ERCOT Monthly Operational Overview
(September 2019)

ERCOT Public
October 15, 2019

Monthly Highlights

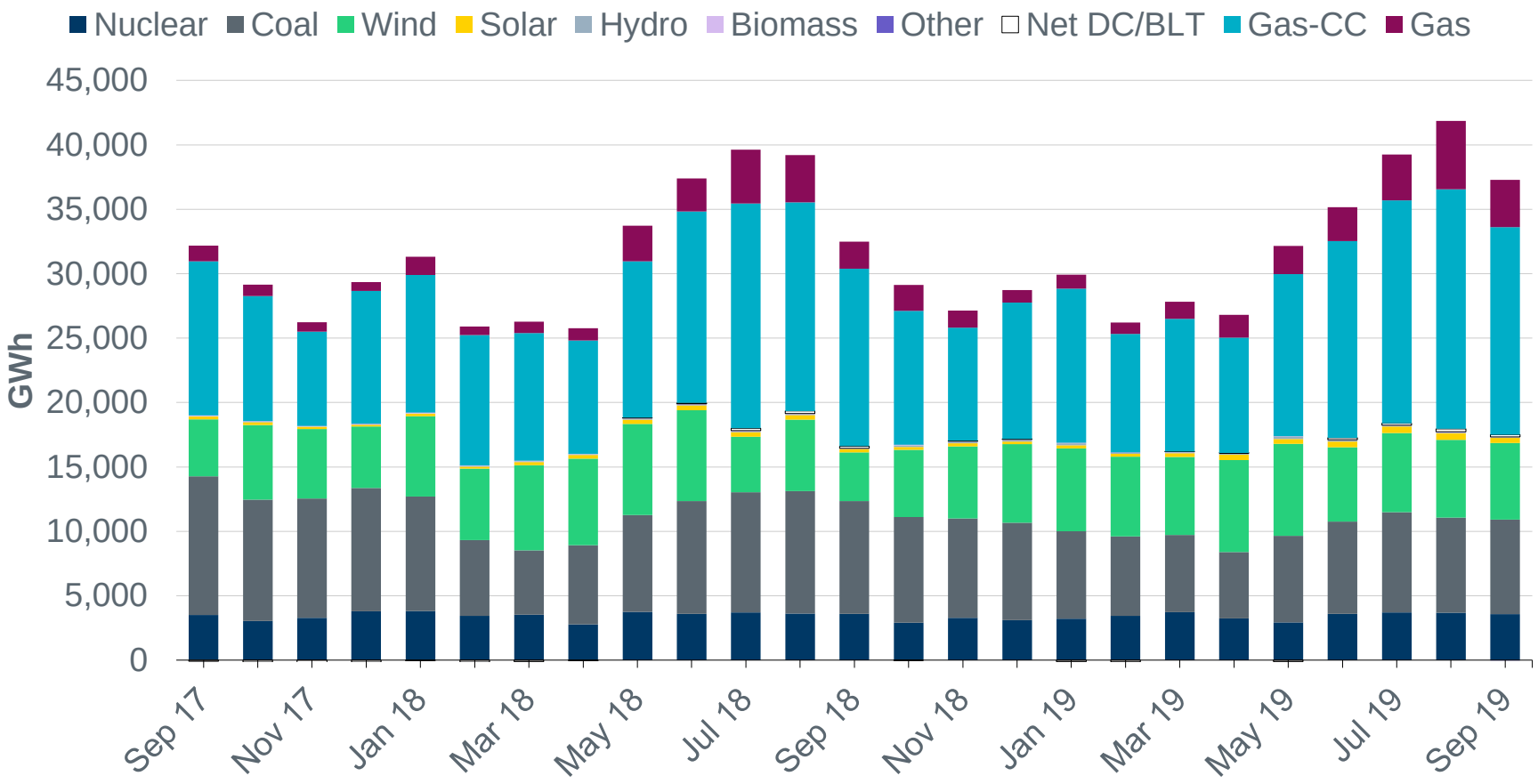
- ERCOT set a maximum peak demand of 68,959 MW* in September 2019, which is 4,329 MW more than the September 2018 demand of 64,630 MW.

- The amount of planned project capacity that was categorized as “Inactive” as of the end of September was 4,731 MW, up by 1,093 MW compared to August.

- ERCOT issued 19 notifications:
  - 13 OCNs total. 11 issued due to projected reserve capacity shortage. 2 issued for extreme hot weather.
  - 6 Advisories total. 4 issued due to Physical Responsive Capability (PRC) being below 3,000 MW. 2 issued due to postponement of the deadline for the posting of the DAM Solution.

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

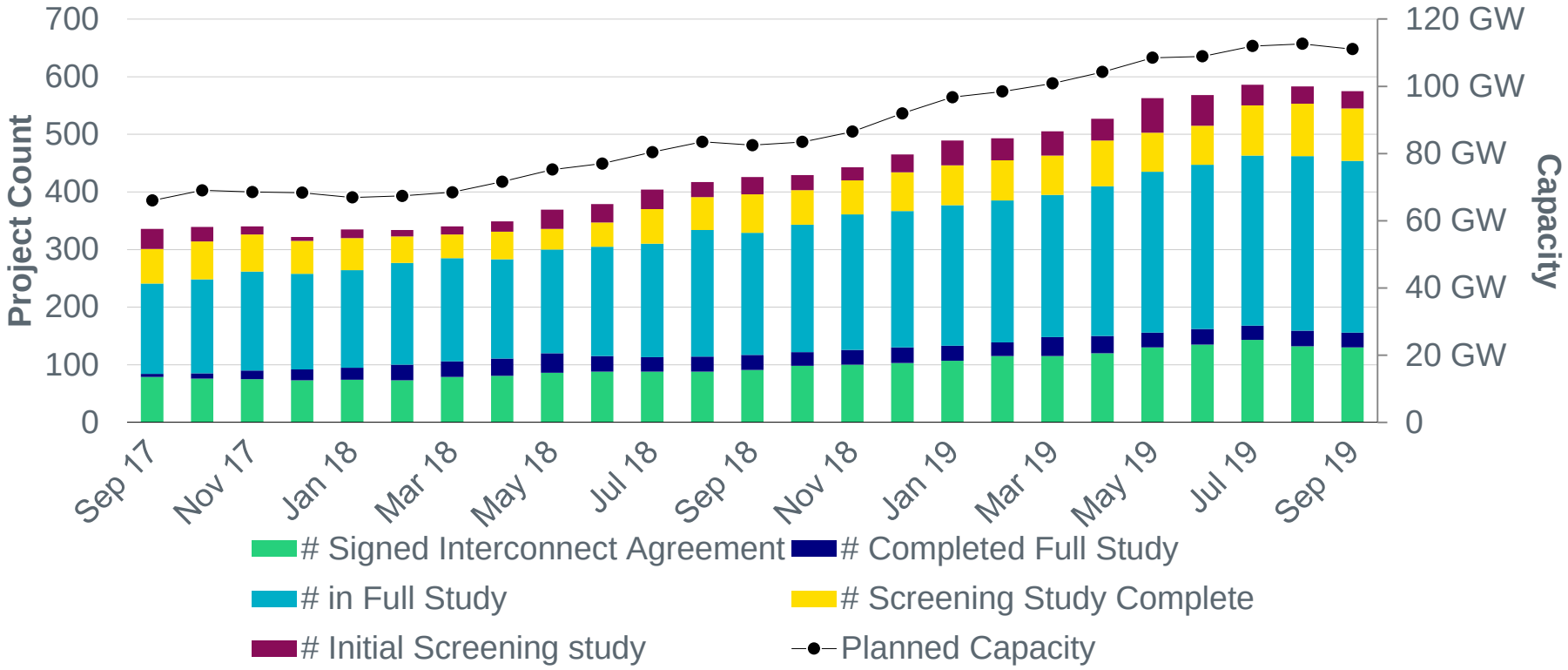
Monthly energy generation increased 15% year-over-year to 37,292 GWh in September 2019, compared to 32,481 GWh in September 2018



Data for latest two months are based on preliminary settlements.

