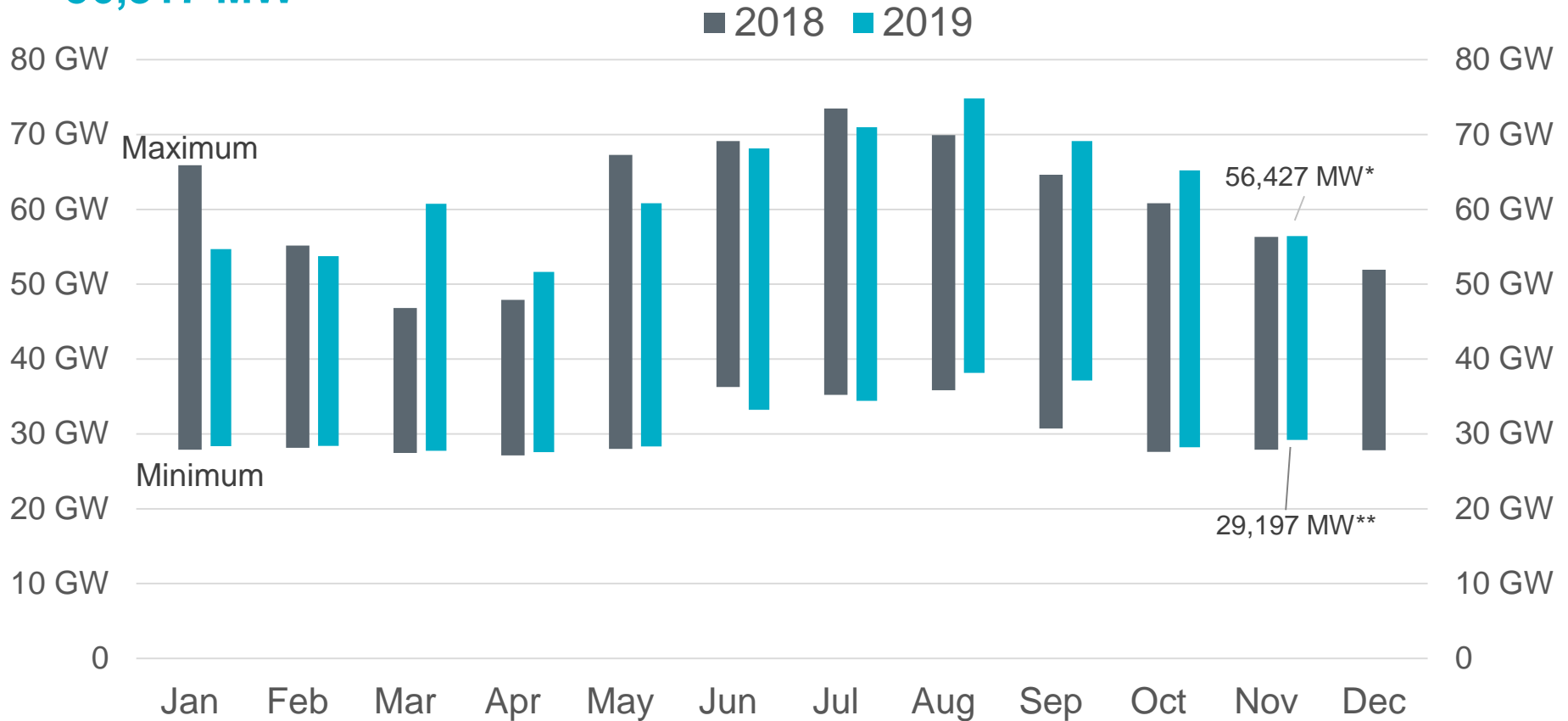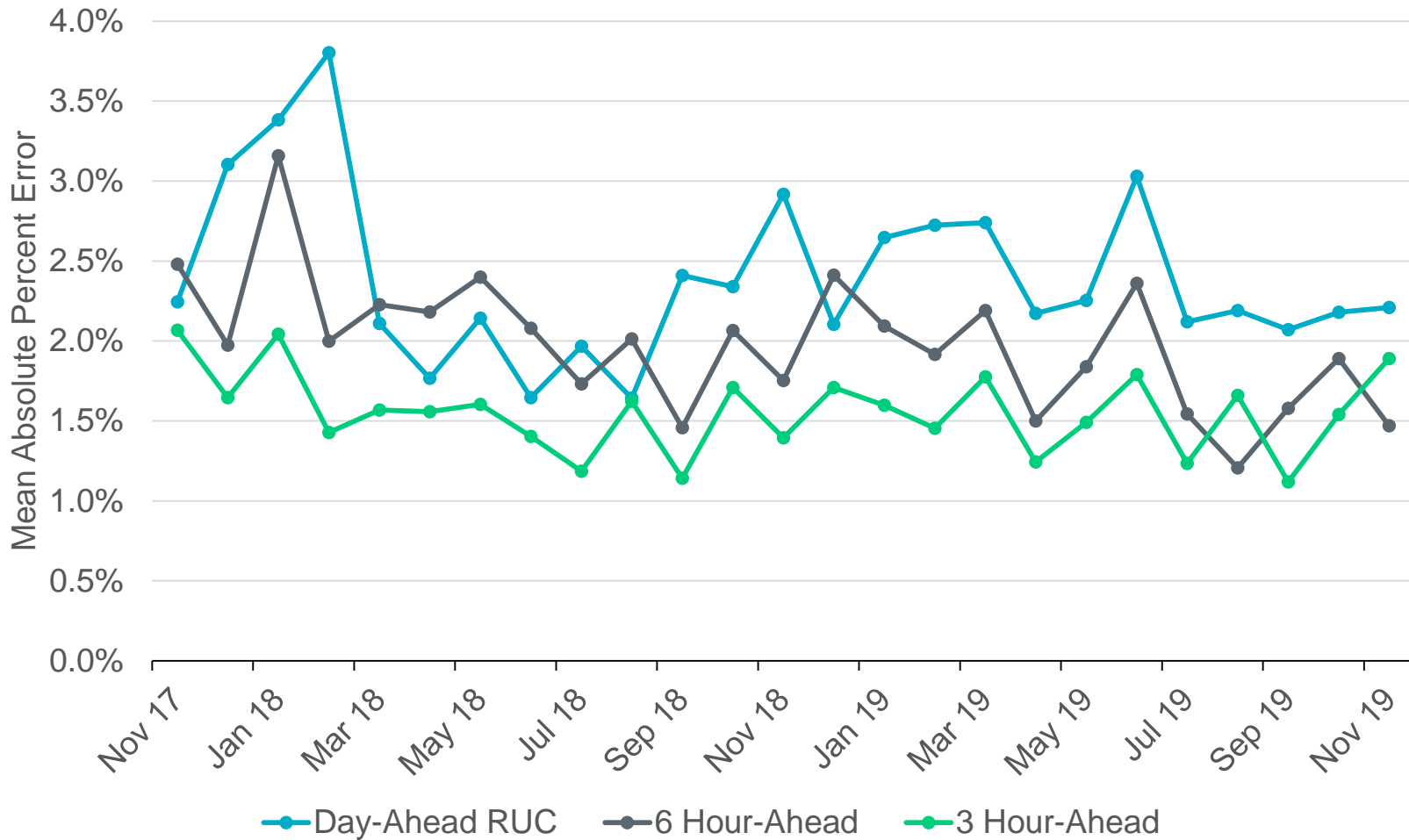
*Value based on net system hourly data from November release of Demand and Energy 2019 report.
**Value based on 15-minute metered data from November release of Demand and Energy 2019 report.
Data for latest two months are based on preliminary settlements.
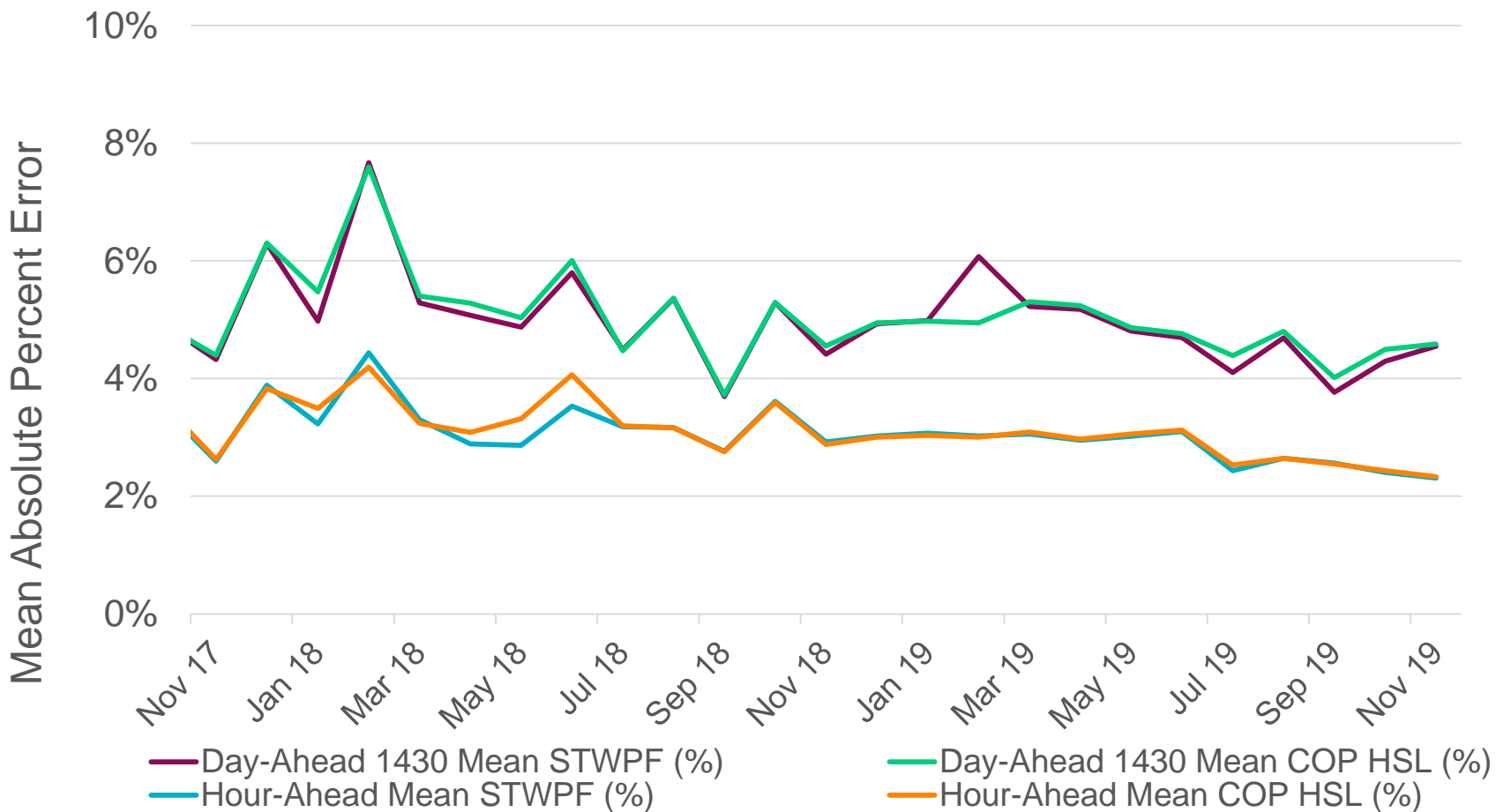
Mid-Term Load Forecast Performance

