



## **ERCOT Monthly Operational Overview** (March 2017) Revised 04.24.17

ERCOT Public  
April 15, 2017

# **Grid Planning & Operations**

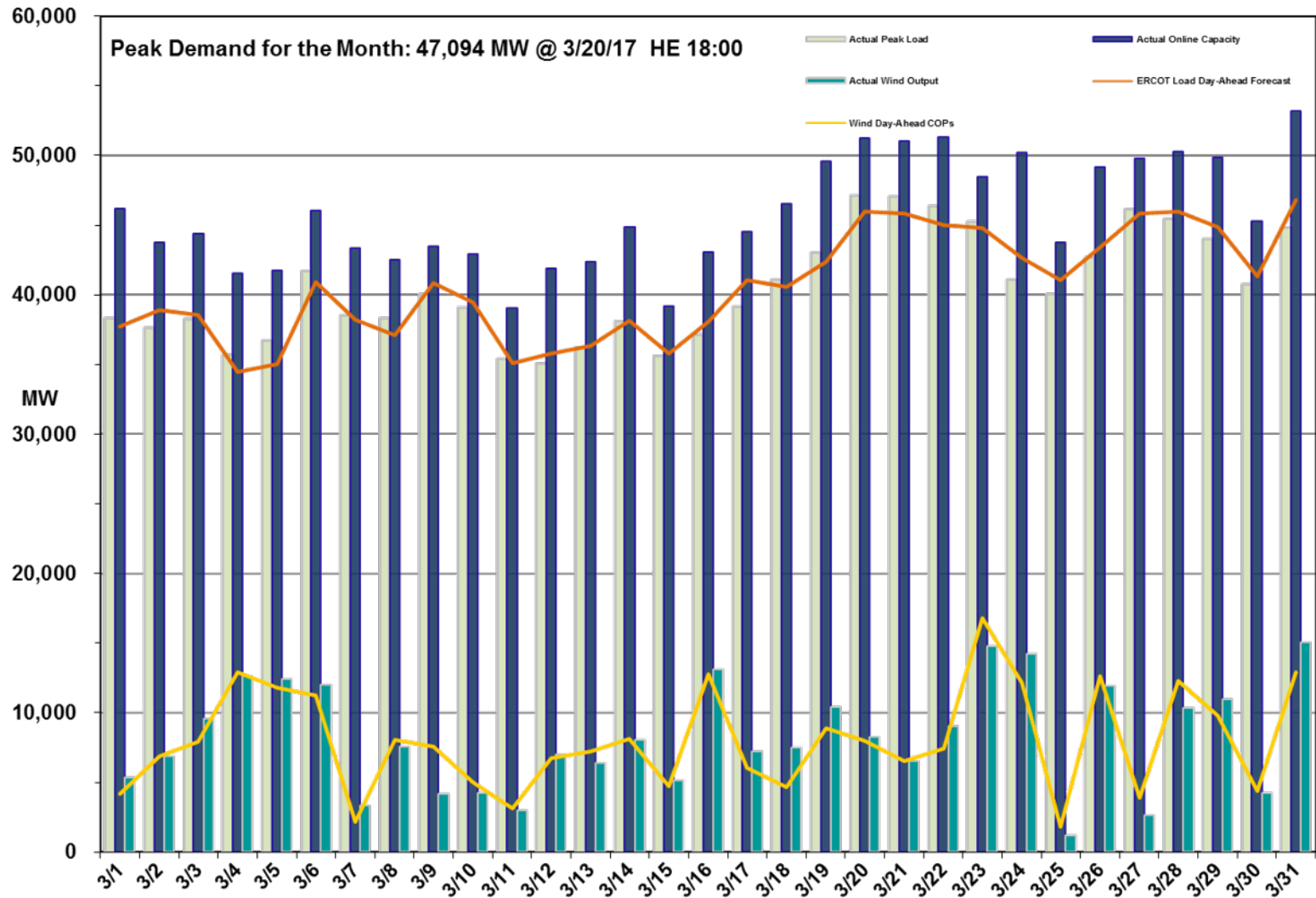
### Operations

- The preliminary Settlements hourly peak demand of 47,094\* MW on March 20 was higher than the day-ahead mid-term load forecast peak of 45,994 MW for the same operating hour.
  - The operational instantaneous peak demand was 47,645 MW (telemetry).
- Day-ahead load forecast error for March was 2.18%
- ERCOT issued four notifications:
  - Two Advisories issued due to Physical Responsive Capability being below 3000 MW
  - One Advisory issued due to VSAT being unavailable
  - One Watch issued due to issued due to North to Houston Interface

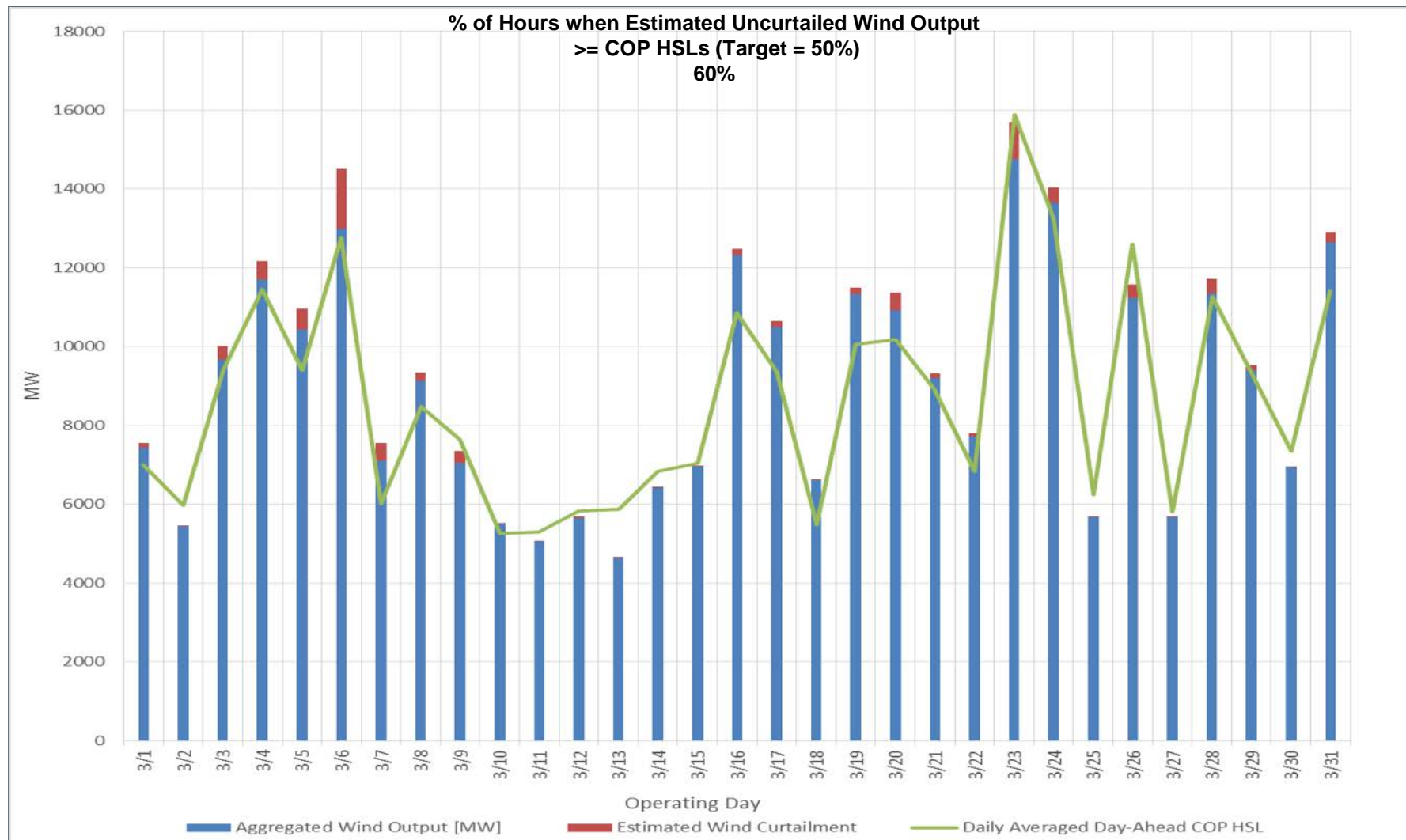
### Planning Activities

- 266 active generation interconnection requests totaling 60,948 MW, including 26,565 MW of wind generation, as of March 31, 2017. Six additional requests and an increase of 681 MW from February 28, 2017.
- 18,589 MW wind capacity in commercial operations as of April 1, 2017.

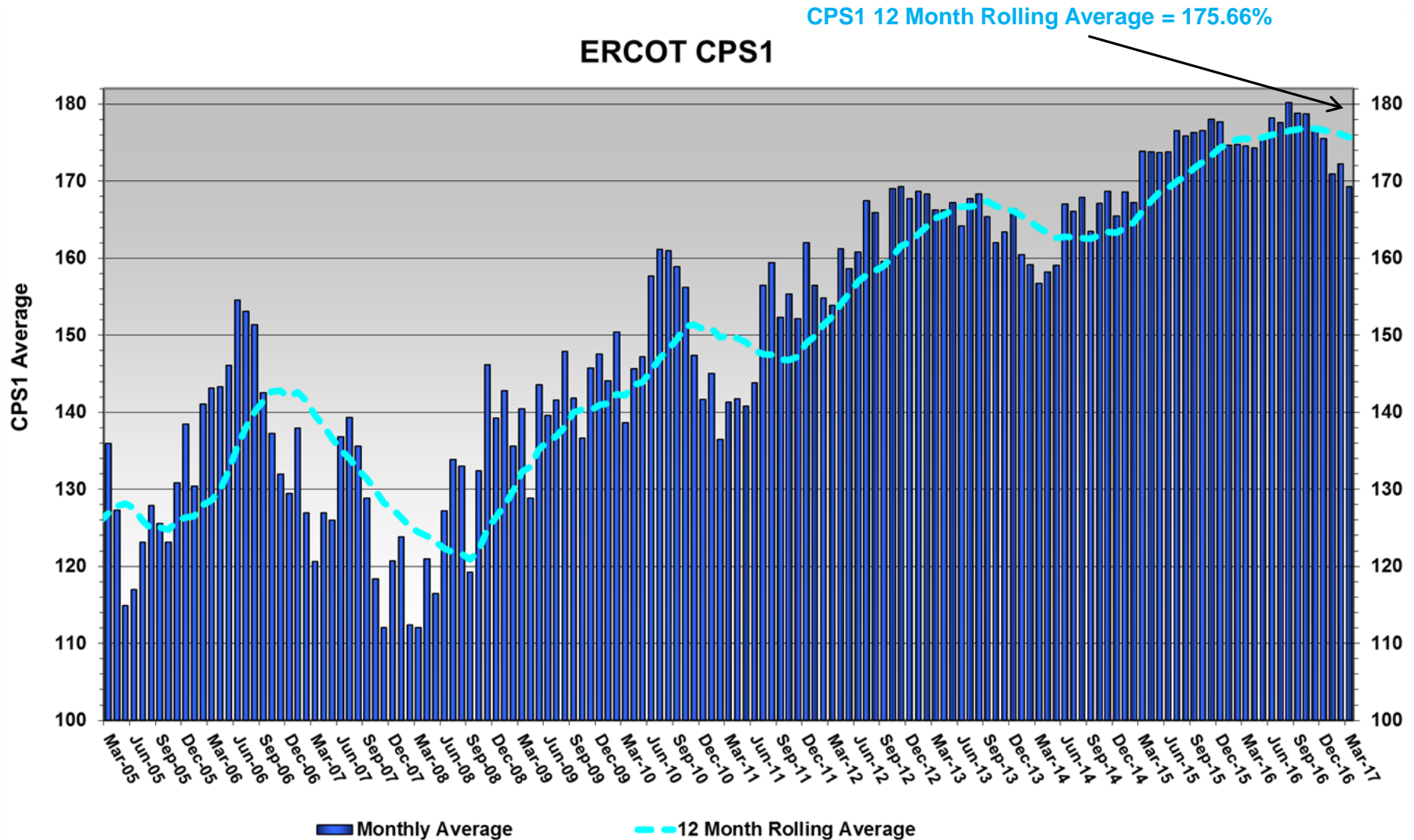
# Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs & On-Line Capacity at Peak – March 2017



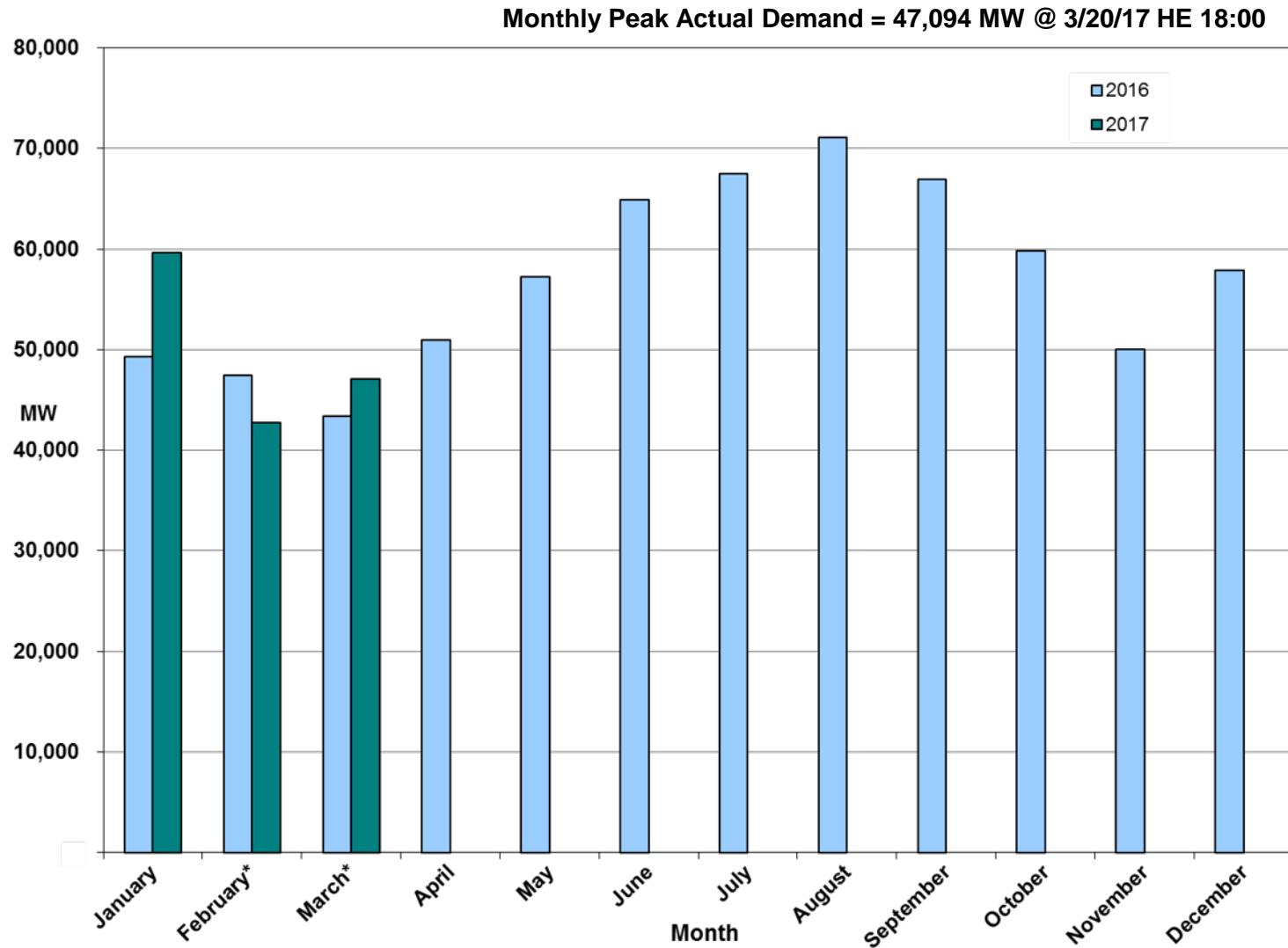
# Actual Wind Output plus Curtailments vs. Wind Day-Ahead COPs for All Hours – March 2017