Generation Interconnection activity by project phase

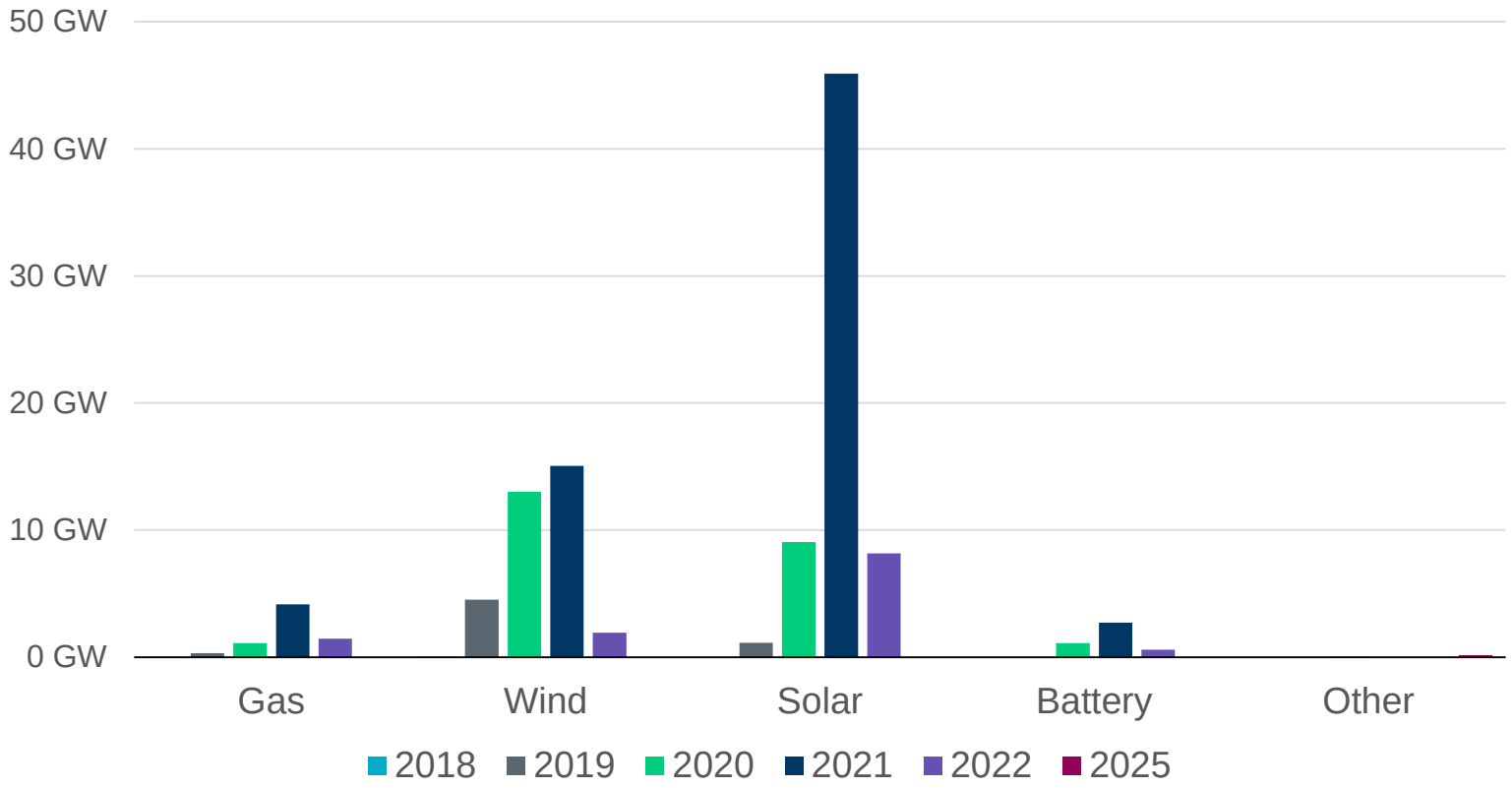
(excludes 4,731 MW of project capacity changed to Inactive during Aug and Sep due to PGRR066)



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 64 GW (58%), Wind 35 GW (31%), Gas 7 GW (7%), Battery 4 GW (4%) (excludes 4,731 MW of project capacity (wind 54%, gas 26%, solar 20%) changed to Inactive during Aug and Sep 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 575 active generation interconnection requests totaling 111,068 MW. This includes 64,344 MW of solar projects and 34,554 MW of wind projects as of September 30, 2019.

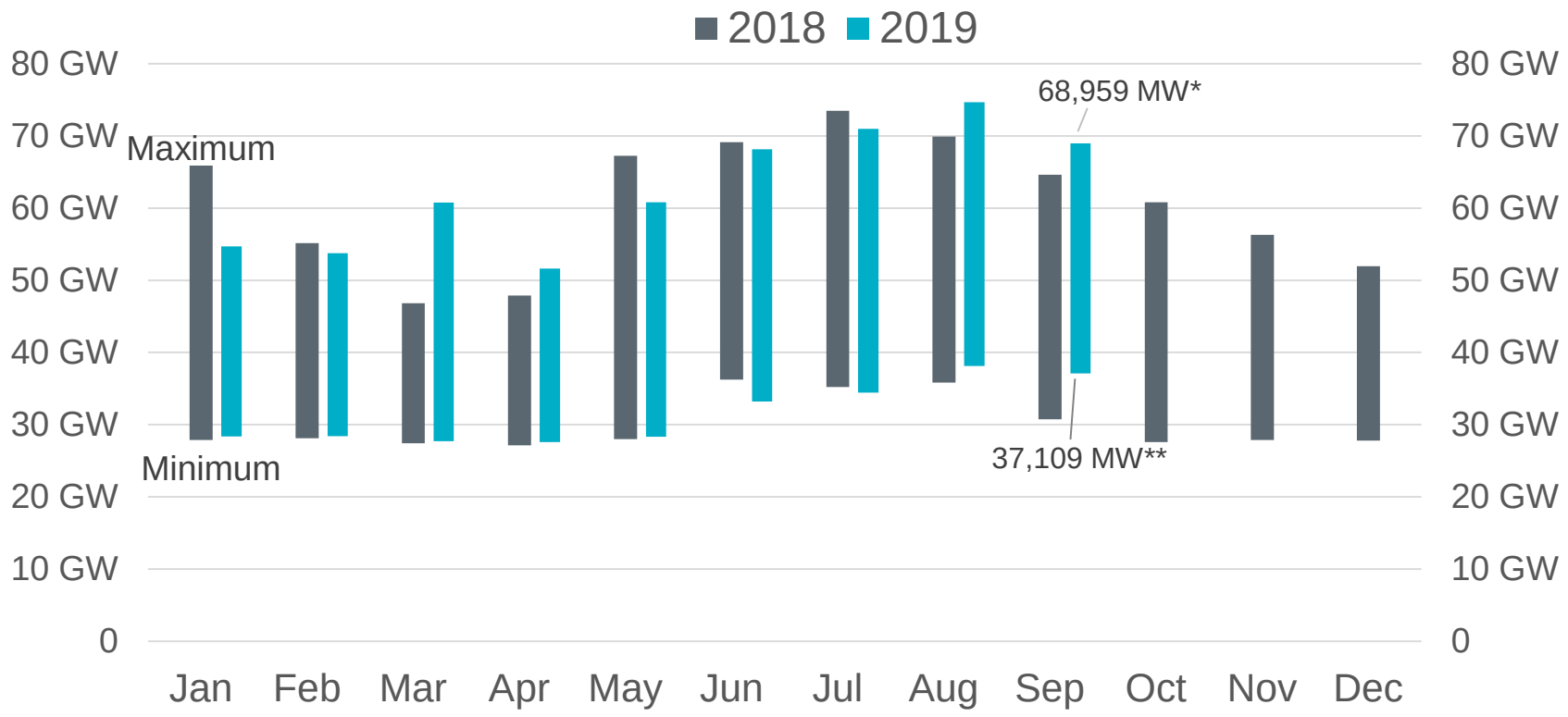
- ERCOT is currently reviewing proposed transmission improvements with a total estimated cost of $1,003.8 Million as of September 30, 2019.

- Transmission Projects endorsed in 2019 total $416.3 Million as of September 30, 2019.

