



**ERCOT Monthly Operational Overview**  
(May 2017)

ERCOT Public  
June 15, 2017

# Grid Planning & Operations

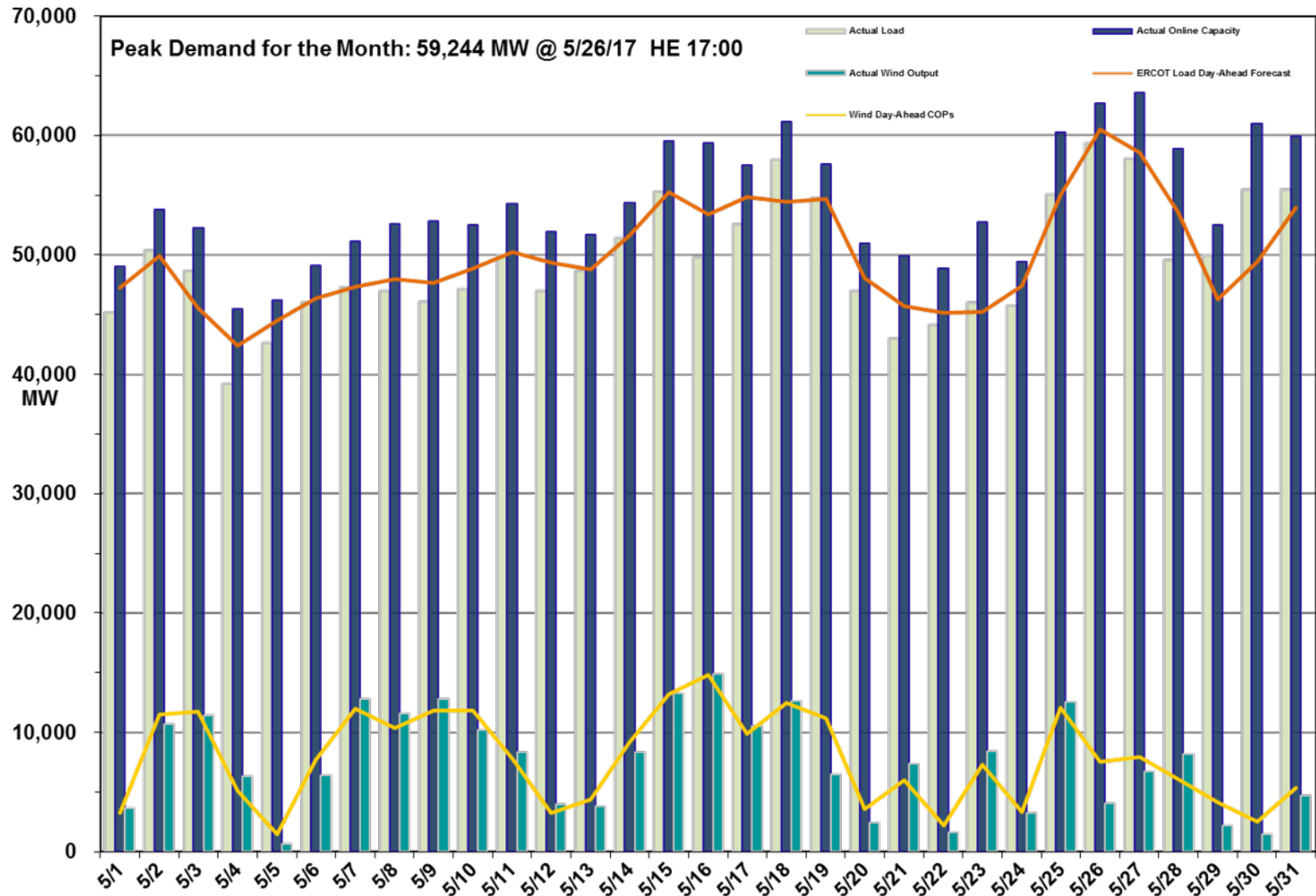
### Operations

- The preliminary Settlements hourly peak demand of 59,244\* MW on May 26 was lower than the day-ahead mid-term load forecast peak of 60,476 MW for the same operating hour.
  - The operational instantaneous peak demand was 59,521 MW (telemetry).
- Day-ahead load forecast error for May was 2.77%
- ERCOT issued 11 notifications:
  - Two Advisories issued due to Physical Responsive Capability being below 3000 MW
  - One Advisory issued due to K-7 Index Level Geomagnetic Disturbance Alert
  - One Advisory issued due to ERCOT's VSAT tool unavailable
  - One Advisory issued due to ERCOT's SE/RTCA unavailable
  - Four Watches issued for the de-rate of the Railroad DC Tie Transfer capability
  - One Watch issued for the DC\_S (Eagle Pass) Tie Tripped
  - One OCN issued for Capacity Insufficiency

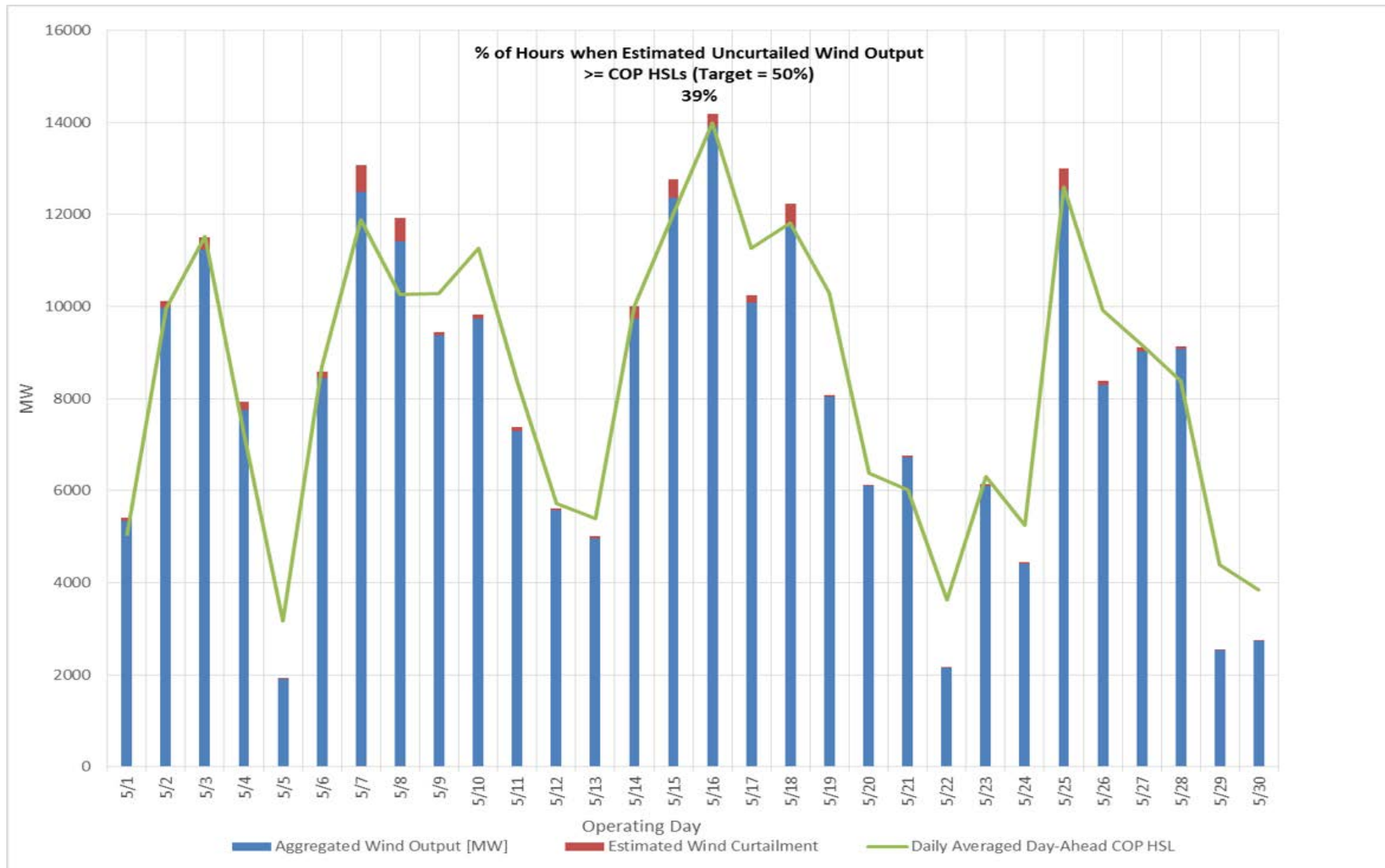
### Planning Activities

- 290 active generation interconnection requests totaling 64,371 MW, including 28,230 MW of wind generation, as of May 31, 2017. Six additional requests and an decrease of 469 MW from April 30, 2017.
- 19,079 MW wind capacity in commercial operations as of June 1, 2017.

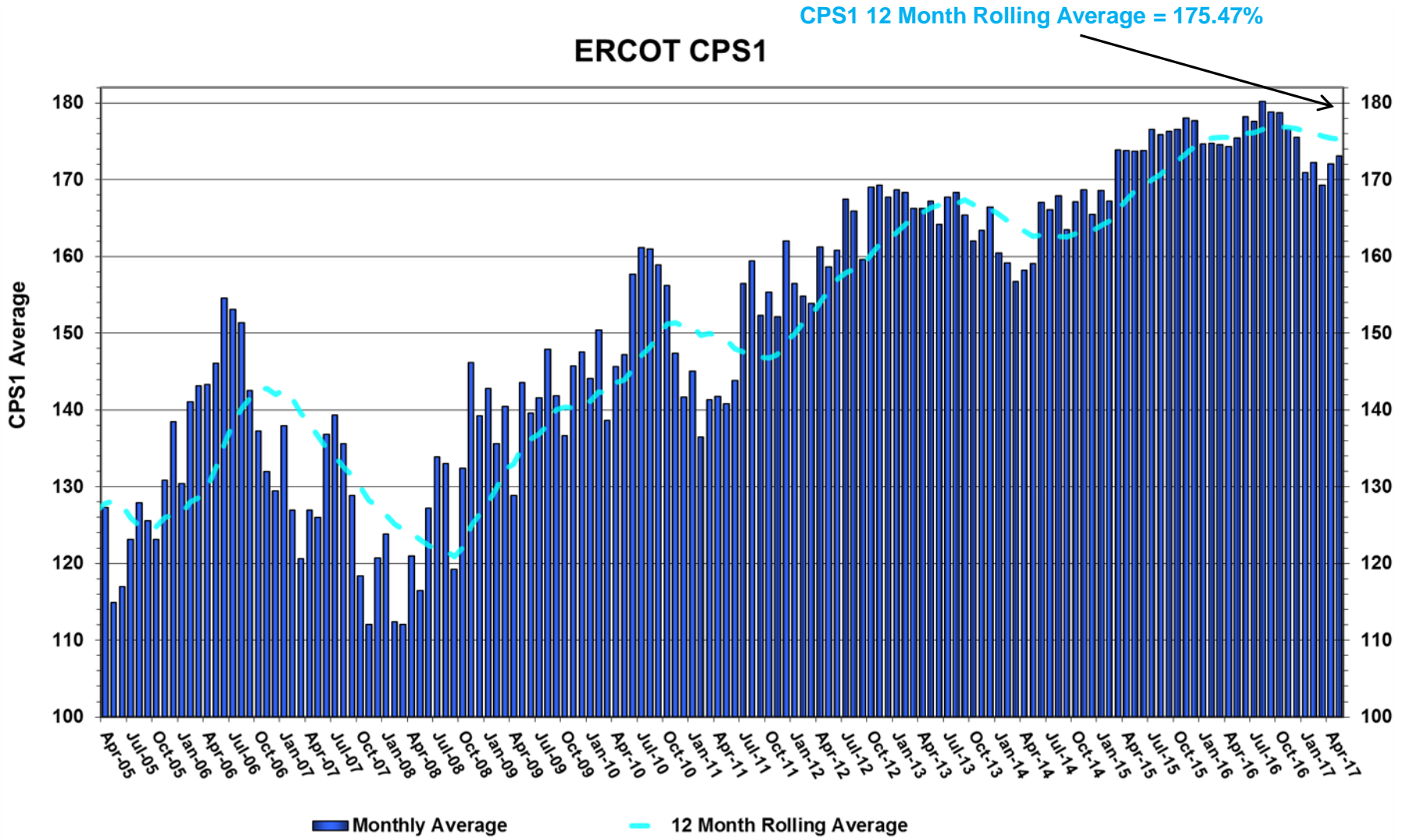
# Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs & On-Line Capacity at Peak – May 2017



# Actual Wind Output plus Curtailments vs. Wind Day-Ahead COPs for All Hours – May 2017

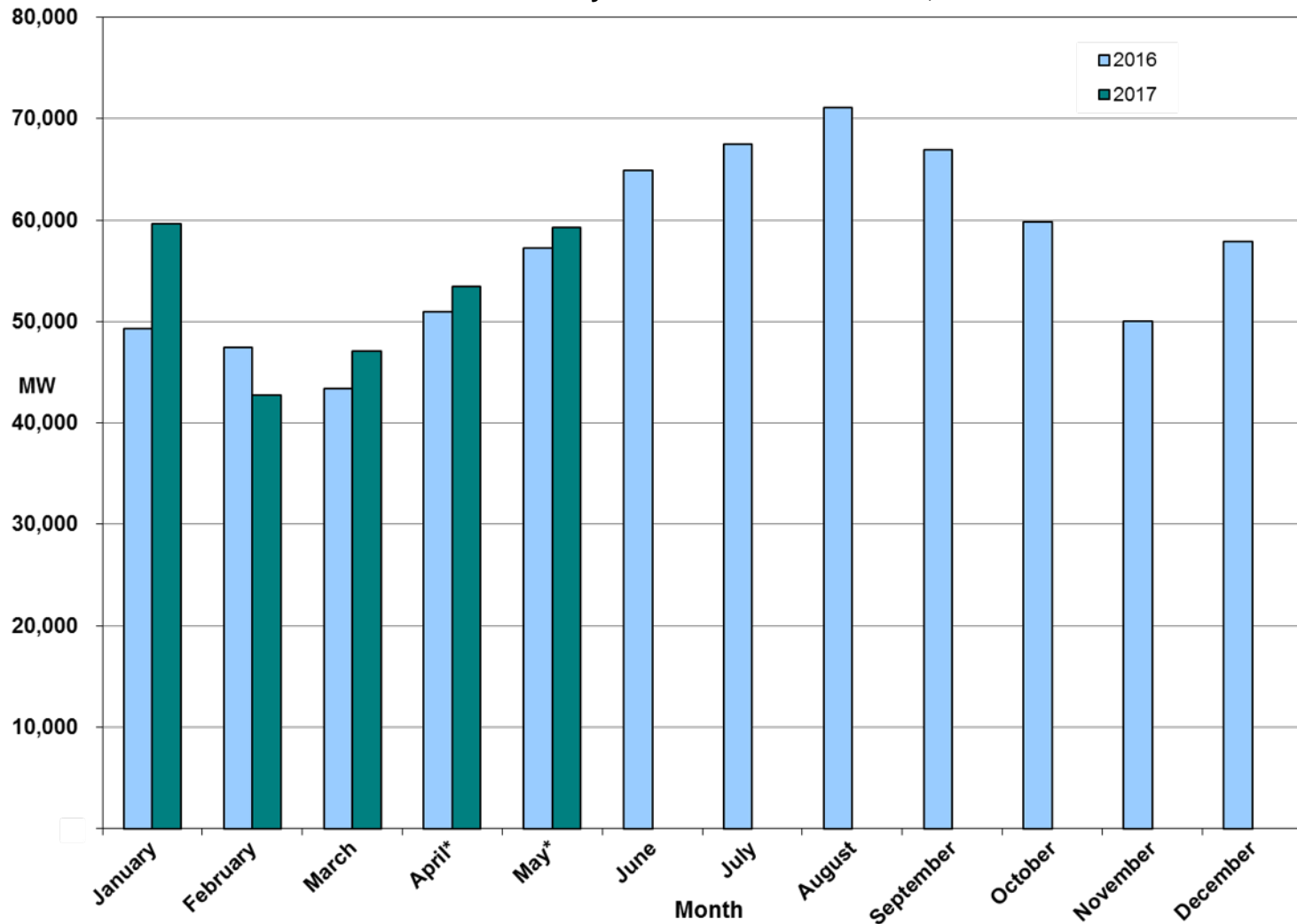


# ERCOT's CPS1 Monthly Performance – May 2017



# Monthly Peak Actual Demand – May 2017

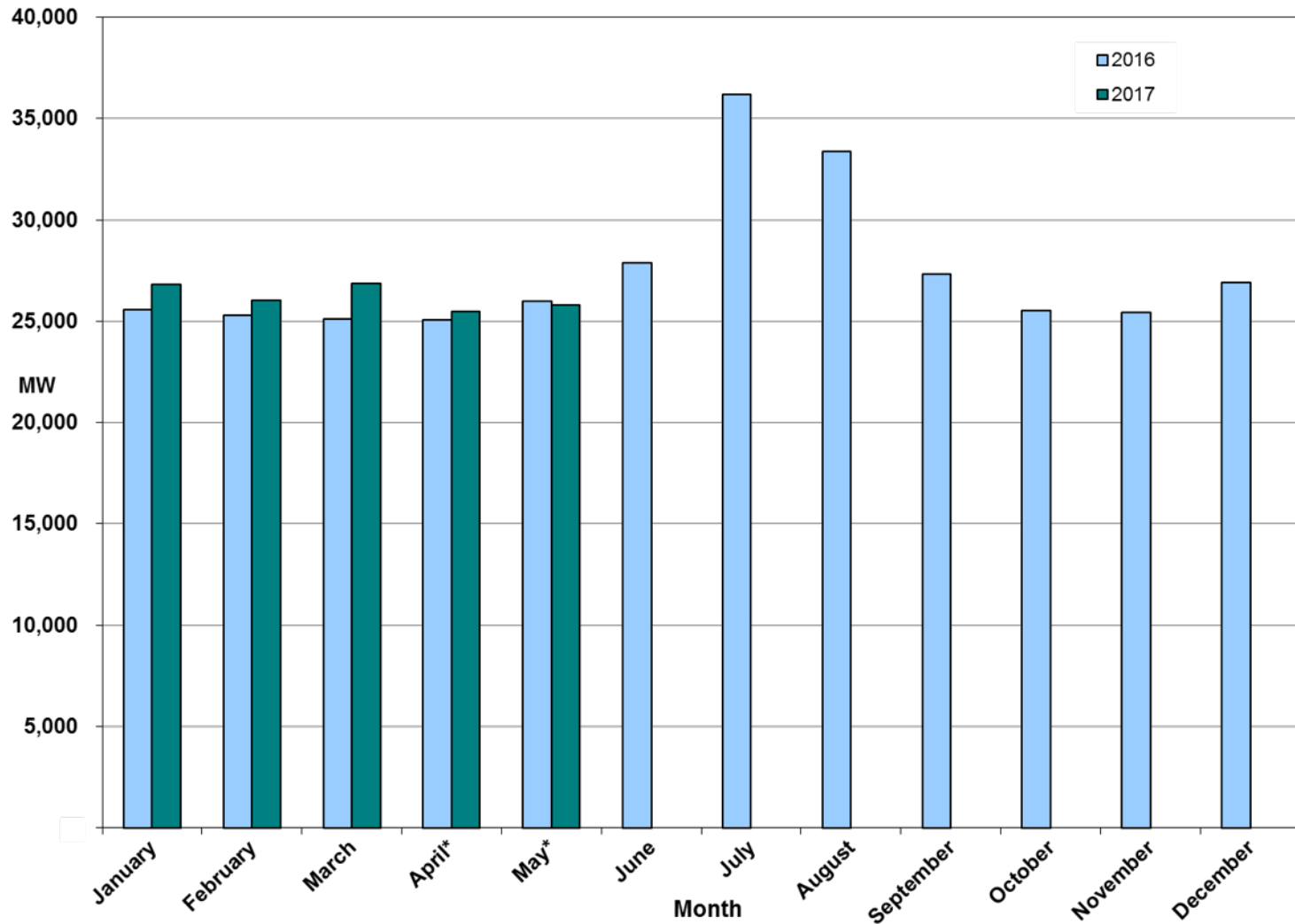
Monthly Peak Actual Demand = 59,244 MW @ 5/26/17 HE 17:00