# ERCOT's CPS1 Monthly Performance – March 2017

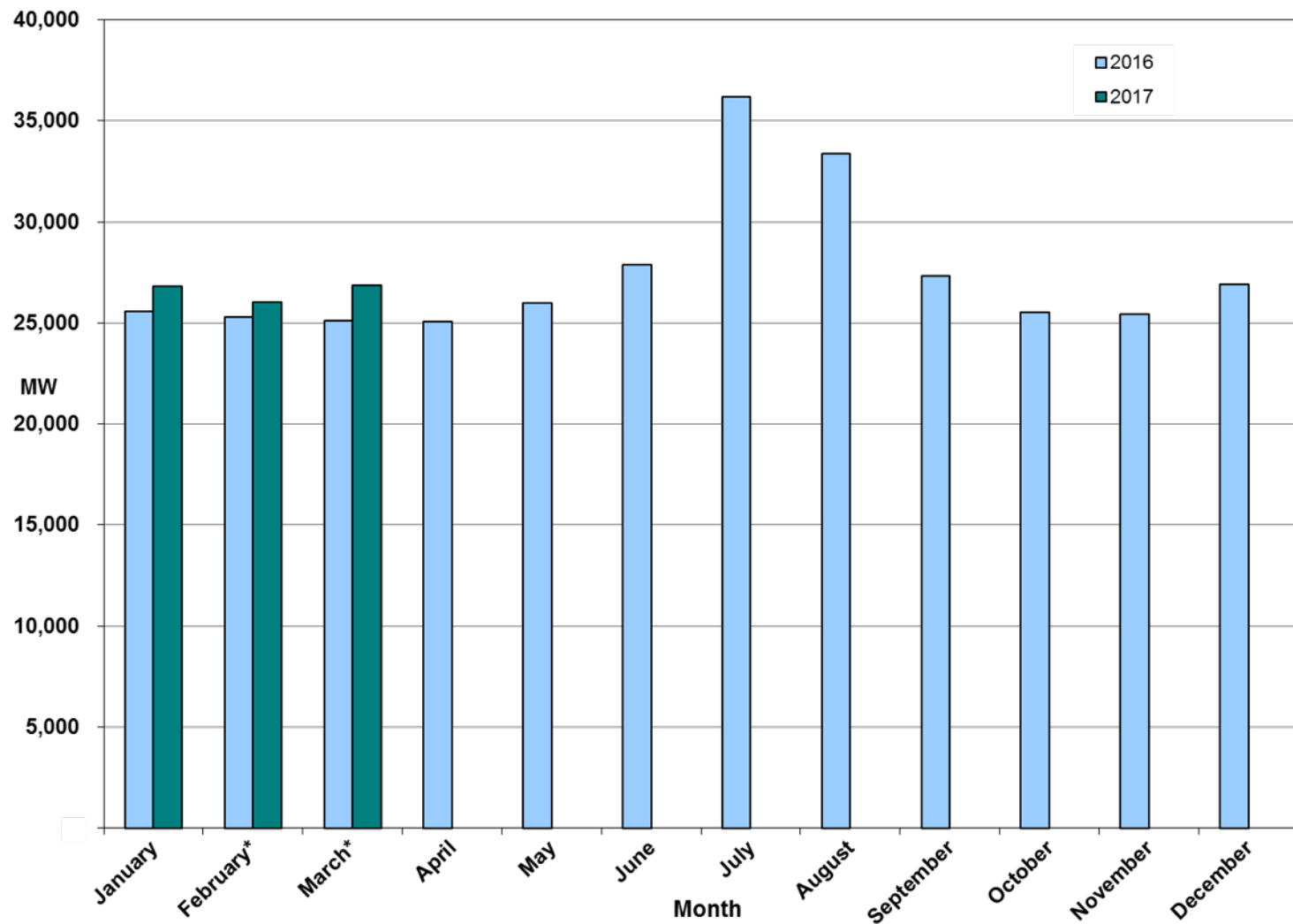


## Monthly Peak Actual Demand – March 2017



\* Preliminary for latest two months of the current year

## Monthly Minimum Actual 15-Minute Demand – March 2017



\* Preliminary for latest two months of the current year



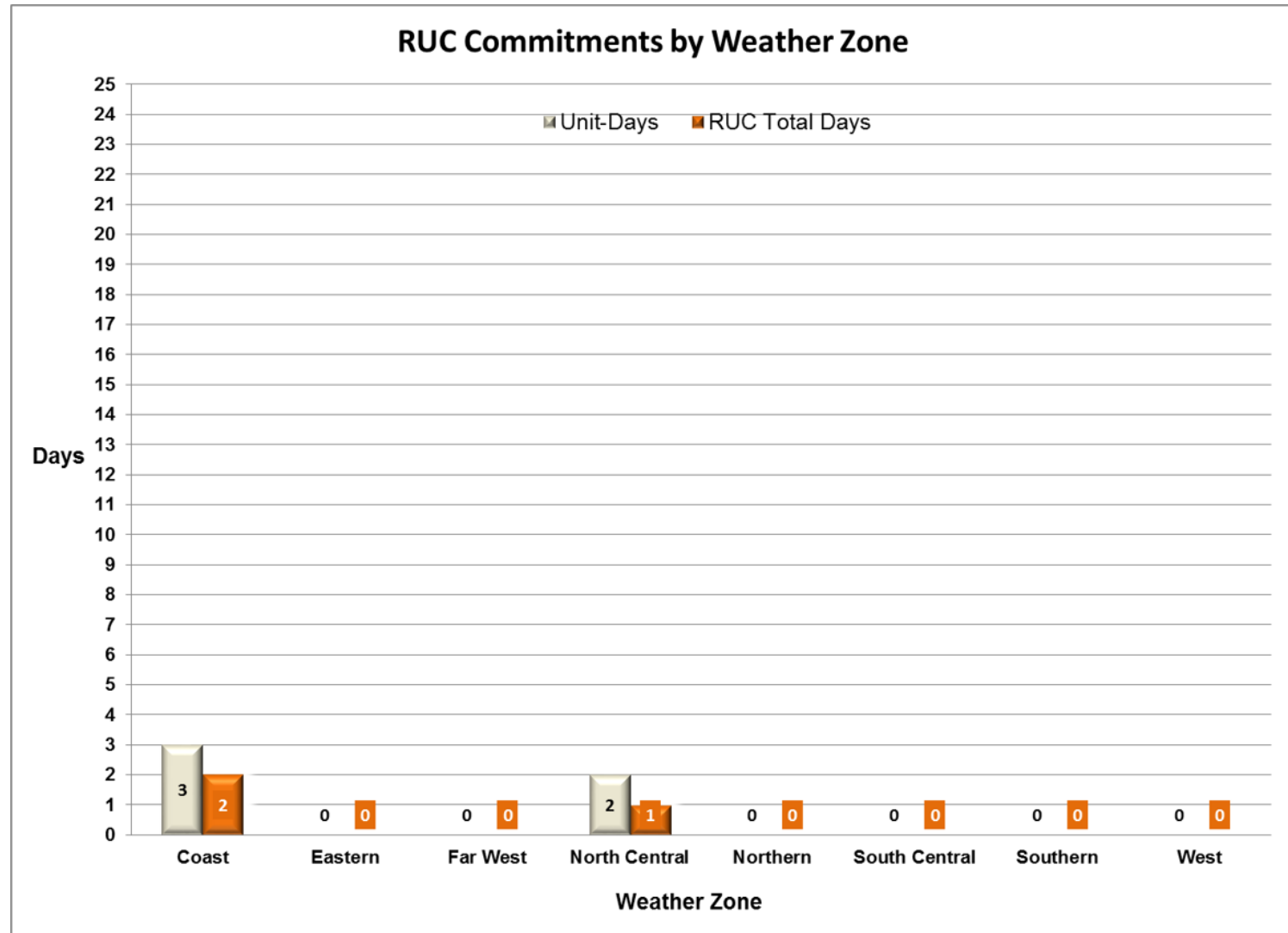
## Day-Ahead Load Forecast Performance – March 2017

**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>March 2017 MAPE</b>	
<b>Average Annual MAPE</b>	2.83	2.86	2.62	2.76	2.18	
<b>Lowest Monthly MAPE</b>	2.15	1.89	1.94	2.02	<b>Lowest Daily MAPE</b>	0.79 March 23
<b>Highest Monthly MAPE</b>	3.70	3.81	3.86	4.07	<b>Highest Daily MAPE</b>	5.08 March 2

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

## March 2017



## Generic Transmission Constraints (GTCs) – March 2017

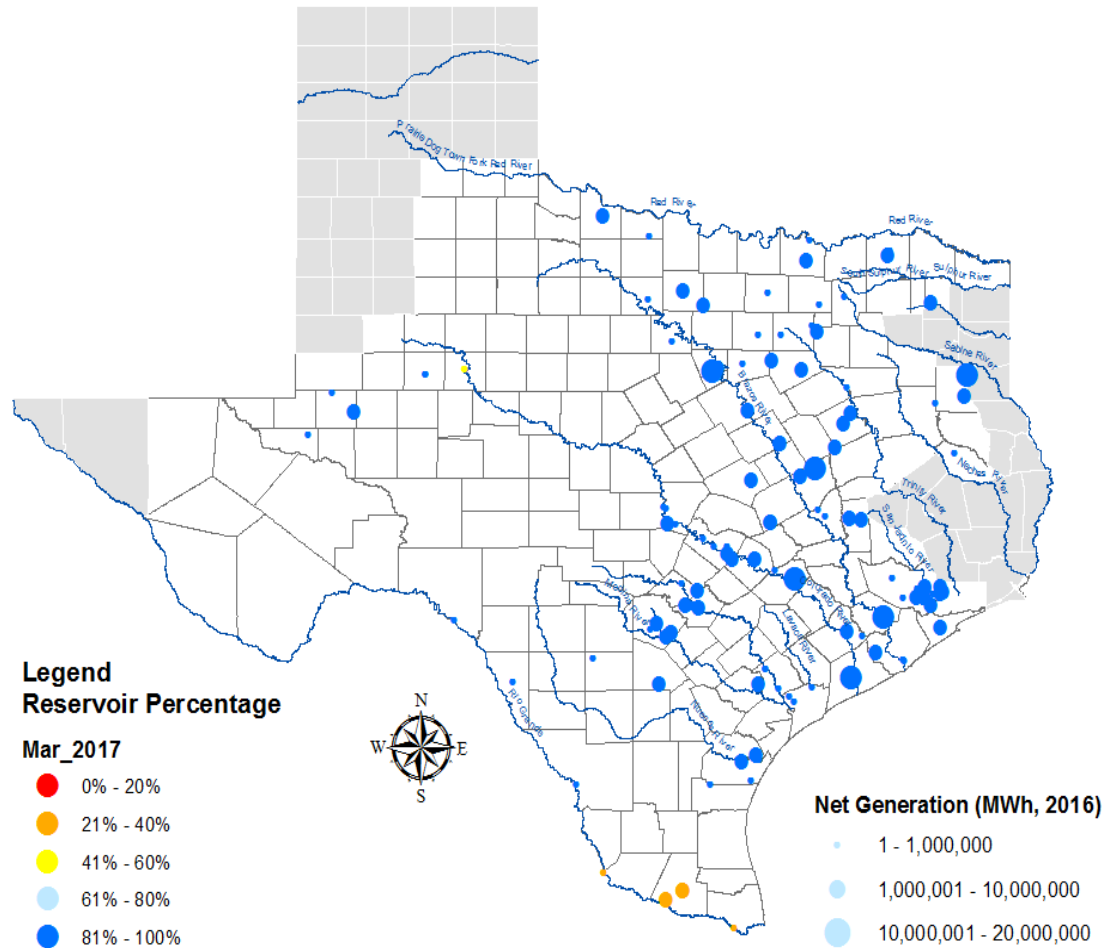
GTCs	Mar-16 Days GTCs	Jan-17 Days GTCs	Feb-17 Days GTCs	March-17 Days GTCs	Last 12 Months Total Days (Apr 16 – Mar 17)
North – Houston	2	1	0	0	1
Valley Import	1	0	1	1	7
Zorillo - Ajo	6	0	9	0	65
Panhandle	5	17	21	29	204
Laredo	0	0	0	0	12
Liston	26	21	13	0	223
Red Tap	-	0	0	0	0
Bakersfield	-	0	7	30	37

**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.

- Two Advisories issued due to Physical Responsive Capability being below 3000 MW
  - Issued on 03/09, 03/11
- One Advisory issued due to VSAT being unavailable
  - Issued on 03/30
- One Watch issued due to North to Houston Interface
  - Issued on 03/27

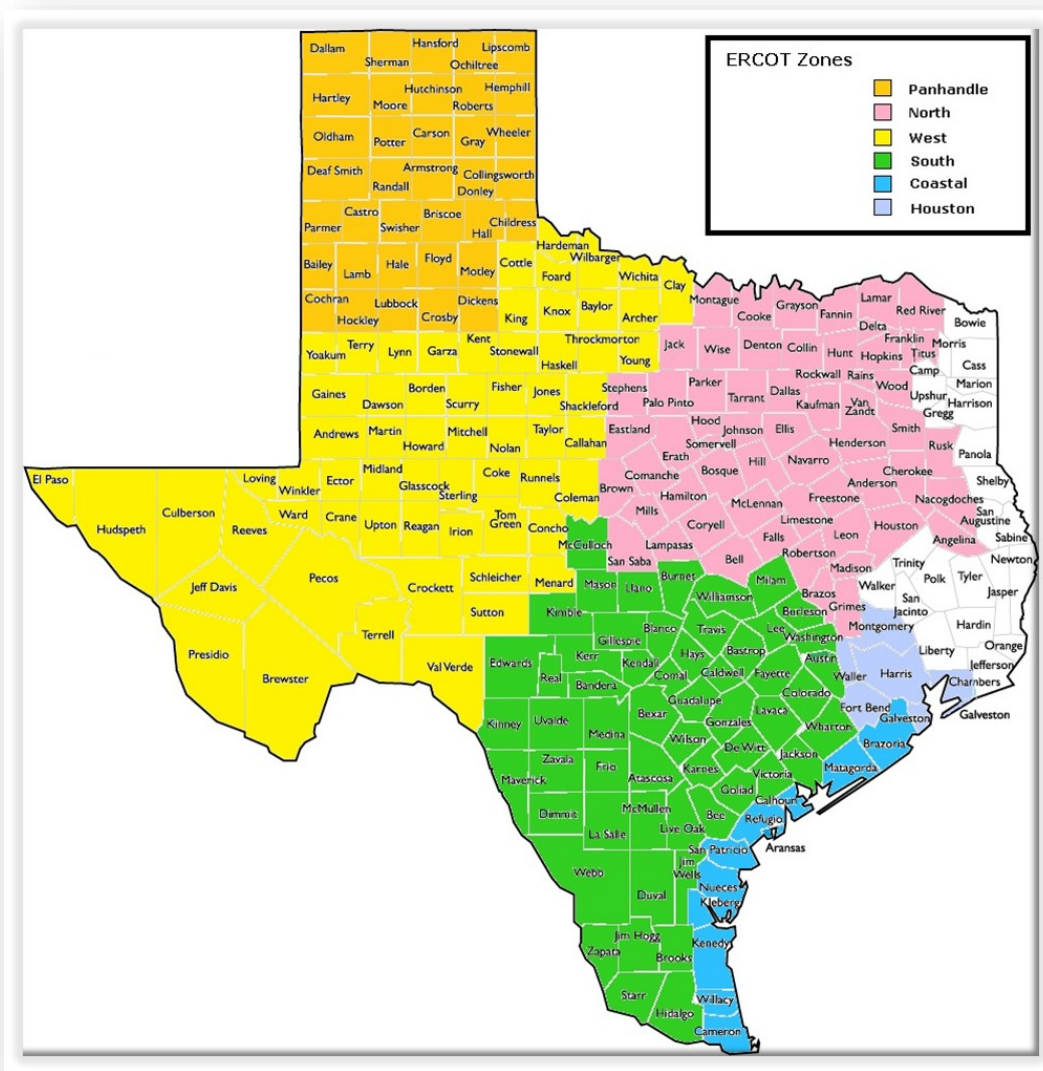
# Lake Levels Update – April 1, 2017



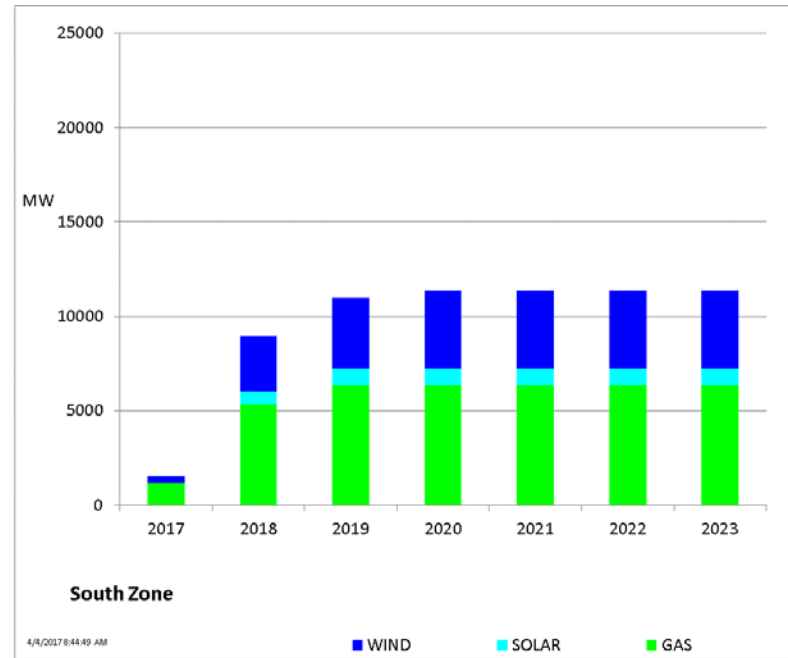
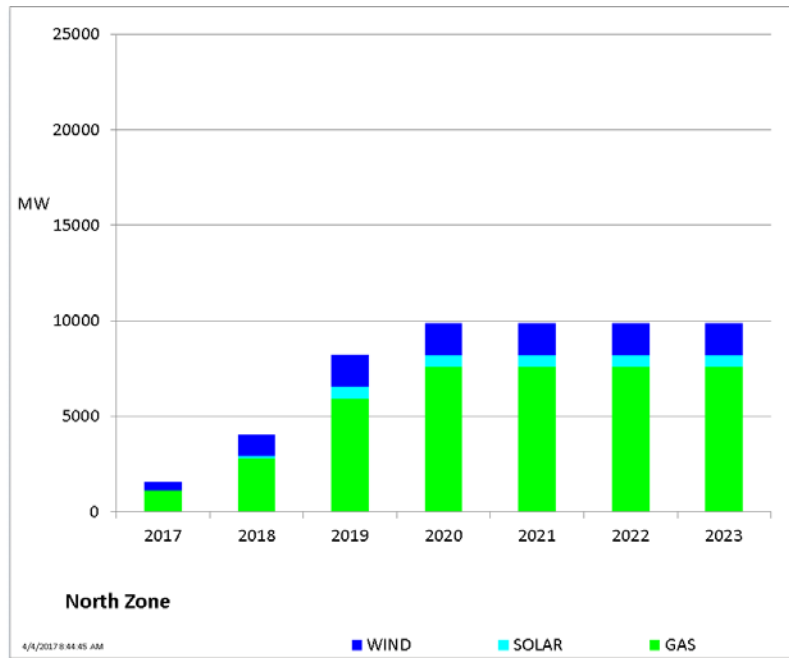
## Planning Summary – March 2017