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

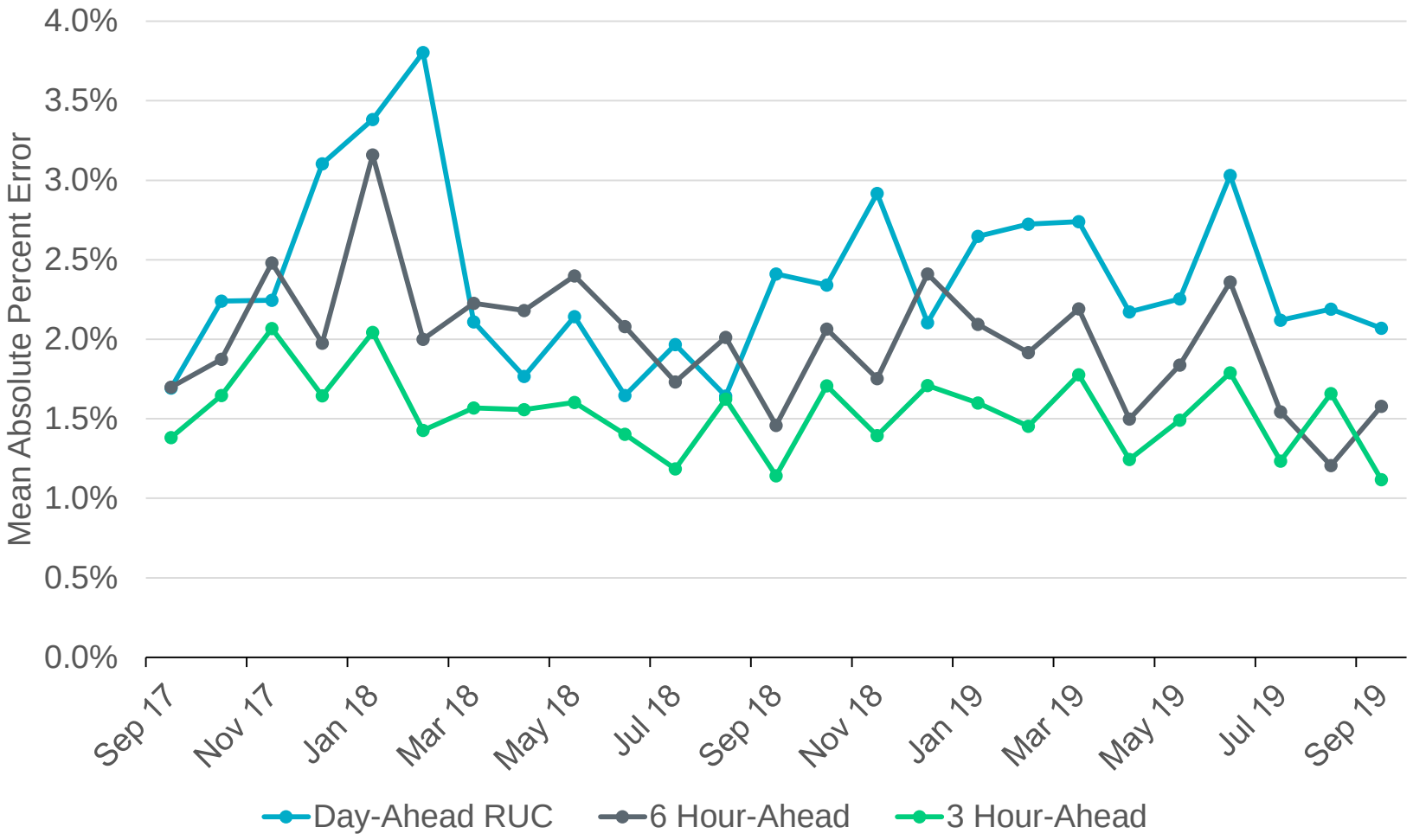
- Transmission Projects energized in 2019 total about $1.30 Billion as of October 1, 2019.

ERCOT set a maximum peak demand of 68,959 MW* in September 2019, that is 4,329 MW more than the September 2018 demand of 64,630 MW.



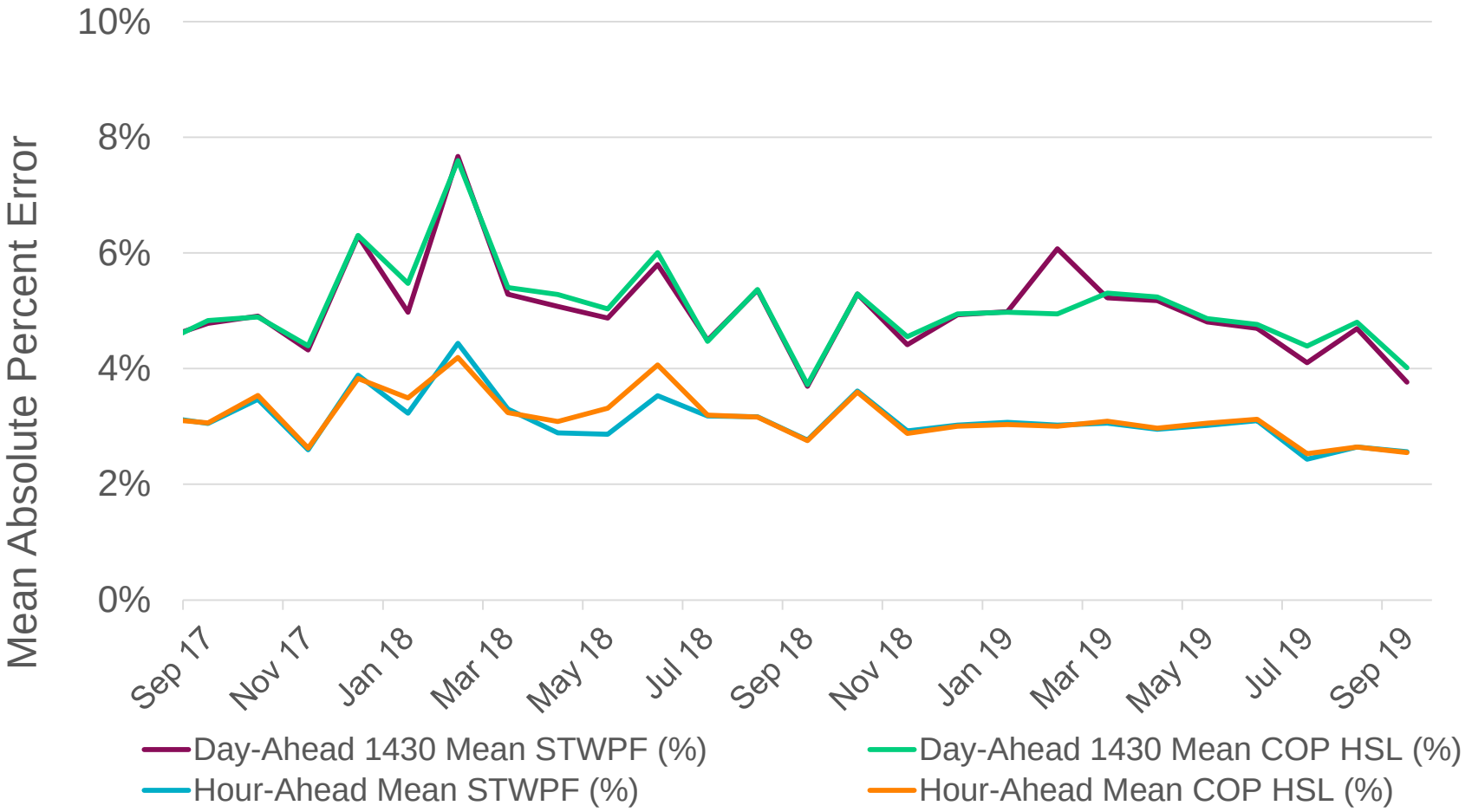
*Value based on net system hourly data from October release of Demand and Energy 2019 report.
**Value based on 15-minute metered data from October release of Demand and Energy 2019 report.
Data for latest two months are based on preliminary settlements.

