



## **ERCOT Monthly Operational Overview** (July 2016)

ERCOT Public  
August 15, 2016

# Grid Planning & Operations

# Summary – July 2016

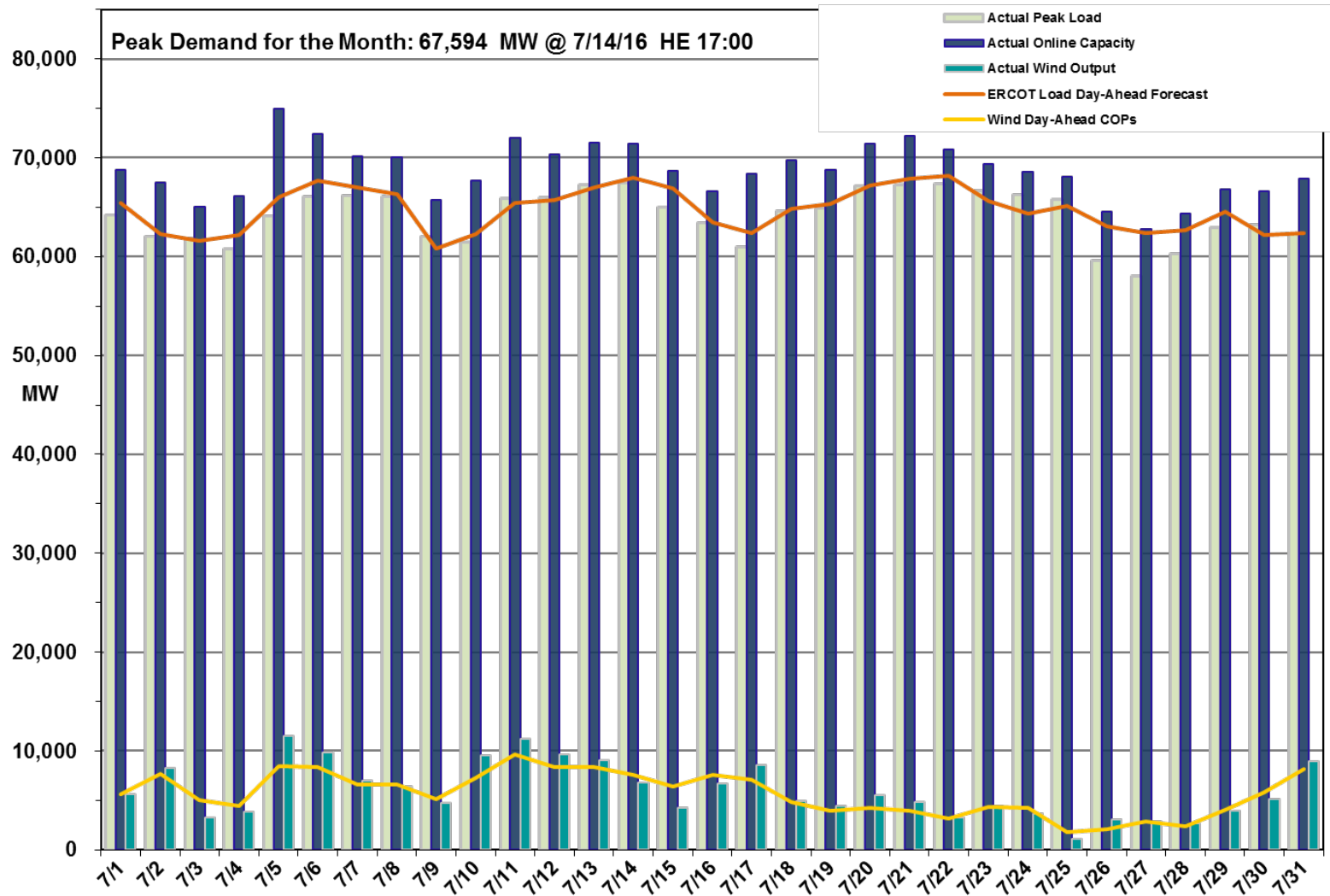
## Operations

- The peak demand of 67,594 MW on July 14th was less than the day-ahead mid-term forecast peak of 67,935 MW of the same operating period. In addition, it was less than the July 2015 actual peak demand of 67,647 MW
- Day-ahead load forecast error for July was 1.94%
- ERCOT issued 17 notifications:
  - One OCN due to the forecasted probability of a 4,000 MW down-ramp in the next 180 minutes
  - One OCN due to capacity insufficiency
  - One advisory due to ERCOT's State Estimator/RTCA being unavailable
  - Two advisories due to ERCOT's Voltage Security Assessment Tool being unavailable.
  - Nine advisories due to Physically Responsive Capability being less than 3,000 MW
  - Two watches due to HRUC not completing due to failure
  - One Emergency Notice due to the failure of SCED/RLC being unavailable