- ERCOT is currently tracking 266 active generation interconnection requests totaling 60,948 MW. This includes 26,565 MW of wind generation.
- ERCOT is currently reviewing proposed transmission improvements with a total cost of \$1.15 Billion.
- Transmission Projects endorsed in 2017 total \$110.7 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 – March 2017

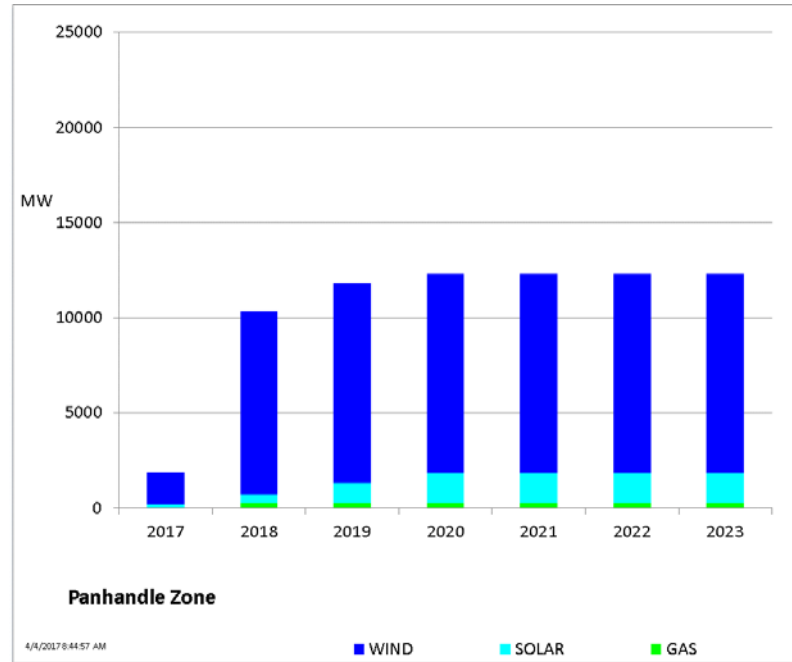
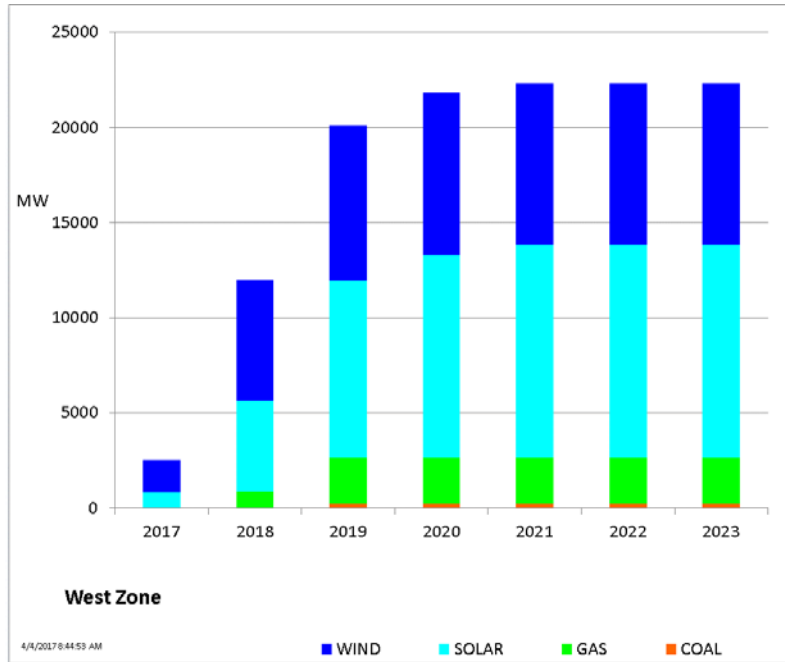


# Cumulative MW Capacity of Interconnection Requests by Zone – March 2017

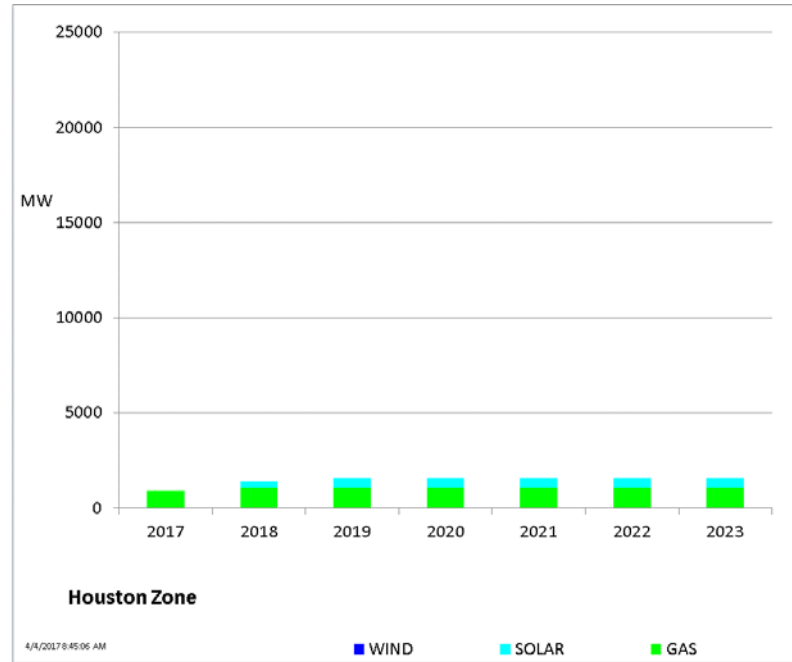
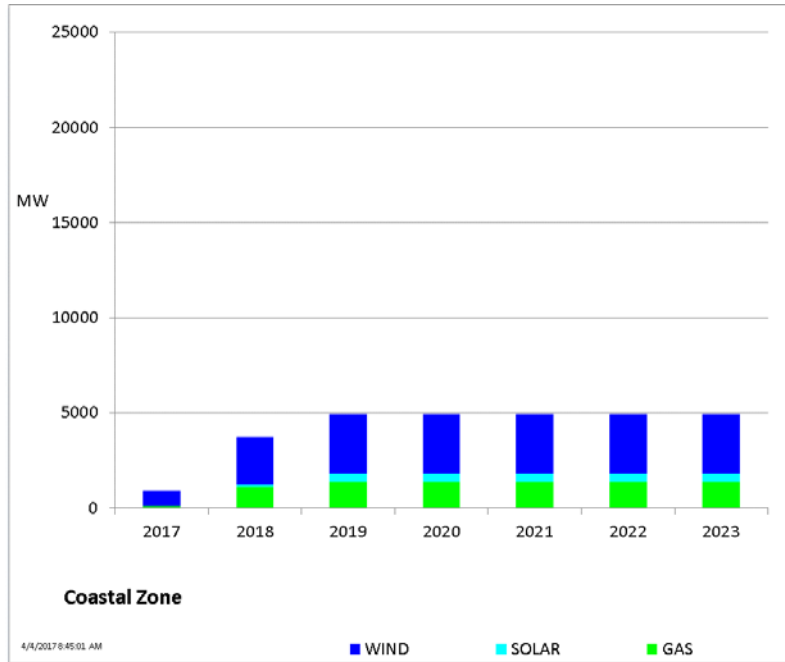




# Cumulative MW Capacity of Interconnection Requests by Zone – March 2017

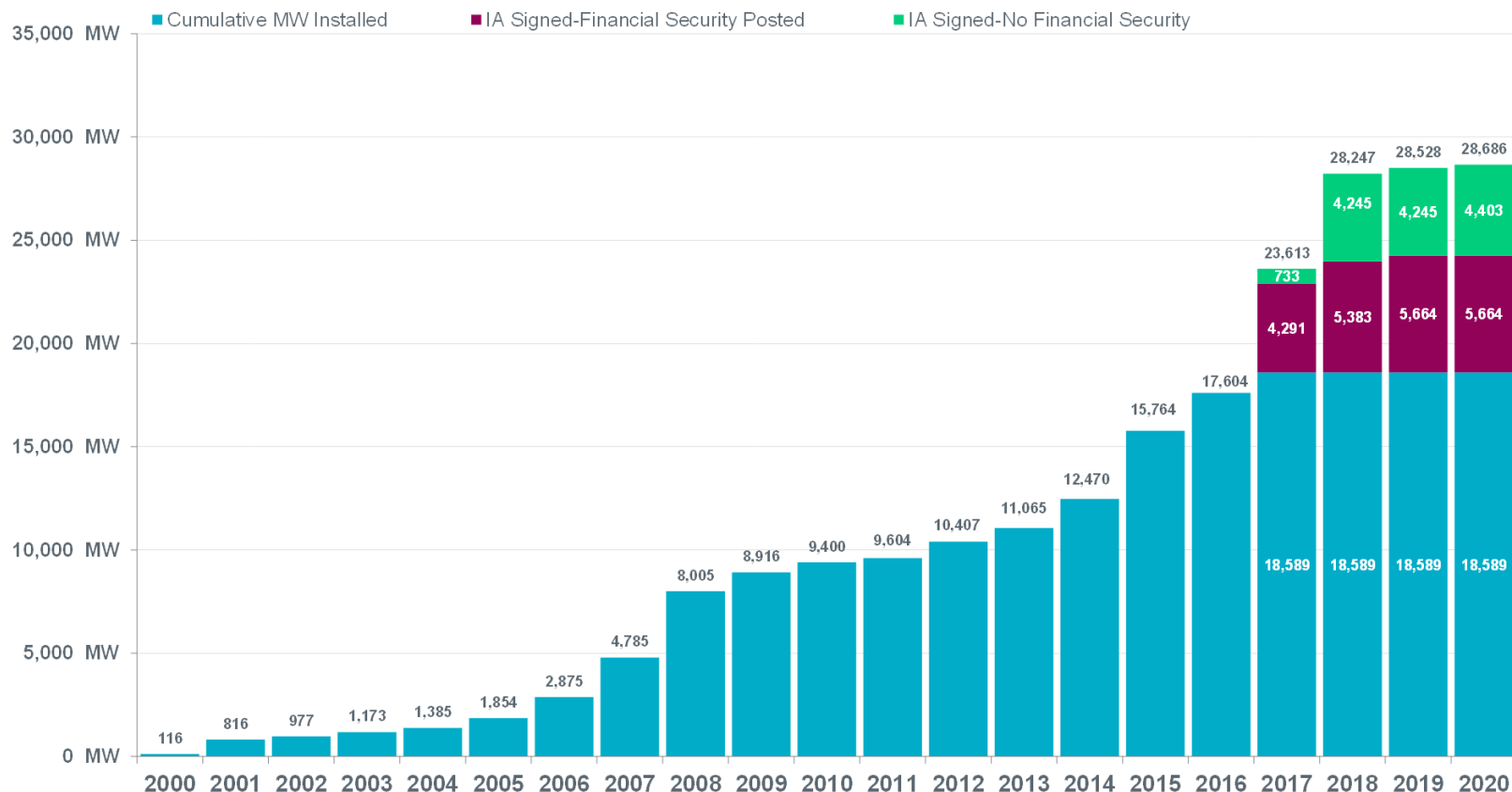


# Cumulative MW Capacity of Interconnection Requests by Zone – March 2017



# Wind Generation – March 2017

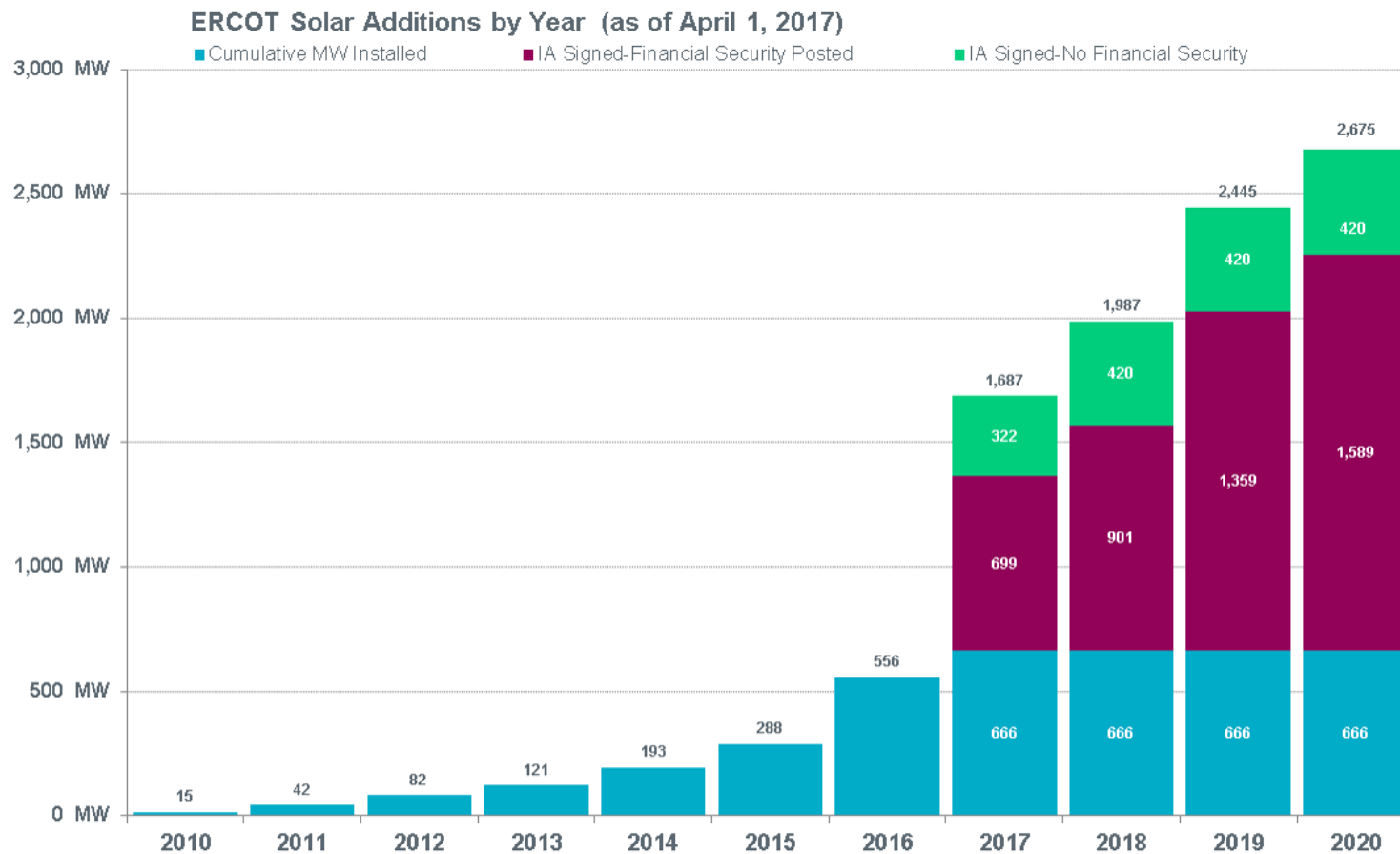
ERCOT Wind Additions by Year (as of April 1, 2017)



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

# Solar Generation – March 2017



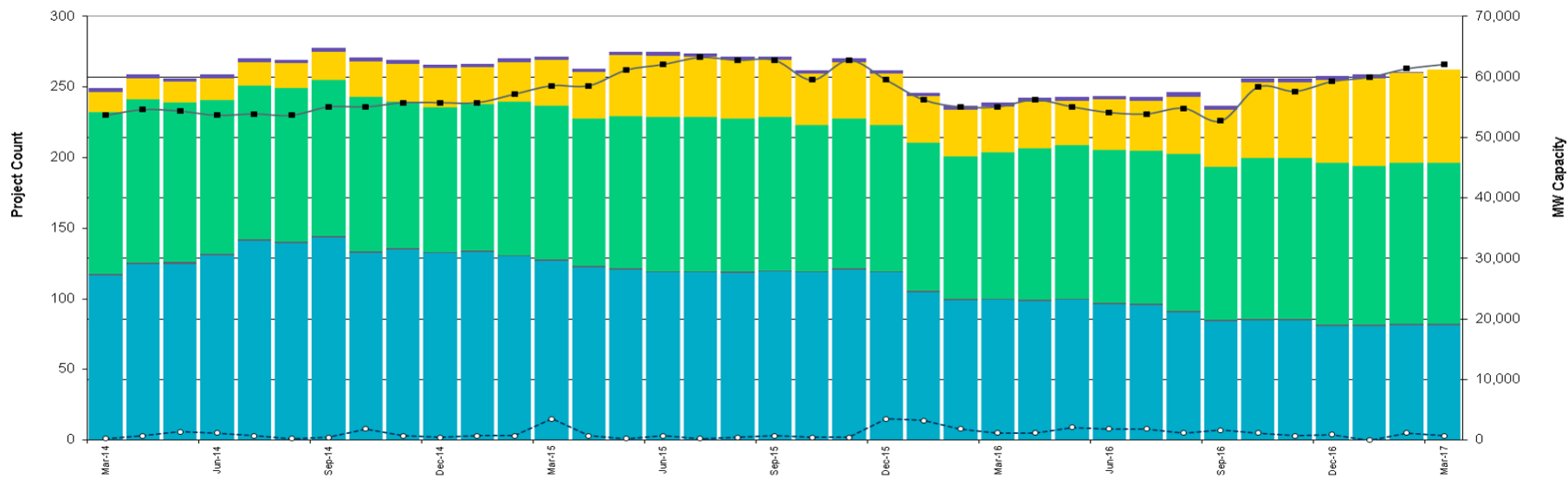
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# Generation Interconnection Activity by Fuel – March 2017