Mid-Term Load Forecast Performance



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

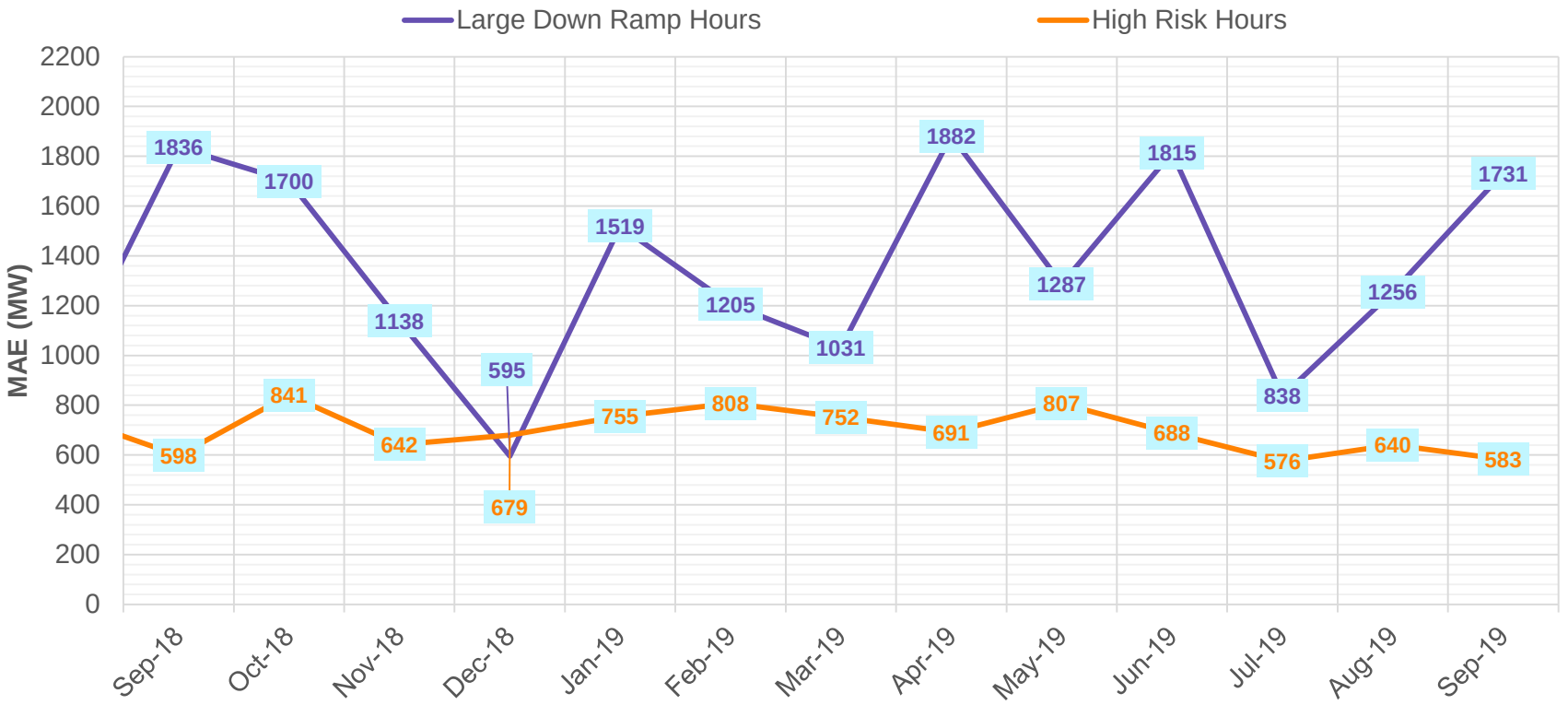
Wind Forecast Performance



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

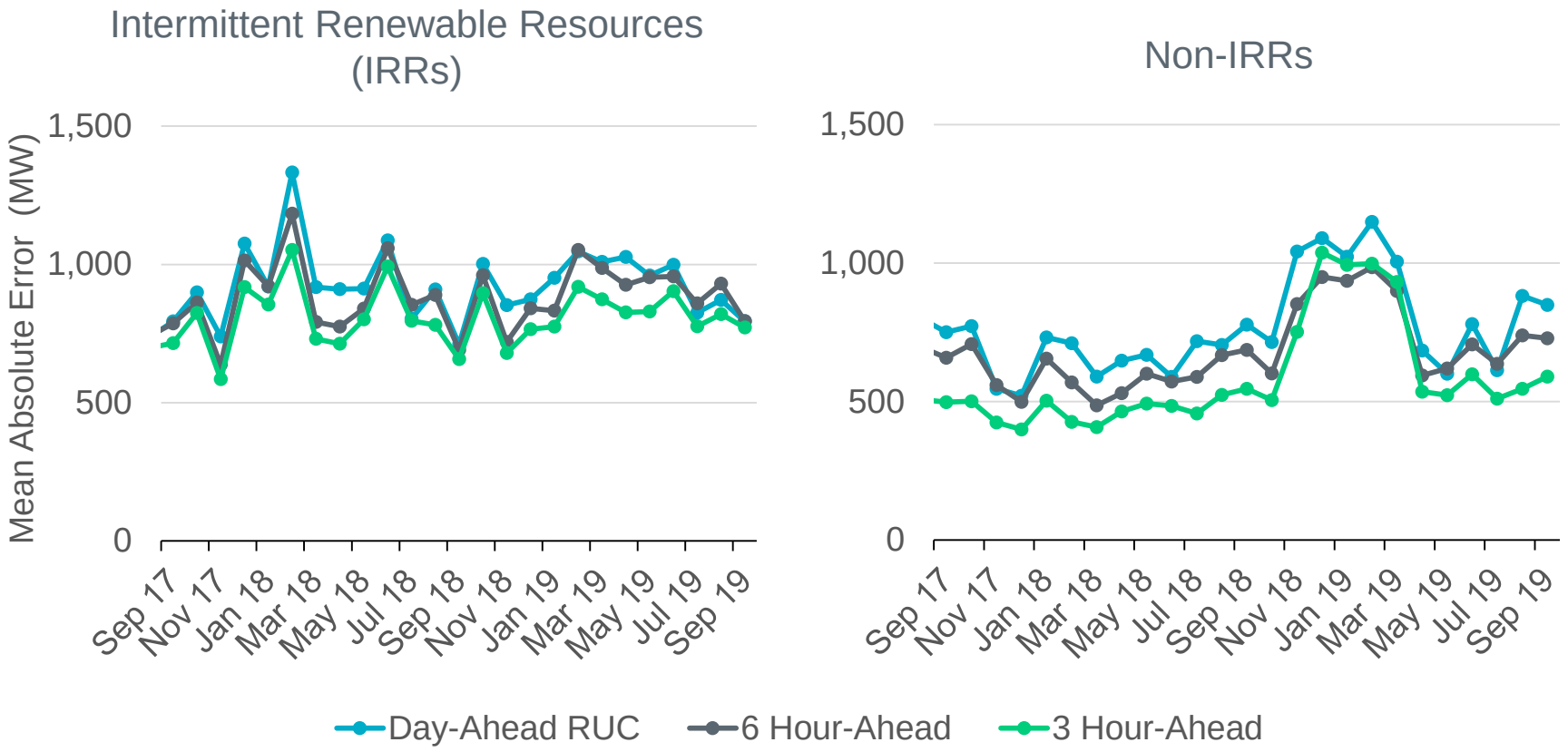
Hour-Ahead Mean Absolute Error (MAE) During Large Down Ramp (> 2000 MW) and High Risk Hours*



**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.*

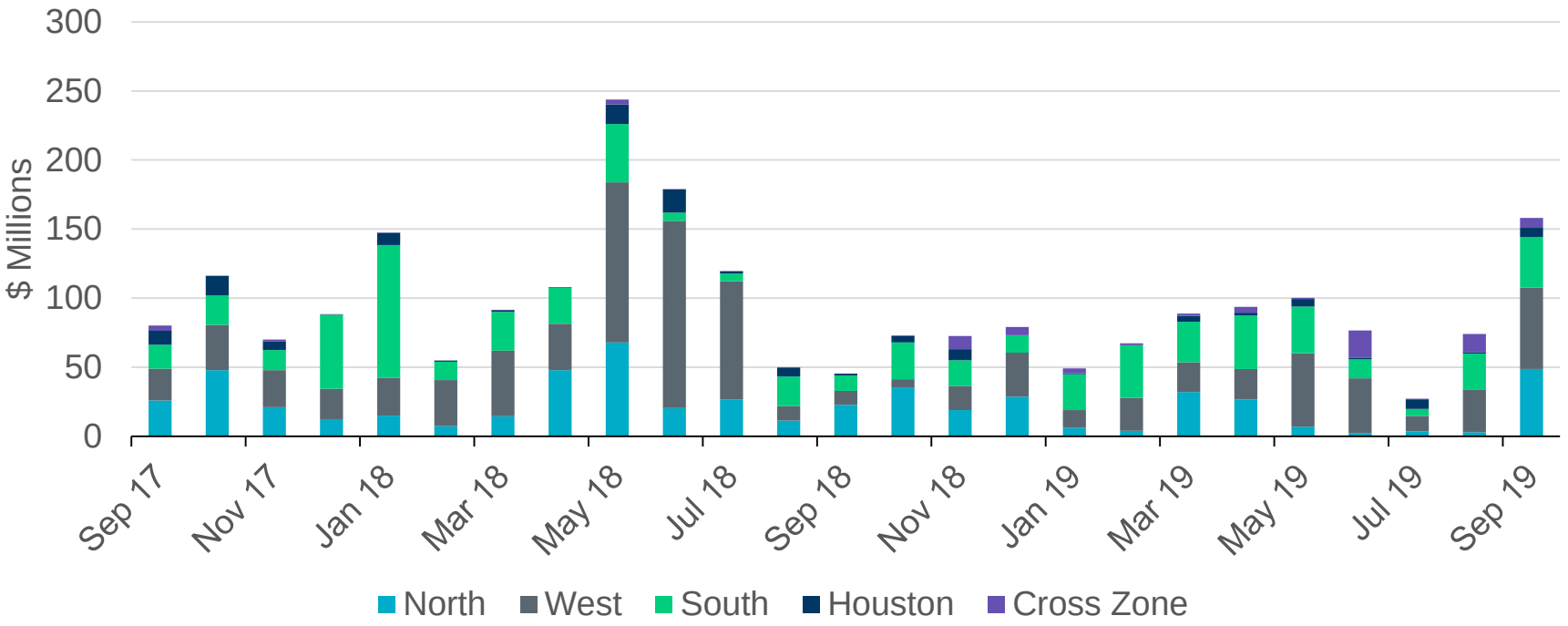
Forecast performance during large down ramp (wind ramp > 2000 MW) hours and high risk hours (historic risk of load ramping up and wind ramping down is high) is focused upon. Note that for the purposes of forecast performance measurement every hour in a month is classified as either a large down ramp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



- 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 25,060 MW (as of September 30, 2019).