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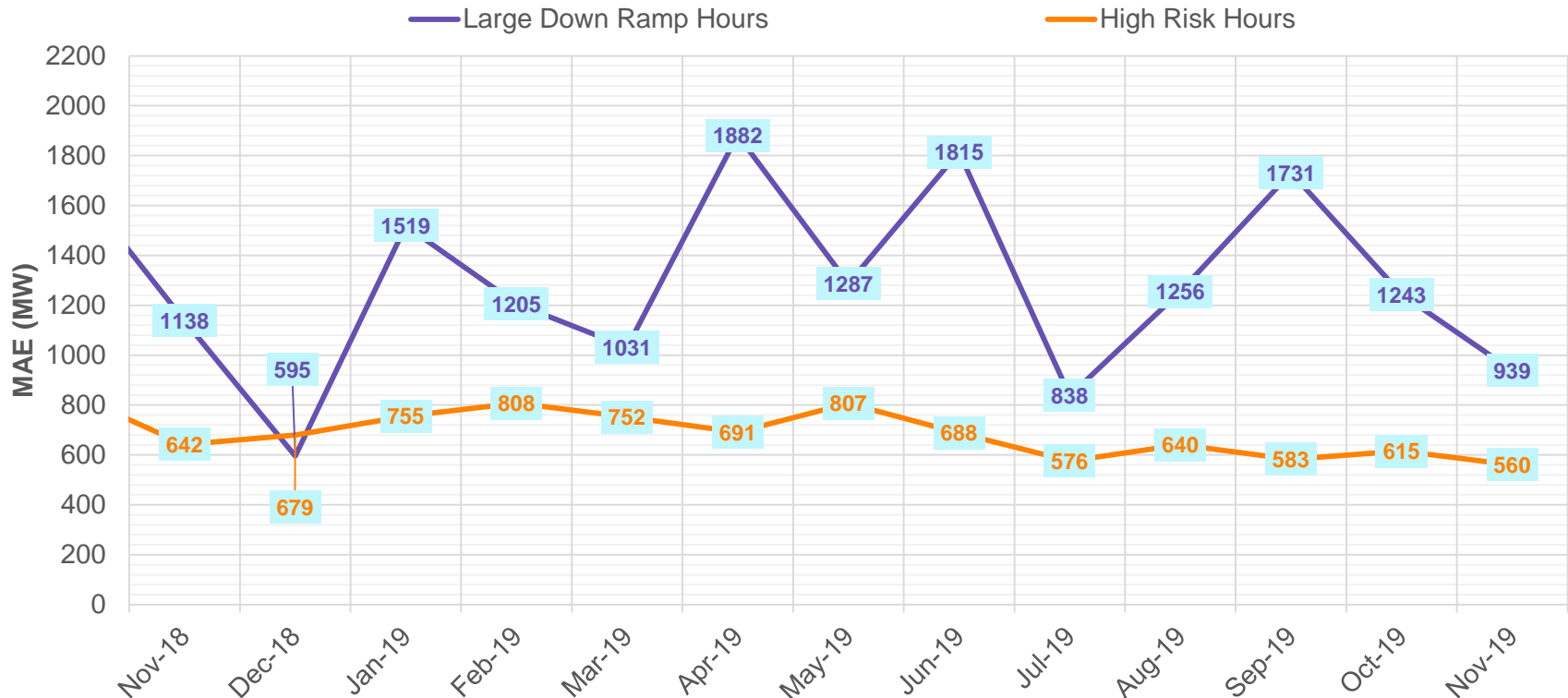
Wind Forecast Performance