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

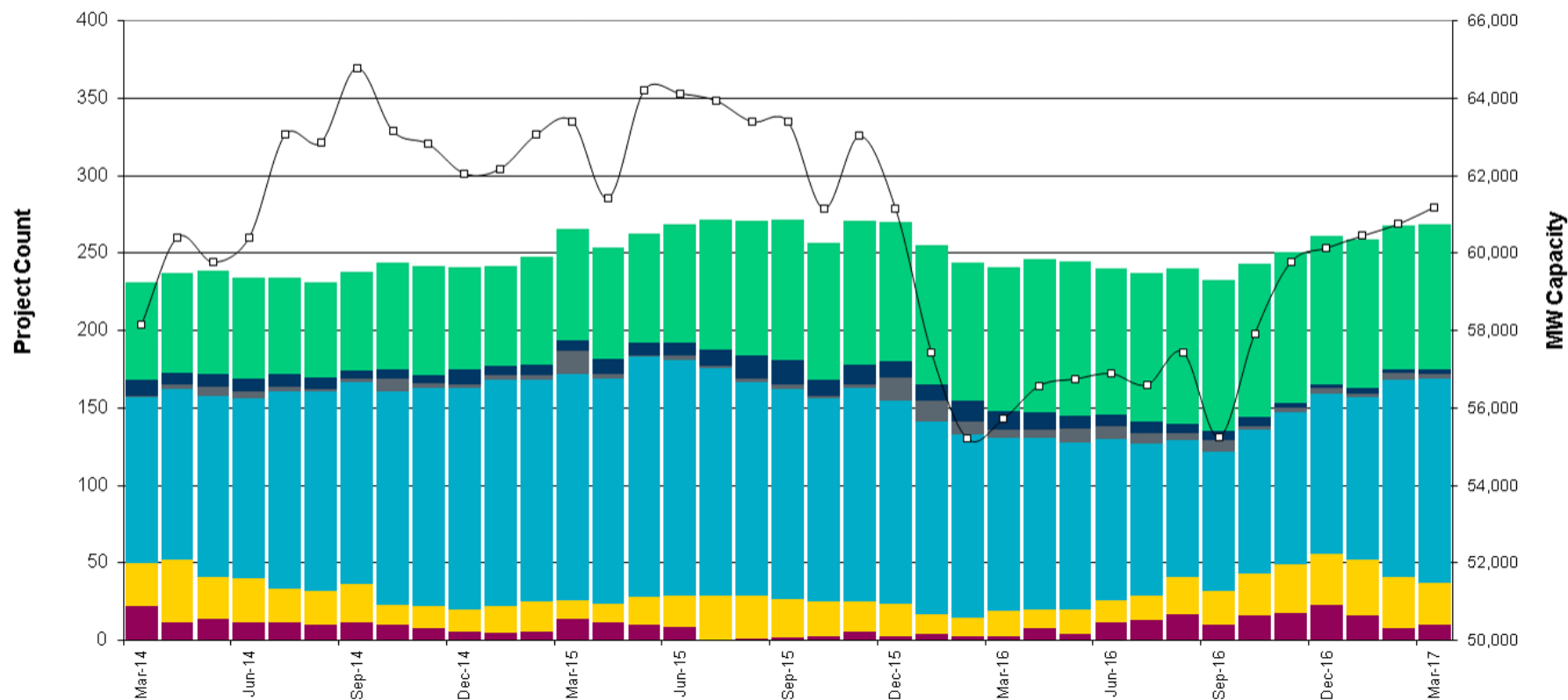
Projects in all phases of interconnection study are reflected in this graph



# Generation Interconnection Activity by Project Phase – March 2017

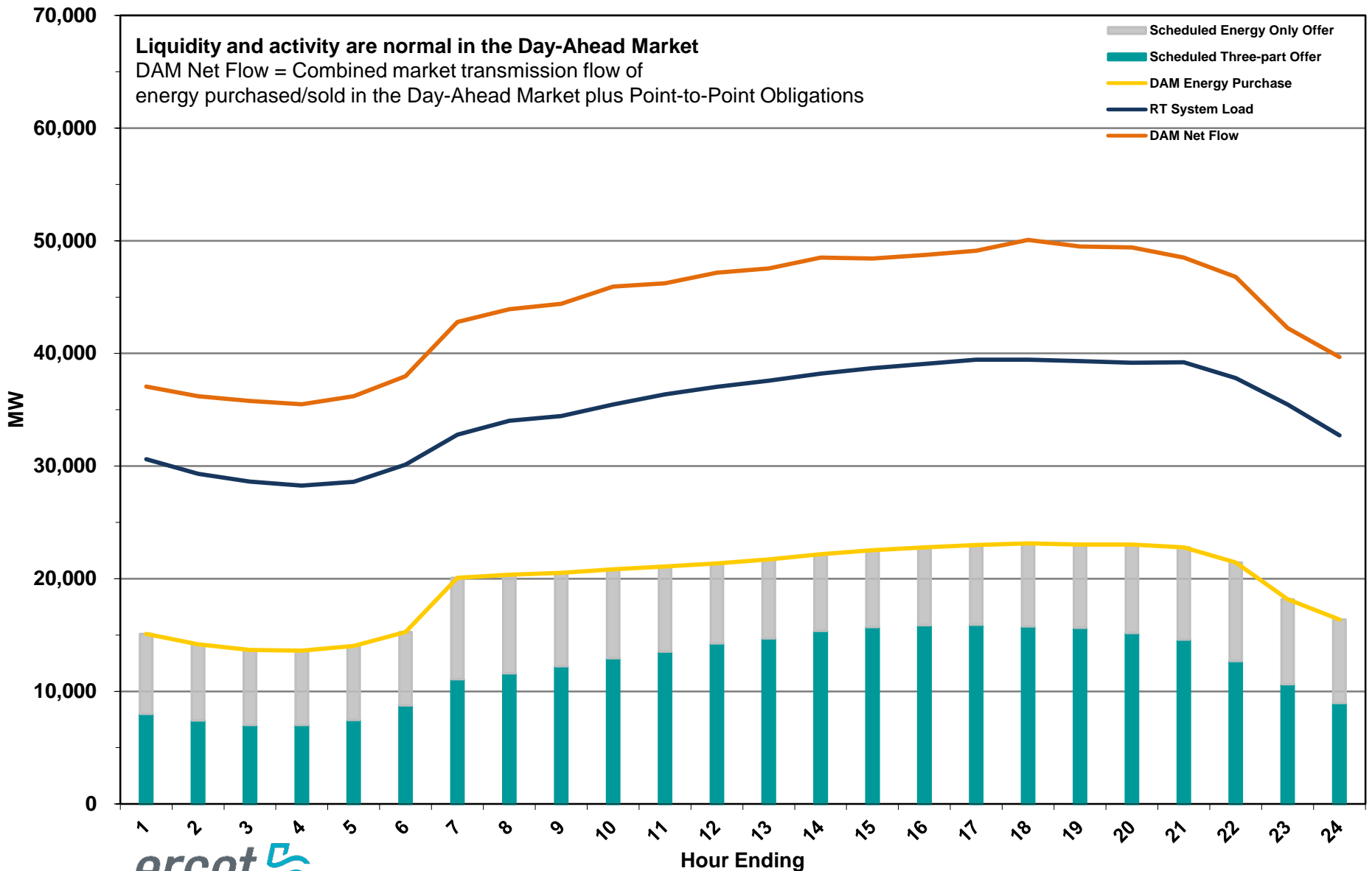
■ # Signed Interconnect Agreement    
 ■ # Completed Full Study    
 ■ # Projects Cancelled    
 ■ # in Full Study  
■ # Screening Study Complete    
■ # Initial Screening Study    
—□— MW Capacity Under Study \*