\* Preliminary for latest two months of the current year



# Monthly Minimum Actual 15-Minute Demand – May 2017



\* Preliminary for latest two months of the current year

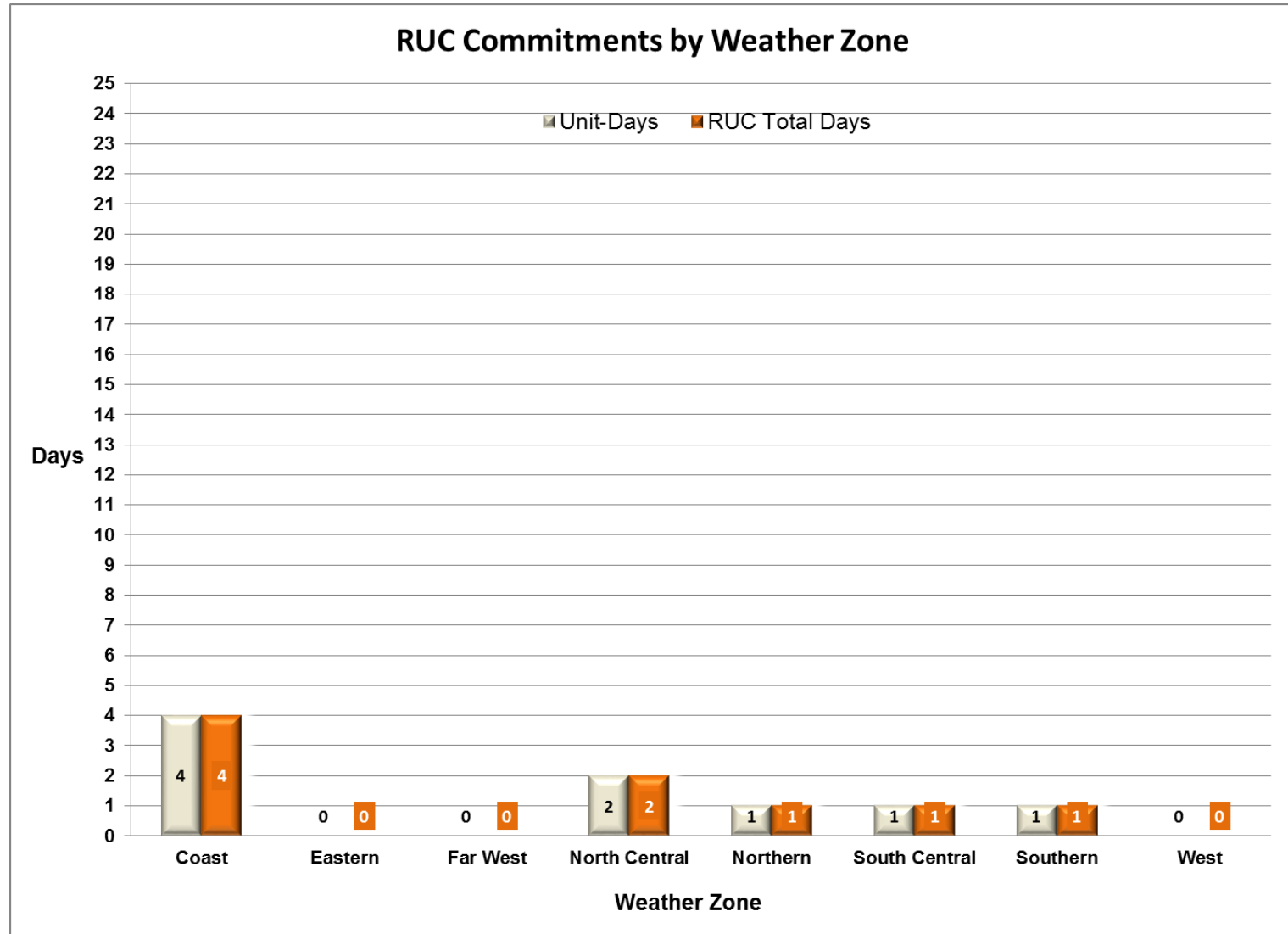


## Day-Ahead Load Forecast Performance – May 2017

**Mean Absolute Percent Error (MAPE) for ERCOT Mid-Term Load Forecast (MTLF)  
Run at 14:00 Day Ahead**

	<b>2014 MAPE</b>	<b>2015 MAPE</b>	<b>2016 MAPE</b>	<b>2017 MAPE</b>	<b>May 2017 MAPE</b>	
<b>Average Annual MAPE</b>	2.83	2.86	2.62	2.72	2.77	
<b>Lowest Monthly MAPE</b>	2.15	1.89	1.94	2.02	<b>Lowest Daily MAPE</b>	0.71 May 2
<b>Highest Monthly MAPE</b>	3.70	3.81	3.86	4.07	<b>Highest Daily MAPE</b>	5.73 May 30

# Reliability Unit Commitment (RUC) Capacity by Weather Zone – May 2017



## Generic Transmission Constraints (GTCs) – May 2017

GTCs	May-16	Mar-17	Apr-17	May-17	Last 12 Months Total Days <small>(June 16 – May 17)</small>
	Days GTCs	Days GTCs	Days GTCs	Days GTCs	
North – Houston	0	0	1	1	3
Valley Import	3	1	0	0	4
Zorillo - Ajo	12	0	0	0	40
Panhandle	20	29	28	28	231
Laredo	1	0	0	0	11
Liston	24	0	0	0	174
Red Tap	-	0	0	0	0
Bakersfield	-	30	29	3	69

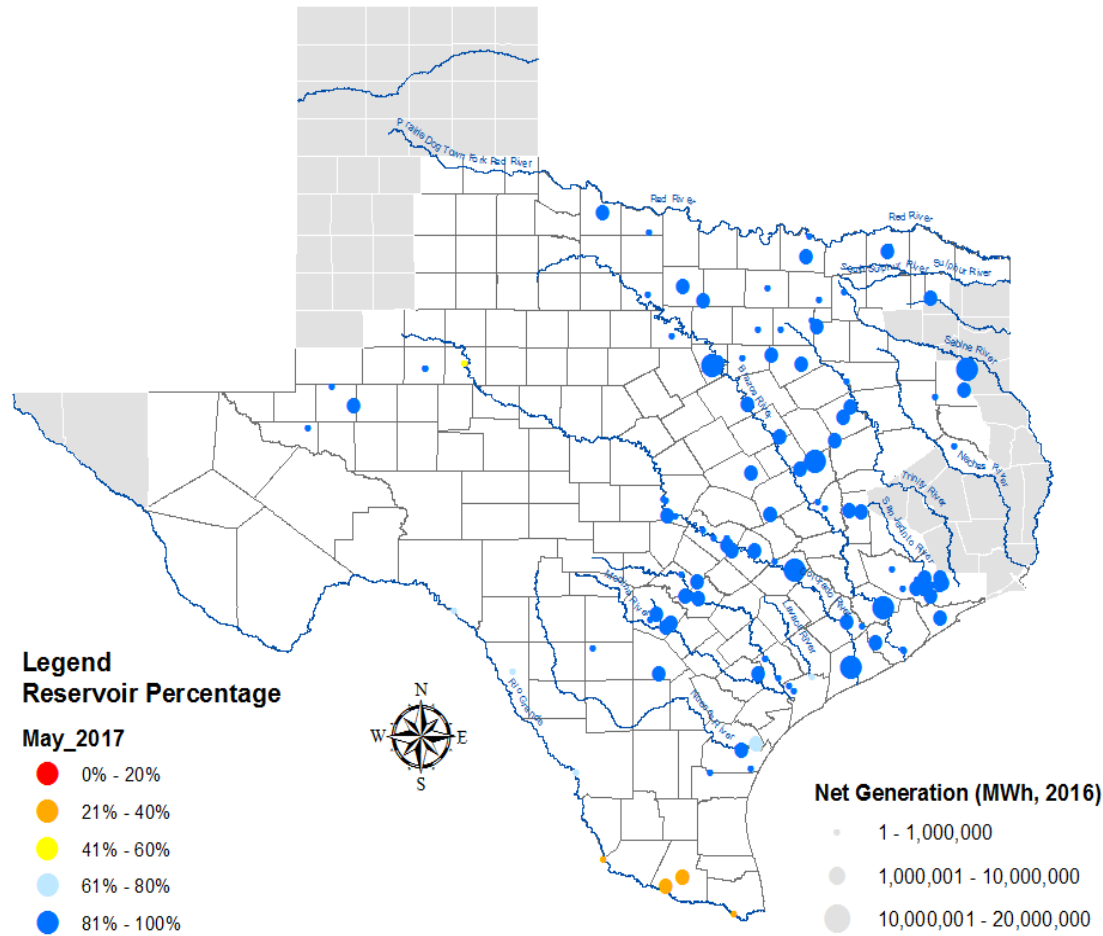
**GTC:** A transmission flow limit more constraining than a Transmission Element’s normal limit established to constrain flow between geographic areas of the ERCOT Transmission System that is used to enforce stability and voltage constraints that cannot be modeled directly in ERCOT’s transmission security analysis applications.

**Note:** This table lists how many times a constraint has been activated to avoid exceeding a GTC limit, it does not imply an exceedance of the GTC occurred.

## Advisories and Watches – May 2017

- Two Advisories issued due to Physical Responsive Capability being below 3000 MW
  - Issued on 05/06, 05/29
- One Advisory issued due to K-7 Index Level Geomagnetic Disturbance Alert
  - Issued on 5/27
- One Advisory issued due to ERCOT's VSAT tool unavailable
  - Issued on 5/4
- One Advisory issued due to ERCOT's SE/RTCA unavailable
  - Issued on 5/4
- Four Watches issued for the de-rate of the Railroad DC Tie Transfer capability
  - Issued on 5/22(2), 5/23, 5/25
- One Watch issued for the DC\_S (Eagle Pass) Tie Tripped
  - Issued 5/25
- One OCN issued for Capacity Insufficiency
  - Issued on 5/30

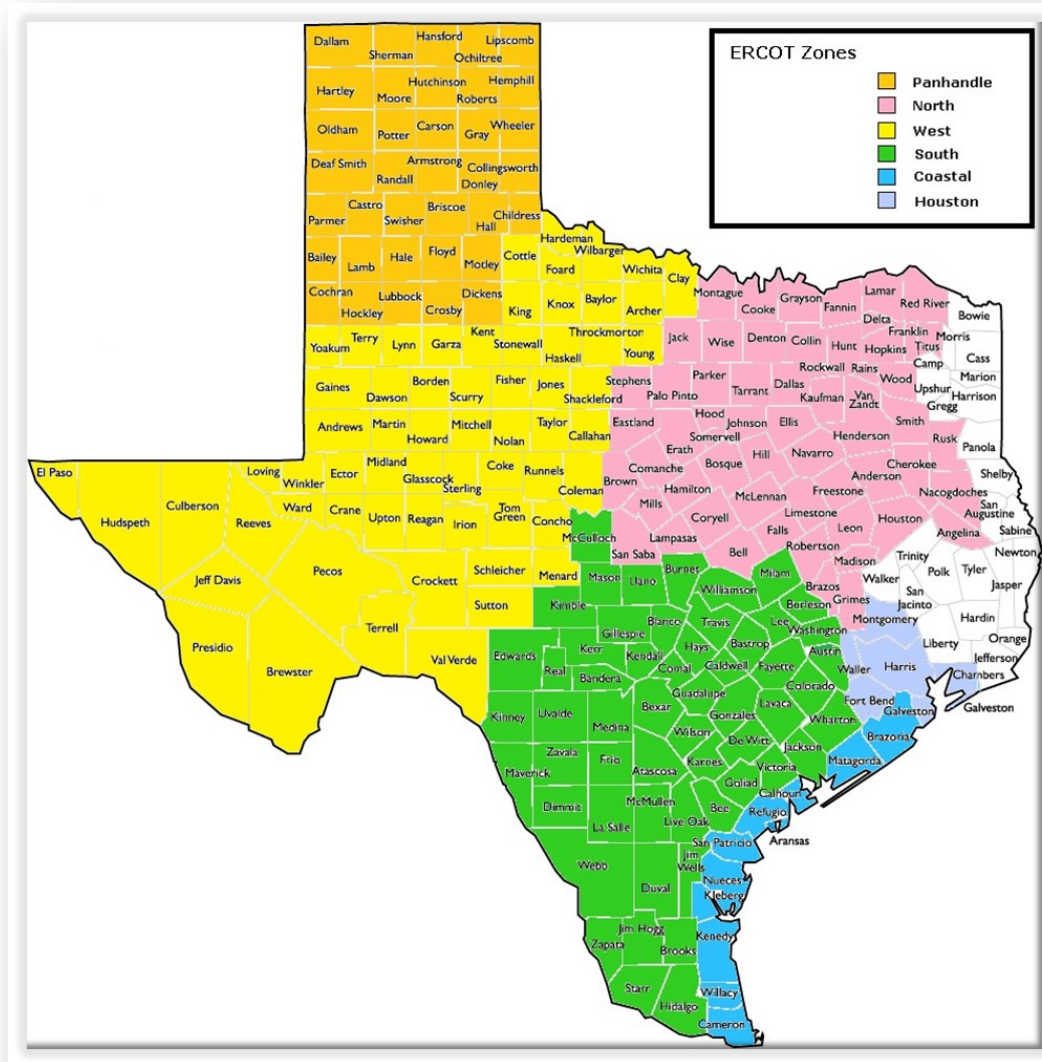
# Lake Levels Update – June 1, 2017



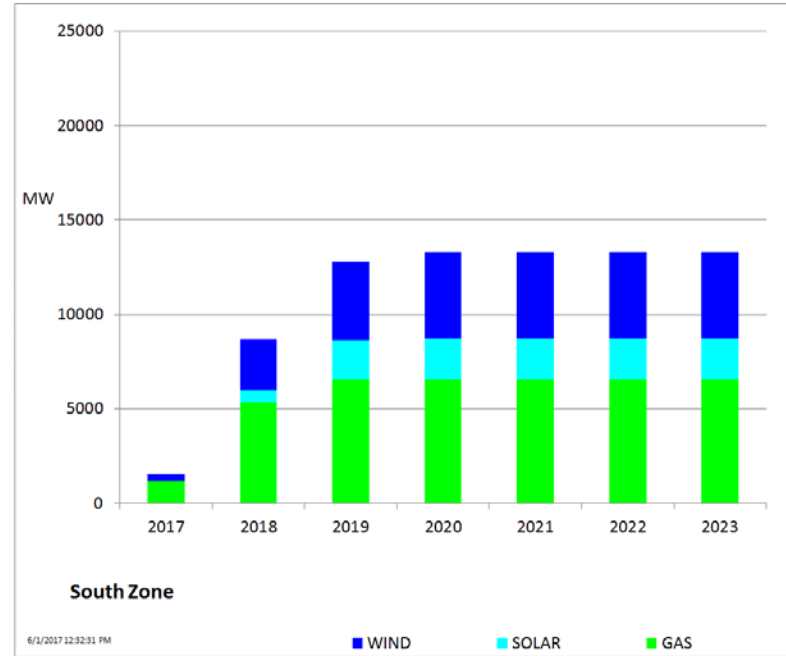
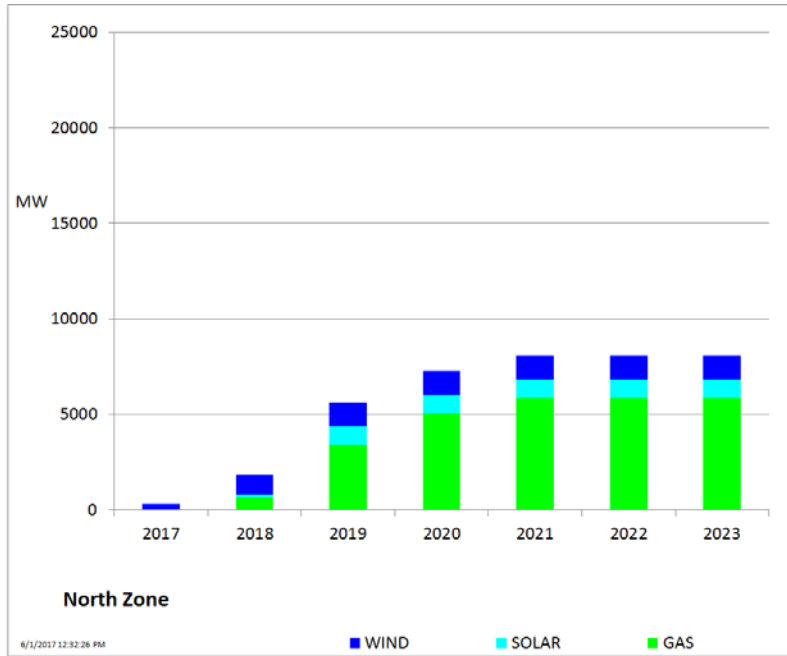
## Planning Summary – May 2017

- ERCOT is currently tracking 290 active generation interconnection requests totaling 64,371 MW. This includes 28,230 MW of wind generation.
- ERCOT is currently reviewing proposed transmission improvements with a total cost of \$1.24 Billion.
- Transmission Projects endorsed in 2017 total \$175.8 Million.
- All projects (in engineering, routing, licensing, and construction) total approximately \$6.91 Billion (as of February 1, 2017).
- Transmission Projects energized in 2017 total about \$3.71 Million (as of February 1, 2017).