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

Intermittent Renewable Resources (IRRs)

Non-IRRs
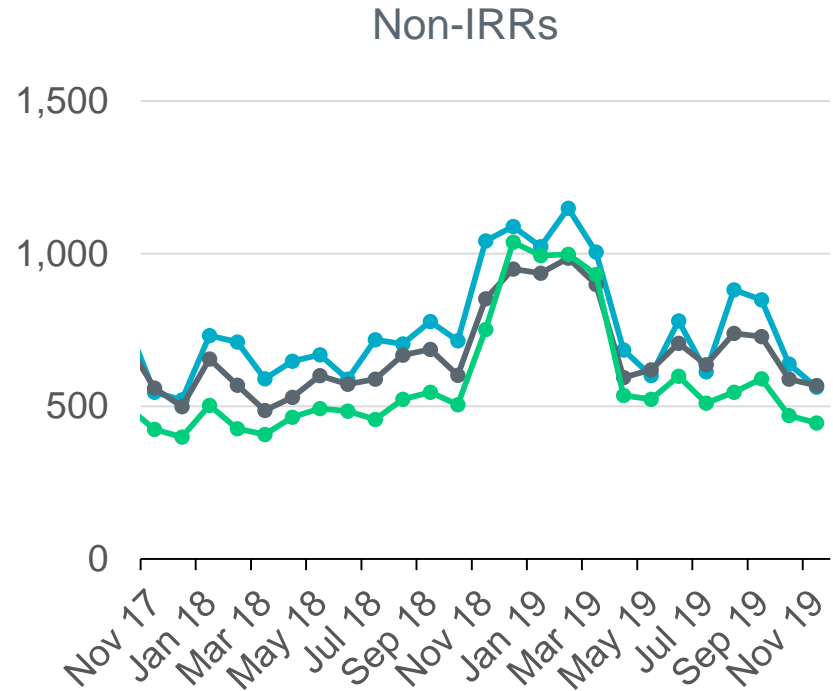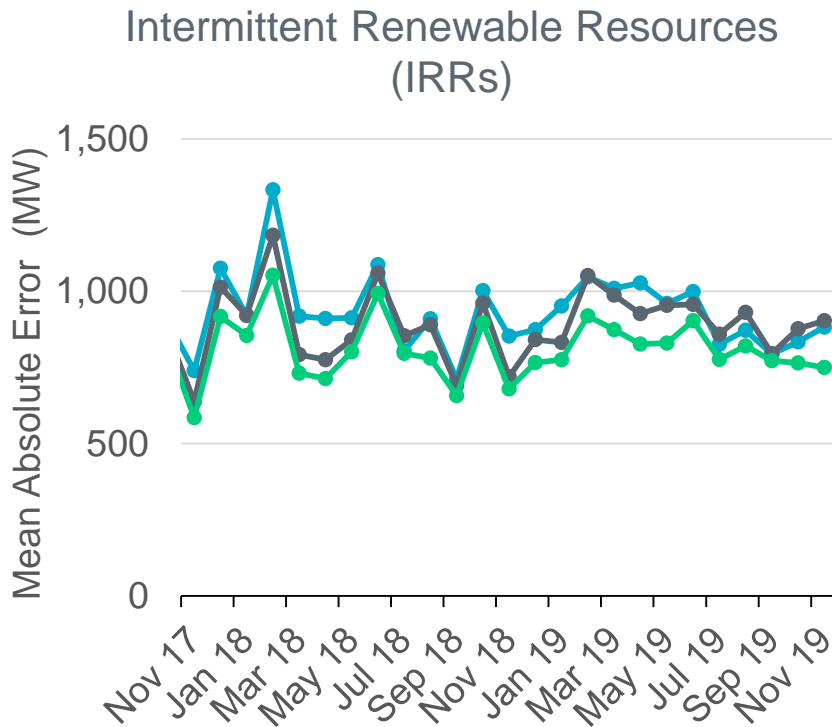
Legend: Day-Ahead RUC, 6 Hour-Ahead, 3 Hour-Ahead

- COPs for IRRs are derived from wind and solar forecasts from ERCOT with any adjustments from Qualified Scheduling Entities.