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



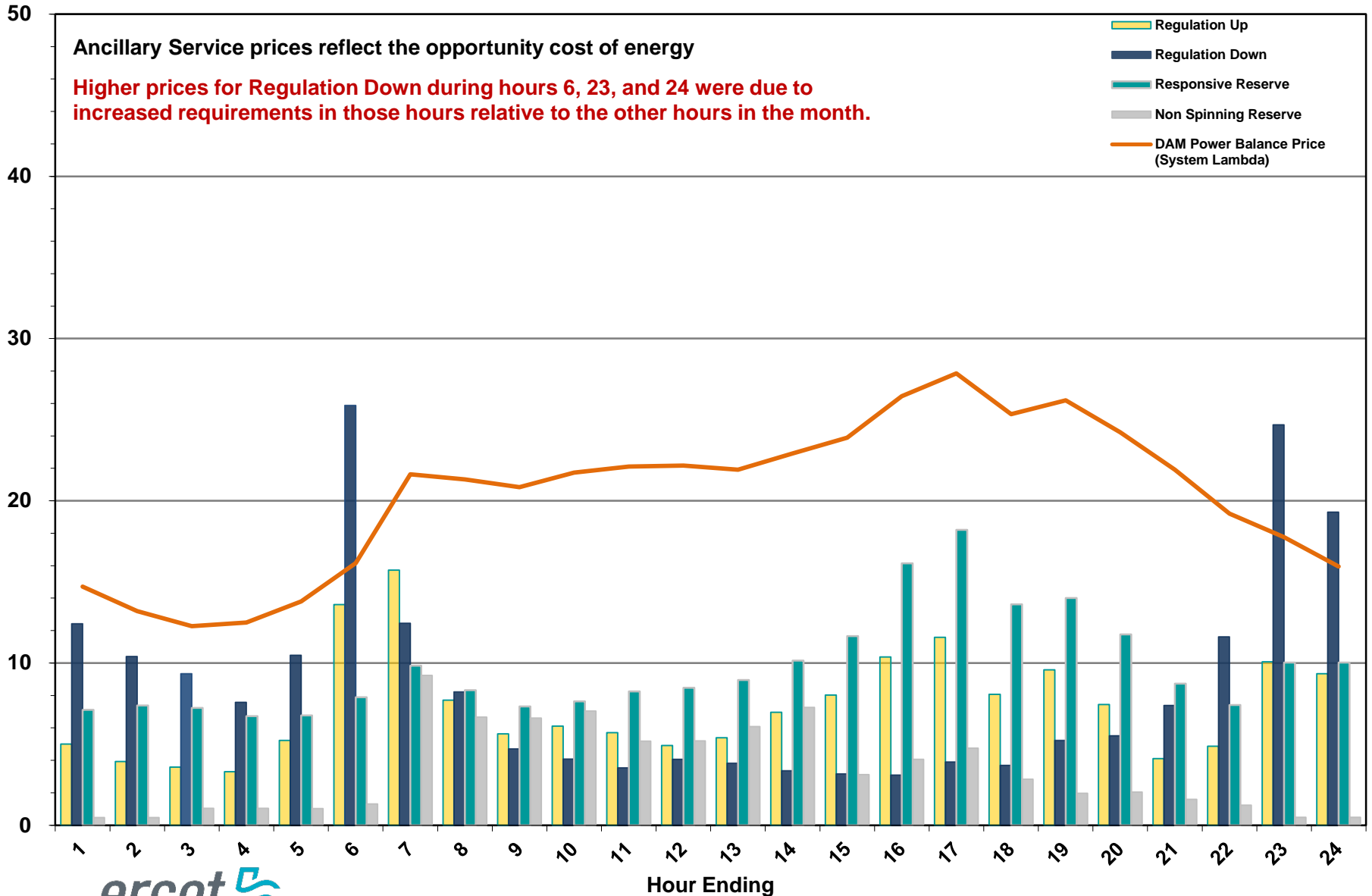
# Market Operations

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

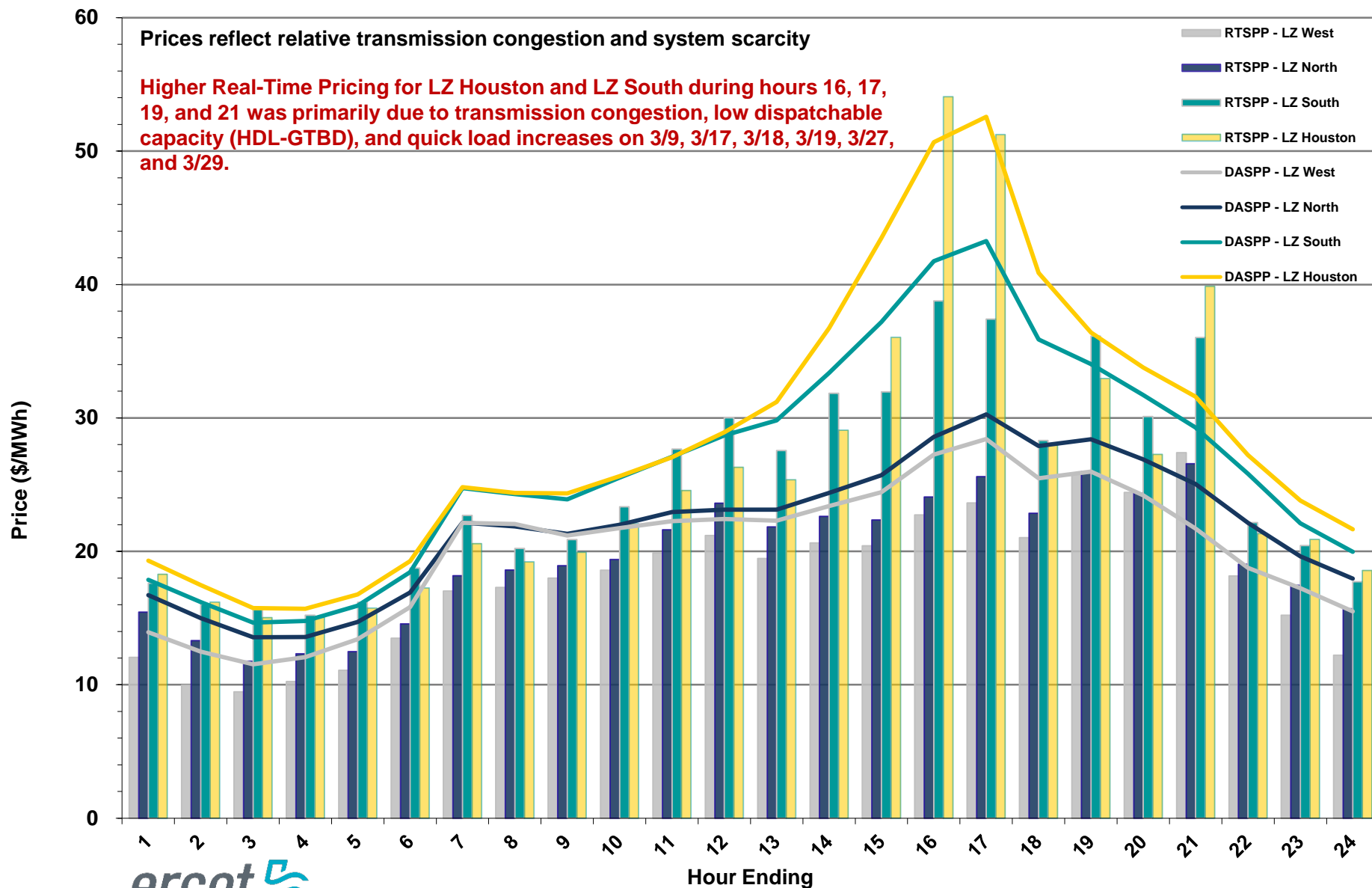




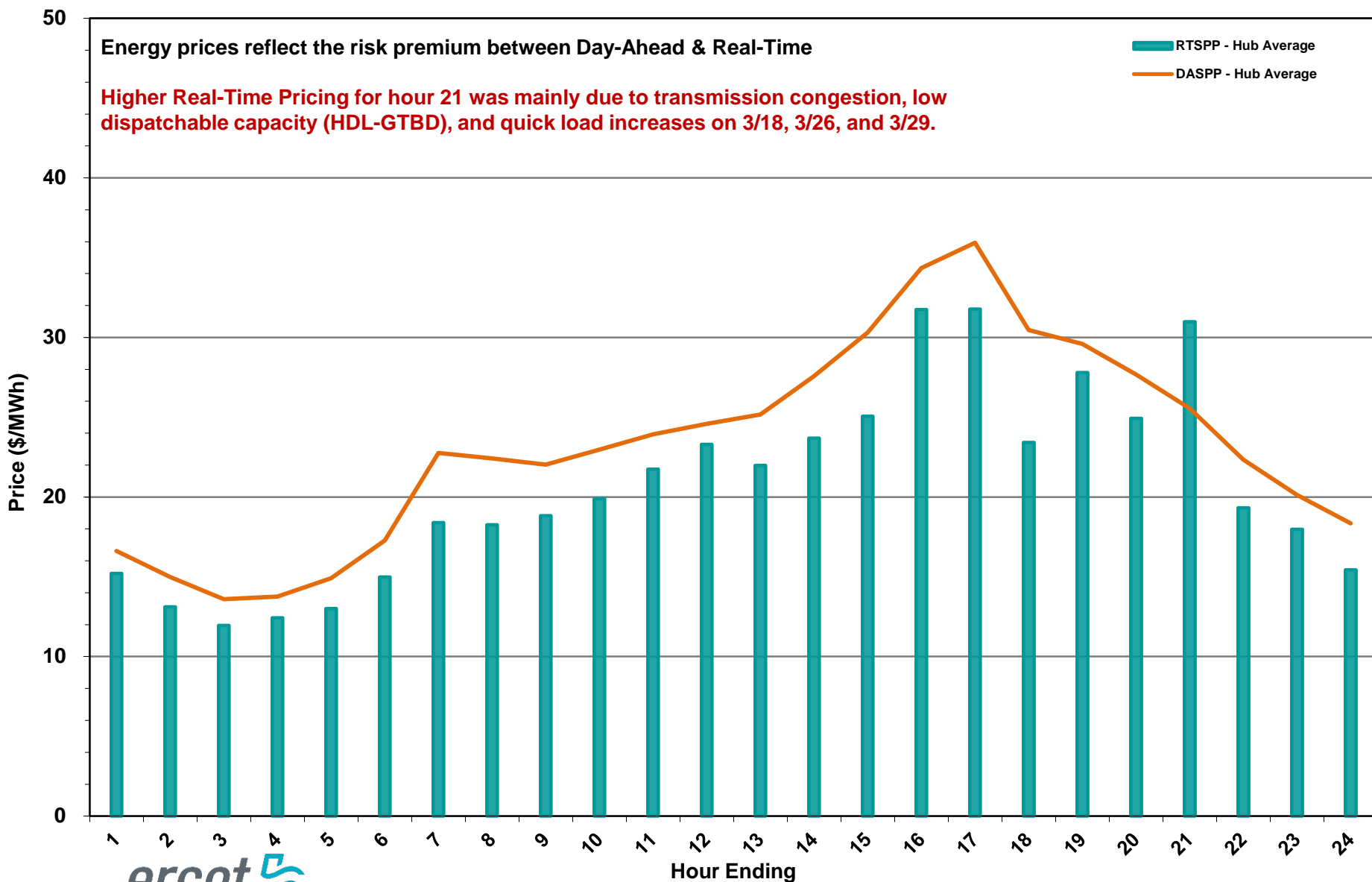
# Day-Ahead Electricity and Ancillary Service Prices (Hourly Average) – March 2017



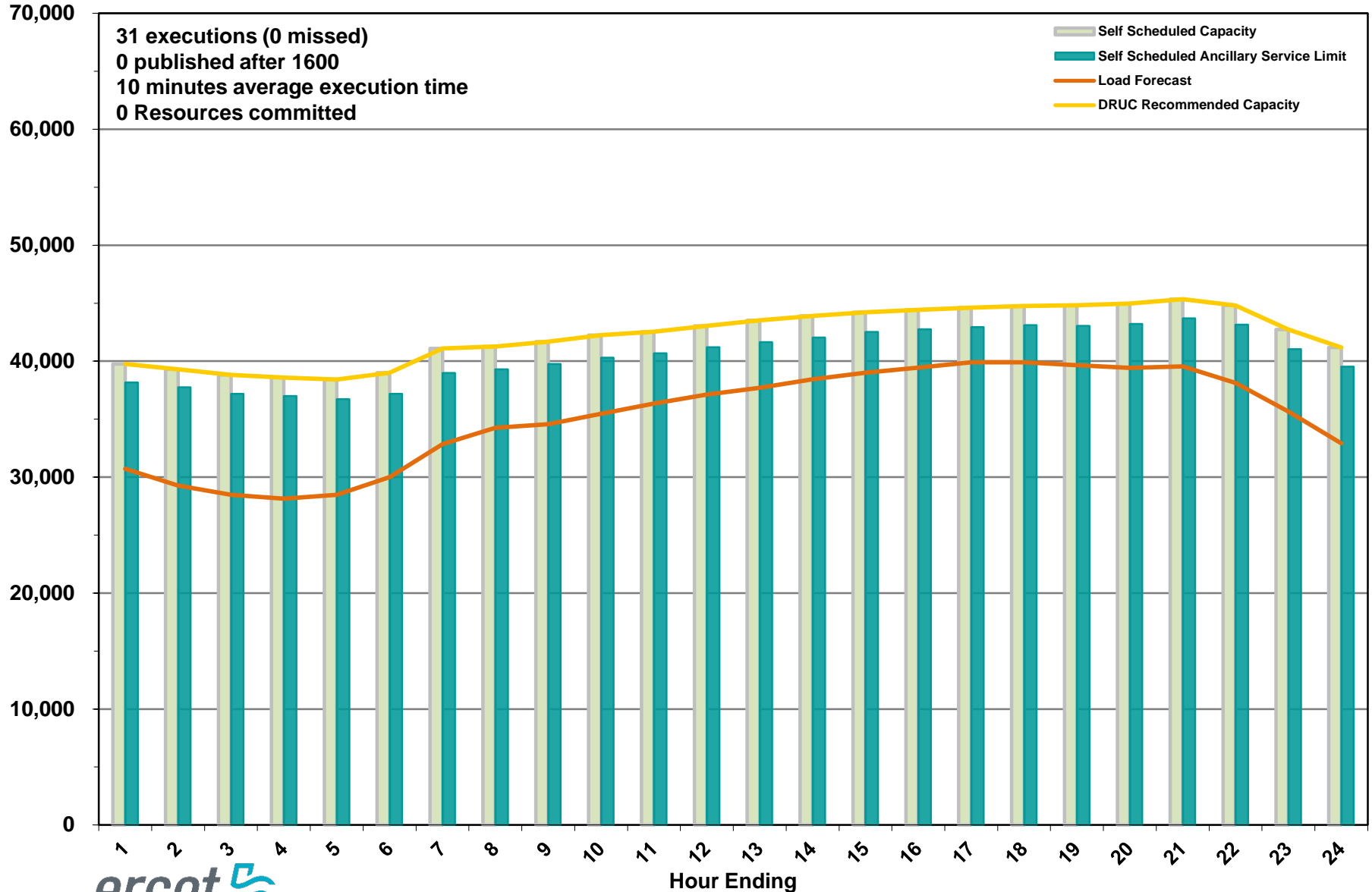
# Day-Ahead vs Real-Time Load Zone SPP (Hourly Average) – March 2017



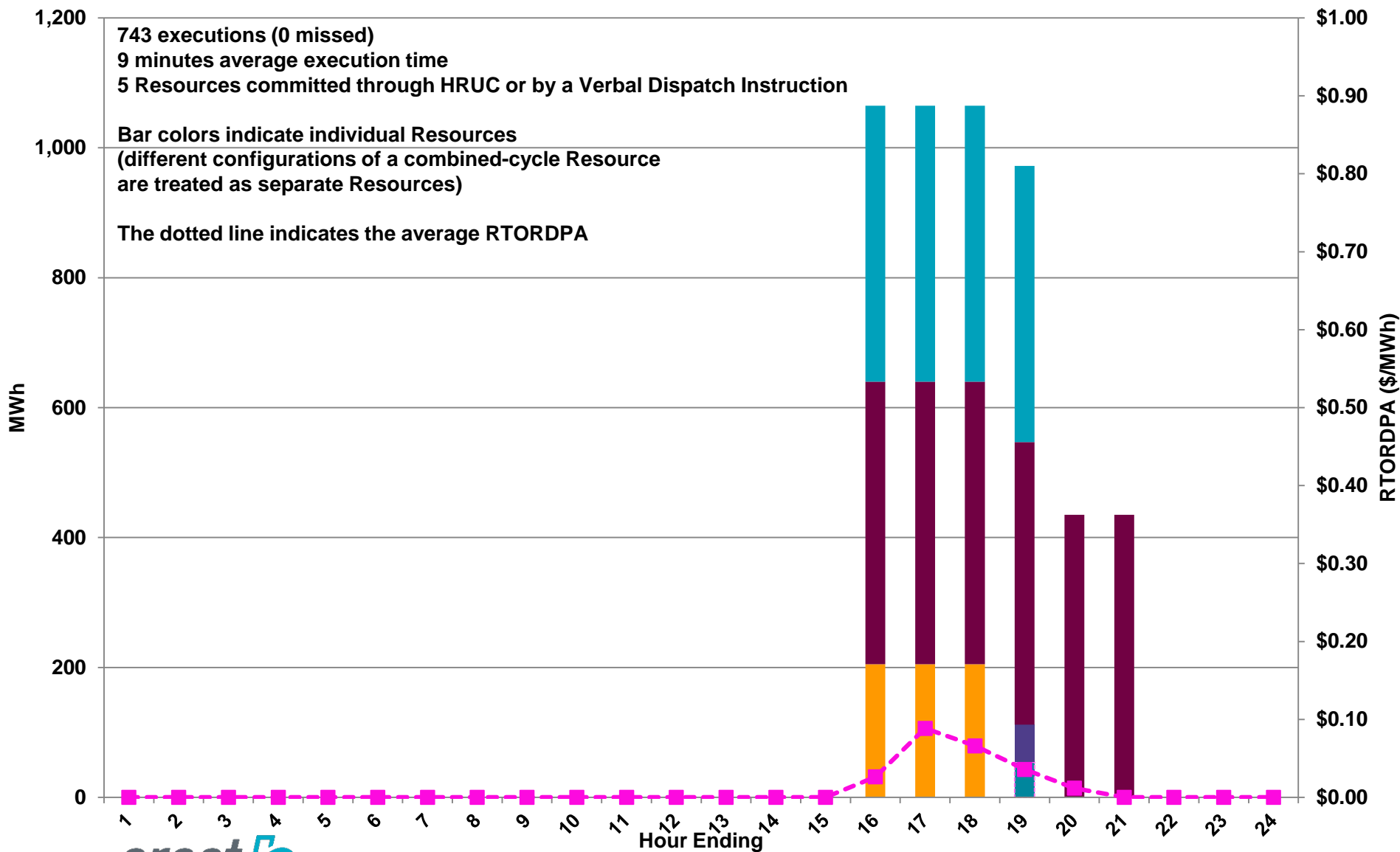
# Day-Ahead vs Real-Time Hub Average SPP (Hourly Average) – March 2017



# DRUC Monthly Summary (Hourly Average) – March 2017



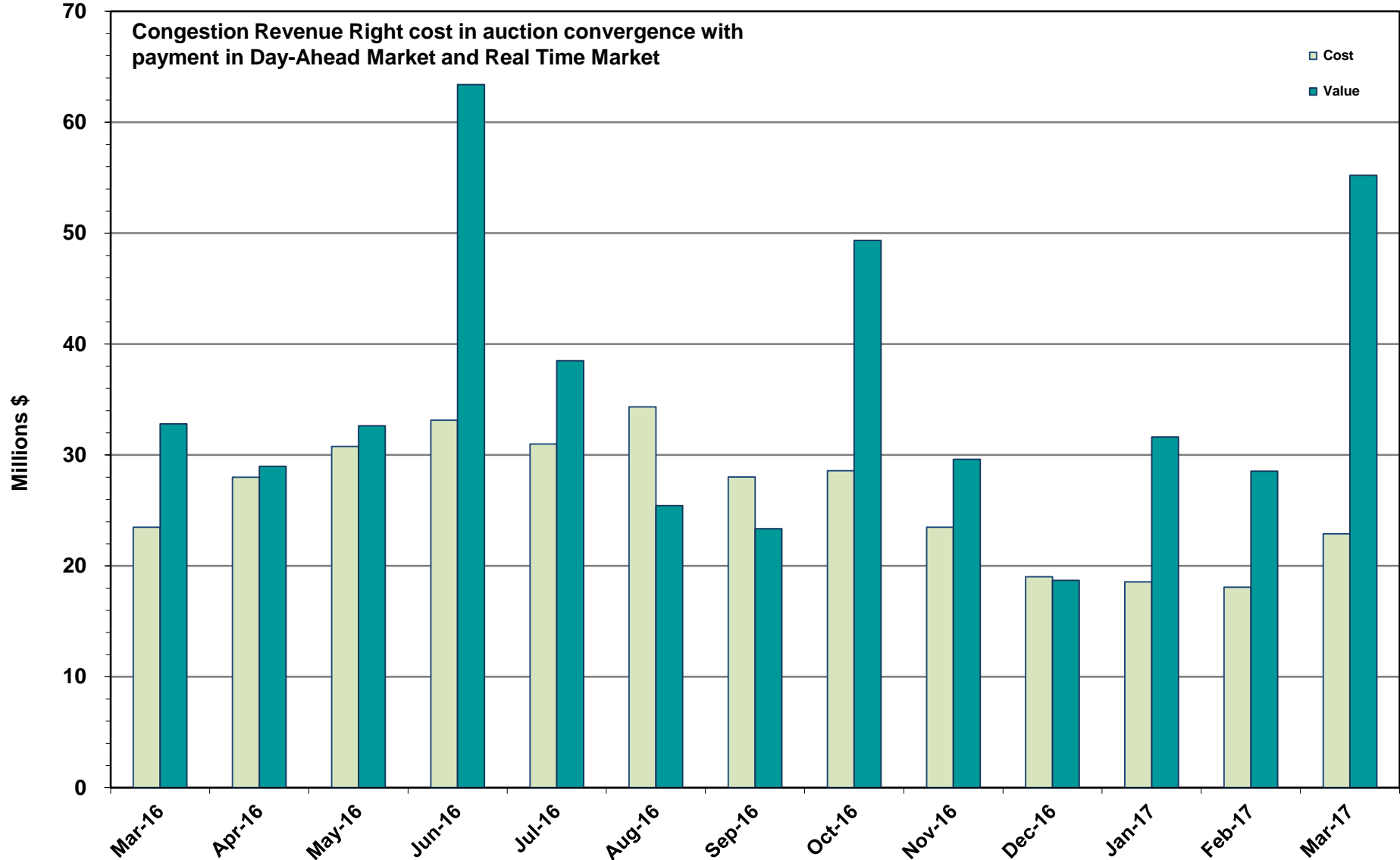
# HRUC Monthly Summary and Real Time On-Line Reliability Deployment Price Adder (RTORDPA) (Hourly Average) – March 2017



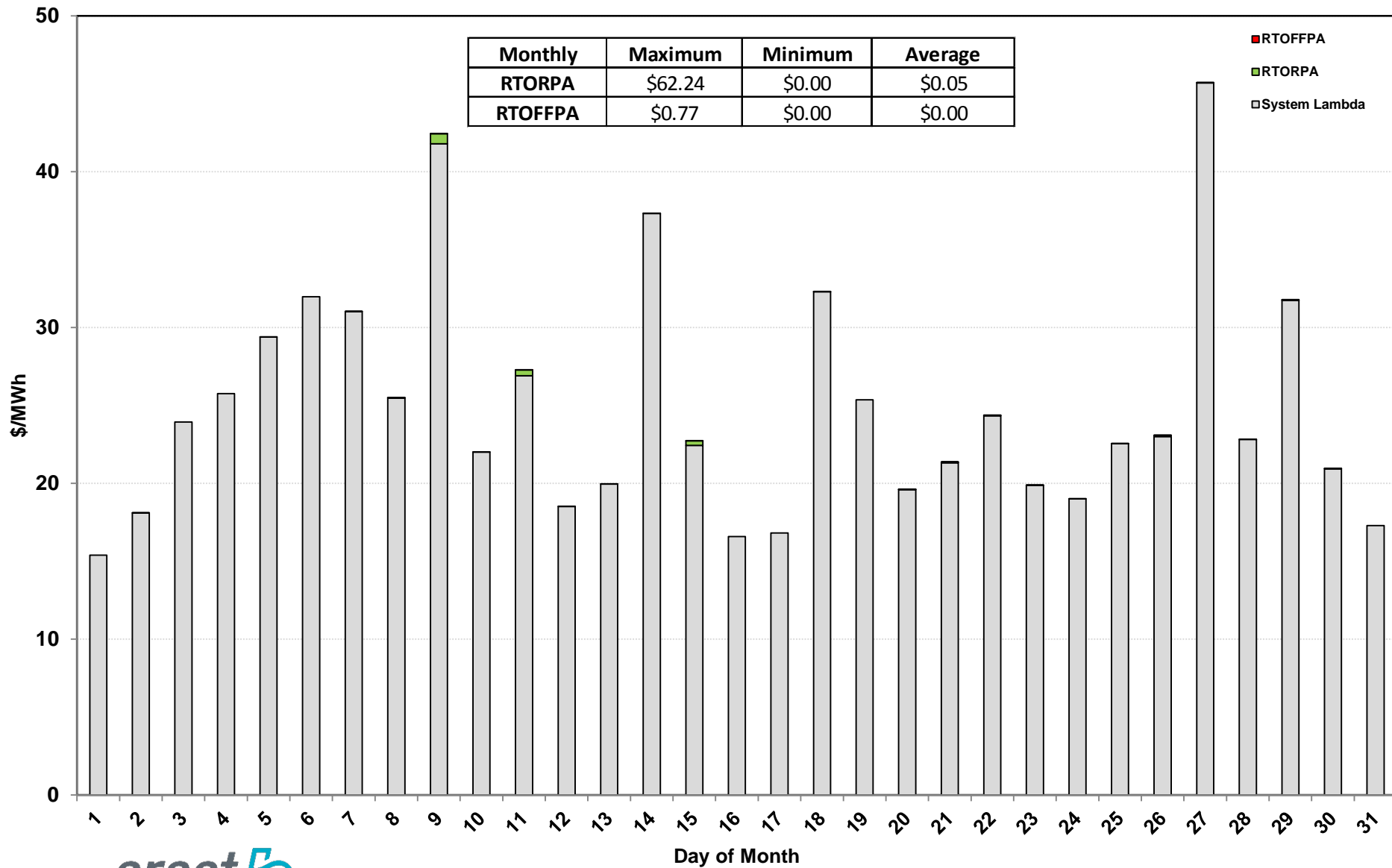
## Non-Spinning Reserve Service Deployment – March 2017