# Mapping of Counties to ERCOT Zones – May 2017

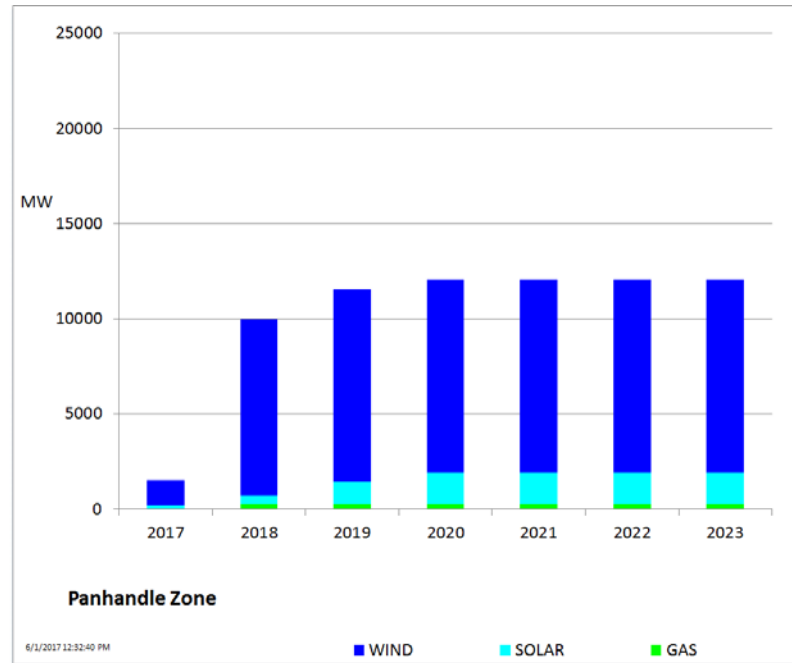
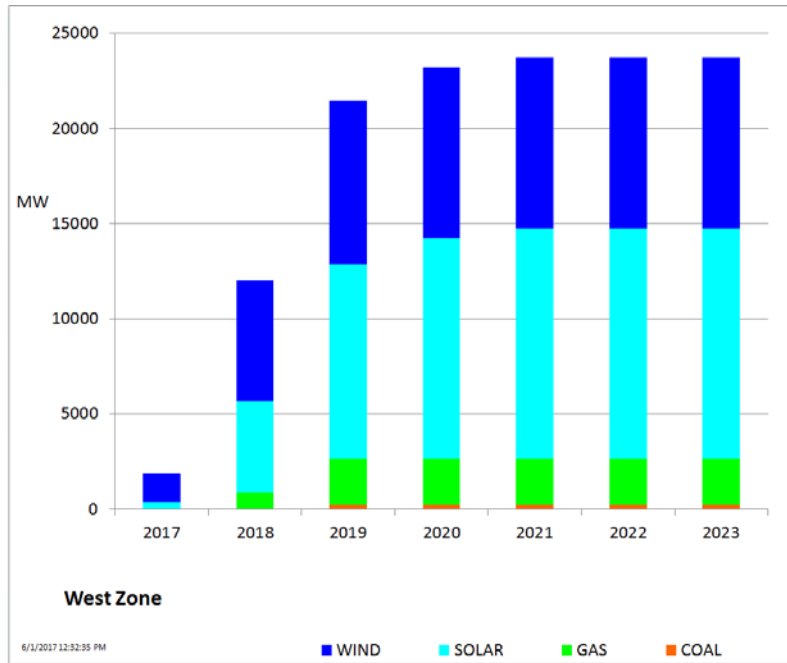


# Cumulative MW Capacity of Interconnection Requests by Zone – May 2017

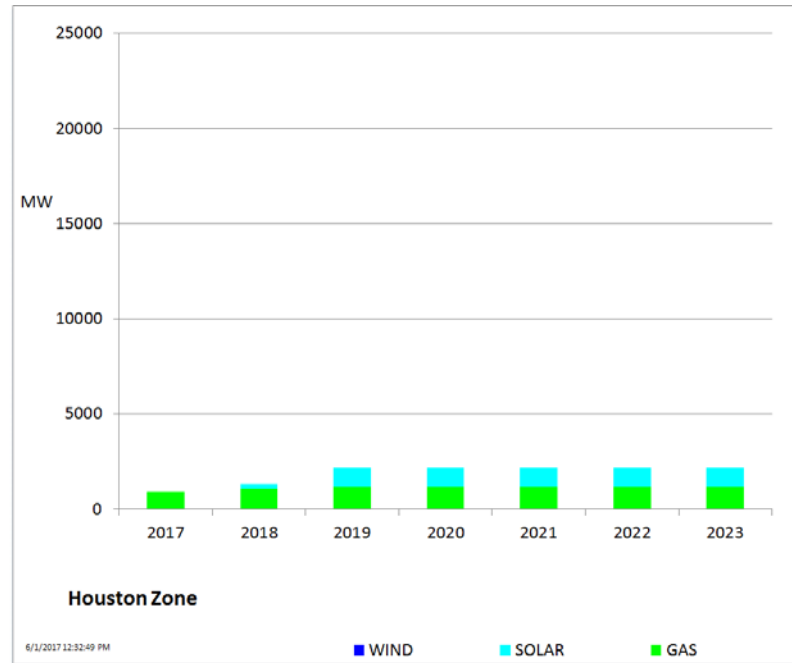
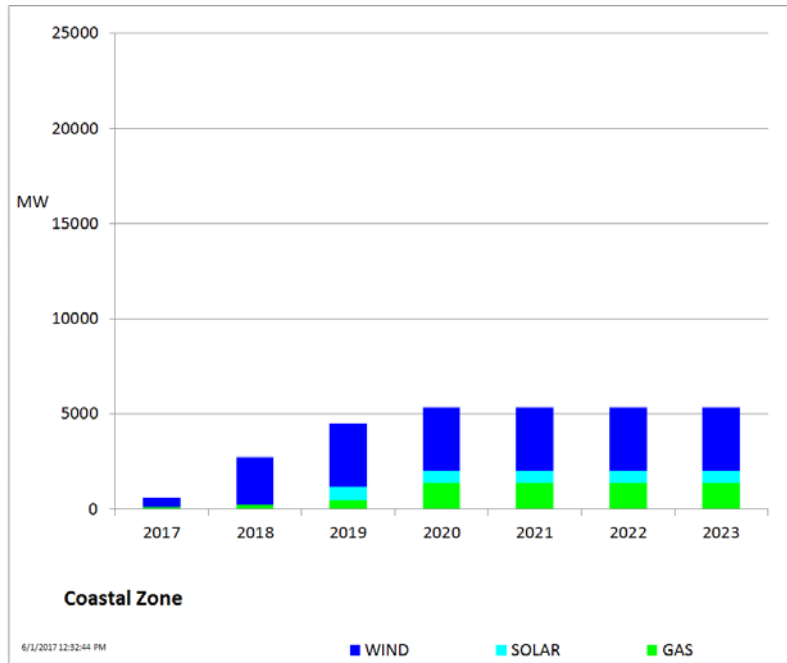




# Cumulative MW Capacity of Interconnection Requests by Zone – May 2017

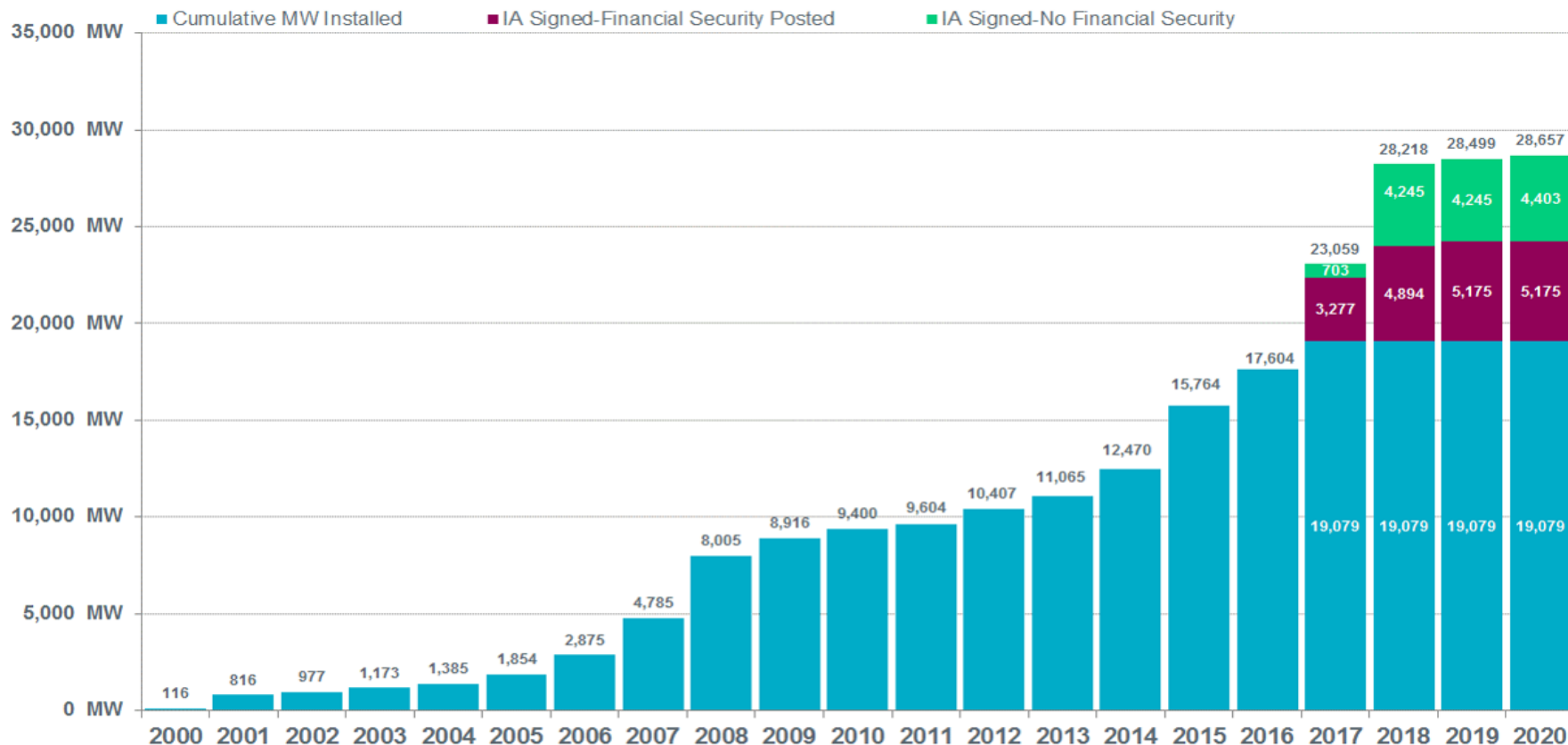


# Cumulative MW Capacity of Interconnection Requests by Zone – May 2017



# Wind Generation – May 2017

ERCOT Wind Additions by Year (as of June 1, 2017)

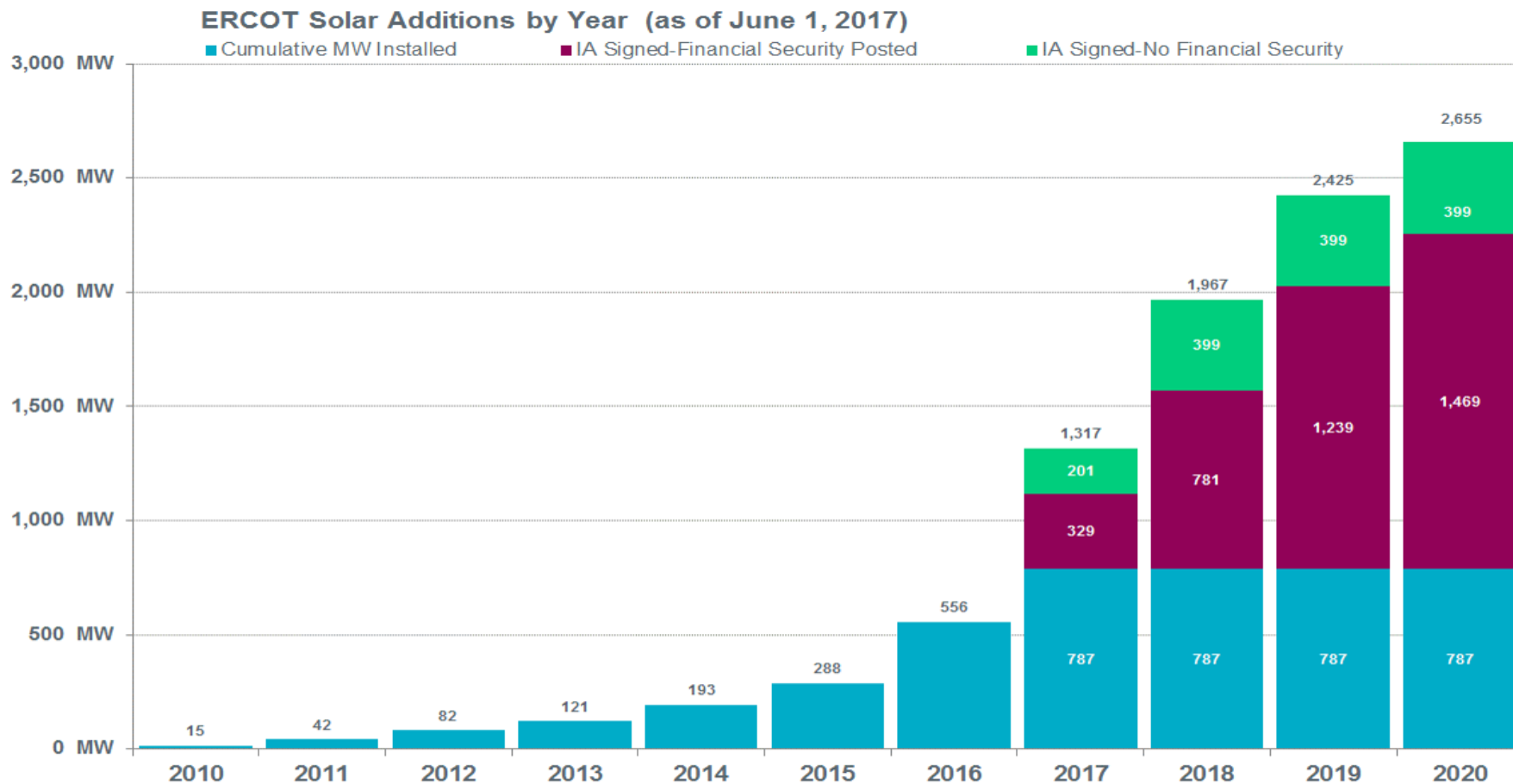


Notes:

- The data presented here is based upon the latest information provided to ERCOT by resource owners and developers and can change without notice.
- Installed capacities for the current year account for changes reported by the facility owners during the reporting month, and will be reflected in subsequent years' totals.
- Installed capacities include only wind facilities that have registered with ERCOT (Those larger than one megawatt and supply power to the ERCOT system.)
- This chart reports annual planned units with projected Commercial Operations Dates throughout the calendar year. In contrast, ERCOT's Capacity, Demand and Reserves (CDR) report shows planned capacity projected to be commercially available on or before the start of the Summer and Winter Peak Load seasons.
- Financial security posted for funding interconnection facilities does not include CREZ security deposits, which are refunded to the Interconnecting Entity when an IA is signed.



# Solar Generation – May 2017



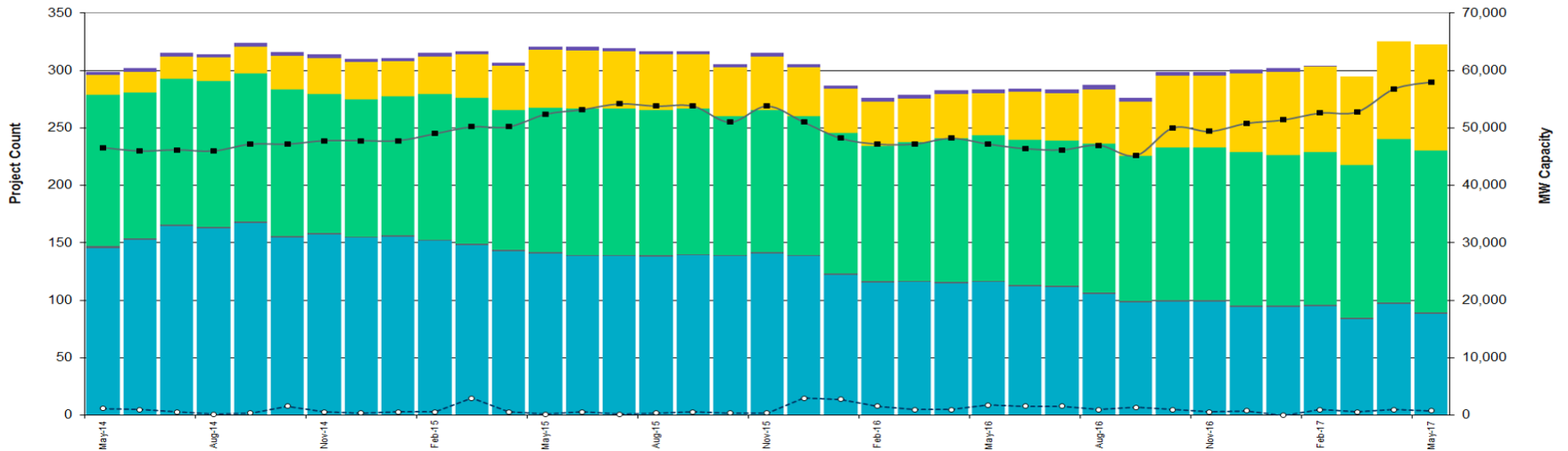
- Notes:
- The data presented here is based upon the latest information provided to ERCOT by resource owners and developers and can change without notice.
  - Installed capacities for the current year account for changes reported by the facility owners during the reporting month, and will be reflected in subsequent years' totals.
  - Installed capacities include only solar facilities that have registered with ERCOT (Those larger than one megawatt and supply power to the ERCOT system.)
  - This chart reports annual planned units with projected Commercial Operations Dates throughout the calendar year. In contrast, ERCOT's Capacity, Demand and Reserves (CDR) report shows planned capacity projected to be commercially available on or before the start of the Summer and Winter Peak Load seasons.