Real-Time Congestion Rent by Zone

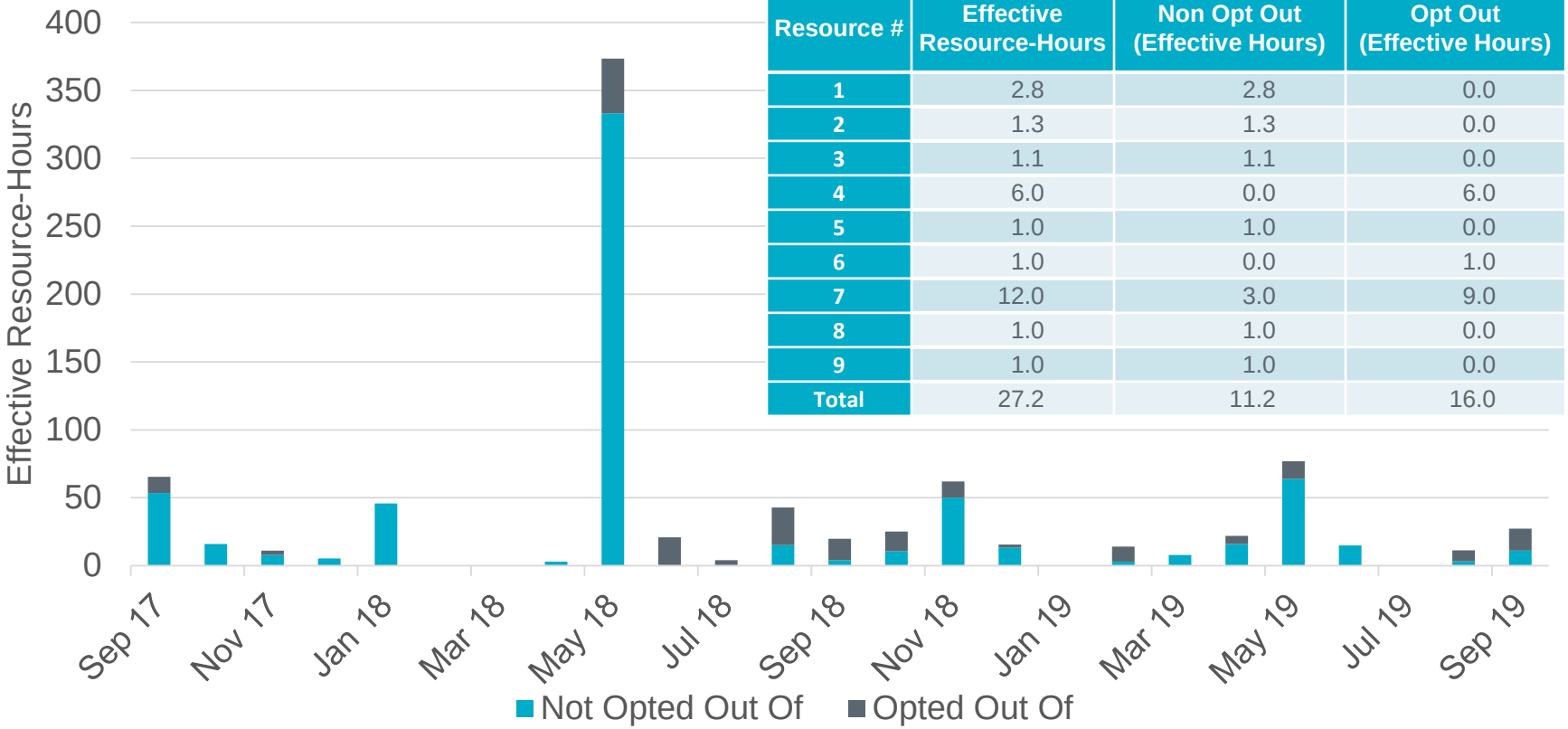


- The congestion rent in the North, West, and South Zones increased significantly in September compared to August, in part due to planned transmission outages. The most significant constraints are listed below.

  North - DHCKSAG8: 6265__A and DNAVWTR5: 530__C
  West - SECNMO28: 6100__G and BASE CASE: PNHNDL
  South - SWHIBUT8: 372T359_1

- 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.

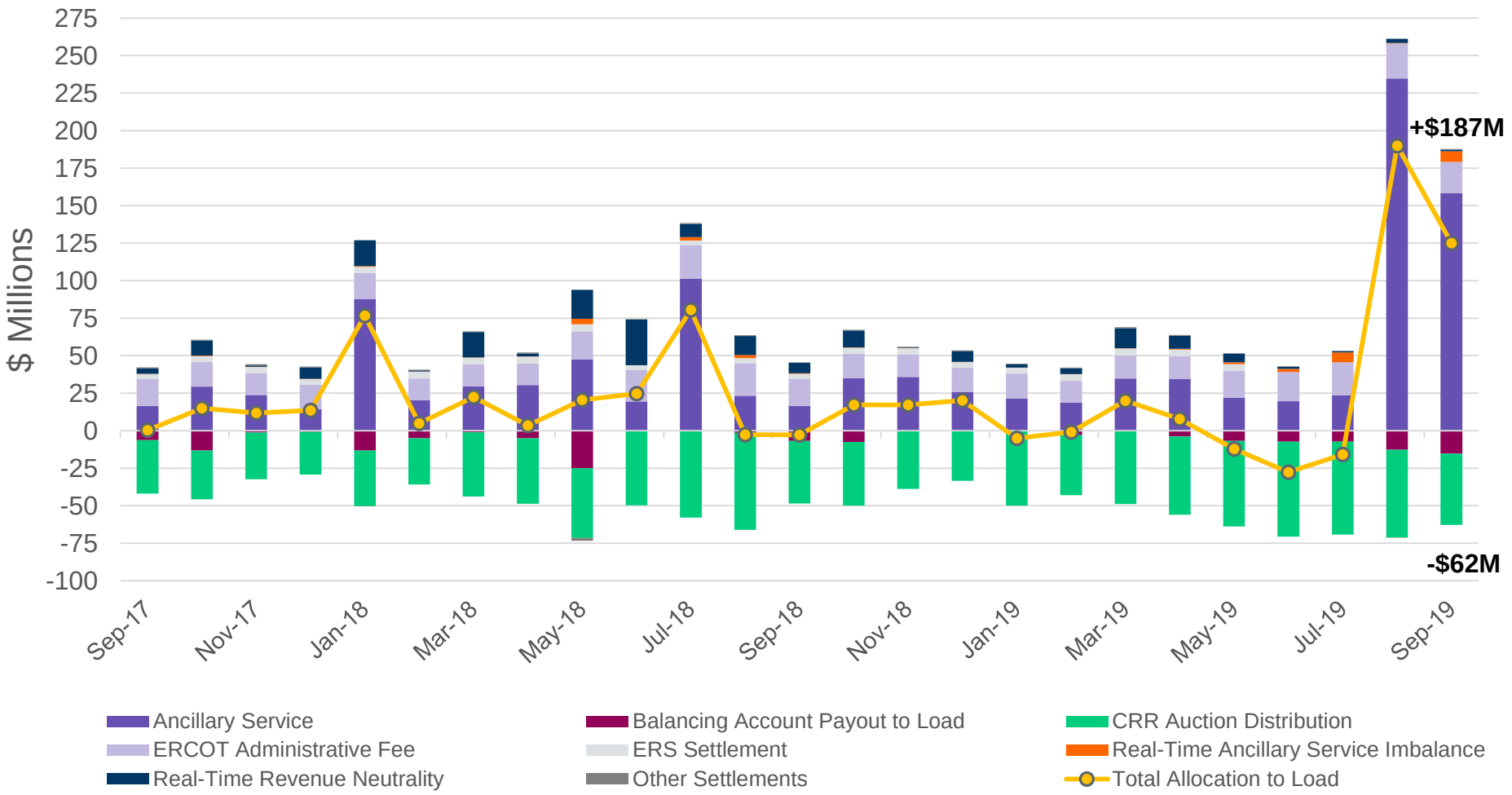
Nine Resources Committed in September for Congestion and Capacity



Resource #	Effective Resource-Hours	Non Opt Out (Effective Hours)	Opt Out (Effective Hours)
1	2.8	2.8	0.0
2	1.3	1.3	0.0
3	1.1	1.1	0.0
4	6.0	0.0	6.0
5	1.0	1.0	0.0
6	1.0	0.0	1.0
7	12.0	3.0	9.0
8	1.0	1.0	0.0
9	1.0	1.0	0.0
Total	27.2	11.2	16.0