Deployment Start Time	Deployment End Time	Deployment Duration (Hours)	Max Deployment (MW)	Reason
3/27/2017 4:00:47 PM	3/27/2017 6:00:00 PM	2	106	Transmission congestion (reliability margin on North to Houston Generic Transmission Constraint)

## CRR Price Convergence – March 2017



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





## ERS Procurement for February – May 2017

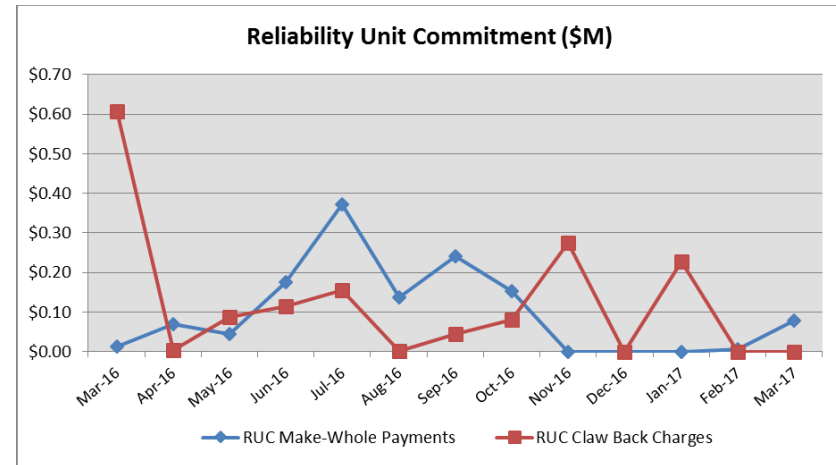
	TP1	TP2	TP3	TP4	TP5	TP6
Non Weather-Sensitive ERS-10 MW	304.071	314.139	312.787	307.631	301.799	285.273
Non Weather-Sensitive ERS-30 MW	570.588	626.265	608.201	604.502	586.119	515.379
Weather-Sensitive ERS-10 MW	0	0	0	0	0	0
Weather-Sensitive ERS-30 MW	.91	0	.68	.91	0	0
Total MW Procured	875.569	940.404	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.

<u>Time Period</u>	<u>Time Period Hours</u>
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 – March 2017

Reliability Unit Commitment (RUC)	\$ in Millions
RUC Make-Whole Payments	(\$0.08)
RUC Clawback Charges	\$0.00
<b>RUC Commitment Settlement</b>	<b>(\$0.08)</b>
RUC Capacity Short Charges	\$0.08
RUC Make-Whole Uplift	\$0.00
<b>RUC Commitment Cost Allocation</b>	<b>\$0.08</b>
RUC Decommitment Payments	\$0.00



RUC Make-Whole Payments were \$0.08M in March 2017.  
RUC Clawback Charges were \$0.00M.

There was \$0.00M allocated directly to load in March 2017, compared to:

- \$0.00M in February 2017
- \$0.61M in March 2016

## Capacity Services – March 2017

Capacity Services	\$ in Millions
Regulation Up Service	\$1.75
Regulation Down Service	\$2.05
Responsive Reserve Service	\$16.40
Non-Spinning Reserve Service	\$4.53
Black Start Service	\$0.61
Voltage Services - Reactive Power	\$0.00
Voltage Services - Lost Opportunity	\$0.00
<b>Total Charges</b>	<b>\$25.34</b>

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

March 2017 cost was \$25.34M, compared to:

- A charge of \$23.02M in February 2017
- A charge of \$33.91M in March 2016

## Energy Settlement – March 2017

Day-Ahead Market Energy Settlement	\$ in Millions
Energy Purchases	\$362.11
Point to Point Obligation Purchases	\$63.50
RMR Day-Ahead Revenue	\$0.00
Energy Sales	(\$359.18)
Day-Ahead Congestion Rent	\$66.43
Day-Ahead Market Make-Whole Payments	(\$0.18)

Day-Ahead Market energy settlement increased from last month and increased from March 2016.

Real-Time Market energy settlement activity increased from last month and increased from March 2016.

Real-Time Market Energy Settlement	\$ in Millions
Energy Imbalance at a Resource Node	(\$281.60)
Energy Imbalance at a Load Zone	\$474.10
Energy Imbalance at a Hub	(\$140.58)
Real Time Congestion from Self Schedules	\$0.72
Block Load Transfers and DC Ties	(\$0.44)
Impact to Revenue Neutrality	\$52.20
Emergency Energy Payments	(\$0.06)
Base Point Deviation Charges	\$0.18
Real-Time Metered Generation (MWh in millions)	25.96

## Congestion Revenue Rights (CRR) – March 2017

	\$ in Millions
Annual Auction	(\$18.33)
Monthly Auction	(\$4.56)
<b>Total Auction Revenue</b>	<b>(\$22.89)</b>
Day-Ahead CRR Settlement	(\$55.20)
Day-Ahead CRR Short-Charges	\$0.16
Day-Ahead CRR Short-Charges Refunded	(\$0.16)
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>(\$55.20)</b>
Day-Ahead Point to Point Obligations Settlement	\$63.50
Real-Time Point to Point Obligation Settlement	(\$78.45)
<b>Net Point to Point Obligation Settlement</b>	<b>(\$14.95)</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 \$14.95M compared to a net credit of \$8.32M last month.

## CRR Balancing Account Fund – March 2017

CRR Balancing Account Fund	\$ in Millions
Beginning Balance for the Month	\$10.00
CRR Balancing Account Credit Total	\$11.39
CRR PTP Option Award Charges	\$0.06
Day-Ahead CRR Short-Charges Refunded	(\$0.16)
Load Allocated CRR Amount	(\$11.28)
<b>Total Fund Amount</b>	<b>\$10.00</b>

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

As of March 2017, the CRR Balancing Account Fund was at \$10.00M and excess funds of \$11.28M were allocated to Load.

## Revenue Neutrality – March 2017

### Revenue Neutrality Settlement

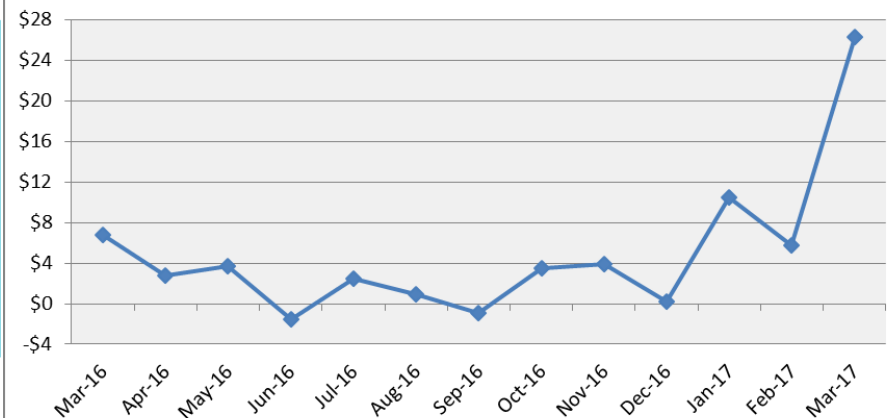
	\$ in Millions
Real-Time Point to Point Obligation Settlement	(\$78.45)
Real-Time Point to Point Options and Options with Refund Settlement	\$0.00
Real-Time Energy Imbalance Settlement	\$51.93
Real-Time Congestion from Self-Schedules Settlement	\$0.72
DC Tie & Block Load Transfer Settlement	(\$0.44)
<b>Charge to Load</b>	<b>\$26.24</b>

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

March 2017 was a charge of \$26.24M, compared to:

- \$5.73M charge in February 2017
- \$6.83M charge in March 2016

Revenue Neutrality Uplift (\$M)



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

Real-Time Ancillary Service Imbalance	\$ in Thousands
Real-Time AS Imbalance Payment Amount	(\$33.16)
Load Allocated AS Imbalance Revenue Neutrality Amount	\$33.15
<b>Total Charges</b>	<b>\$33.15</b>

In March 2017, total credits to QSEs with an Ancillary Service Imbalance were \$33,157 while total credits in February 2017 were \$4,633.

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

All days in March 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 March 11<sup>th</sup> in the amount of \$10,129.



## Net Allocation to Load – March 2017

### Market-Based Allocation

\$ in Millions

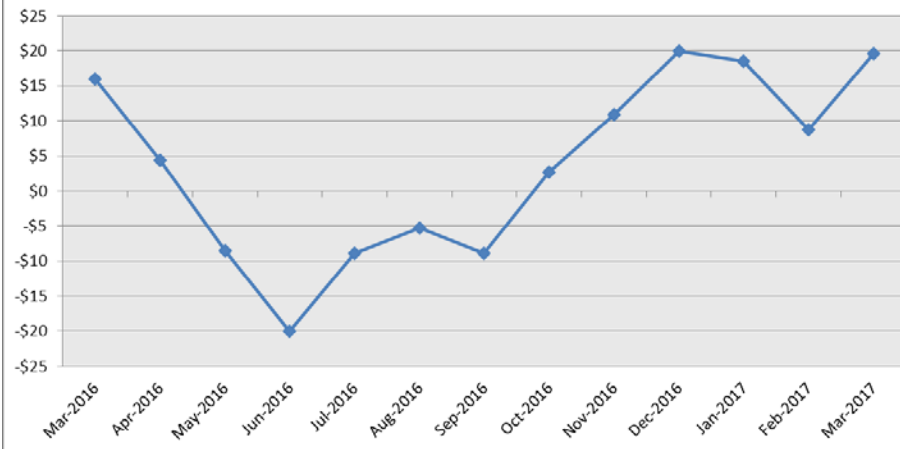
CRR Auction Revenue Disbursement Settlement	(\$22.90)
Balancing Account Proceeds Settlement	(\$11.28)
Net Reliability Unit Commitment Settlement	\$0.00
Ancillary Services Settlement	\$25.34
Reliability Must Run Settlement (incl. RMR for Capacity)	\$2.37
Real-Time Revenue Neutrality Settlement	\$26.24
Emergency Energy Settlement	\$0.06
Base Point Deviation Settlement	(\$0.18)
ORDC Settlement	\$0.03
<b>Total</b>	<b>\$19.68</b>
<b>Fee Allocation</b>	
ERCOT Administrative Fee Settlement	\$14.46
<b>Net Allocated to Load</b>	<b>\$34.14</b>

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

March 2017 was a charge of \$34.14M, compared to:

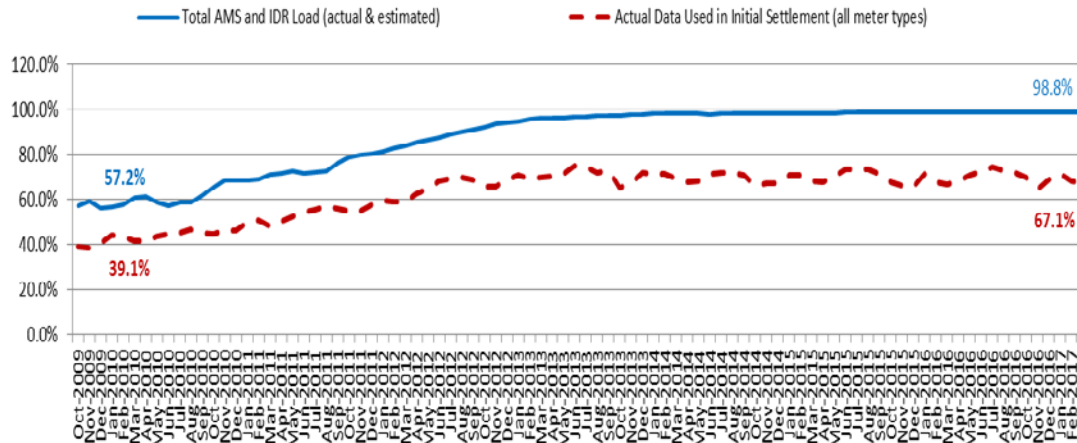
- A charge of \$21.48M in February 2017
- A charge of \$29.52M in March 2016

Market Based Fees Net Impact to Load (\$M)



# Advanced Meter Settlement Impacts – March 2017

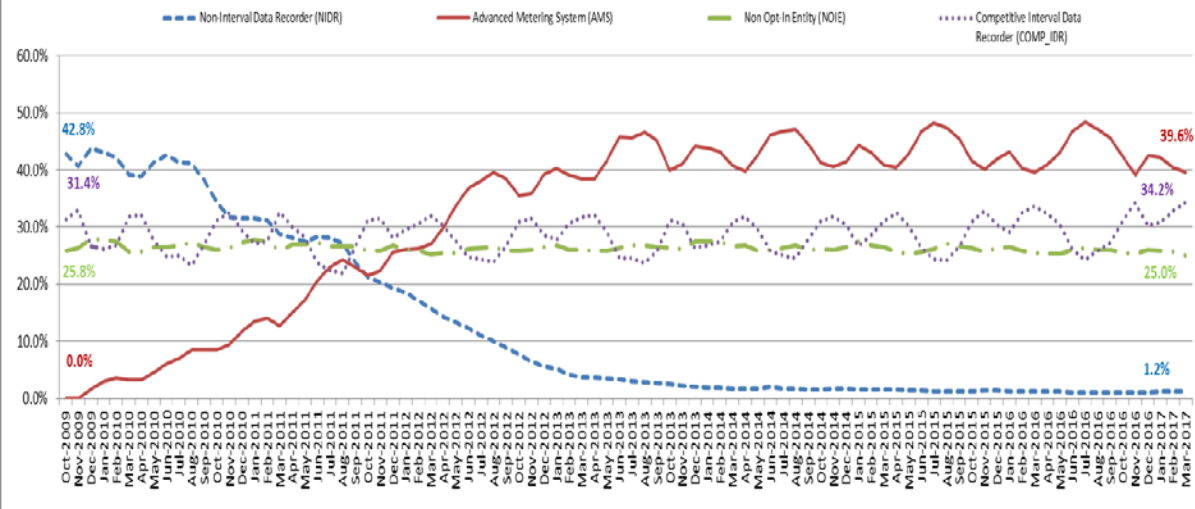
Percent Actual/Percent Interval Data Recorder (IDR)