# Generation Interconnection Activity by Fuel – May 2017

■ MW Natural Gas 
 ▨ MW Nuclear 
 ■ MW Coal 
 ■ MW Wind 
 ■ MW Solar 
 ■ MW Biomass 
 ■ MW Other 
 —■— Total # of Projects 
 - - - ○ - - - # of Cancelled Projects

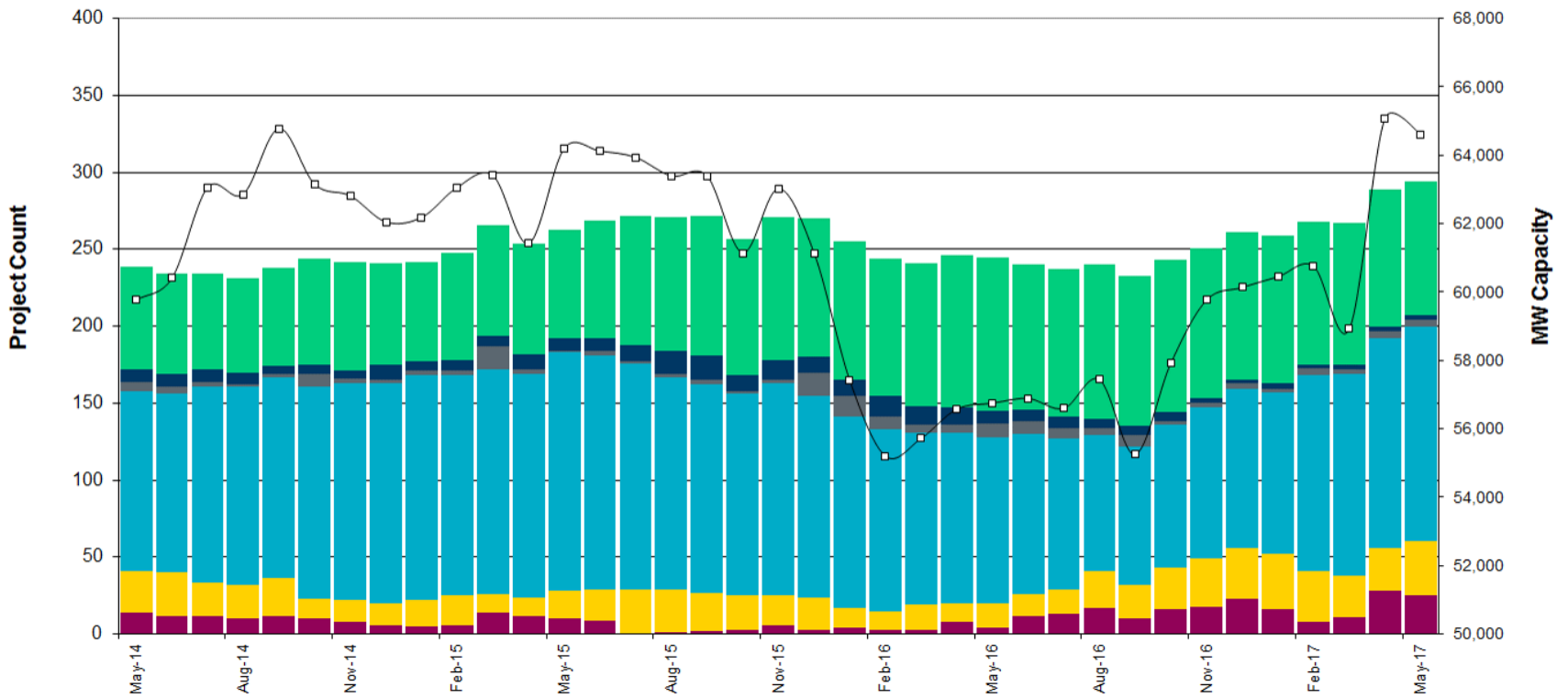
Projects in all phases of interconnection study are reflected in this graph



# Generation Interconnection Activity by Project Phase – May 2017

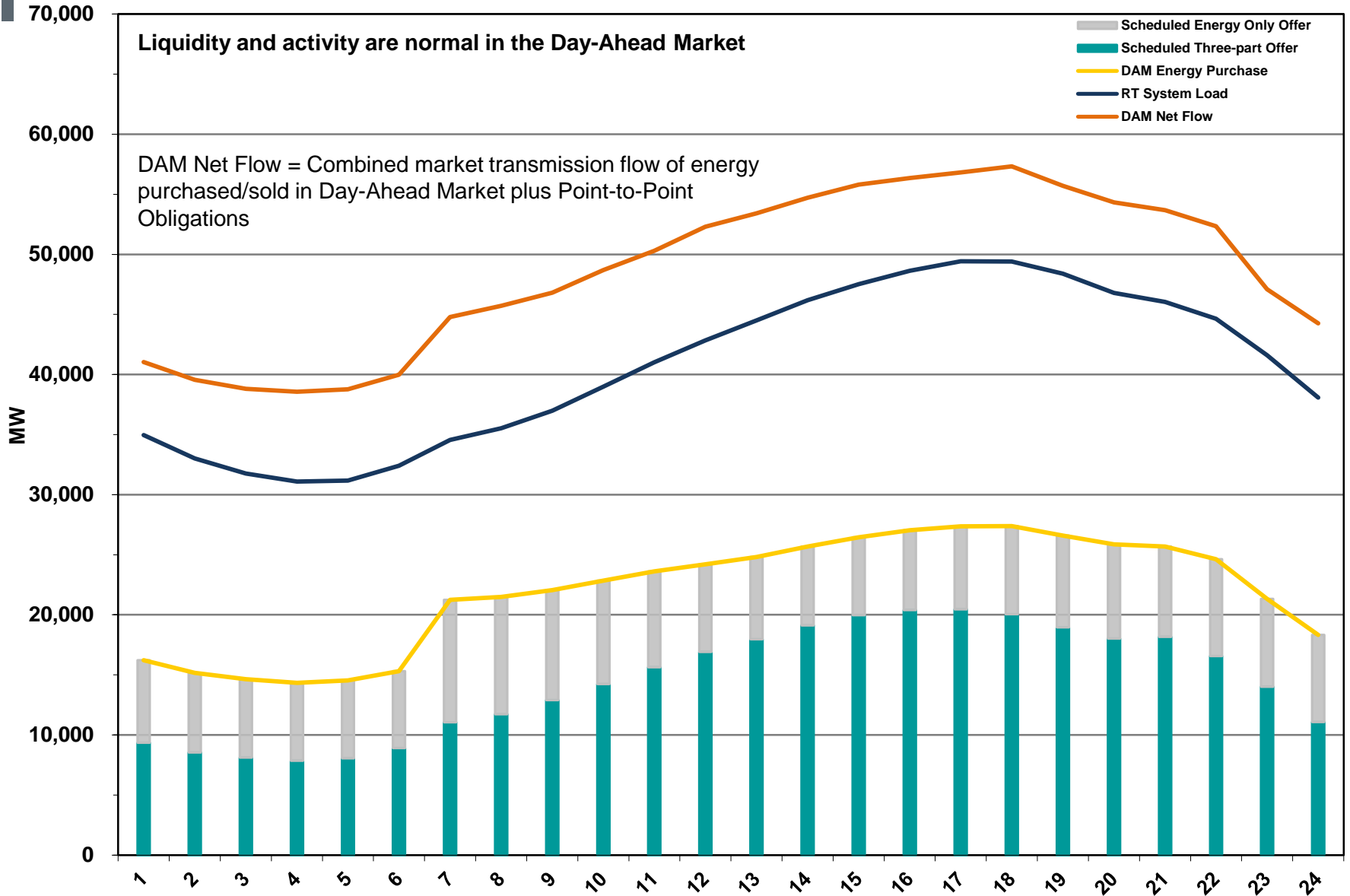
- # Signed Interconnect Agreement
- # Completed Full Study
- # Projects Cancelled
- # in Full Study
- # Screening Study Complete
- # Initial Screening Study
- MW Capacity Under Study \*

\* Nameplate capacity will change across time due to additional projects, cancellations, expirations, adjustments from study results, and projects being placed in service.



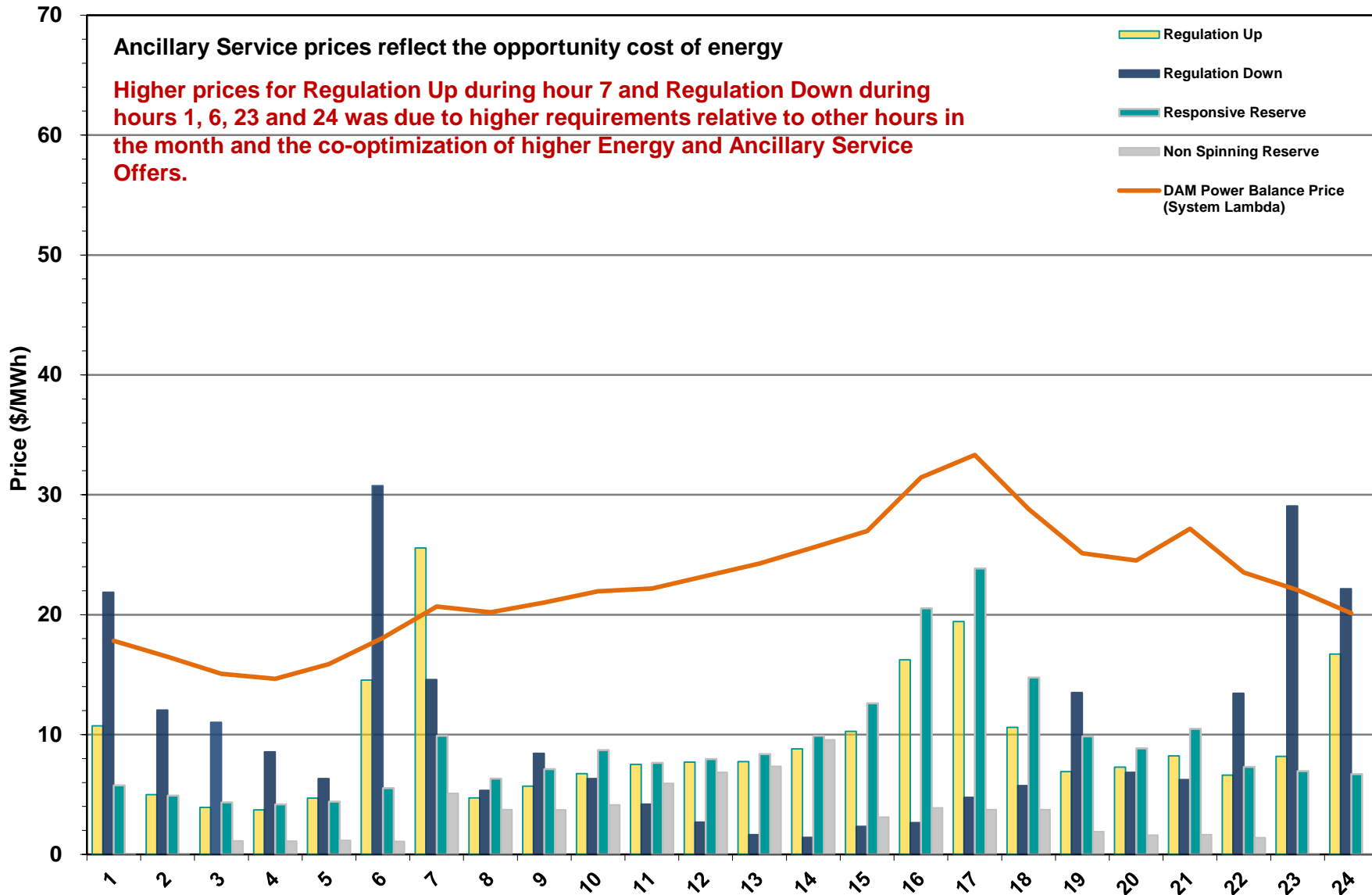
# Market Operations

# Day-Ahead Schedule (Hourly Average) – May 2017

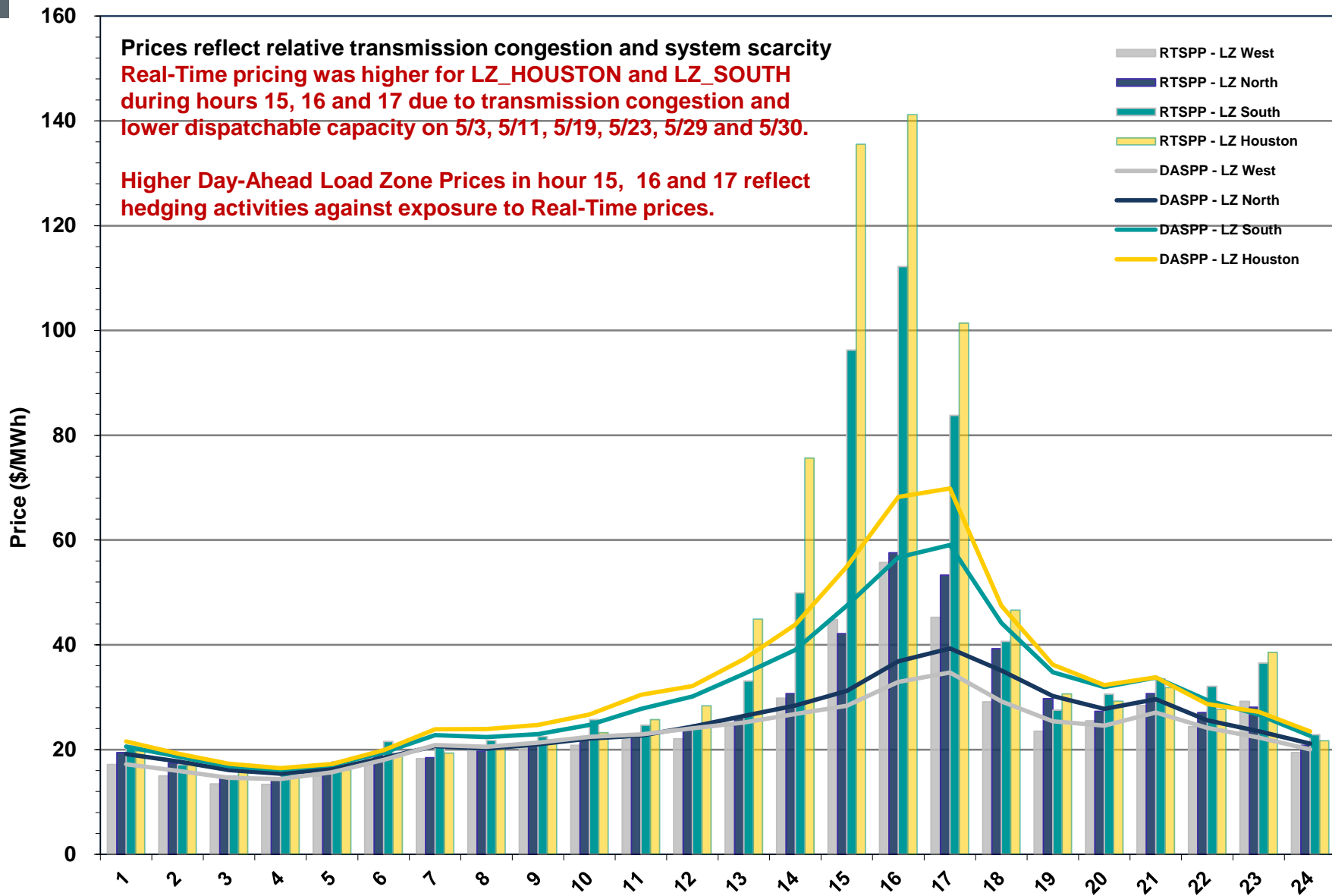




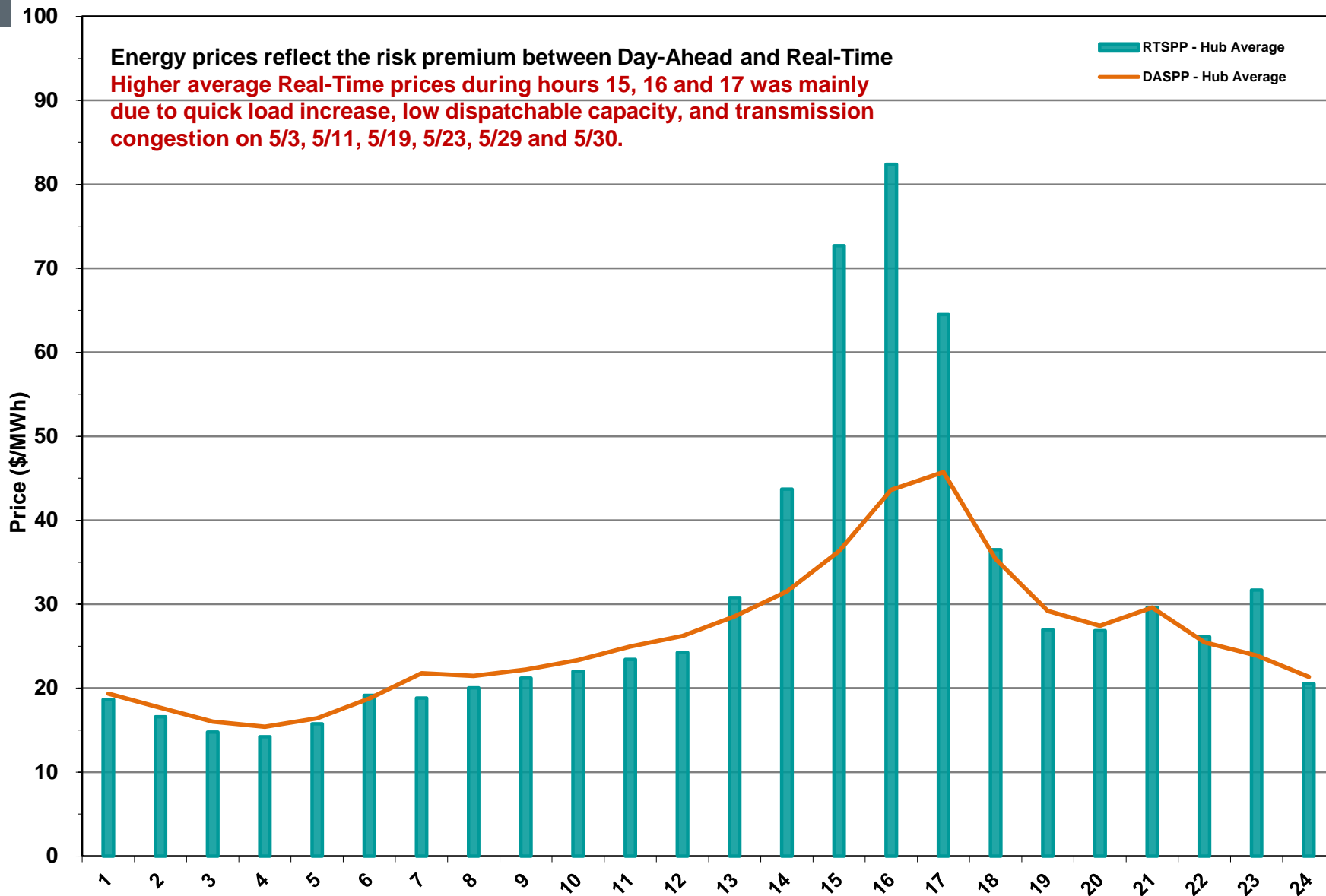
# Day-Ahead Electricity And Ancillary Service Hourly Average Prices – May 2017