- The installed capacity of approved IRRs is 25,888 MW (as of November 30, 2019).
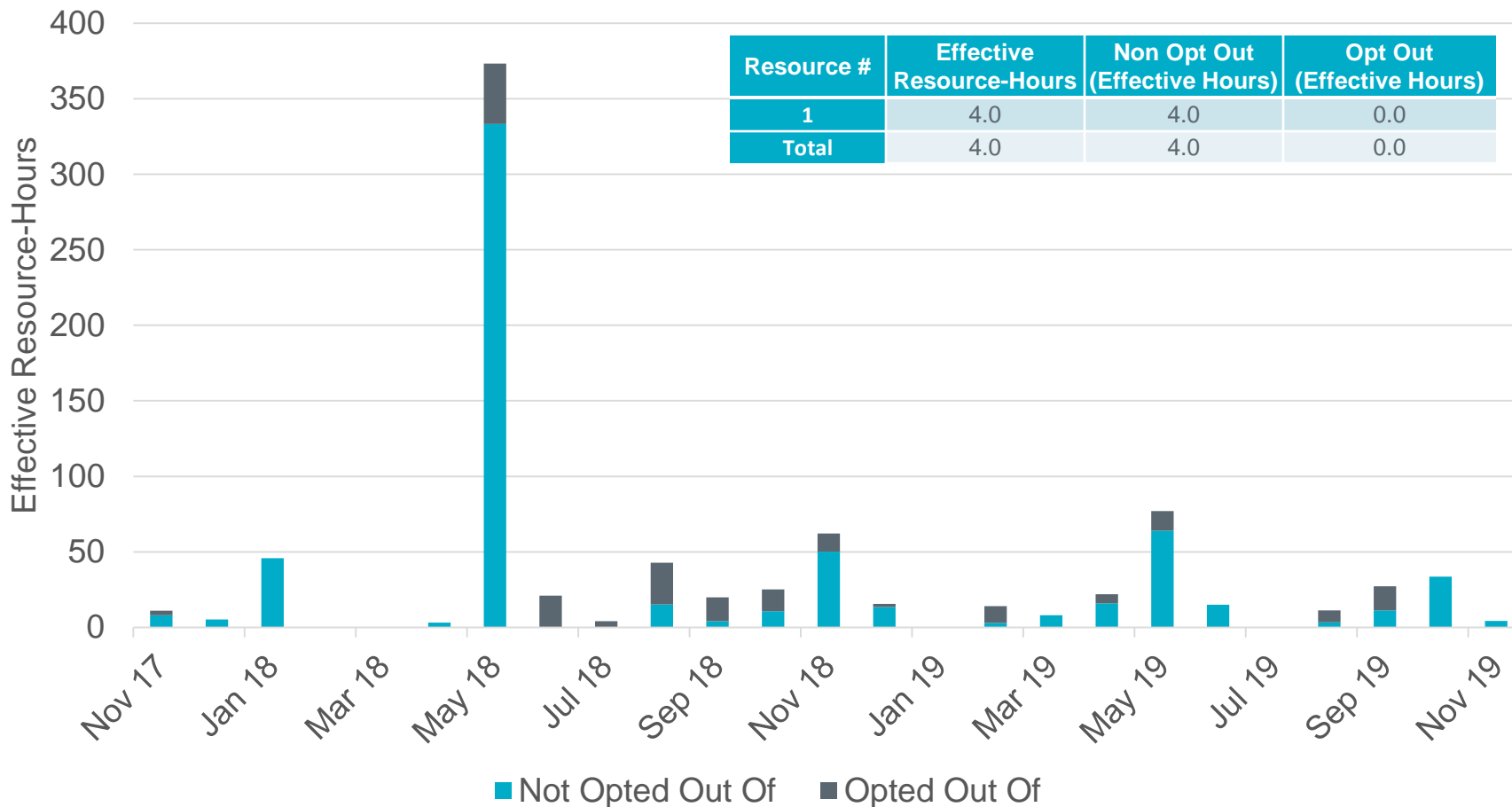
Real-Time Congestion Rent by Zone
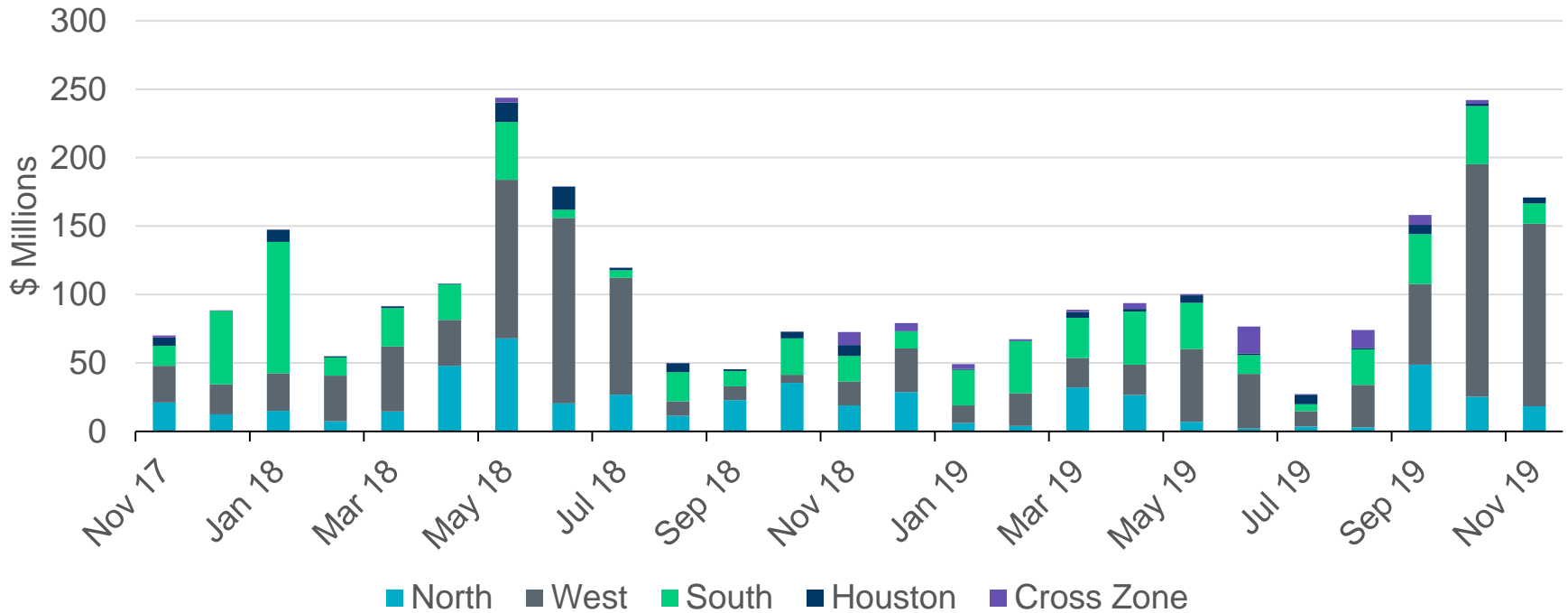
- The congestion rent in the West zone remained high for November, in part due to planned transmission outages. The most significant West zone constraints for November include SECNMO28: 6100__F and DWINDUN8: 6100__F in the Odessa – Midland area and BASE CASE: PNHNDL.

- 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.