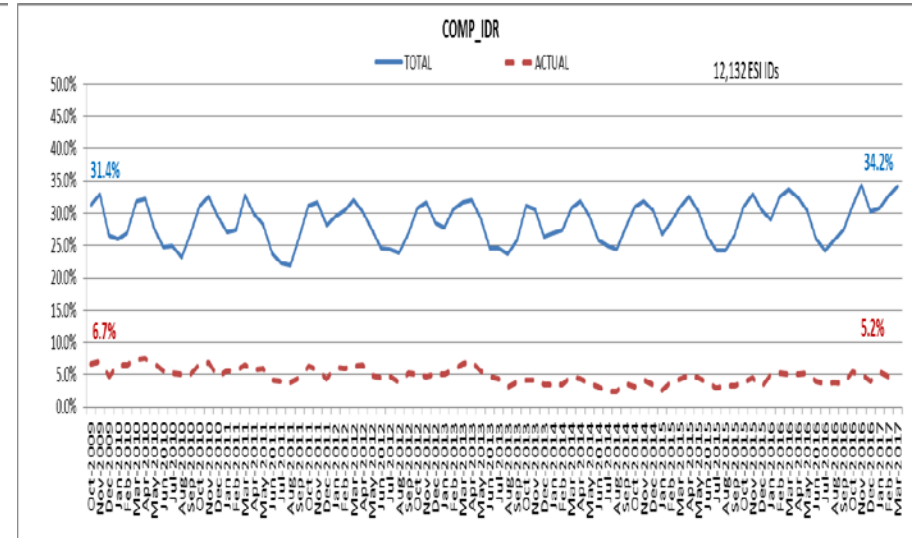
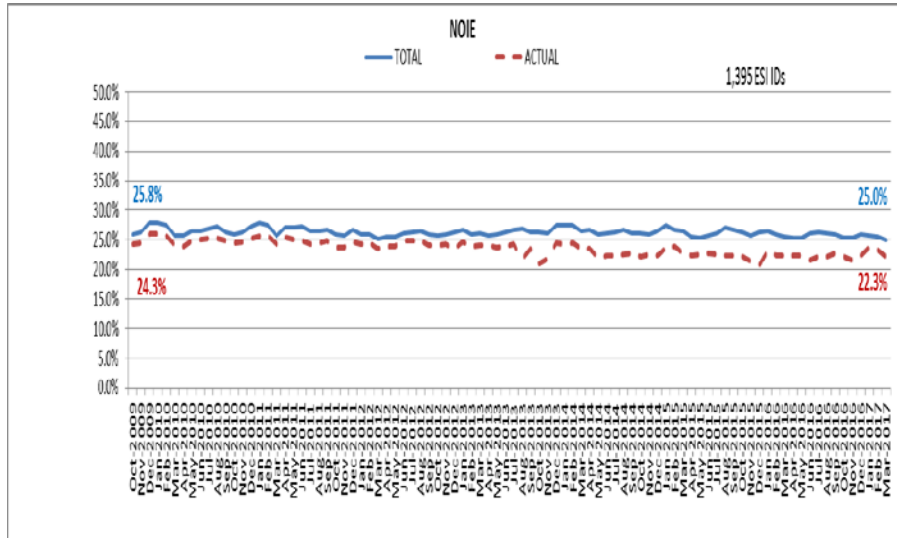
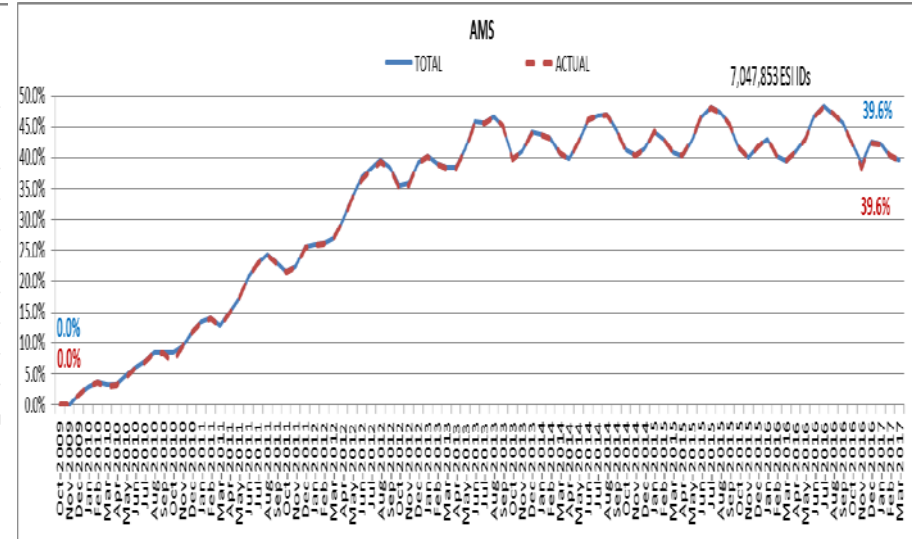
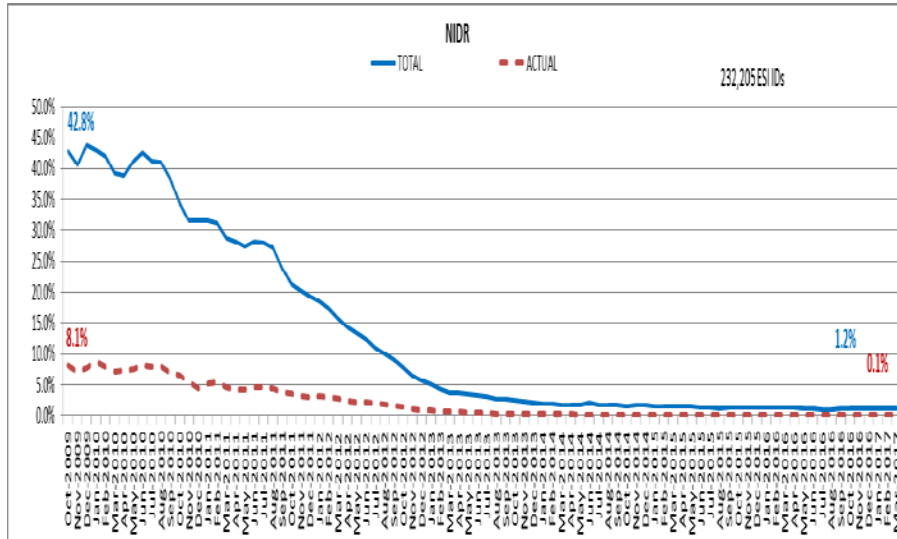
March 2017: At month end, settling 7.0M ESIIDs using Advanced Meter data.

March 2017: 98.8% 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 – March 2017

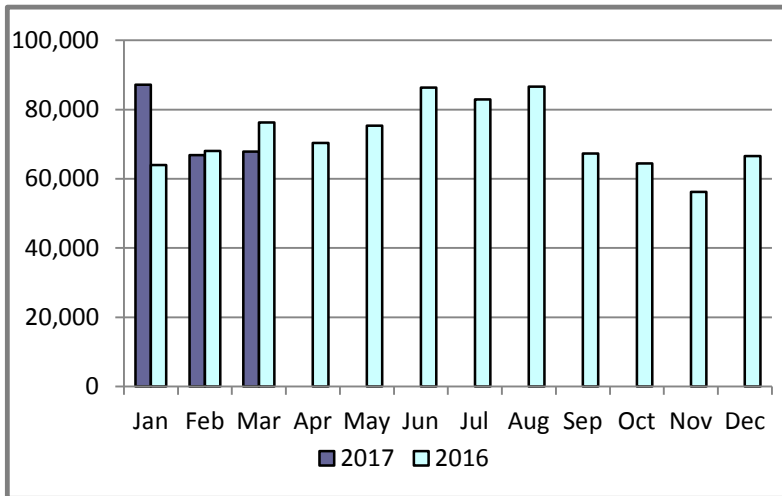


## Retail Transaction Volumes – Summary – March 2017

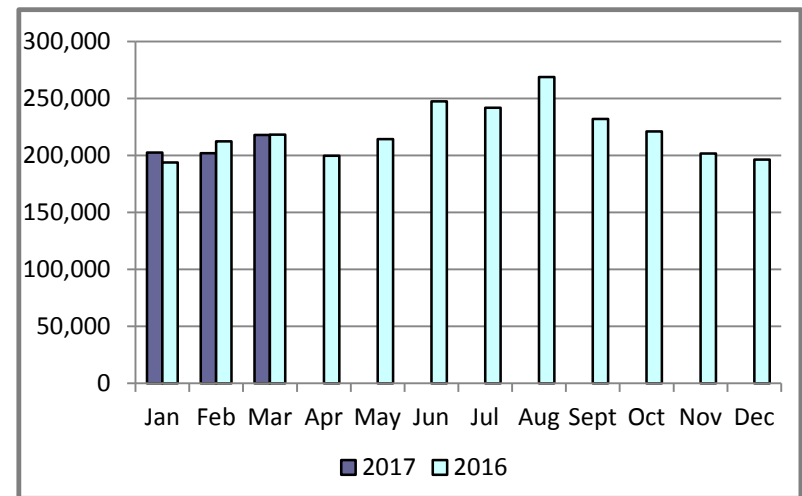
	Year-To-Date		Transactions Received	
Transaction Type	March 2017	March 2016	March 2017	March 2016
Switches	221,860	208,246	67,845	76,235
Acquisition	0	0	0	0
Move - Ins	622,558	624,435	217,962	218,245
Move - Outs	312,851	309,653	111,459	109,278
Continuous Service Agreements (CSA)	104,903	150,115	21,791	59,400
Mass Transitions	0	0	0	0
<b>Total</b>	<b>1,262,172</b>	<b>1,292,449</b>	<b>419,057</b>	<b>463,158</b>