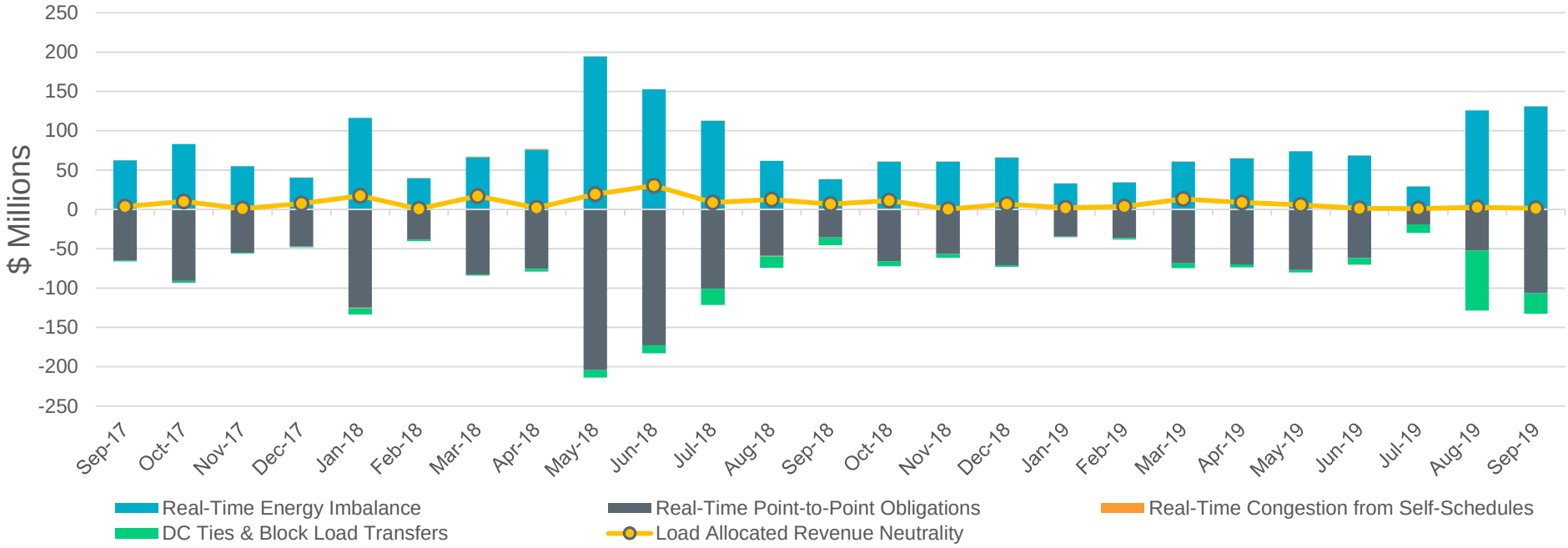
- 14.2 effective Resource-hours were for capacity and 13 effective Resource-hours were for congestion.
- “Effective Resource-hours” excludes any period during a Reliability Unit Commitment hour when the RUC-committed Resource was starting up, shutting down, off-line, or otherwise not available for dispatch by SCED.

Net Allocation to Load in September 2019 was $125 Million



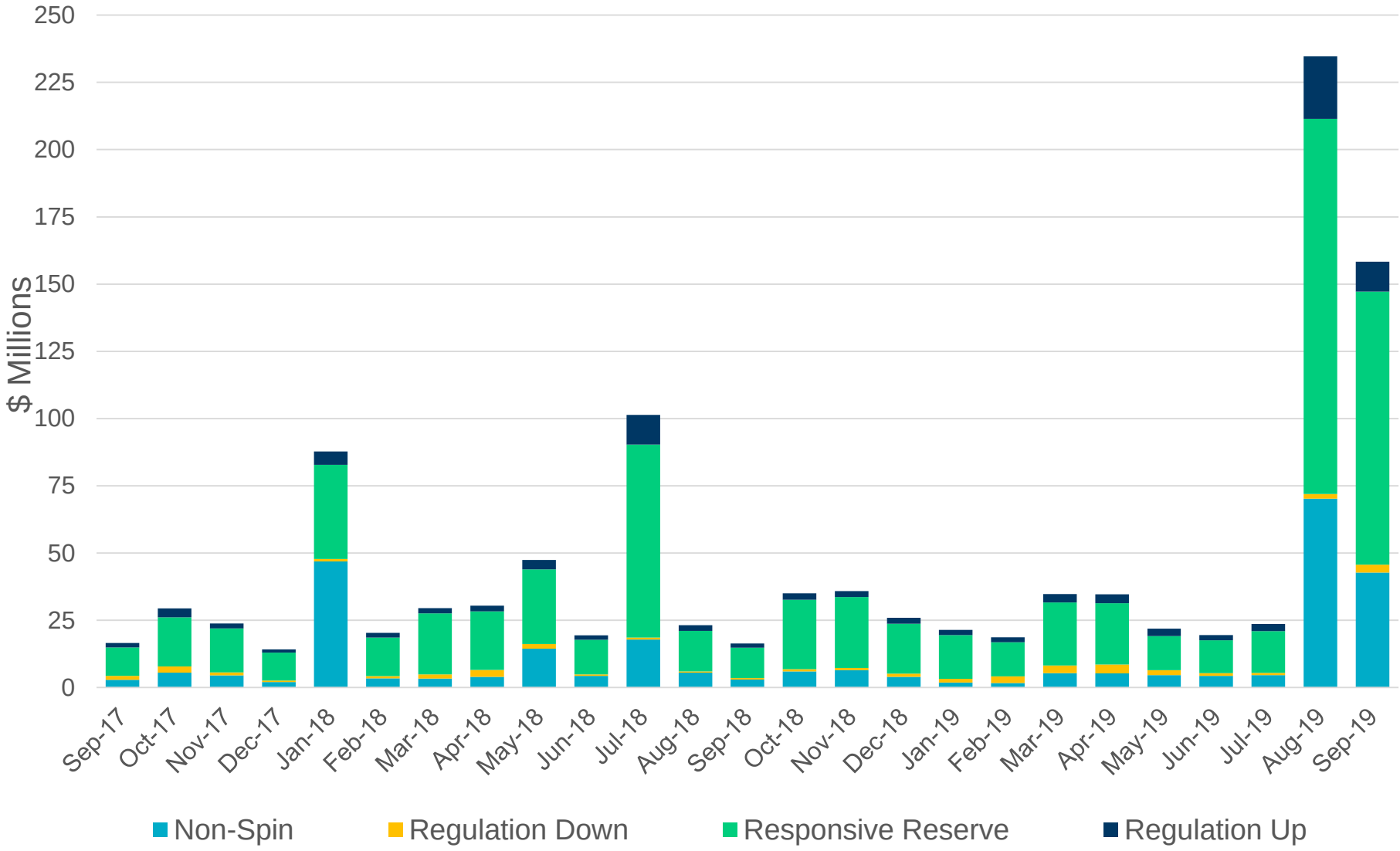
This information is available in tabular form in the Settlement Stability Report presented quarterly to the Market Settlement Working Group and Wholesale Market Subcommittee