One Resource was Committed in November for Congestion

Resource #	Effective Resource-Hours	Non Opt Out (Effective Hours)	Opt Out (Effective Hours)
1	4.0	4.0	0.0
Total	4.0	4.0	0.0

■ Not Opted Out Of   ■ Opted Out Of

"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.
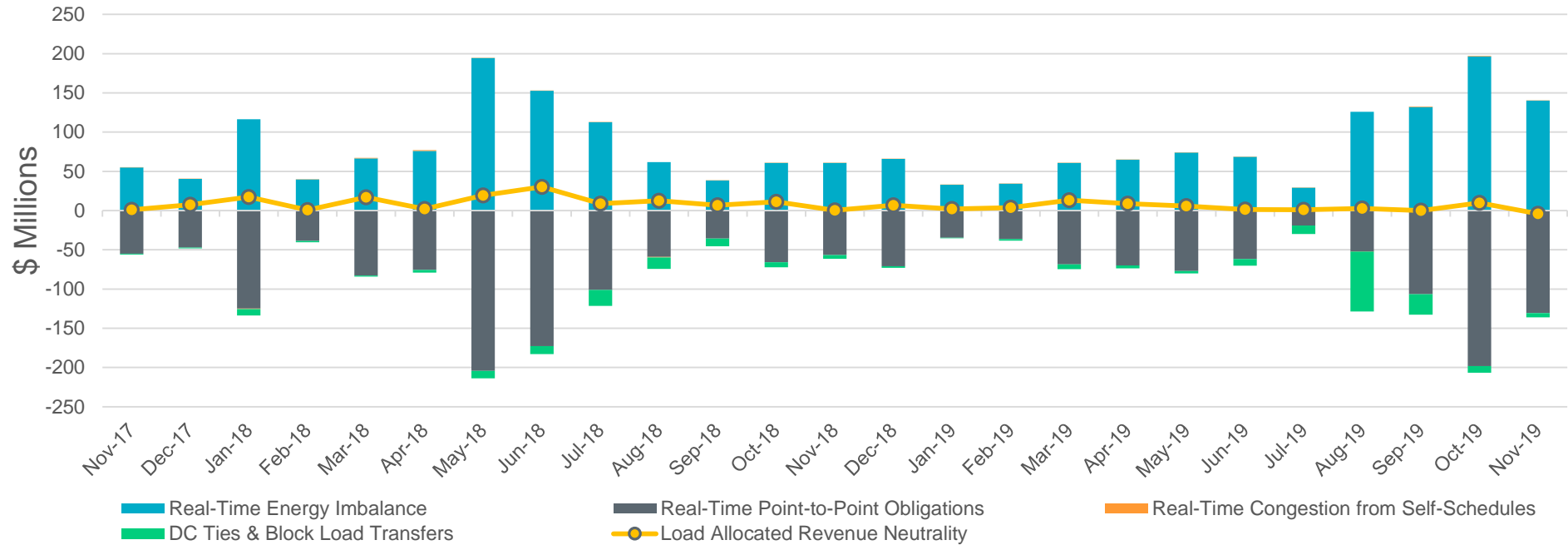
Net Allocation to Load in November 2019 was $-16.20 Million
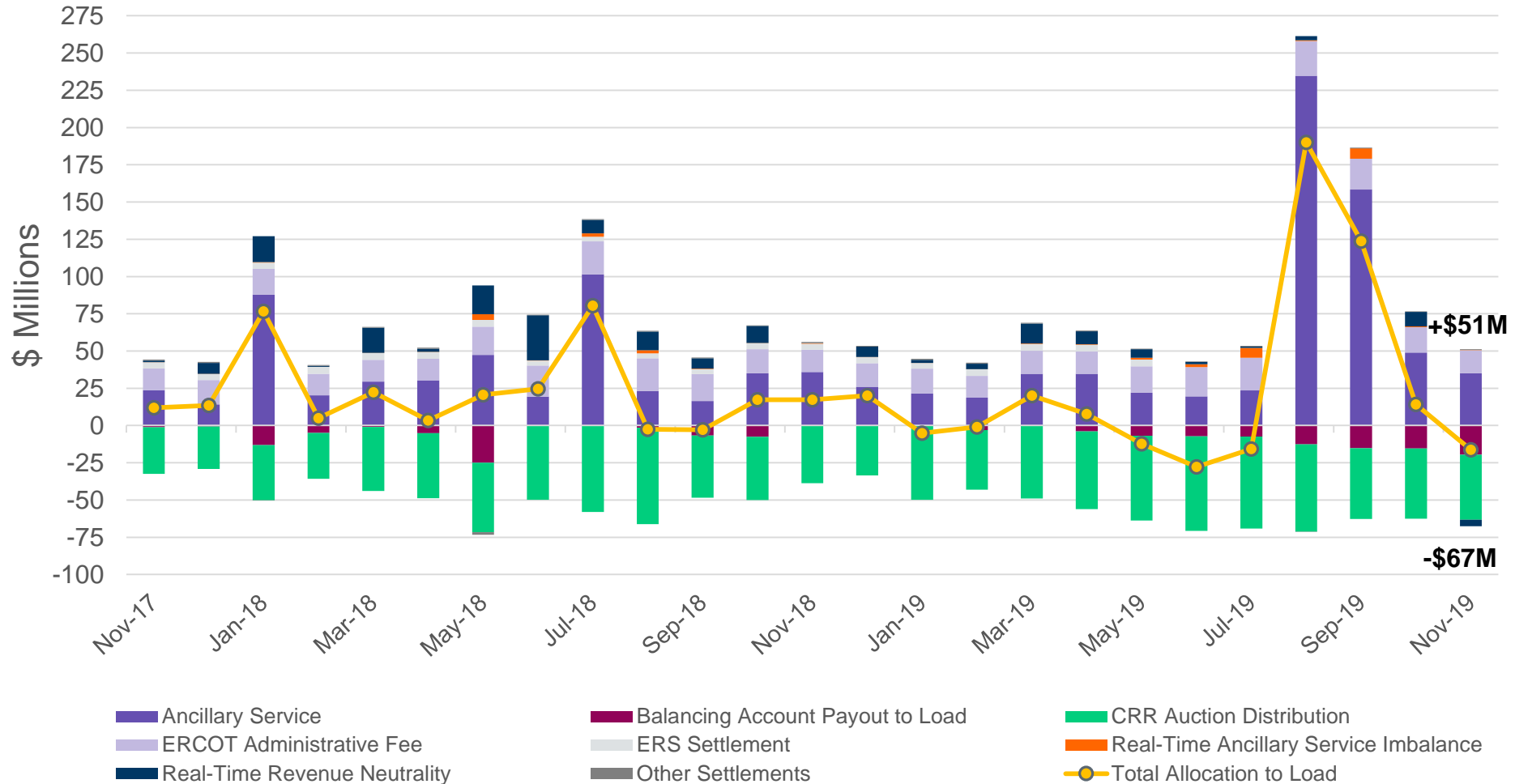
This information is available in tabular form in the Settlement Stability Report presented quarterly to the Market Settlement Working Group and Wholesale Market Subcommittee