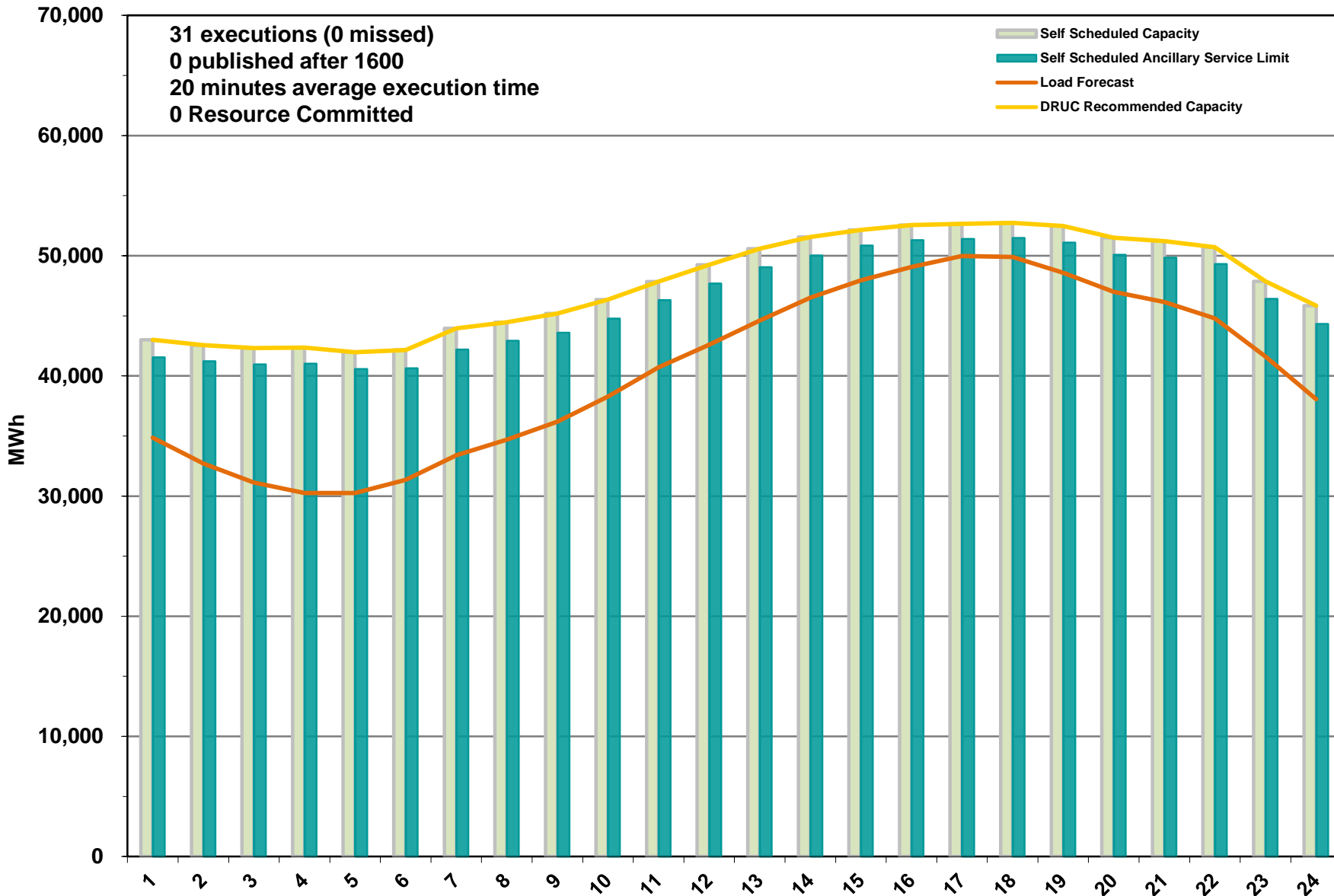
# Day-Ahead Vs Real-Time Load Zone SPP (Hourly Average) – May 2017



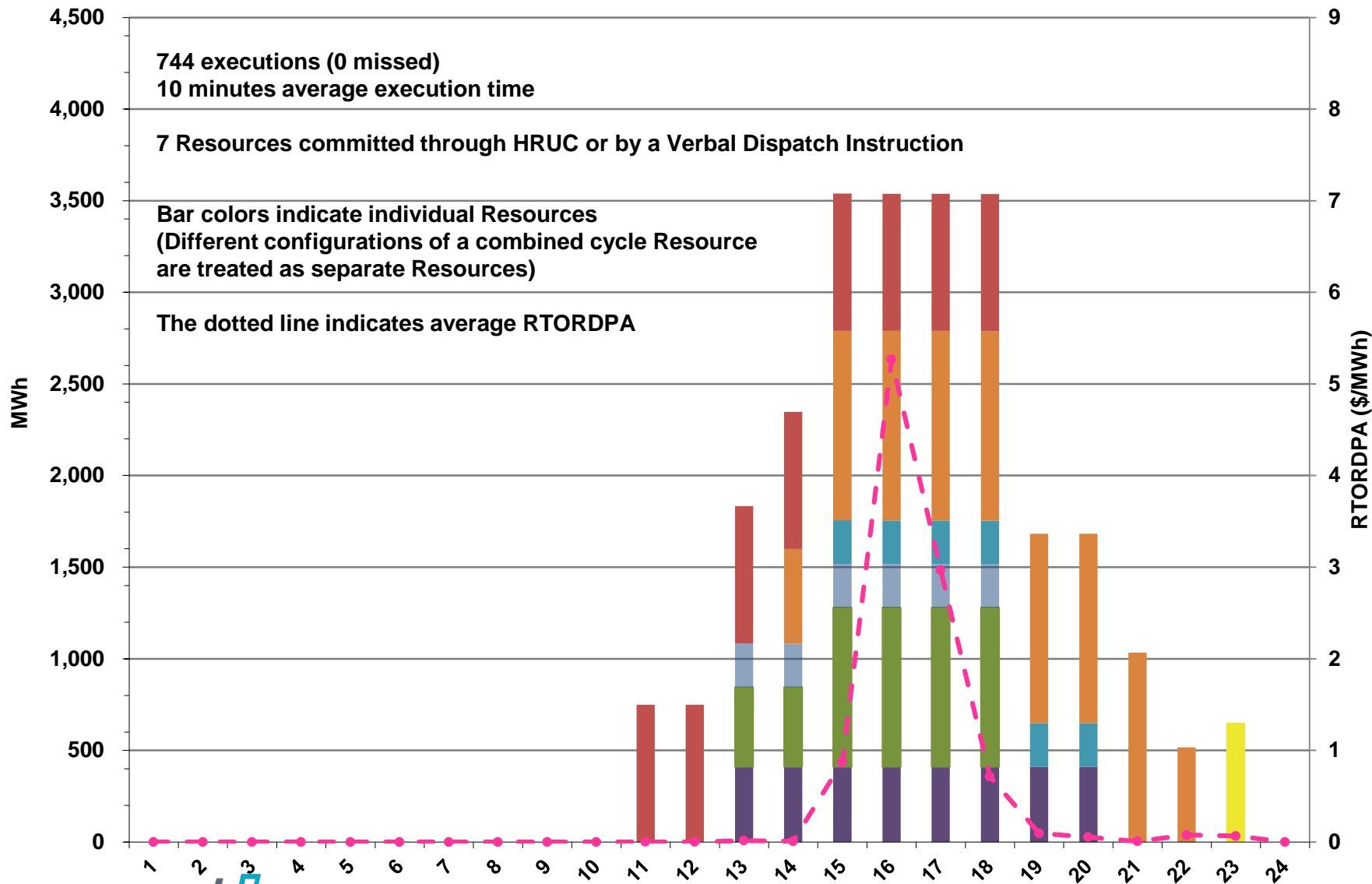
# Day-Ahead Vs Real-Time Hub Average SPP (Hourly Average) – May 2017



# DRUC Monthly Summary (Hourly Average) – May 2017



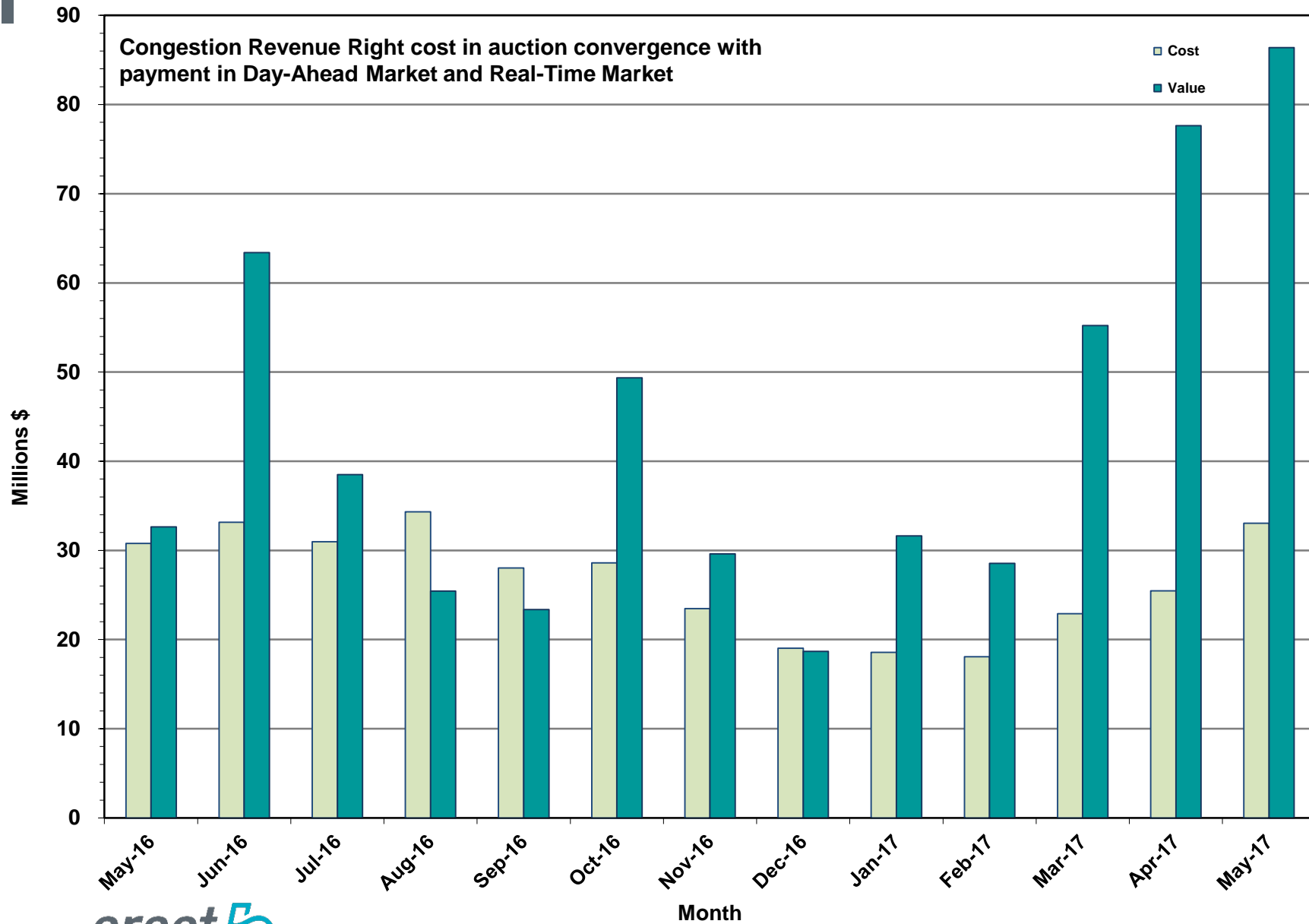
# HRUC Monthly Summary and Real Time On-Line Reliability Deployment Price Adder (RTORDPA) (Hourly Average) – May 2017



## Non-Spinning Reserve Service Deployment – May 2017

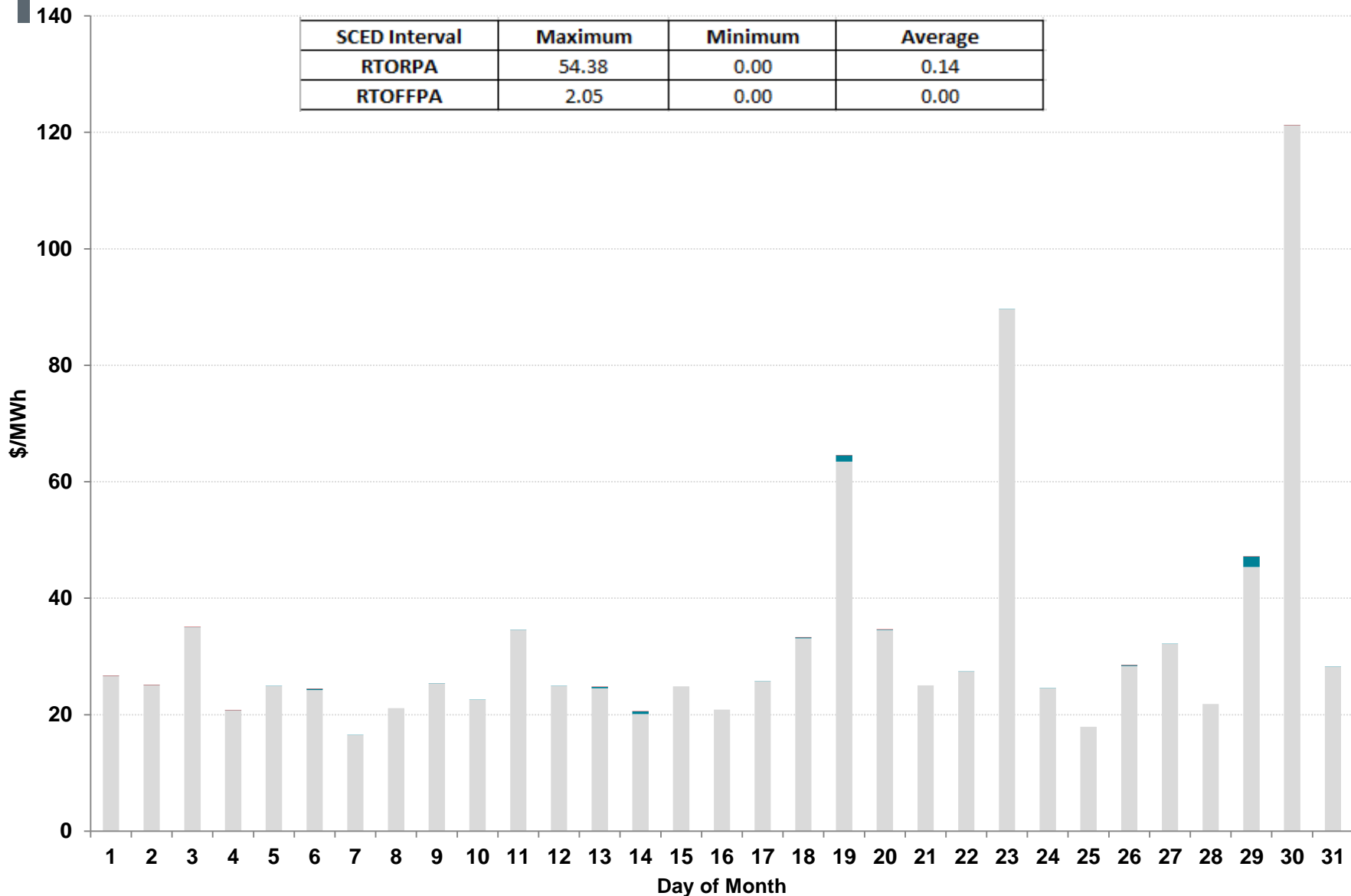
Deployment Start Time	Deployment End Time	Deployment Duration (Hours)	Max Deployment (MW)	Reason
5/15/2017 5:38:10 PM	5/15/2017 8:04:43 PM	2.4	140	Voltage support
5/16/2017 4:05:13 PM	5/16/2017 9:59:52 PM	5.9	140	Constraint DMGSQAL5 (Big Spring – Lamesa Area)

# CRR Price Convergence – May 2017



# Daily Average ORDC Price Adders and System Lambda – May 2017

SCED Interval	Maximum	Minimum	Average
RTORPA	54.38	0.00	0.14
RTOFFPA	2.05	0.00	0.00



System Lambda RTORPA RTOFFPA



## ERS Procurement for February – May 2017

	TP1	TP2	TP3	TP4	TP5	TP6
Non Weather-Sensitive ERS-10 MW	304.071	314.139	312.787	307.631	301.799	285.273
Non Weather-Sensitive ERS-30 MW	570.588	626.265	608.201	604.502	586.119	515.379
Weather-Sensitive ERS-10 MW	0	0	0	0	0	0
Weather-Sensitive ERS-30 MW	.91	0	.68	.91	0	0
Total MW Procured	875.569	940.404	921.668	913.043	887.918	800.652
Clearing Price	\$20.45	\$11.33	\$1.96	\$19.93	\$12.08	\$2.27

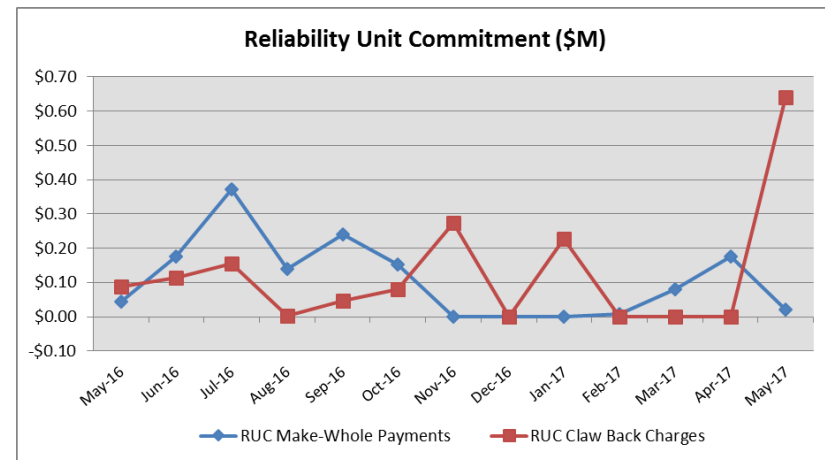
\*Weather-Sensitive Time Periods for Feb.-May 2017 are TP1, TP3, TP4 and TP5.

**Time Period**      **Time Period Hours**

- Time Period 1      Hours Ending 0600 - 0800 (5:00:00 a.m. to 8:00:00 a.m.) Monday through Friday except ERCOT Holidays.
- Time Period 2      Hours Ending 0900 - 1300 (8:00:00 a.m. to 1:00:00 p.m.) Monday through Friday except ERCOT Holidays.
- Time Period 3      Hours Ending 1400 - 1600 (1:00:00 p.m. to 4:00:00 p.m.) Monday through Friday except ERCOT Holidays.
- Time Period 4      Hours Ending 1700 - 1900 (4:00:00 p.m. to 7:00:00 p.m.) Monday through Friday except ERCOT Holidays.
- Time Period 5      Hours Ending 2000 - 2200 (7:00:00 p.m. to 10:00:00 p.m.) Monday through Friday except ERCOT Holidays.
- Time Period 6      All other hours

## Reliability Services – May 2017

Reliability Unit Commitment (RUC)	\$ in Millions
RUC Make-Whole Payments	(\$0.02)
RUC Clawback Charges	\$0.64
<b>RUC Commitment Settlement</b>	<b>\$0.62</b>
RUC Capacity Short Charges	\$0.02
RUC Make-Whole Uplift	\$0.00
<b>RUC Commitment Cost Allocation</b>	<b>\$0.02</b>
RUC Decommitment Payments	\$0.00



RUC Make-Whole Payments were \$0.02M in May 2017. RUC Clawback Charges were \$0.64M.

There was \$0.64M allocated directly to load in May 2017, compared to:

- \$0.00M in April 2017
- \$0.09M in May 2016

## Capacity Services – May 2017

<b>Capacity Services</b>	<b>\$ in Millions</b>
<b>Regulation Up Service</b>	\$2.52
<b>Regulation Down Service</b>	\$2.85
<b>Responsive Reserve Service</b>	\$14.42
<b>Non-Spinning Reserve Service</b>	\$4.19
<b>Black Start Service</b>	\$0.62
<b>Voltage Services - Reactive Power</b>	\$0.00
<b>Voltage Services - Lost Opportunity</b>	\$0.00
<b>Total Charges</b>	<b>\$24.60</b>

Capacity Services costs decreased from last month and increased from May 2016.