Real-Time Revenue Neutrality Allocated to Load was $1.20M for September 2019

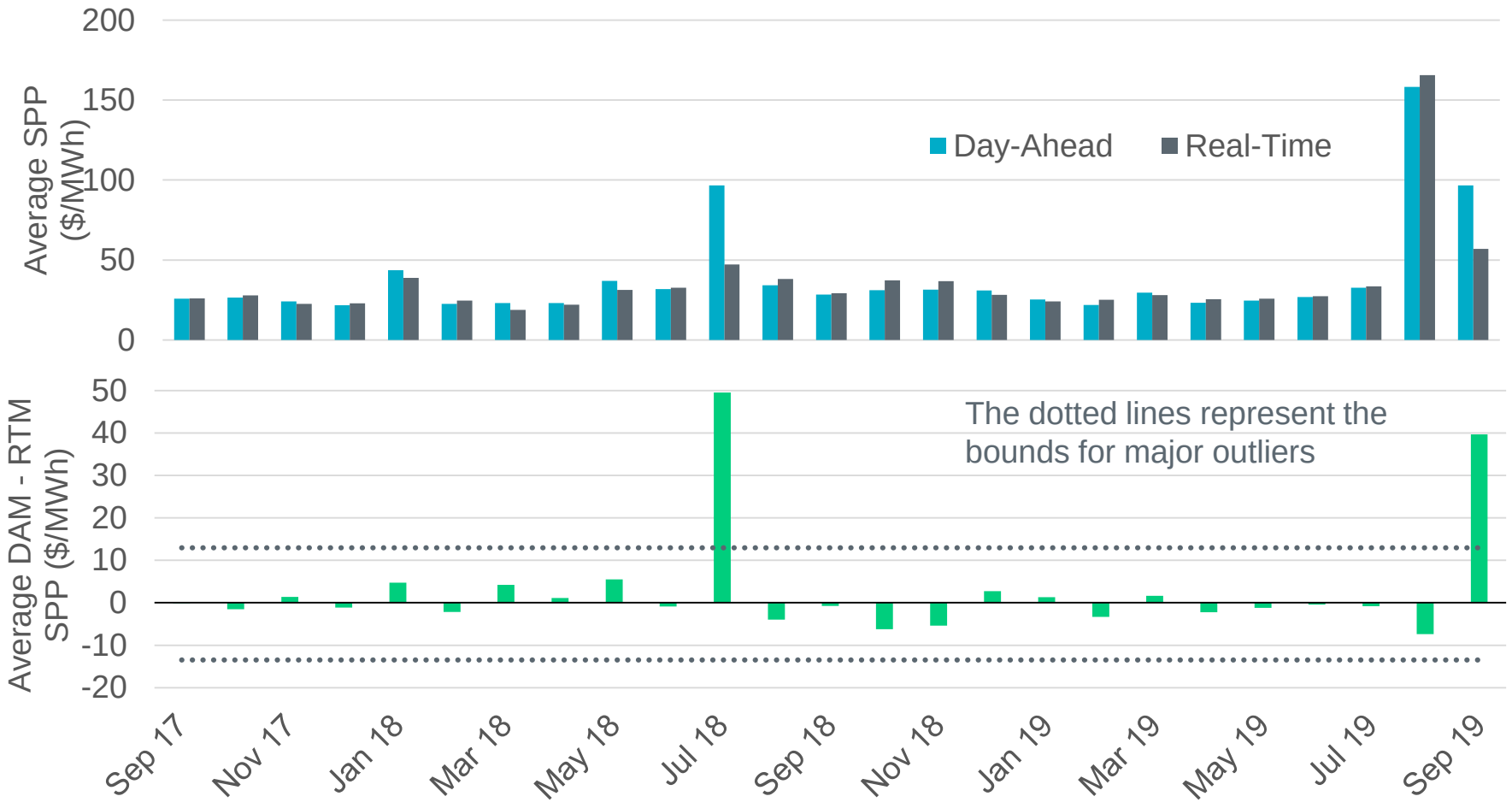


	September 2019 ($M)
Real-Time Energy Imbalance	$130.96
Real-Time Point-to-Point Obligation	($106.54)
Real-Time Congestion from Self-Schedules	$0.41
DC Tie & Block Load Transfer	($26.03)
Load Allocated Revenue Neutrality	**$1.20**

Ancillary Services for September 2019 totaled $158.3M



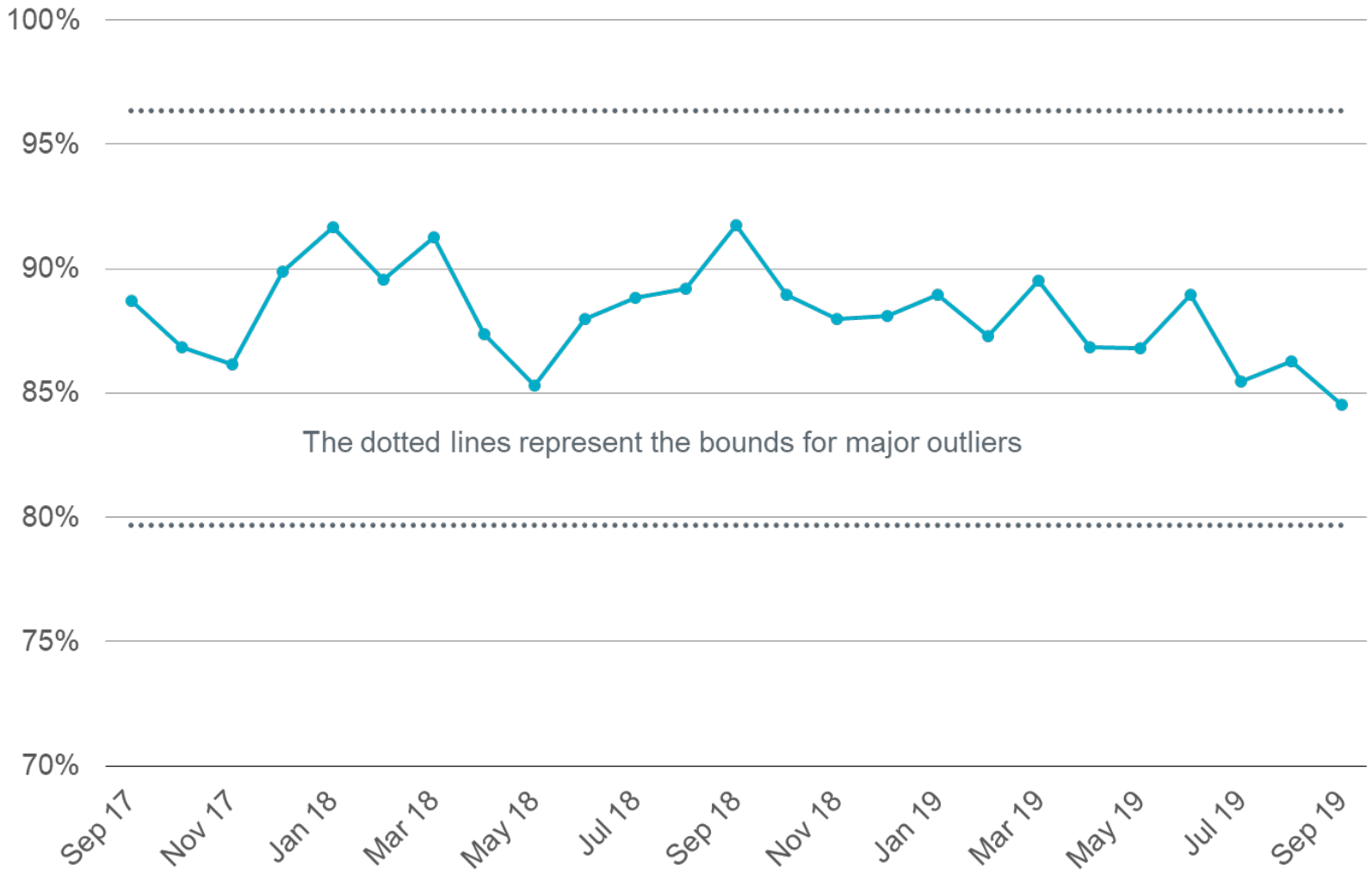
Day-Ahead and Real-Time Market Price Differences



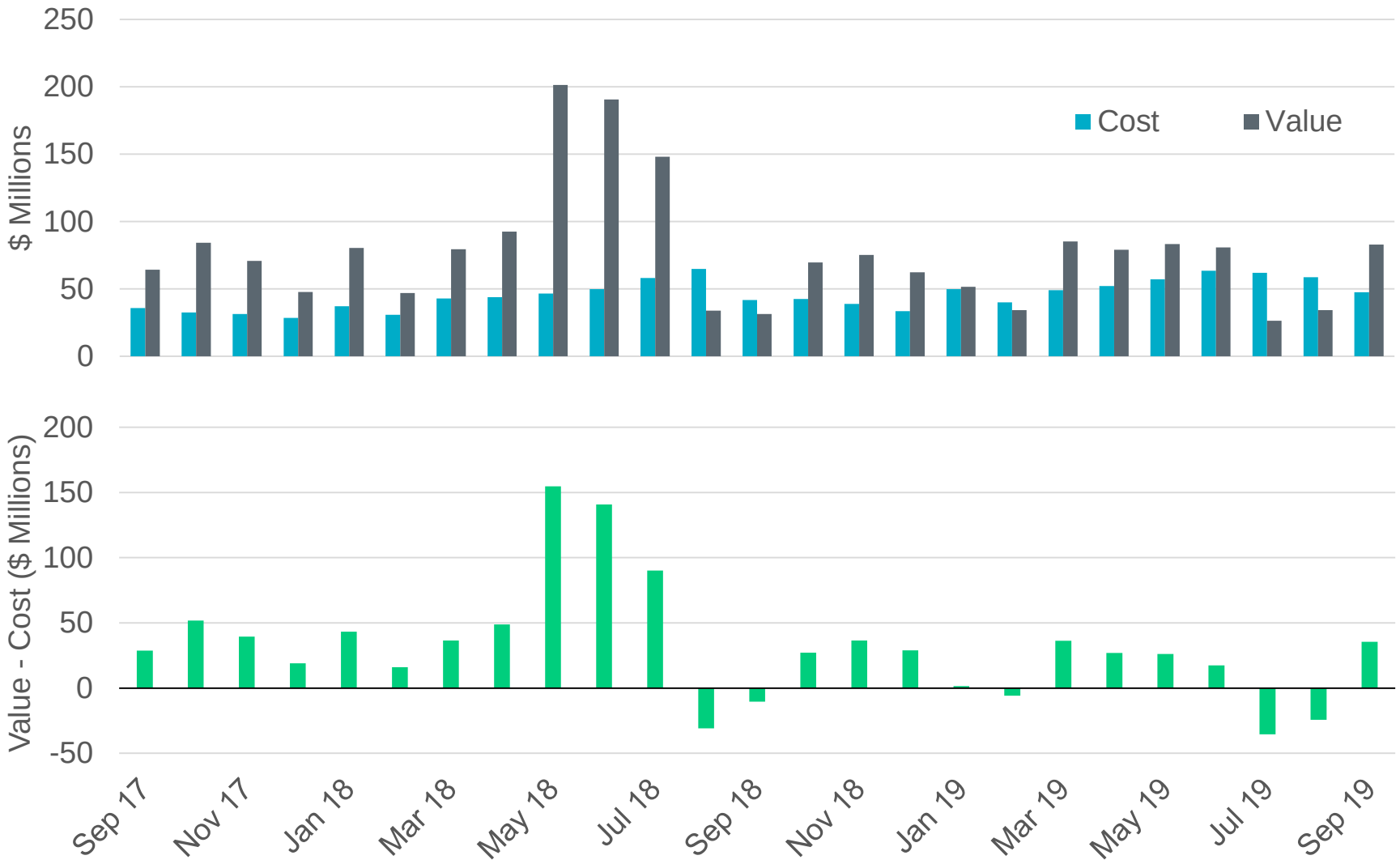
The DAM-RTM spread was largely driven by significant differences across peak hours for September 5th and 6th.