Real-Time Revenue Neutrality Allocated to Load was $-4.22M for November 2019

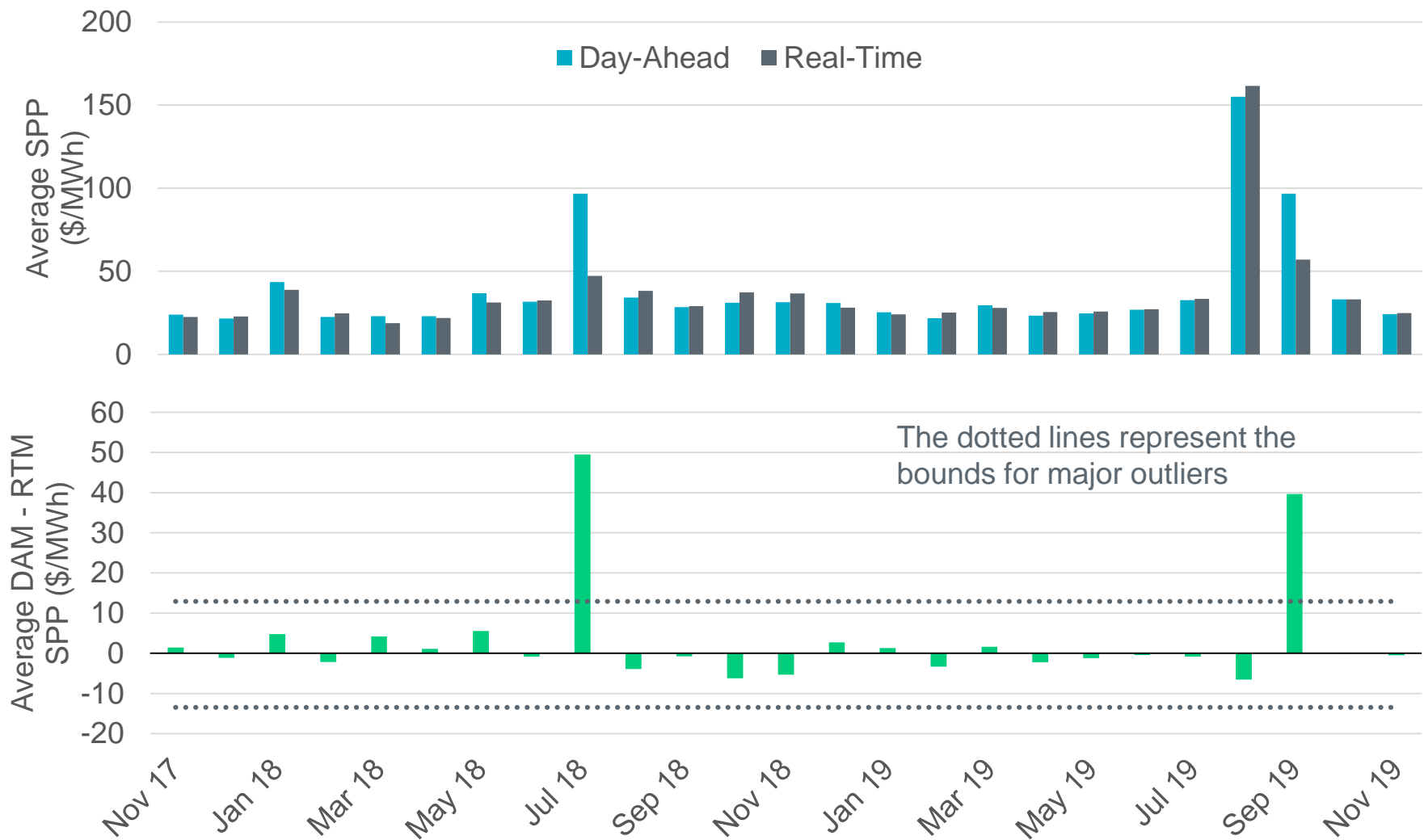|	November 2019 ($M)
Real-Time Energy Imbalance	$139.99
Real-Time Point-to-Point Obligation	($130.49)
Real-Time Congestion from Self-Schedules	$0.16
DC Tie & Block Load Transfer	($5.43)
Load Allocated Revenue Neutrality	**($4.22)**

# Ancillary Services for November 2019 totaled $35.12M

Legend: ■ Non-Spin   ■ Regulation Down   ■ Responsive Reserve   ■ Regulation Up
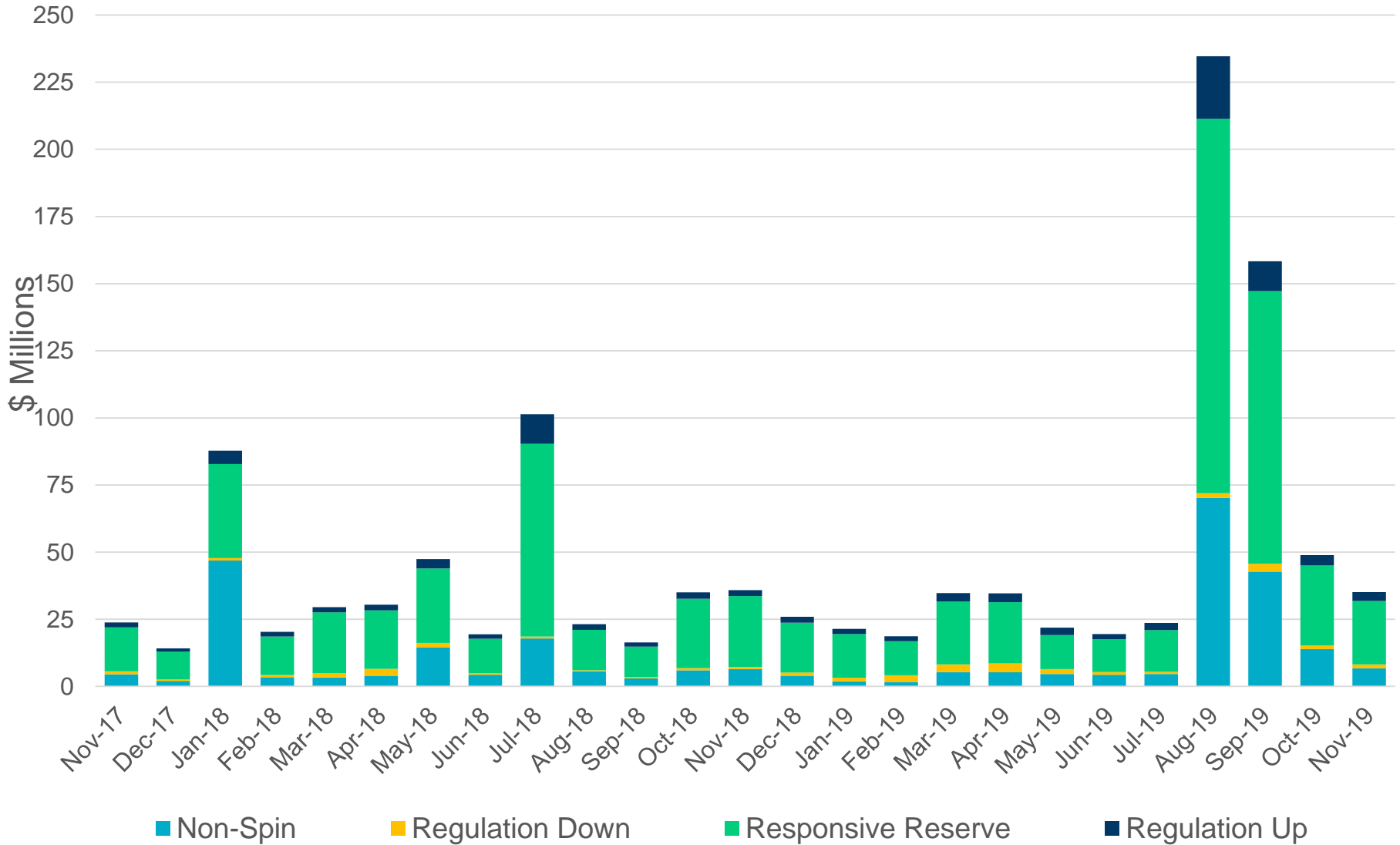
Day-Ahead and Real-Time Market Price Differences