May 2017 cost was \$24.60M, compared to:

- A charge of \$27.49M in April 2017
- A charge of \$22.37M in May 2016

## Energy Settlement – May 2017

<b>Day-Ahead Market Energy Settlement</b>	<b>\$ in Millions</b>
<b>Energy Purchases</b>	\$454.73
<b>Point to Point Obligation Purchases</b>	\$83.05
<b>RMR Day-Ahead Revenue</b>	\$0.00
<b>Energy Sales</b>	(\$444.95)
<b>Day-Ahead Congestion Rent</b>	\$92.83
<b>Day-Ahead Market Make-Whole Payments</b>	(\$0.25)

Day-Ahead Market and Real-Time Market energy settlement activity increased from last month and increased from May 2016.

<b>Real-Time Market Energy Settlement</b>	<b>\$ in Millions</b>
<b>Energy Imbalance at a Resource Node</b>	(\$502.84)
<b>Energy Imbalance at a Load Zone</b>	\$852.86
<b>Energy Imbalance at a Hub</b>	(\$244.14)
<b>Real Time Congestion from Self Schedules</b>	\$0.85
<b>Block Load Transfers and DC Ties</b>	(\$1.08)
<b>Impact to Revenue Neutrality</b>	\$105.65
<b>Emergency Energy Payments</b>	(\$0.07)
<b>Base Point Deviation Charges</b>	\$0.26
<b>Real-Time Metered Generation (MWh in millions)</b>	30.09

## Congestion Revenue Rights (CRR) – May 2017

	\$ in Millions
Annual Auction	(\$22.78)
Monthly Auction	(\$10.25)
<b>Total Auction Revenue</b>	<b>(\$33.03)</b>
Day-Ahead CRR Settlement	(\$86.39)
Day-Ahead CRR Short-Charges	\$1.80
Day-Ahead CRR Short-Charges Refunded	(\$1.80)
Real-Time CRR Settlement	\$0.00
Real-Time CRR Short-Charges	\$0.00
Real-Time CRR Short-Charges Refunded	\$0.00
<b>Total CRR Funding</b>	<b>(\$86.39)</b>
Day-Ahead Point to Point Obligations Settlement	\$83.05
Real-Time Point to Point Obligation Settlement	(\$114.41)
<b>Net Point to Point Obligation Settlement</b>	<b>(\$31.36)</b>

Congestion Revenue Rights settlement payments were fully funded and excess funds were paid to load.

Point to Point Obligations settled with a net credit of \$31.36M compared to a net credit of \$25.01M last month.

## CRR Balancing Account Fund – May 2017

<b>CRR Balancing Account Fund</b>	<b>\$ in Millions</b>
<b>Beginning Balance for the Month</b>	\$10.00
<b>CRR Balancing Account Credit Total</b>	\$8.23
<b>CRR PTP Option Award Charges</b>	\$0.06
<b>Day-Ahead CRR Short-Charges Refunded</b>	(\$1.80)
<b>Load Allocated CRR Amount</b>	(\$6.49)
<b>Total Fund Amount</b>	\$10.00

ERCOT implemented the rolling CRR Balancing Account Fund beginning with Operating Month December 2014.

As of May 2017, the CRR Balancing Account Fund was at \$10.00M and excess funds of \$6.49M were allocated to Load.

# Revenue Neutrality – May 2017

## Revenue Neutrality Settlement

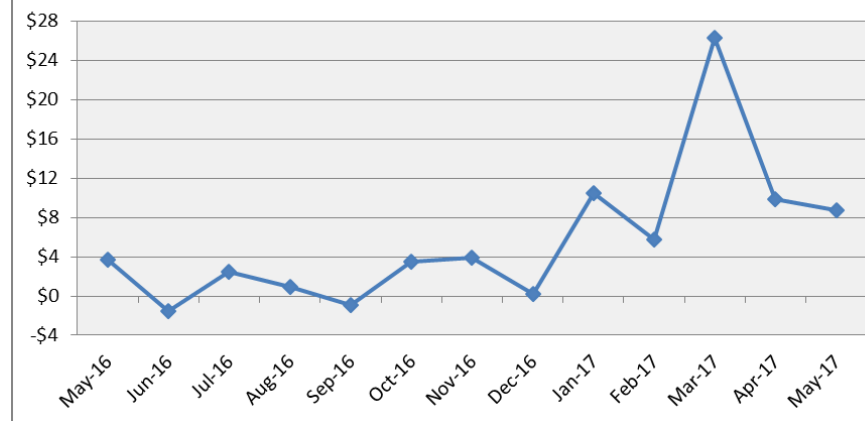
	\$ in Millions
Real-Time Point to Point Obligation Settlement	(\$114.41)
Real-Time Point to Point Options and Options with Refund Settlement	\$0.00
Real-Time Energy Imbalance Settlement	\$105.88
Real-Time Congestion from Self-Schedules Settlement	\$0.85
DC Tie & Block Load Transfer Settlement	(\$1.08)
<b>Charge to Load</b>	<b>\$8.76</b>

Revenue Neutrality charge to load decreased compared to last month and increased compared to May 2016.

May 2017 was a charge of \$8.76M, compared to:

- \$9.88M charge in April 2017
- \$3.65M charge in May 2016

Revenue Neutrality Uplift (\$M)



## Real-Time Ancillary Service Imbalance (ORDC) – May 2017

<b>Real-Time Ancillary Service Imbalance</b>	\$ in Thousands
<b>Real-Time AS Imbalance Payment Amount</b>	(\$105.34)
<b>Load Allocated AS Imbalance Revenue Neutrality Amount</b>	\$105.33
<b>Total Charges</b>	\$105.33

In May 2017, total credits to QSEs with an Ancillary Service Imbalance were \$105,338 while total credits in April 2017 were \$ 72,734.

10 of the 31 days in May had settlement dollars equal to \$0 for the day.

All days in May with settlement greater than \$0 were settled as a net credit to QSEs with an Ancillary Service Imbalance and as a charge to QSEs representing load.

The highest payment to QSEs with an Ancillary Service Imbalance occurred on May 29<sup>th</sup> in the amount of \$39,047.



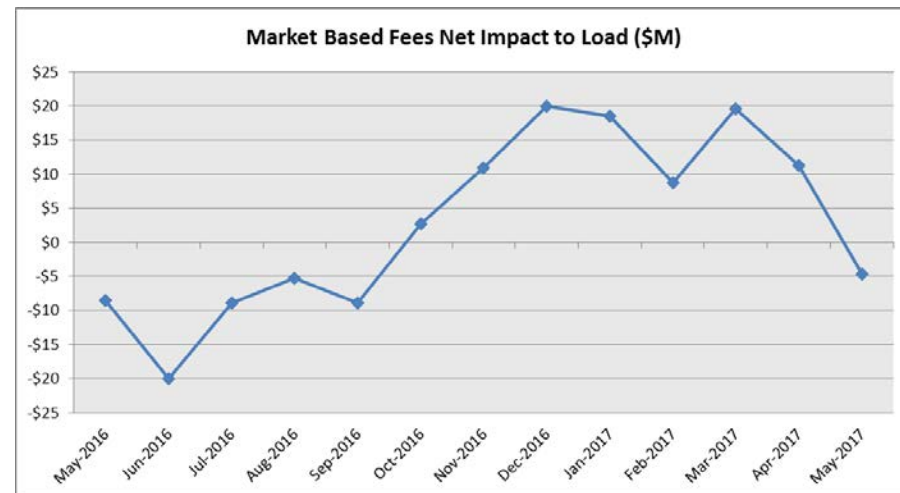
## Net Allocation to Load – May 2017

Market-Based Allocation	\$ in Millions
CRR Auction Revenue Disbursement Settlement	(\$33.03)
Balancing Account Proceeds Settlement	(\$6.49)
Net Reliability Unit Commitment Settlement	(\$0.64)
Ancillary Services Settlement	\$24.60
Reliability Must Run Settlement (incl. RMR for Capacity)	\$2.22
Real-Time Revenue Neutrality Settlement	\$8.76
Emergency Energy Settlement	\$0.07
Base Point Deviation Settlement	(\$0.26)
ORDC Settlement	\$0.11
<b>Total</b>	<b>(\$4.66)</b>
<b>Fee Allocation</b>	
ERCOT Administrative Fee Settlement	\$16.75
<b>Net Allocated to Load</b>	<b>\$12.09</b>

The charge for the net allocation to Load decreased from last month and increased from May 2016.

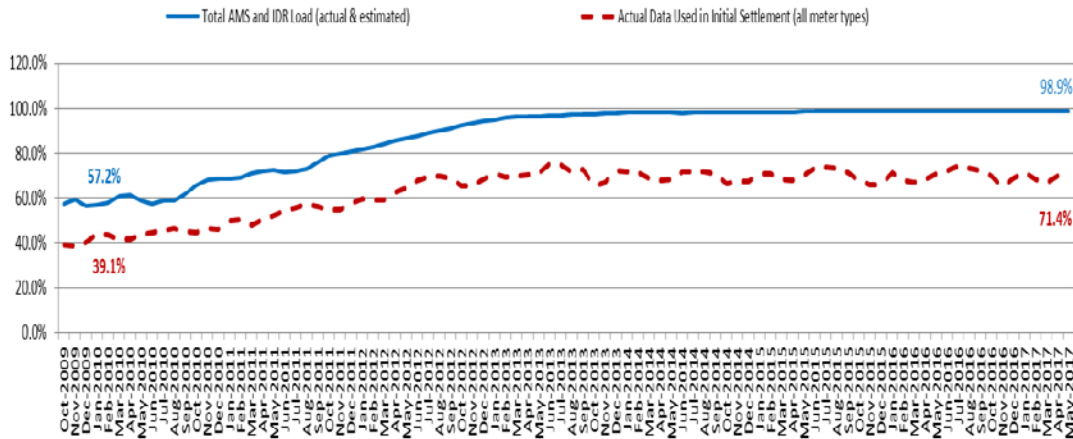
May 2017 was a charge of \$12.09M, compared to:

- A charge of \$25.76M in April 2017
- A charge of \$7.37M in May 2016



# Advanced Meter Settlement Impacts – May 2017

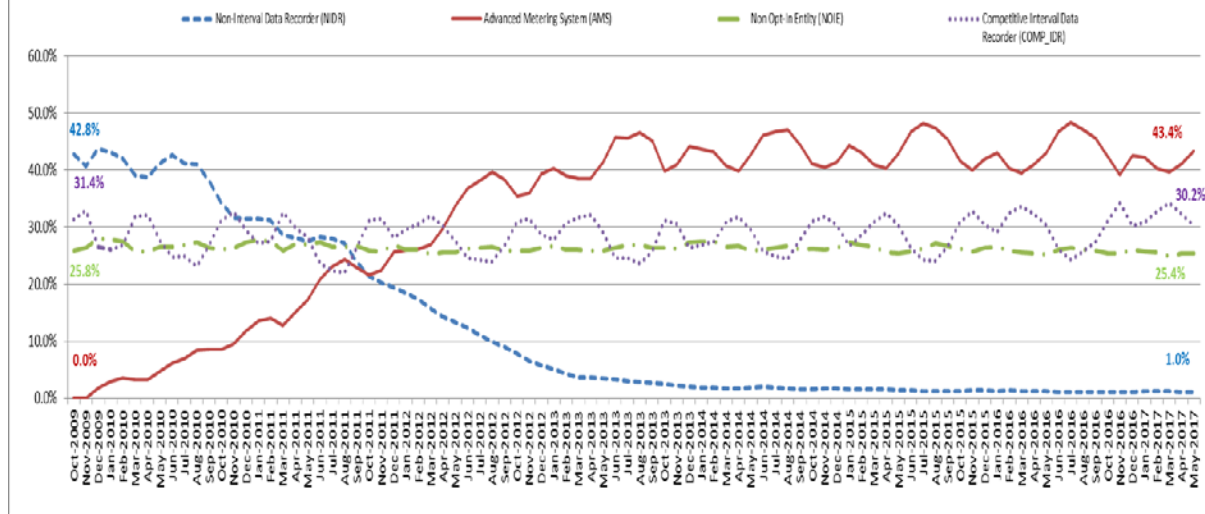
Percent Actual/Percent Interval Data Recorder (IDR)



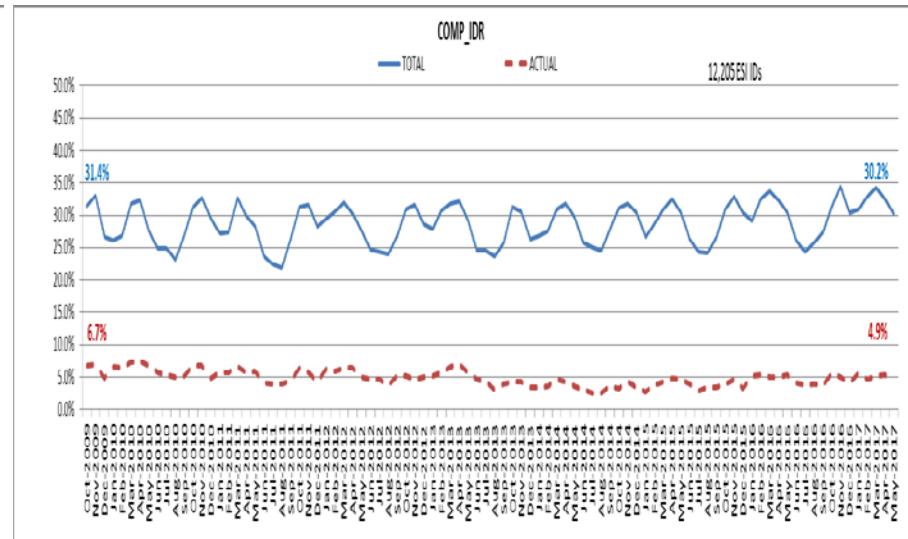
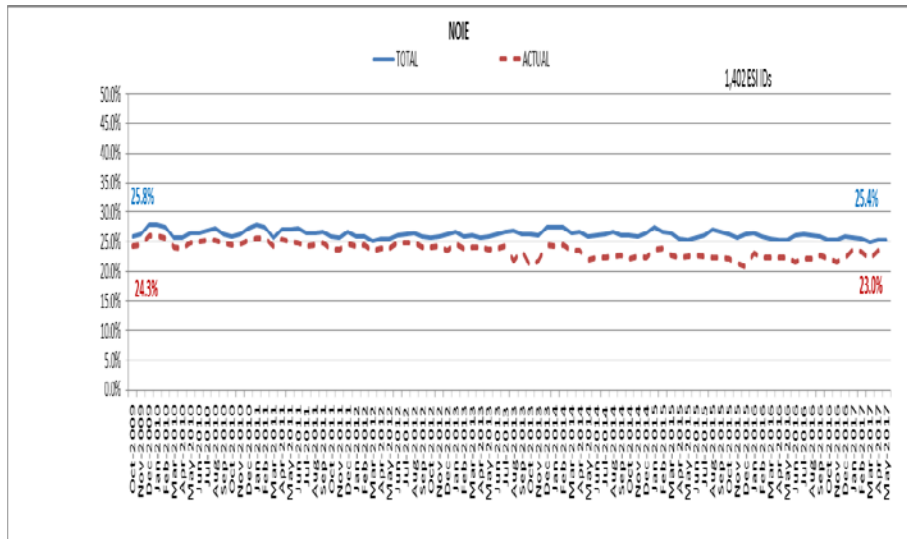
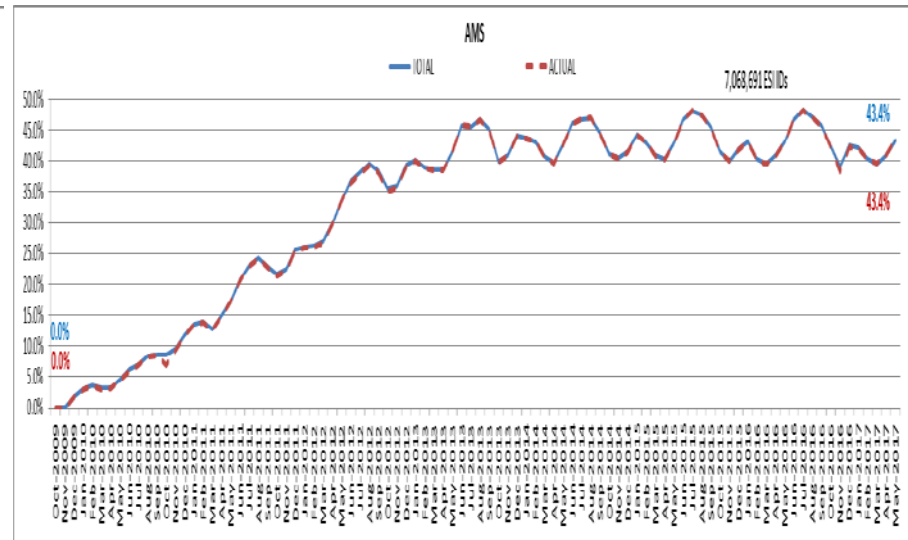
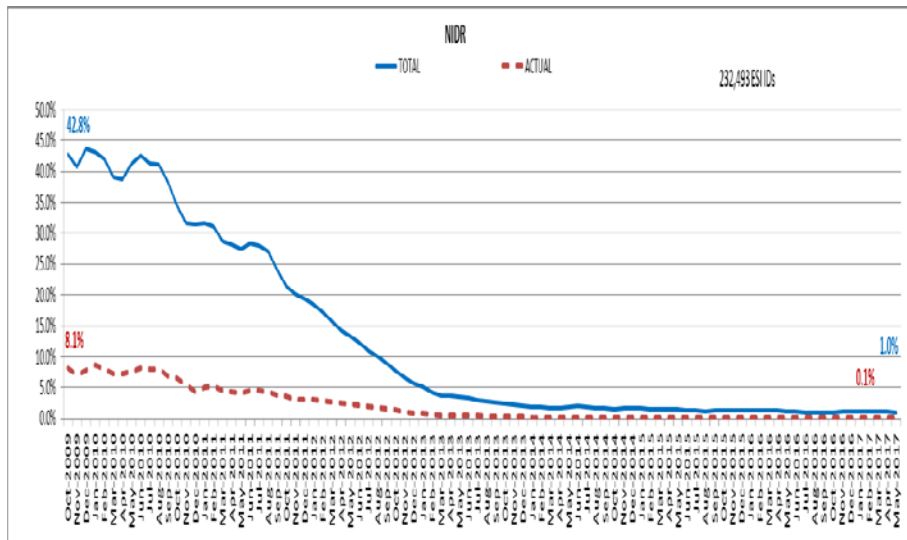
May 2017: At month end, settling 7.0M ESIDs using Advanced Meter data.

May 2017: 98.9% of the load in ERCOT is settled with 15-min interval data (AMS, Competitive IDR, and NOIE IDR).