*Averages are weighted by Real-Time Market Load

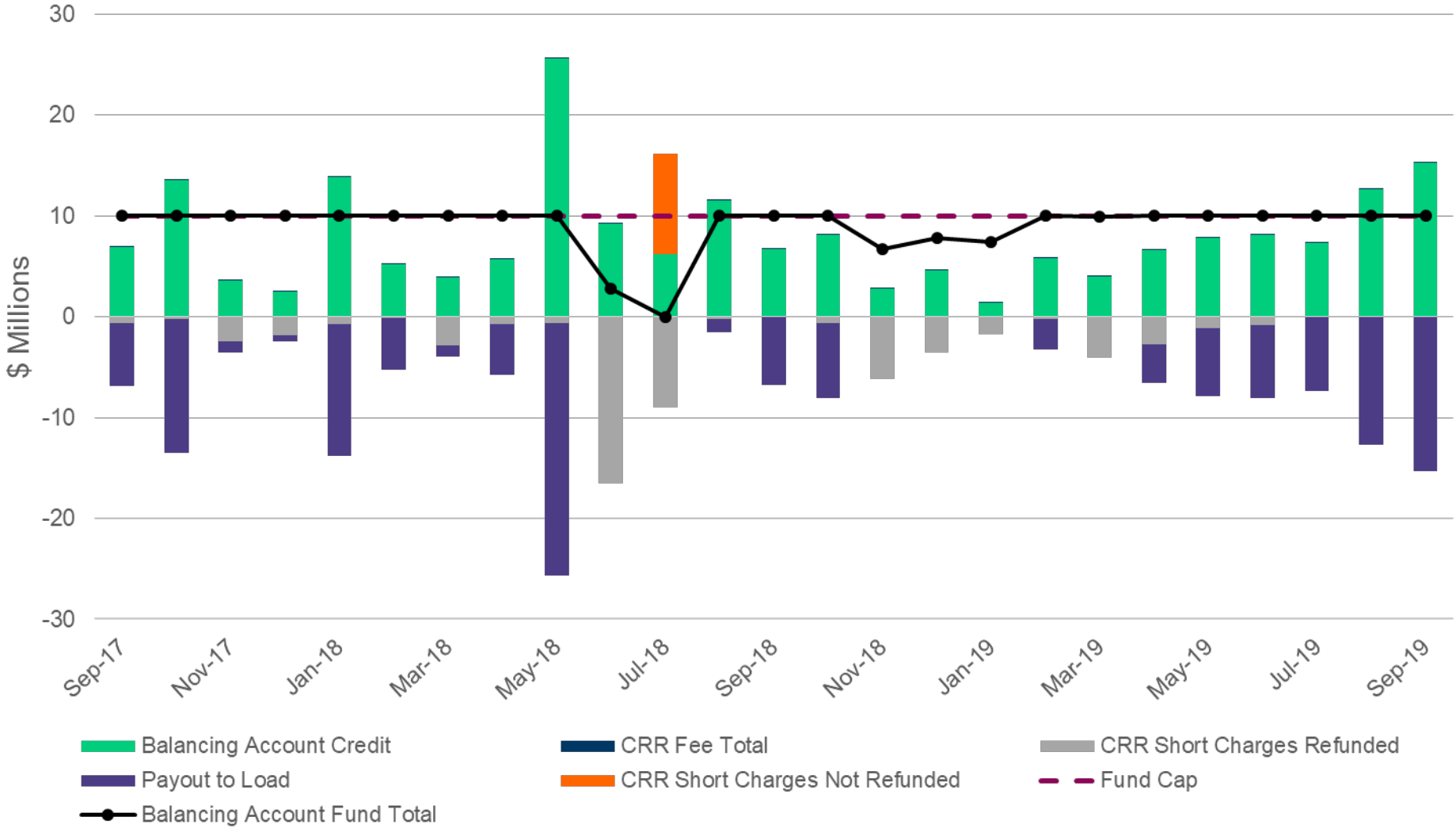
Percentage of Real-Time Load Transacted in the Day-Ahead Market



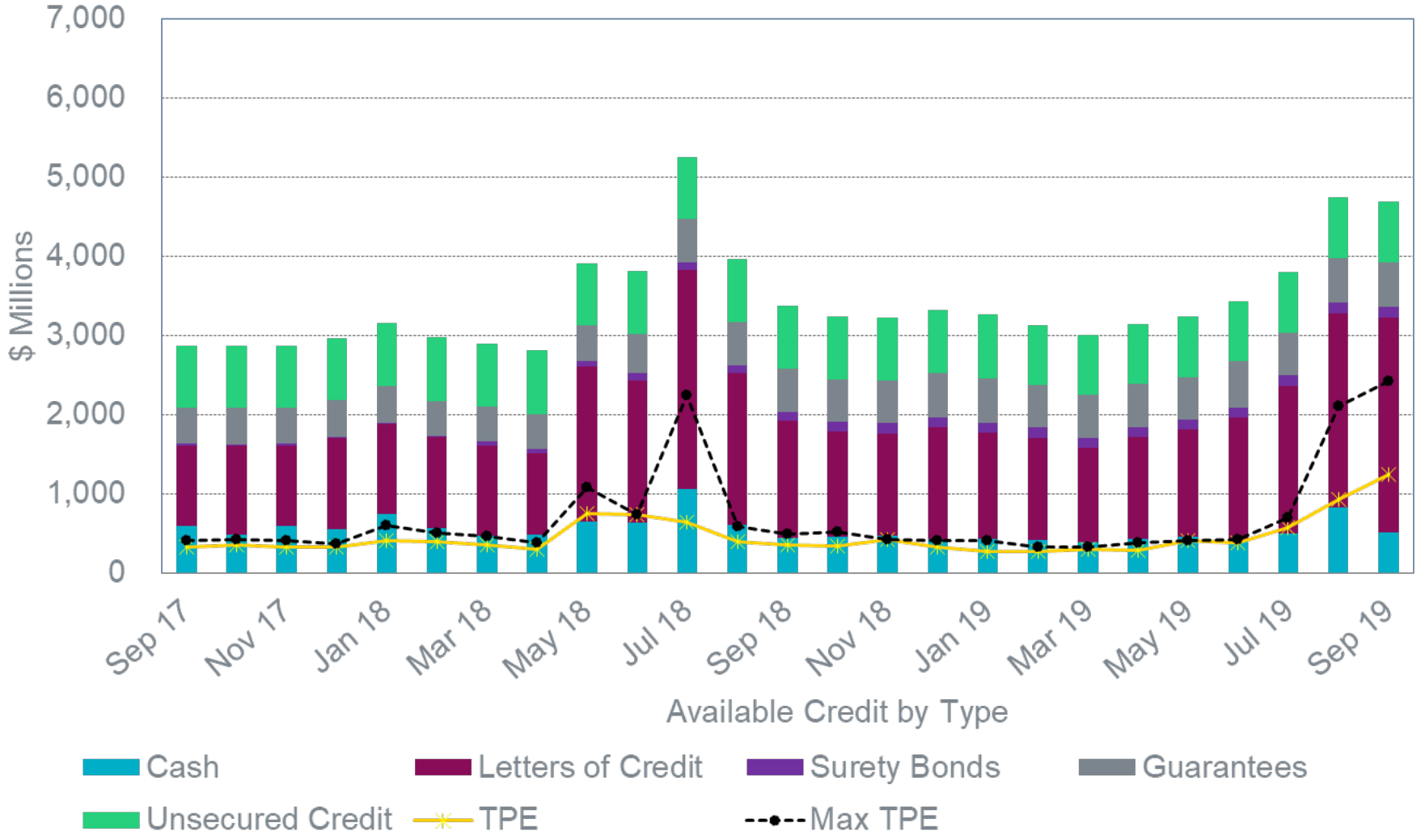
CRR Value and Cost Differences



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



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



*Numbers are as of month end except for Max TPE

Retail Transaction Volumes – Summary – September 2019

	Year-To-Date		Transactions Received	
Transaction Type	September 2019	September 2018	September 2019	September 2018
Switches	1,080,975	879,854	104,974	89,078
Acquisition	0	0	0	0
Move - Ins	2,262,996	2,185,607	257,060	230,635
Move - Outs	1,051,578	1,053,091	117,123	107,043
Continuous Service Agreements (CSA)	740,085	493,169	32,062	37,663
Mass Transitions	0	9,034	0	0
Total	5,135,634	4,620,755	511,219	464,419