The dotted lines represent the bounds for major outliers

*Averages are weighted by Real-Time Market Load

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

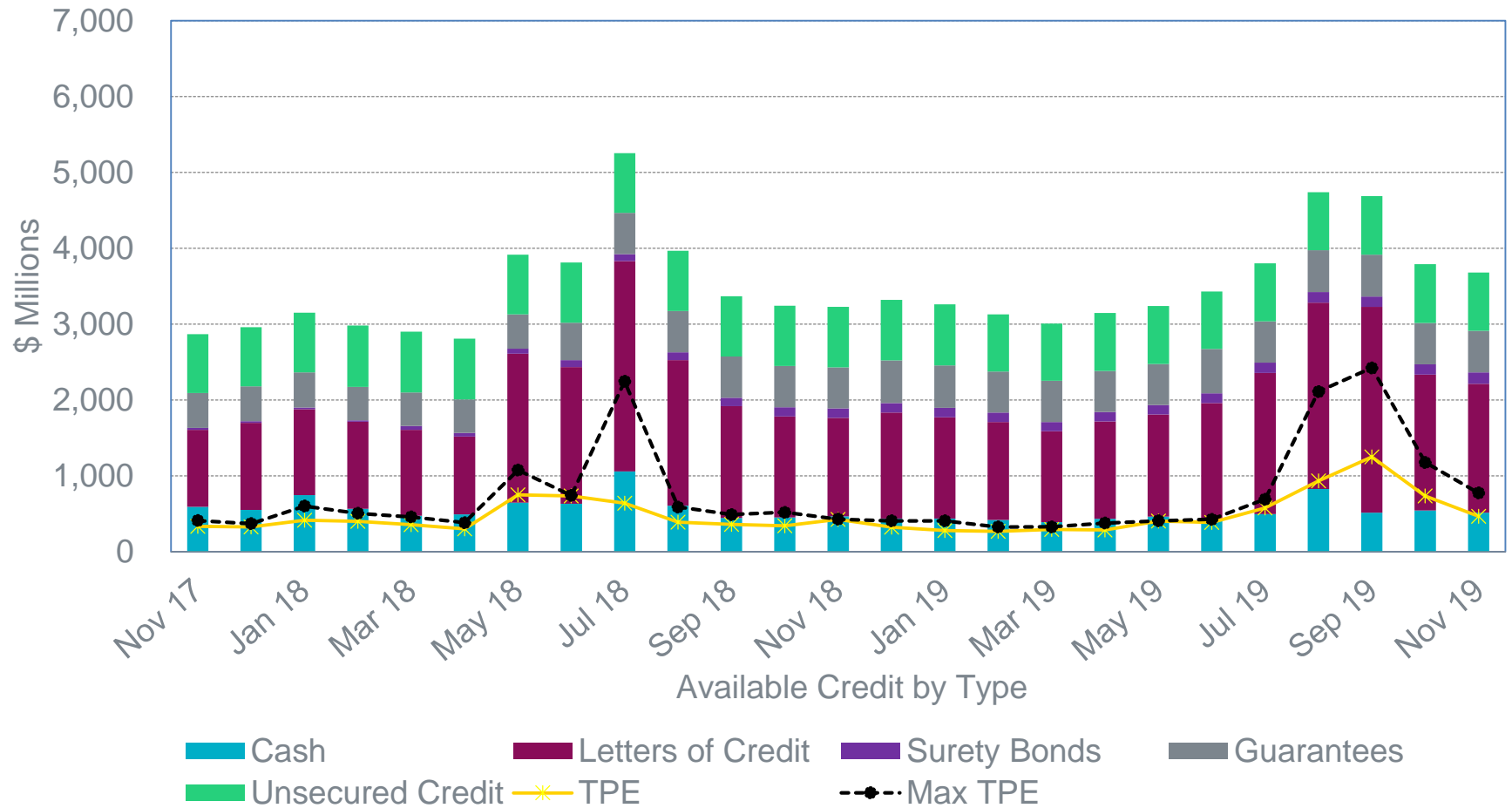The dotted lines represent the bounds for major outliers
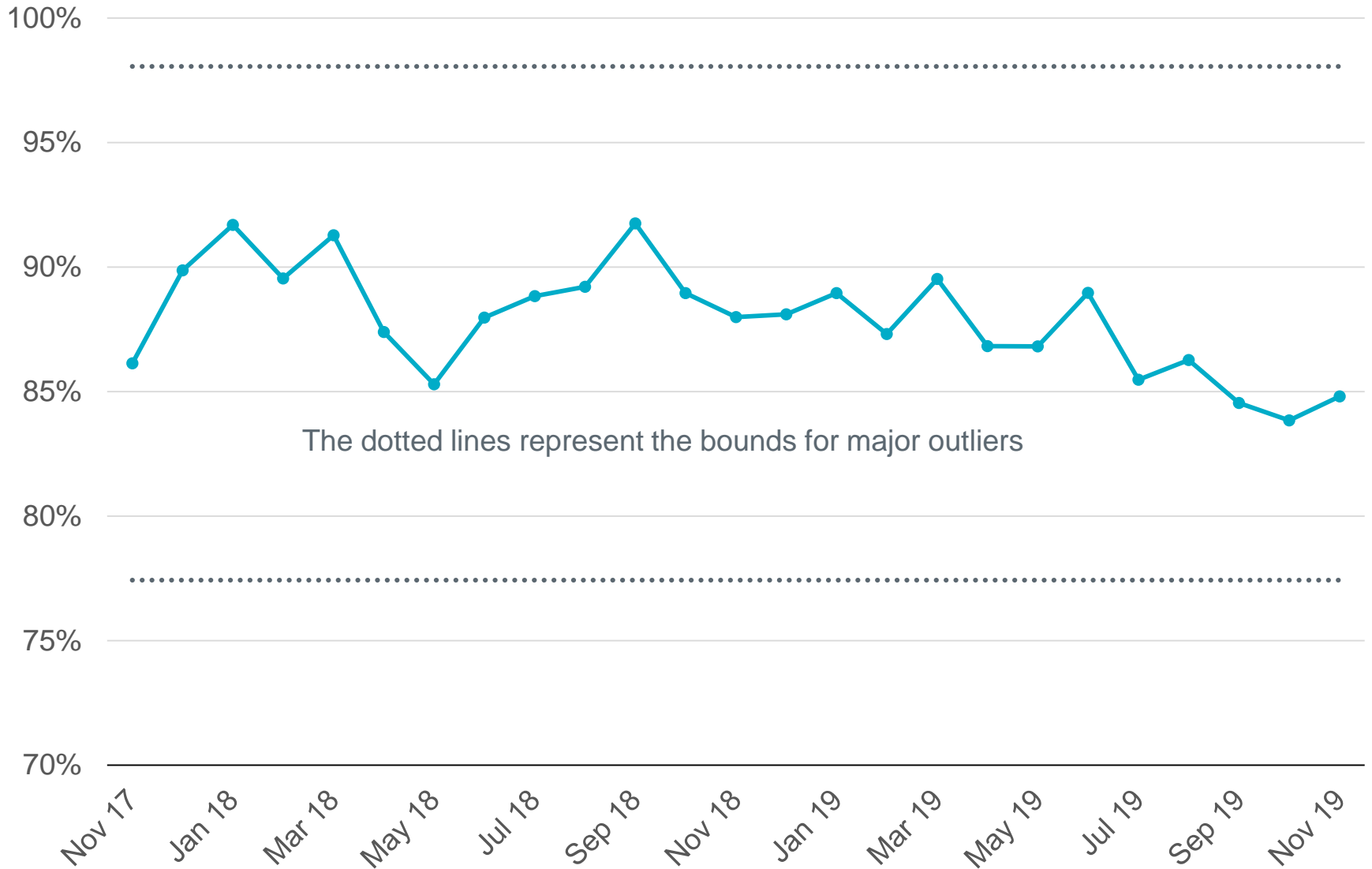
CRR Value and Cost Differences