Percent of Load by Meter Type



# ERCOT Wide Load Volumes by Meter Type – INITIAL Settlement – May 2017

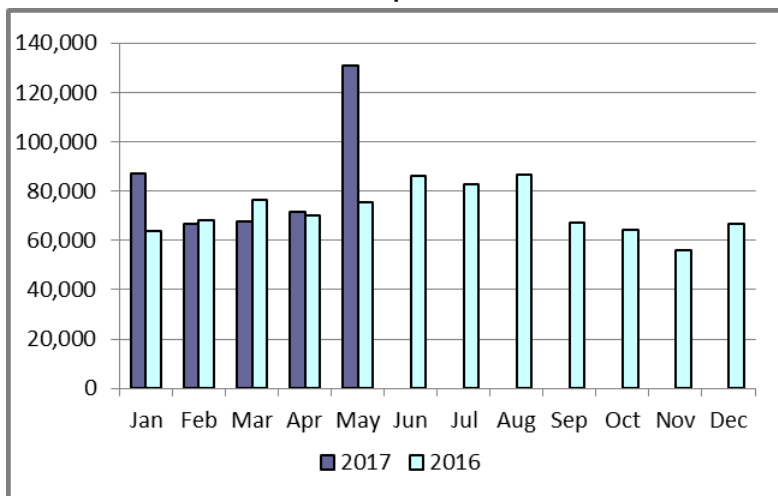


## Retail Transaction Volumes – Summary – May 2017

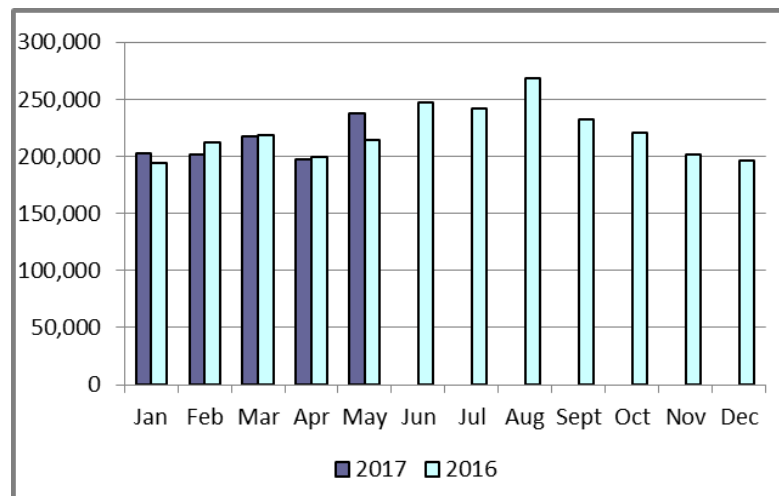
Transaction Type	Year-To-Date		Transactions Received	
	May 2017	May 2016	May 2017	May 2016
Switches	424,457	353,869	130,828	75,323
Acquisition	0	0	0	0
Move - Ins	1,058,034	1,038,622	237,611	214,383
Move - Outs	542,124	531,464	127,218	118,022
Continuous Service Agreements (CSA)	183,744	260,089	52,139	50,499
Mass Transitions	0	0	0	0
<b>Total</b>	<b>2,208,359</b>	<b>2,184,044</b>	<b>547,796</b>	<b>458,227</b>

# Retail Transaction Volumes – Summary – May 2017

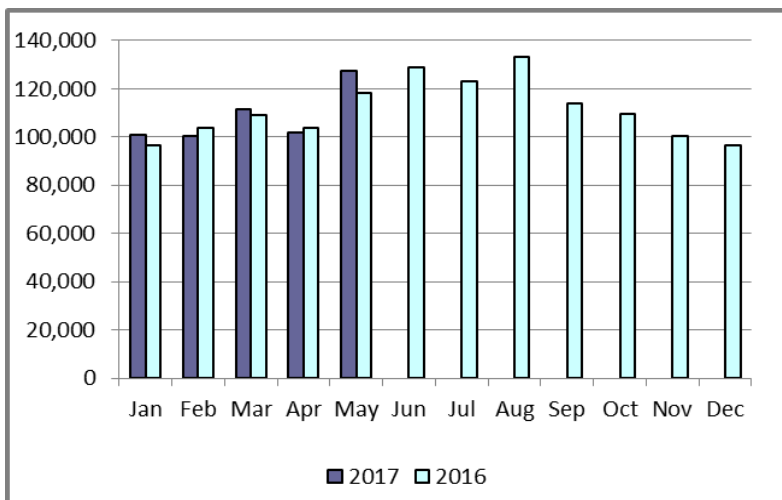
## Switches/Acquisitions



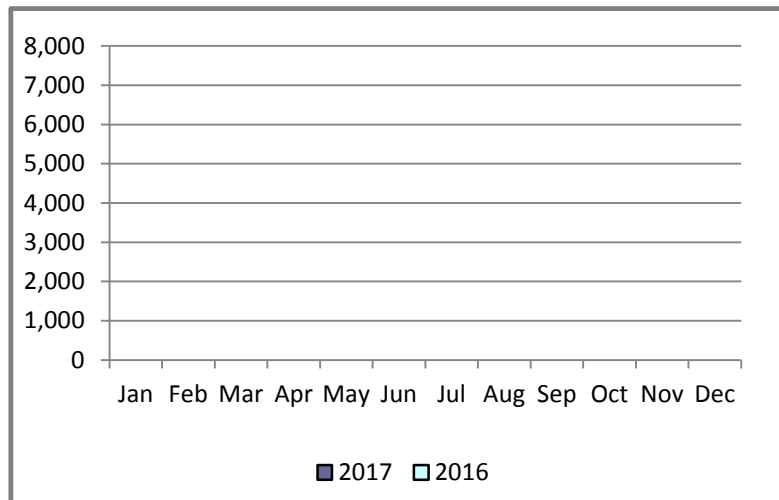
## Move-Ins



## Move-Outs

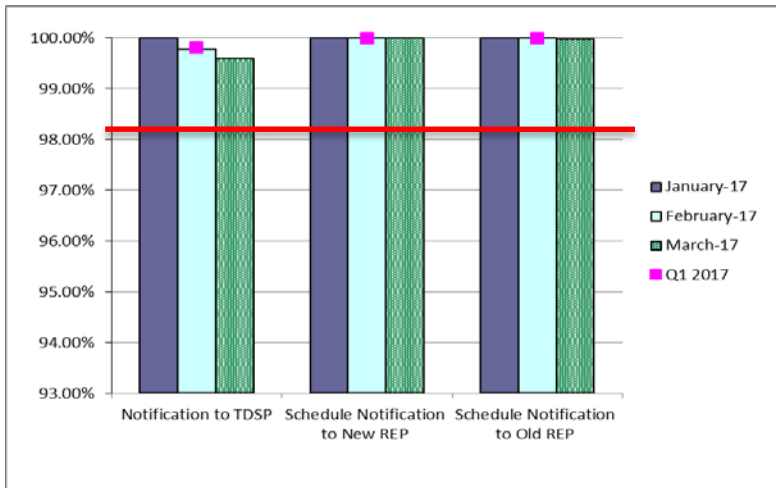


## Mass Transition

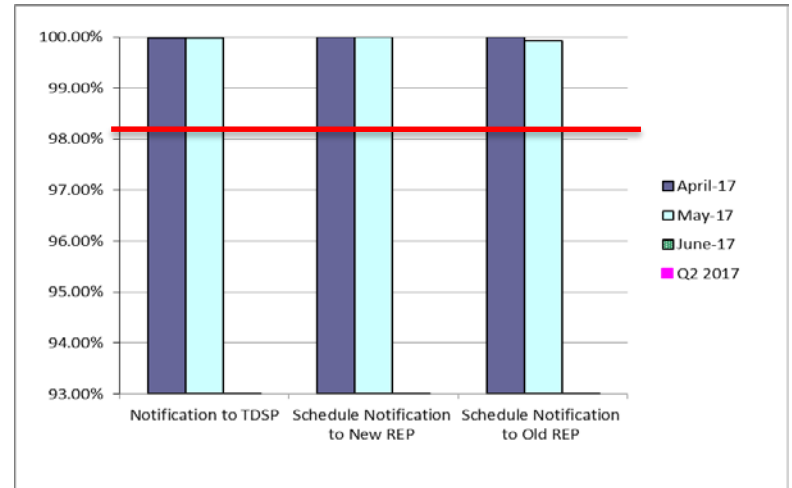


# Retail Performance Measures – Switch – May 2017

## 1<sup>st</sup> Quarter



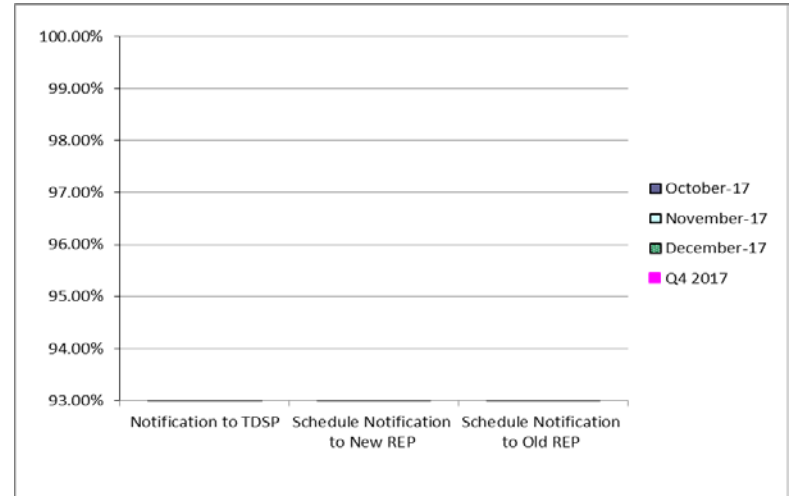
## 2<sup>nd</sup> Quarter



## 3<sup>rd</sup> Quarter

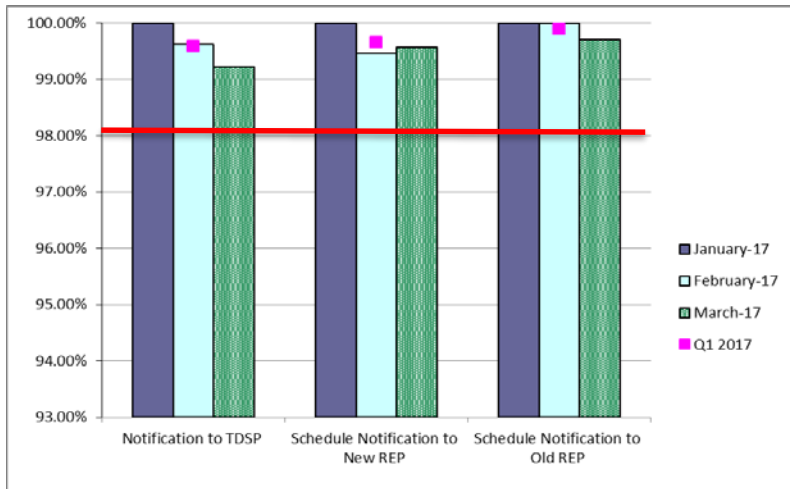


## 4<sup>th</sup> Quarter

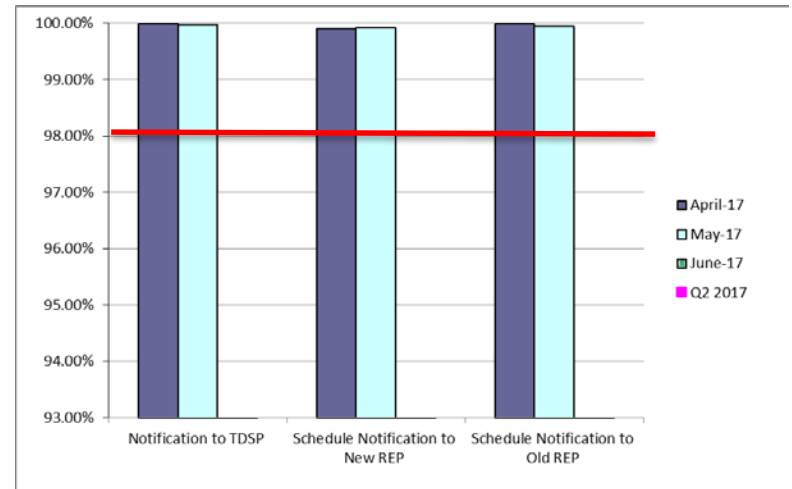


# Retail Performance Measures – Same Day Move-In – May 2017

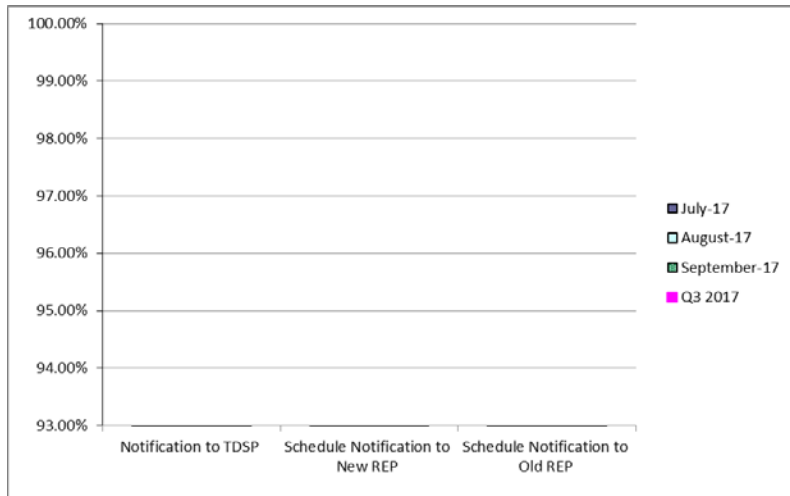
## 1<sup>st</sup> Quarter



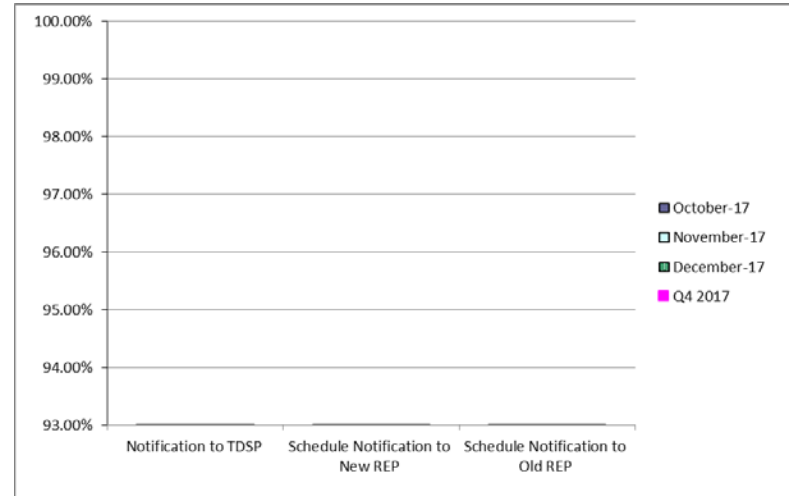
## 2<sup>nd</sup> Quarter



## 3<sup>rd</sup> Quarter

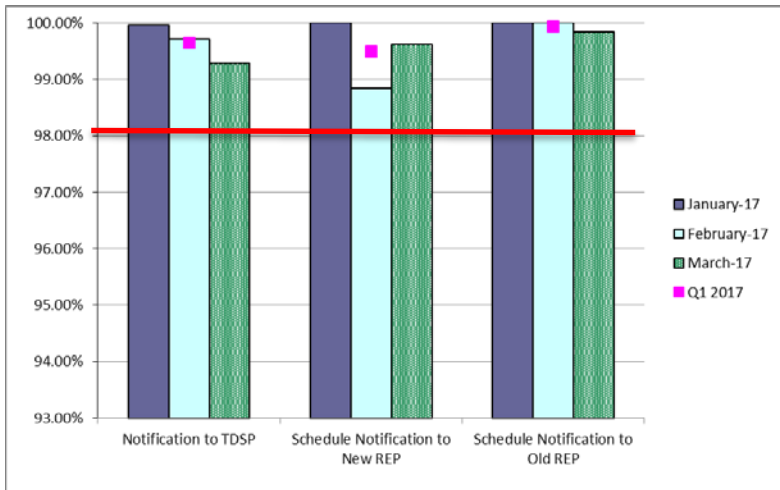


## 4<sup>th</sup> Quarter

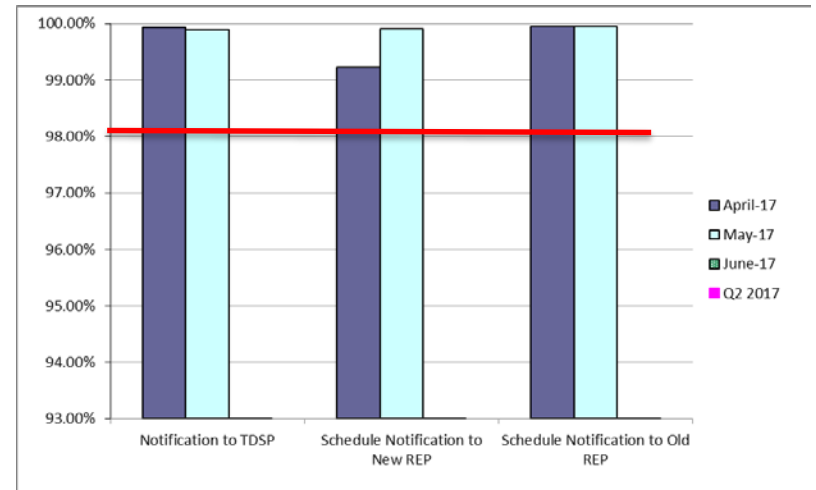


# Retail Performance Measures – Standard Move-In – May 2017

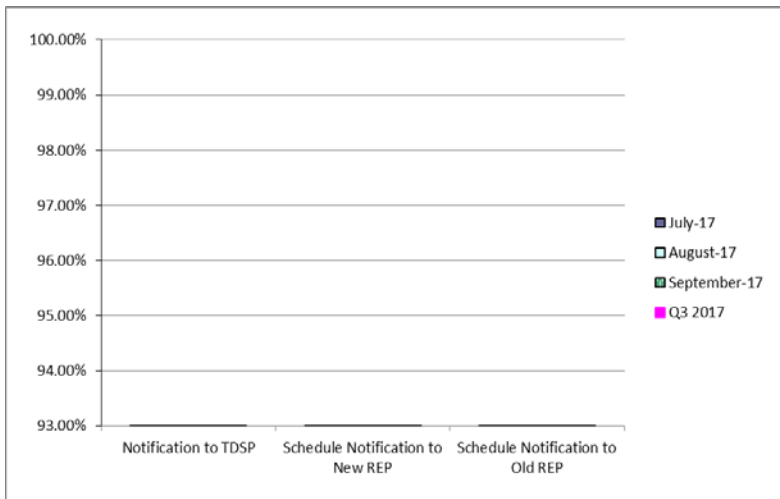
## 1<sup>st</sup> Quarter



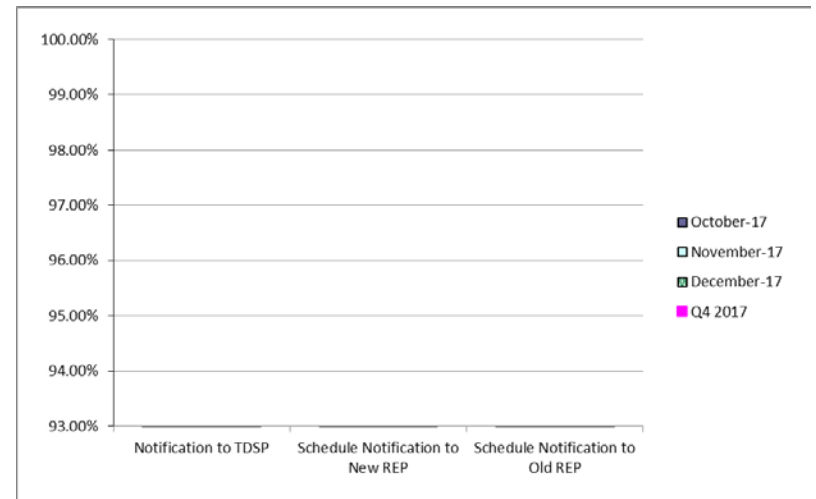
## 2<sup>nd</sup> Quarter



## 3<sup>rd</sup> Quarter



## 4<sup>th</sup> Quarter





# Projects Report

# ERCOT Portfolio Stoplight Report – May 2017

Impact Metric Tolerances	2017 Project Funding	\$20,500,000	2017 Portfolio Spending Estimate
Unfavorable variances are represented as negative numbers within the report. - Green = No more than 4.9% unfavorable variance - Yellow = Unfavorable variance between 4.9% and 9.9% - Red = Unfavorable variance more than 9.9%	Projects In Flight/On Hold (Count = 78)		\$23,120,223
	Projects Not Yet Started (Count = 13)		\$ 811,567
	Projects Completed (Count = 22)		\$ 685,315
	Spending Reductions Required to Maintain Capital Budget		\$ (4,117,105)
	<b>TOTAL</b>		<b>\$20,500,000</b>