# Retail Transaction Volumes – Summary – March 2017

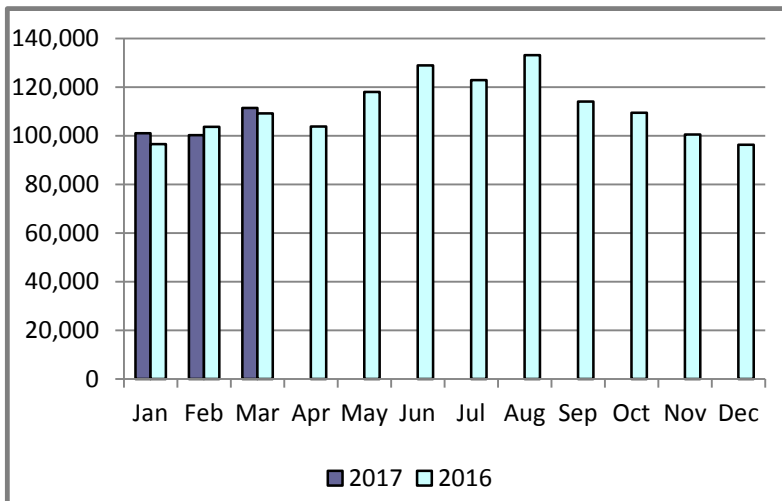
## Switches/Acquisitions



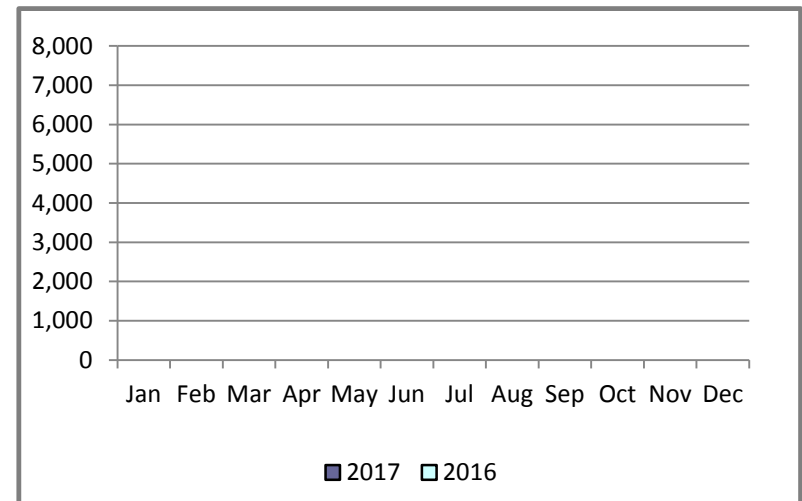
## Move-Ins



## Move-Outs

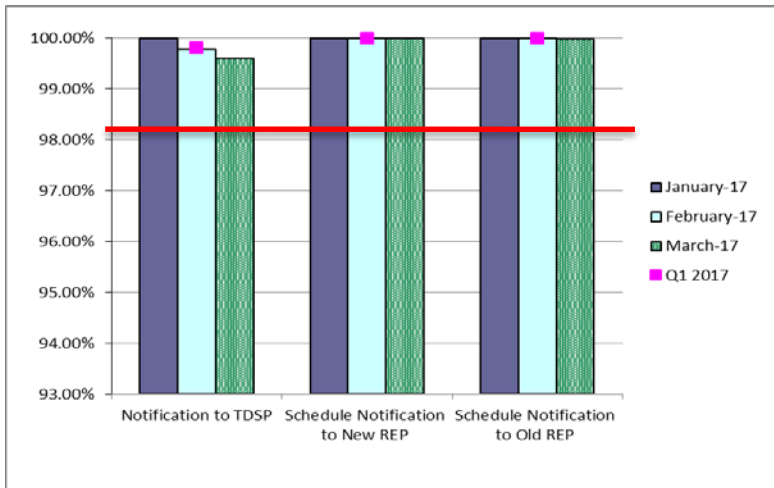


## Mass Transition

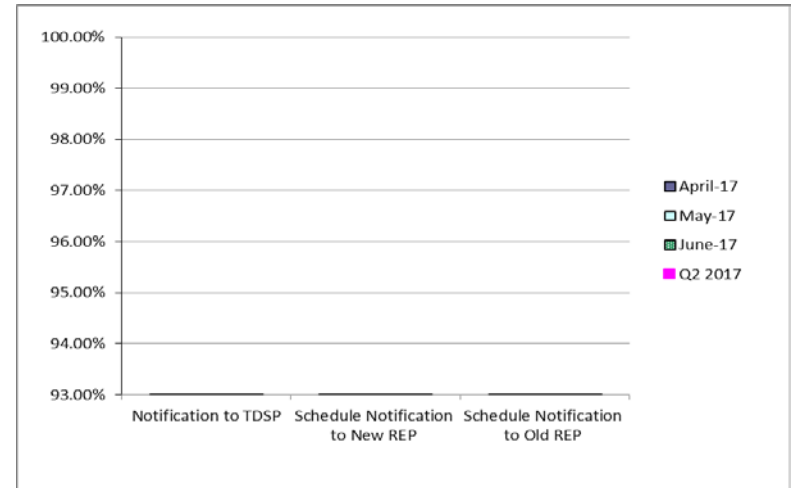


# Retail Performance Measures – Switch – March 2017

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



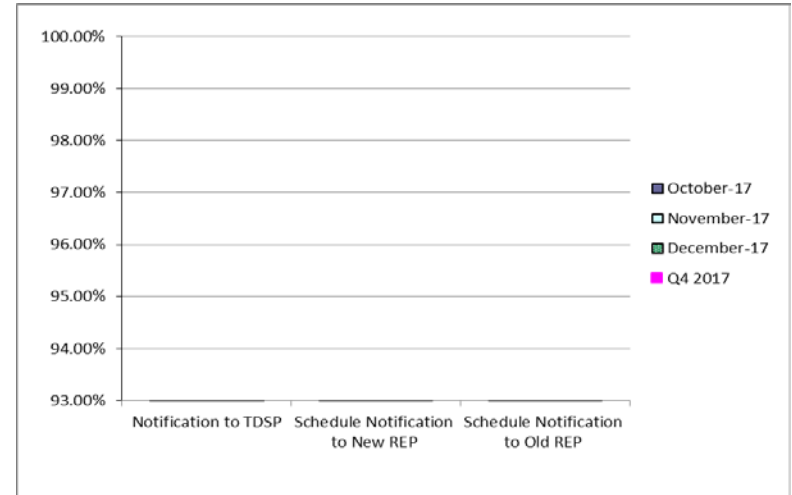
## 2<sup>nd</sup> Quarter



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

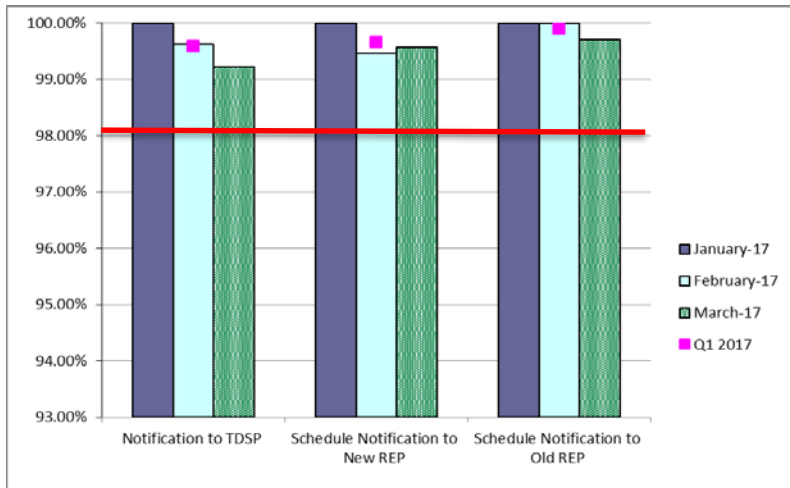


## 4<sup>th</sup> Quarter

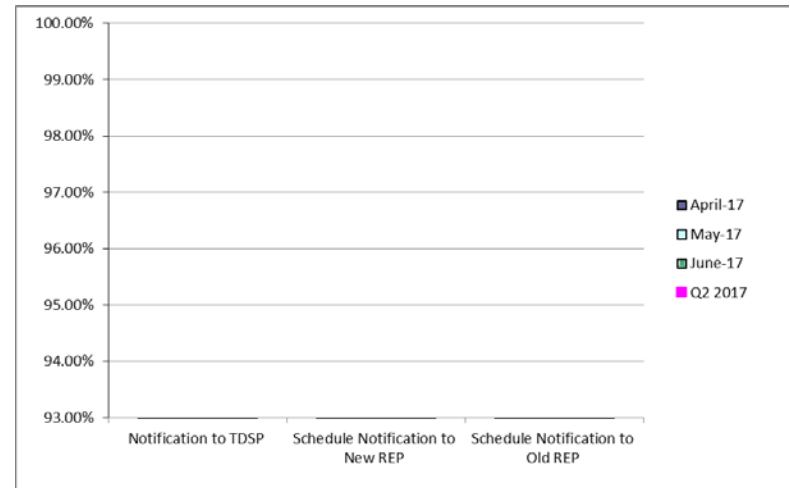


# Retail Performance Measures – Same Day Move-In – March 2017

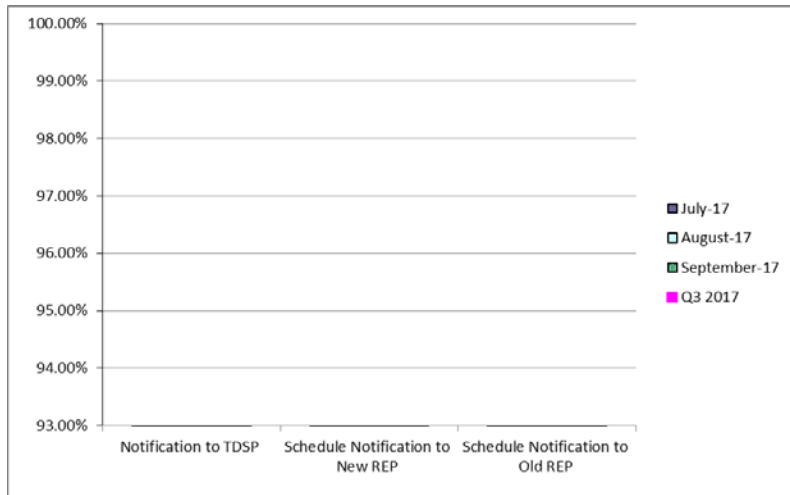
## 1<sup>st</sup> Quarter



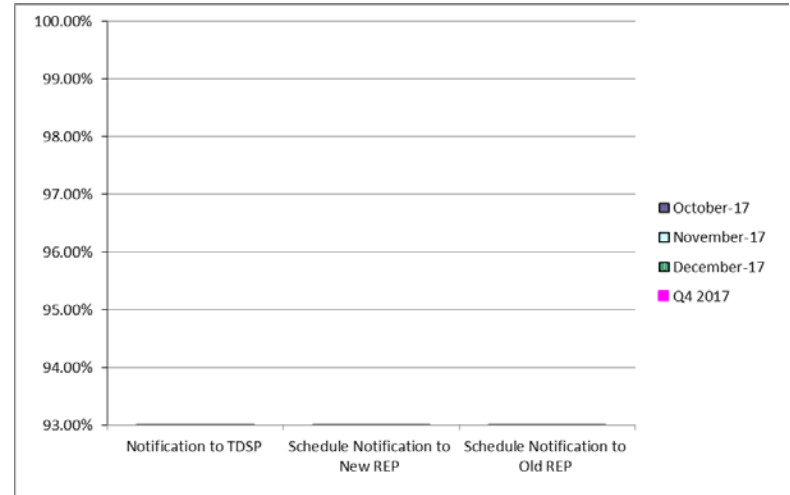
## 2<sup>nd</sup> Quarter



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

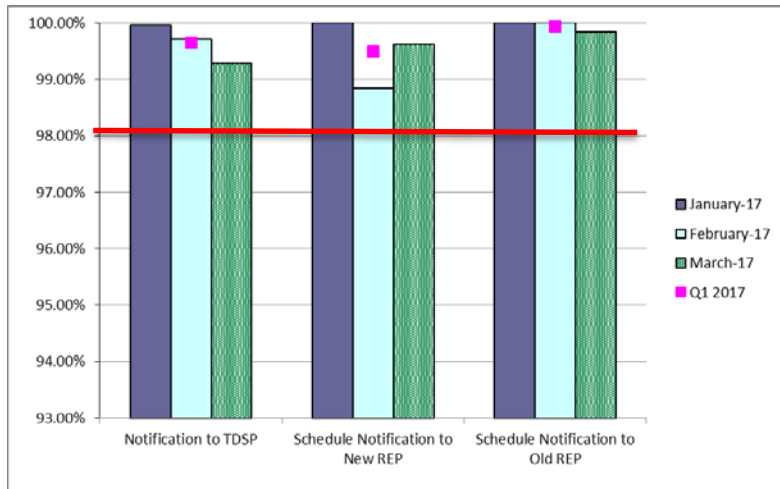


## 4<sup>th</sup> Quarter

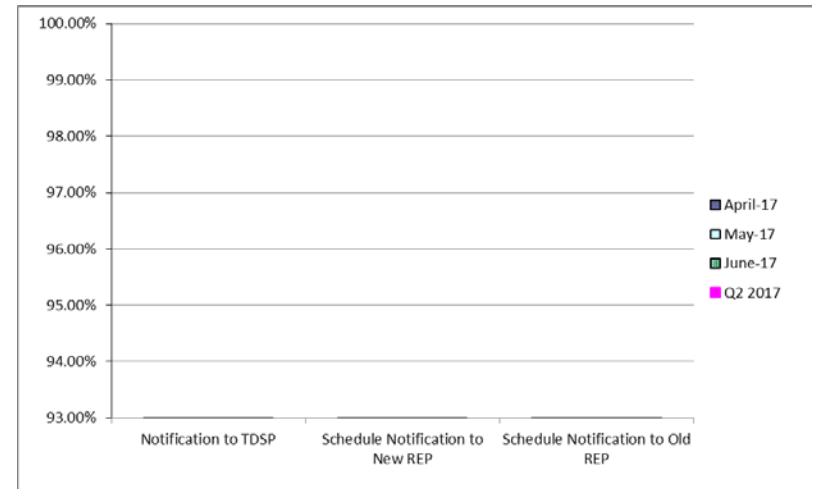


# Retail Performance Measures – Standard Move-In – March 2017

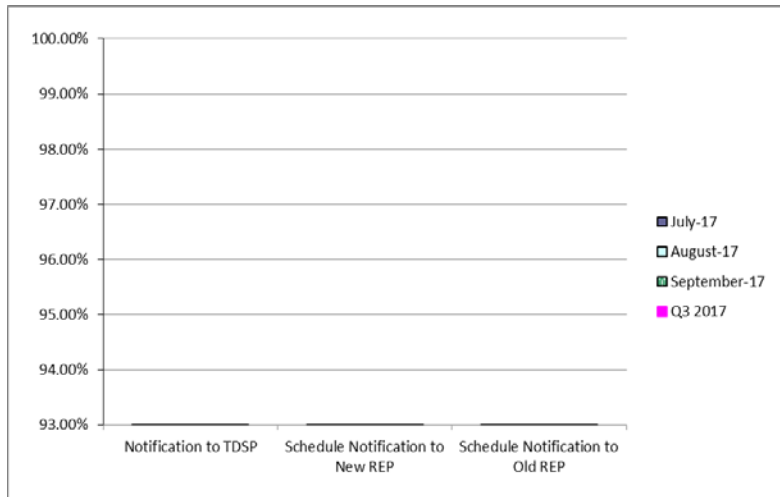
## 1<sup>st</sup> Quarter



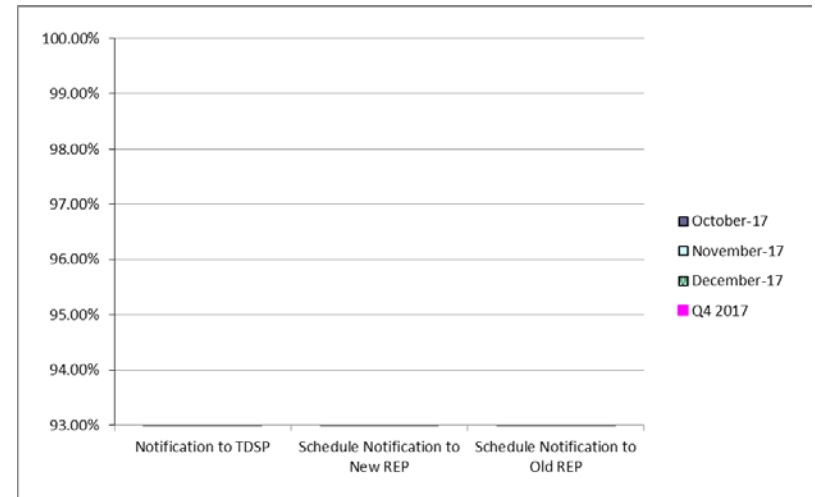
## 2<sup>nd</sup> Quarter



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



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





# Projects Report

# ERCOT Portfolio Stoplight Report – March 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 = 76)		\$18,350,239
	Projects Not Yet Started (Count = 14)		\$ 3,712,974
	Projects Completed (Count = 18)		\$ 433,867
	Spending Reductions Required to Maintain Capital Budget		\$ (1,997,080)
	<b>TOTAL</b>		<b>\$20,500,000</b>

Project Number	Projects in Initiation Phase (Count = 7)
241-01	AREA - Generation
242-00	Portfolio Reporting Assessment
243-01	Training Facility - Scope and Design
238-01	Application Authentication Tech Refresh
239-01	Identity and Access Management
240-01	PaperFree Replacement Assessment
198-02	Reactive Power Coordination PoC

## 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 – March 2017

Project Number	Projects in Planning Phase (Count = 14)	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	5/4/2016	11/9/2016	4/28/2017	TBD	5/3/2017		-1%		3%
210-01	REC Technology Refresh	3/15/2017	7/19/2017	7/19/2017	TBD	7/19/2017		0%		0%
212-01	Test Data and Environment Enhancements Initiative (TDEE)	10/5/2016	11/2/2016	5/31/2017	TBD	5/31/2017		0%		8%
217-01	Cyber Security Project #20	12/7/2016	5/11/2017	5/11/2017	TBD	5/11/2017		0%		36%
218-01	Cyber Security Project #21	1/11/2017	5/3/2017	5/3/2017	TBD	5/3/2017		0%		40%
228-01	Enterprise Database Upgrade	2/1/2017	6/28/2017	6/28/2017	TBD	6/28/2017		0%		29%
229-01	IT Change and Configuration Management Phase 2	1/25/2017	5/17/2017	5/17/2017	TBD	5/17/2017		0%		8%
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
NPRR782	Settlement of Infeasible Ancillary Services Due to Transmission Constraints	3/1/2017	4/5/2017	5/17/2017	TBD	5/17/2017		0%		-1%
SCR781	MP Online Data Entry - Market Requirements	3/29/2017	TBD	TBD	TBD	TBD		0%	NA	See #106-01
SCR781	RARF Replacement	3/29/2017	TBD	TBD	TBD	TBD		0%		40%

# ERCOT Portfolio Stoplight Report – March 2017

Project Number	Projects in Execution Phase (Count = 51)	Phase Start	Baseline Go-Live Date	Approved Go-Live Date	Scheduled Go-Live Date	Scheduled Phase Finish	Schedule Health		Budget Health	
065-01	NMMS Upgrade	12/17/2014	9/22/2016	5/1/2017	5/1/2017	8/2/2017		0%		11%
158-01	Load Forecast Enhancements	9/28/2016	5/21/2017	5/21/2017	5/11/2017	7/19/2017		4%		5%
170-01	Enterprise Content Alignment Program	8/26/2015	11/15/2017	9/25/2017	9/25/2017	9/25/2017		0%		27%
172-01	Physical Security Project #2	6/30/2016	2/13/2017	4/6/2017	6/23/2017	7/12/2017	1	-27%		5%
177-01	Cyber Security Project #19	4/6/2016	7/13/2016	7/24/2017	7/24/2017	7/26/2017		0%		12%
181-01	CRR Framework Upgrade	10/26/2016	10/2/2017	1/22/2018	1/22/2018	3/16/2018		0%		3%
183-01	CMM Tech Refresh	3/15/2017	5/19/2018	5/19/2018	5/19/2018	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%		2%
188-01	Mass Transition/Acquisition Enhancements (MTAQ)	5/25/2016	4/2/2017	6/22/2017	6/4/2017	7/14/2017		4%		0%
196-01	GINR Project Status Application Replacement	12/21/2016	9/14/2017	9/14/2017	9/14/2017	10/4/2017		0%		10%
197-01	AREA - Demand and Energy Report	9/14/2016	5/4/2017	5/4/2017	5/4/2017	5/11/2017		0%		10%
205-01	TIBCO BusinessWorks Application Upgrade	1/11/2017	6/26/2017	6/26/2017	6/26/2017	9/1/2017		0%		6%
209-01	Multi Station Breaker to Breaker One Lines (Planning)	2/8/2017	3/9/2018	3/9/2018	3/9/2018	5/2/2018		0%		11%
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%		4%
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
222-01	Physical Security Project #3	2/8/2017	5/31/2017	5/31/2017	5/31/2017	6/21/2017		0%		0%
224-01	TelAlert Replacement	4/5/2017	6/27/2017	6/27/2017	6/27/2017	7/26/2017		0%		0%
230-01	SAS Technical Architecture Redesign	3/1/2017	11/15/2017	11/15/2017	10/13/2017	11/3/2017		12%		2%
233-00	Capital Efficiencies and Enhancements - 2017	1/1/2017	12/31/2017	12/31/2017	12/31/2017	12/31/2017		0%		-1%
234-01	Reporting Solution Resiliency (RSR)	4/5/2017	8/23/2017	8/23/2017	8/23/2017	9/27/2017		0%		-3%
235-01	Forecast Monitoring and HSL Tracking	2/8/2017	5/11/2017	5/11/2017	5/12/2017	6/4/2017		-1%		23%
Various	2016 RARF Enhancements	11/16/2016	2/17/2017	5/15/2017	5/15/2017	6/14/2017		0%		1%
Various	NPRR797 & NPRR789 Load Forecast Enhancements	3/8/2017	6/29/2017	6/29/2017	6/29/2017	7/21/2017		0%		12%
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%		3%
RMGRR127	Efficiencies for Acquisition Transfer	5/25/2016	4/2/2017	6/22/2017	6/4/2017	7/14/2017		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.

# ERCOT Portfolio Stoplight Report – March 2017

Project Number	Projects in Execution Phase (Count = 51)	Phase Start	Baseline Go-Live Date	Approved Go-Live Date	Scheduled Go-Live Date	Scheduled Phase Finish	Schedule Health		Budget Health	
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.
NPRR519	Exemption of ERS-Only QSEs from Collateral and Capitalization Requirements	3/15/2017	5/19/2018	5/19/2018	5/19/2018	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	5/19/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR648	Remove References to Flowgate Rights	3/15/2017	5/19/2018	5/19/2018	5/19/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR660	Remove CRR State Change Adder	3/15/2017	5/19/2018	5/19/2018	5/19/2018	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	5/19/2018	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	5/19/2018	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	5/19/2018	9/11/2018		0%	NA	See 2015 CMM NPRRs
NPRR744	RUC Trigger for the Reliability Deployment Price Adder and Alignment with RUC Settlement	2/8/2017	6/29/2017	6/29/2017	6/29/2017	7/19/2017		0%		16%
NPRR746	Adjustments Due to Negative Load	1/25/2017	5/11/2017	5/11/2017	5/11/2017	8/9/2017		0%		32%
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	8/31/2017	9/15/2017		0%		44%
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
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
NPRR792	Changing Special Protection System (SPS) to Remedial Action Scheme (RAS)	11/30/2016	5/21/2017	5/21/2017	5/21/2017	5/21/2017		0%		See #187-00
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
SCR790	Wind Resource Power Production and Forecast Transparency	1/11/2017	5/11/2017	5/11/2017	5/11/2017	5/11/2017		0%		6%

# ERCOT Portfolio Stoplight Report – March 2017

Project Number	Projects in Stabilization (Count = 4)	Execution Phase Start	Baseline Go-Live Target	Approved Go-Live Target	Actual Go-Live Date	Scheduled Execution Phase Finish	Schedule Health		Budget Health	
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	6/21/2017		0%		19%
RMGRR134	Allow AMS Data Submittal Process for TDSP-Read Non-Modeled Generators	12/14/2016	3/9/2017	3/9/2017	3/9/2017	6/14/2017		0%		19%
173-01	Serena Software (MarkeTrak) Upgrade	10/5/2016	1/29/2017	3/26/2017	3/26/2017	5/3/2017		0%		4%
223-01	Control Room Video Support and Upgrade	11/16/2016	2/17/2017	2/17/2017	2/3/2017	6/12/2017		15%		7%
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 = 18)	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	4/12/2017	4/12/2017	1	-23%		40%
170-04	ECAP - ERCOT Information Governance and Taxonomy	11/16/2016	1/19/2017	2/17/2017	2/17/2017	2/22/2017		0%		21%
189-01	Enterprise Resource Planning	4/13/2016	9/27/2016	9/27/2016	9/27/2016	4/12/2017		0%		63%
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%		15%
202-01	Email Gateway Replacement	11/9/2016	4/4/2017	4/4/2017	3/24/2017	4/5/2017		7%		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%		19%
227-01	Engineer Workstations and Other Equipment	11/30/2016	3/1/2017	3/1/2017	2/28/2017	3/8/2017		1%		6%
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%		34%
NPRR649	Addressing Issues Surrounding High Dispatch Limit (HDL) Overrides	11/9/2016	3/19/2017	3/19/2017	3/9/2017	3/29/2017		7%		25%
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%
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
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%
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 – March 2017

Project Number	2017 Projects Not Yet Started (Count = 14)	Forecast Start Date
SCR789	Update NMMS Topology Processor to PSSE 34 Capability	Apr-2017
TBD	2017 EPS Metering Enhancements	Apr-2017
TBD	Corporate Wireless	Apr-2017
TBD	iTest Data Refresh	Apr-2017
TBD	Standard Report for Events and Near-Miss Analysis	May-2017
NPRR776	Voltage Set Point Communication	Jun-2017
NPRR778	Modifications to Date Change and Cancellation Evaluation Window	Jun-2017
TBD	Generic Transmission Constraint Calculation	Jun-2017
TBD	Automation of NPRR487 - QSGR Dispatch Adjustment	Jul-2017
TBD	Emergency Energy Settlements Inputs Automation	Jul-2017
TBD	Replace Paperfree	Jul-2017
TBD	Appworx Replaces TIBCO Code in CSI Framework	Jul-2017
TBD	EIF Database Utilization	Aug-2017
NPRR749	Option Cost for Outstanding CRRs	Sep-2017