The CRR Balancing Account was fully funded and excess amounts were allocated to Load
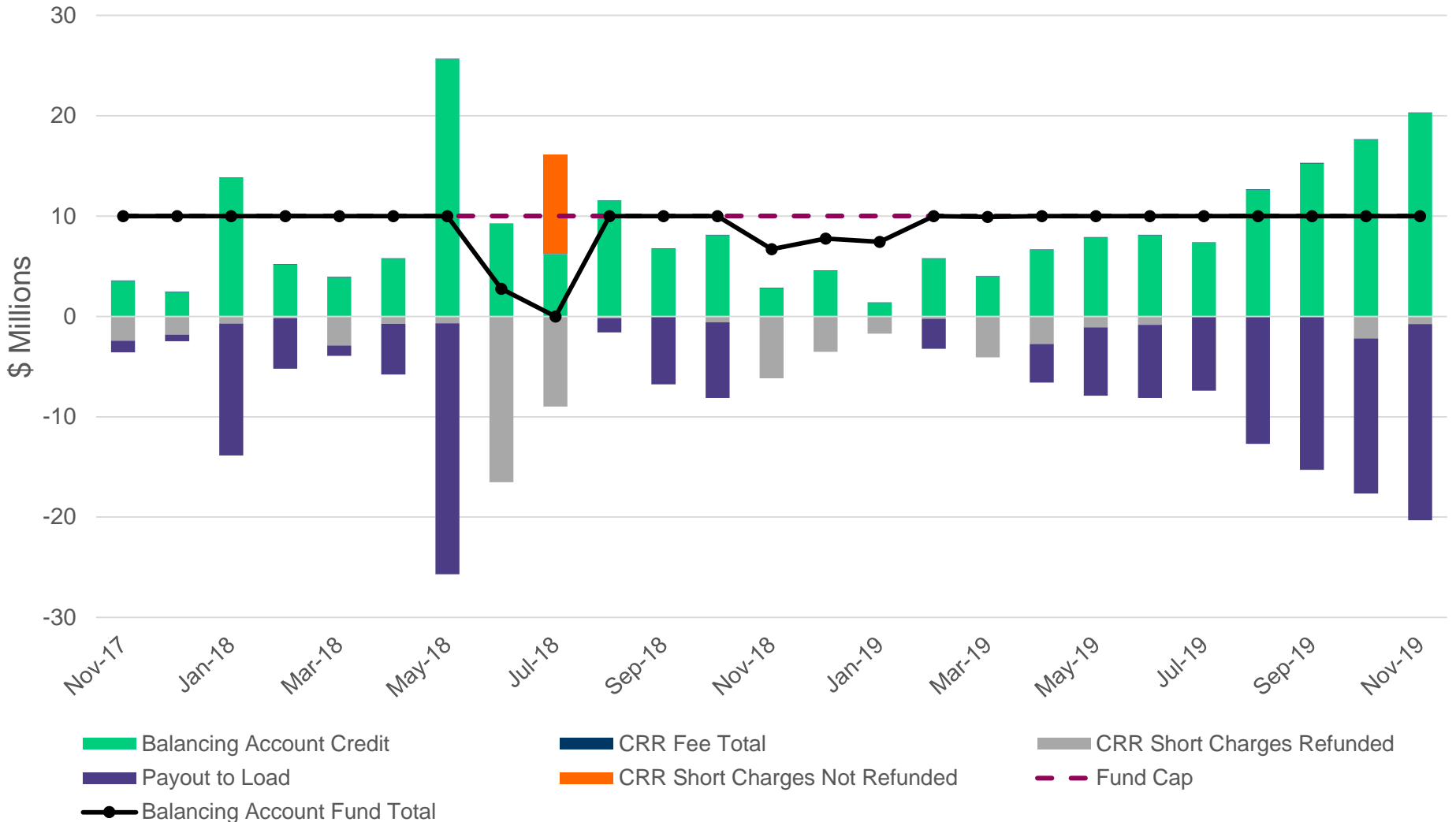
Available Credit by Type Compared to Total Potential Exposure (TPE)

Available Credit by Type

Legend: Cash, Letters of Credit, Surety Bonds, Guarantees, Unsecured Credit, TPE, Max TPE

*Numbers are as of month end except for Max TPE

Retail Transaction Volumes – Summary – November 2019

Transaction Type	Year-To-Date		Transactions Received	
	November 2019	November 2018	November 2019	November 2018
Switches	1,248,284	1,149,282	69,866	185,003
Acquisition	0	0	0	0
Move - Ins	2,733,451	2,644,489	210,793	213,210
Move - Outs	1,272,009	1,269,829	100,078	99,302
Continuous Service Agreements (CSA)	795,208	591,253	26,453	46,093
Mass Transitions	0	9,034	0	0
Total	**6,048,952**	**5,663,887**	**407,190**	**543,608**