Project Number	Projects in Initiation Phase (Count = 6)
SCR789	Update NMMS Topology Processor to PSSE 34 Capability
249-01	Secondary Wind Forecasting Service
244-01	Corporate Wireless
245-01	2017 EPS Metering Enhancements
246-01	iTest Data Refresh
243-01	Training Facility - Scope and Design

## Footnotes

- 1 - One or more phases took longer than expected, resulting in additional time required
- 2 - One or more phases required more labor than expected, resulting in additional funding and/or time required
- 3 - Project placed on hold
- NA - Metric not calculated because:
  - it is reported at the parent project level, or
  - it is an administrative project

# ERCOT Portfolio Stoplight Report – May 2017

Project Number	Projects in Planning Phase (Count = 17)	Phase Start	Baseline Phase Finish	Approved Phase Finish	Scheduled Go-Live Date	Scheduled Phase Finish	Schedule Health		Budget Health	
173-02	ERCOT Flight Certification Website	10/5/2016	2/1/2017	7/19/2017	TBD	7/19/2017		0%		0%
183-01	CMM-FT GUI Integration	12/16/2015	8/17/2016	TBD	TBD	TBD		0%	NA	See 2015 CMM NPRRs
193-01	PMU Tool Evaluation and Implementation	5/31/2017	7/26/2017	7/26/2017	TBD	7/26/2017		0%		13%
198-02	Reactive Power Coordination PoC	4/19/2017	6/28/2017	6/28/2017	TBD	6/28/2017		0%		0%
210-01	REC Technology Refresh	3/15/2017	7/19/2017	7/19/2017	TBD	7/19/2017		0%		4%
212-01	Test Data and Environment Enhancements Initiative (TDEE)	10/5/2016	11/2/2016	5/31/2017	TBD	7/12/2017	1	-17%		29%
228-01	Enterprise Database Upgrade	2/1/2017	6/28/2017	6/28/2017	TBD	8/30/2017	1	-42%		0%
229-01	IT Change and Configuration Management Phase 2	1/25/2017	5/17/2017	7/5/2017	TBD	6/30/2017		3%		5%
238-01	Application Authentication Tech Refresh	5/3/2017	8/30/2017	8/30/2017	TBD	8/30/2017		0%		21%
239-01	Identity and Access Management	6/7/2017	11/8/2017	11/8/2017	TBD	11/8/2017		0%		0%
240-01	EDI Translator and Mapping Replacement Assessment	4/19/2017	9/27/2017	9/27/2017	TBD	9/27/2017		0%		4%
241-01	AREA - Generation	5/31/2017	8/2/2017	8/2/2017	TBD	8/2/2017		0%		0%
242-01	Portfolio Reporting Assessment	5/17/2017	11/1/2017	11/1/2017	TBD	11/1/2017		0%		0%
NPRR484	Revisions to Congestion Revenue Rights Credit Calculations and Payments - Phase 1b / 2	12/16/2015	8/17/2016	TBD	TBD	TBD		0%	NA	See 2015 CMM NPRRs
NPRR702	Flexible Accounts, Payment of Invoices, and Disposition of Interest on Cash Collateral	12/16/2015	8/17/2016	TBD	TBD	TBD		0%	NA	See 2015 CMM NPRRs
NPRR778	Modifications to Date Change and Cancellation Evaluation Window	5/24/2017	7/12/2017	7/12/2017	TBD	7/12/2017		0%		-2%
SCR781	RARF Replacement	3/29/2017	10/31/2017	10/31/2017	TBD	10/26/2017		2%		0%

# ERCOT Portfolio Stoplight Report – May 2017

Project Number	Projects in Execution Phase (Count = 43)	Phase Start	Baseline Go-Live Date	Approved Go-Live Date	Scheduled Go-Live Date	Scheduled Phase Finish	Schedule Health		Budget Health	
158-01	Load Forecast Enhancements	9/28/2016	5/21/2017	5/21/2017	6/14/2017	7/19/2017	1	-10%		1%
170-01	Enterprise Content Alignment Program	8/26/2015	11/15/2017	9/25/2017	9/25/2017	9/25/2017		0%		12%
172-01	Physical Security Project #2	6/30/2016	2/13/2017	7/12/2017	7/12/2017	7/12/2017		0%		8%
177-01	Cyber Security Project #19	4/6/2016	7/13/2016	7/24/2017	7/14/2017	7/26/2017		2%		16%
181-01	CRR Framework Upgrade	10/26/2016	10/2/2017	1/22/2018	1/22/2018	3/16/2018		0%		7%
183-01	CMM Tech Refresh	3/15/2017	5/19/2018	5/19/2018	5/18/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
185-01	Records Management and eDiscovery	12/15/2016	5/24/2017	8/29/2017	8/29/2017	9/13/2017		0%		3%
196-01	GINR Project Status Application Replacement	12/21/2016	9/14/2017	9/14/2017	9/14/2017	10/4/2017		0%		8%
197-01	AREA - Demand and Energy Report	9/14/2016	5/4/2017	6/29/2017	6/29/2017	7/5/2017		0%		-2%
205-01	TIBCO BusinessWorks Application Upgrade	1/11/2017	6/26/2017	8/1/2017	8/1/2017	9/1/2017		0%		0%
209-01	Multi Station Breaker to Breaker One Lines	2/8/2017	3/9/2018	3/9/2018	3/9/2018	5/2/2018		0%		-2%
216-01	CAT & RRS Tools for Control Room Project	11/30/2016	9/15/2017	11/2/2017	11/3/2017	11/29/2017		0%		14%
216-01	Capacity Availability Tool (CAT)	11/30/2016	9/15/2017	11/2/2017	11/3/2017	11/29/2017		0%	NA	See CAT & RRS Tools for Cntl Rm
216-01	Responsive Reserve Service Sufficiency Analysis	11/30/2016	9/15/2017	8/31/2017	9/1/2017	11/29/2017		0%	NA	See CAT & RRS Tools for Cntl Rm
217-01	Cyber Security Project #20	5/17/2017	6/22/2017	6/22/2017	6/22/2017	7/19/2017		0%		6%
218-01	Cyber Security Project #21	5/24/2017	6/23/2017	6/23/2017	7/18/2017	9/7/2017	1	-83%		4%
222-01	Physical Security Project #3	2/8/2017	5/31/2017	7/28/2017	7/28/2017	8/16/2017		0%		0%
224-01	TelAlert Replacement	4/5/2017	6/27/2017	6/27/2017	1/2/2018	1/19/2018	2	-227%	2	-34%
230-01	SAS Technical Architecture Redesign	3/1/2017	11/15/2017	11/15/2017	11/15/2017	2/28/2018		0%		0%
233-00	Capital Efficiencies and Enhancements - 2017	1/1/2017	12/31/2017	12/31/2017	12/31/2017	12/31/2017		0%		0%
233-24	Job Description Repository	1/1/2017	12/31/2017	12/31/2017	12/31/2017	12/31/2017		0%		
234-01	Reporting Solution Resiliency (RSR)	4/5/2017	8/23/2017	8/23/2017	9/21/2017	10/4/2017	1	-20%		39%
235-01	Forecast Monitoring and HSL Tracking	2/8/2017	5/11/2017	6/29/2017	6/29/2017	6/29/2017		0%		6%
Various	NPRR797 & NPRR789 Load Forecast Enhancements	3/8/2017	6/29/2017	6/29/2017	6/29/2017	7/21/2017		0%		15%
Various	2015 CMM NPRRs	3/15/2017	5/19/2018	5/19/2018	5/19/2018	9/11/2018		0%		13%
Various	Implementation of NPRR573 & NPRR801	3/29/2017	6/29/2017	6/29/2017	6/29/2017	7/26/2017		0%		5%
NPRR519	Exemption of ERS-Only QSEs from Collateral and Capitalization Requirements	3/15/2017	5/19/2018	5/19/2018	5/18/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR573	Alignment of PRC Calculation	3/29/2017	6/29/2017	6/29/2017	6/29/2017	7/26/2017		0%	NA	See Implementation of NPRR573 & 801
NPRR620	Collateral Requirements for Counter-Parties with No Load or Generation	3/15/2017	5/19/2018	5/19/2018	5/18/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR648	Remove References to Flowgate Rights	3/15/2017	5/19/2018	5/19/2018	5/18/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs



# ERCOT Portfolio Stoplight Report – May 2017

Project Number	Projects in Execution Phase (Count = 43)	Phase Start	Baseline Go-Live Date	Approved Go-Live Date	Scheduled Go-Live Date	Scheduled Phase Finish	Schedule Health		Budget Health	
NPRR660	Remove CRR State Change Adder	3/15/2017	5/19/2018	5/19/2018	5/18/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR683	Revision to Available Credit Limit Calculation	3/15/2017	5/19/2018	5/19/2018	5/18/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR741	Clarifications to TPE and EAL Credit Exposure Calculations	3/15/2017	5/19/2018	5/19/2018	5/18/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR743	Revision to MCE to Have a Floor For Load Exposure	3/15/2017	5/19/2018	5/19/2018	5/18/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR755	Data Agent-Only QSE Registration	3/15/2017	5/19/2018	5/19/2018	5/19/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR758	Improved Transparency for Outages Potentially Having a High Economic Impact	1/11/2017	7/13/2017	8/31/2017	8/28/2017	9/15/2017		1%		-4%
NPRR760	Calculation of Exposure Variables For Days With No Activity	3/15/2017	5/19/2018	5/19/2018	5/19/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR782	Settlement of Infeasible Ancillary Services Due to Transmission Constraints	5/24/2017	8/31/2017	8/31/2017	8/31/2017	11/1/2017		0%		0%
NPRR789	Publish All Mid-Term Load Forecast Results	3/8/2017	6/29/2017	6/29/2017	6/29/2017	7/19/2017		0%	NA	See NPRR797 & NPRR789 Load Forecast Enhancements
NPRR797	Actual Load by Forecast Zone Report and Display	3/8/2017	6/29/2017	6/29/2017	6/29/2017	7/19/2017		0%	NA	See NPRR797 & NPRR789 Load Forecast Enhancements
NPRR800	Revisions to Credit Exposure Calculations to Use Electricity Futures Market Prices	3/15/2017	5/19/2018	5/19/2018	5/19/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR801	Non-Controllable Load Resource MW in PRC	3/29/2017	6/29/2017	6/29/2017	6/29/2017	7/26/2017		0%	NA	See Implementation of NPRR573 & 801
SCR777	Bilateral CRR Interface Enhancement	10/26/2016	10/2/2017	1/22/2018	1/22/2018	3/16/2018		0%	NA	See #181-01
Project Number	Projects in Stabilization (Count = 12)	Execution Phase Start	Baseline Go-Live Target	Approved Go-Live Target	Actual Go-Live Date	Scheduled Execution Phase Finish	Schedule Health		Budget Health	
NPRR744	RUC Trigger for the Reliability Deployment Price Adder and Alignment with RUC Settlement	2/8/2017	6/29/2017	6/29/2017	5/31/2017	7/19/2017		20%		27%
NPRR746	Adjustments Due to Negative Load	1/25/2017	5/11/2017	5/11/2017	5/11/2017	8/9/2017		0%		19%
NPRR792	Changing Special Protection System (SPS) to Remedial Action Scheme (RAS)	11/30/2016	5/21/2017	5/21/2017	5/11/2017	6/14/2017		5%		See #187-00
Various	2016 RARF Enhancements	11/16/2016	2/17/2017	5/15/2017	5/15/2017	6/14/2017		0%		17%
RMGRR127	Efficiencies for Acquisition Transfer	5/25/2016	4/2/2017	6/22/2017	6/4/2017	6/12/2017		4%	NA	See #188-01
RRGRR003	Modifications to Improve Wind Forecasting	11/16/2016	2/17/2017	5/15/2017	5/15/2017	6/14/2017		0%	NA	See 2016 RARF Enh.
RRGRR006	Clarification of Descriptions and Alignment with Resource Asset Registration Forms	11/16/2016	2/17/2017	5/15/2017	5/15/2017	6/14/2017		0%	NA	See 2016 RARF Enh.
RRGRR007	Adding Solar Resource Registration Inputs	11/16/2016	2/17/2017	5/15/2017	5/15/2017	6/14/2017		0%	NA	See 2016 RARF Enh.
RRGRR009	Adding Voltage Limit Sets, Relay Loadability, MLSE, and GMD Data	11/16/2016	2/17/2017	5/15/2017	5/15/2017	6/14/2017		0%	NA	See 2016 RARF Enh.
065-01	NMMS Upgrade	12/17/2014	9/22/2016	5/1/2017	5/8/2017	8/2/2017		0%		10%
188-01	Mass Transition/Acquisition Enhancements (MTAQ)	5/25/2016	4/2/2017	6/22/2017	6/4/2017	6/21/2017		4%		0%
223-01	Control Room Video Support and Upgrade	11/16/2016	2/17/2017	2/17/2017	2/3/2017	6/14/2017		15%		5%



# ERCOT Portfolio Stoplight Report – May 2017

Project Number	Projects On Hold (Count = 0)	Forecast Start Date	Baseline Phase Finish	Approved Go-Live Target	Scheduled Go-Live Date	Scheduled Phase Finish	Schedule Health		Budget Health	
Project Number	Projects Completed (Count = 22)	Baseline Execution Phase Start	Baseline Go-Live Target	Approved Go-Live Target	Actual Go-Live Date	Actual Execution Phase Finish	Schedule Health		Budget Health	
170-03	ECAP - Enterprise Content Management System (Proof of Concept)	11/16/2016	3/15/2017	3/15/2017	4/11/2017	4/12/2017	1	-22%		24%
170-04	ECAP - ERCOT Information Governance and Taxonomy	11/16/2016	1/19/2017	2/17/2017	2/17/2017	2/22/2017		0%		6%
173-01	Serena Software (MarkeTrak) Upgrade	10/5/2016	1/29/2017	3/26/2017	3/26/2017	6/7/2017		0%		0%
189-01	Enterprise Resource Planning	4/13/2016	9/27/2016	9/27/2016	9/27/2016	4/12/2017		0%		59%
190-01	Collaboration Software Governance	4/27/2016	7/20/2016	12/14/2016	TBD	4/12/2017	1	-51%		4%
198-01	Reactive Power Coordination Assessment	7/13/2016	10/12/2016	1/11/2017	1/18/2017	1/18/2017		-3%		10%
202-01	Email Gateway Replacement	11/9/2016	1/31/2017	1/31/2017	1/31/2017	5/17/2017		0%		62%
203-01	DW Replication Upgrade	10/26/2016	12/10/2016	2/17/2017	2/17/2017	3/1/2017		0%		1%
211-01	Identity & Access Management Evaluation	10/5/2016	2/22/2017	2/22/2017	2/22/2017	3/1/2017		0%		11%
227-01	Engineer Workstations and Other Equipment	11/30/2016	3/1/2017	3/1/2017	2/28/2017	3/8/2017		1%		5%
NOGRR147	Reactive Power Testing Requirements	9/14/2016	12/8/2016	12/8/2016	12/8/2016	1/11/2017		0%	NA	See NOGRR147 & SCR787
NPRR272	Definition and Participation of Quick Start Generation Resources	8/3/2016	2/9/2017	3/9/2017	3/9/2017	4/5/2017		0%		35%
NPRR649	Addressing Issues Surrounding High Dispatch Limit (HDL) Overrides	11/9/2016	3/19/2017	3/9/2017	3/9/2017	3/29/2017		0%		39%
NPRR754	Revise Load Distribution Factors Report Posting Frequency	10/12/2016	12/11/2016	12/11/2016	12/12/2016	1/11/2017		-1%		47%
NPRR764	QSE Capacity Short Calculations Based on an 80% Probability of Exceedance (P80)	11/16/2016	3/9/2017	3/9/2017	3/9/2017	6/7/2017		0%		22%
NPRR785	Synchronizing WGR and PVGR COPs with the Short Term Wind and PhotoVoltaic Forecasts	11/30/2016	3/9/2017	3/9/2017	3/9/2017	3/9/2017		0%		See #187-00
RMGRR134	Allow AMS Data Submittal Process for TDSP-Read Non-Modeled Generators	12/14/2016	3/9/2017	3/9/2017	3/9/2017	6/7/2017		0%		23%
SCR786	Retail Market Test Environment	6/22/2016	12/12/2016	12/12/2016	12/12/2016	2/15/2017		0%		34%
SCR787	Maintain NDCRC Data For Generator Transfer Between Resource Entities	9/14/2016	12/8/2016	12/8/2016	12/8/2016	1/11/2017		0%	NA	See NOGRR147 & SCR787
SCR788	Addition of Integral ACE Feedback to GTBD Calculation	10/5/2016	12/8/2016	12/8/2016	12/8/2016	12/16/2016		0%		53%
SCR790	Wind Resource Power Production and Forecast Transparency	1/11/2017	5/11/2017	5/11/2017	5/11/2017	5/11/2017		0%		10%
Various	NOGRR147 and SCR787 NDCRC Enhancement	9/14/2016	12/8/2016	12/8/2016	12/8/2016	1/11/2017		0%		5%

## ERCOT Portfolio Stoplight Report – May 2017

Project Number	2017 Projects Not Yet Started (Count = 13)	Forecast Start Date
NPRR776	Voltage Set Point Communication	Jun-2017
NPRR808	Three Year CRR Auction	Jun-2017
NPRR809	GTC or GTL for New Generation Interconnection	Jun-2017
NPRR812	Alignment of Currently-Published Reports	Jun-2017
PGRR052	Stability Assessment for Interconnecting Generation	Jun-2017
TBD	CIP Recovery Plan Project - Planning Phase 1	Jun-2017
TBD	Security Constrained Optimal Powerflow in Study Network Analysis	Jun-2017
TBD	Generic Transmission Constraint Calculation	Jul-2017
TBD	JBOSS Upgrade Assessment	Jul-2017
TBD	Real-Time Assessment Continuity	Aug-2017
NPRR810	Applicability of RMR Incentive Factor on Reservation and Transportation Costs Associated with Firm Fuel Supplies	Sep-2017
TBD	Automation of NPRR487 - QSGR Dispatch Adjustment	Nov-2017
TBD	Emergency Energy Settlements Inputs Automation	Nov-2017