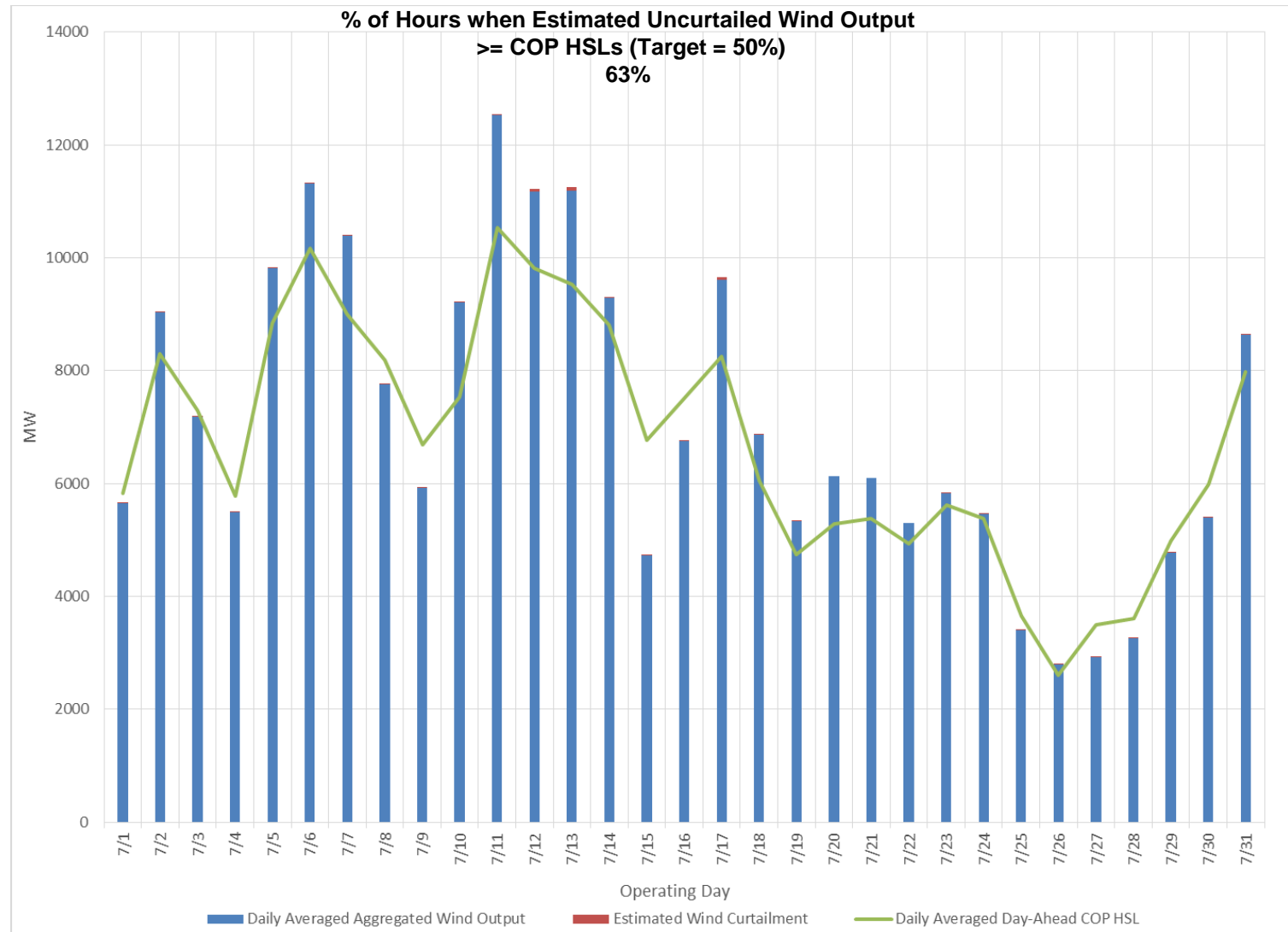
## Planning Activities

- 230 active generation interconnection requests totaling 56,600 MW, including 25,078 MW of wind generation, as of July 31, 2016. Two fewer requests and a decrease of 291 MW from June 30, 2016.
- 16,631 MW wind capacity in commercial operations on July 31, 2016.

# Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs, & On-Line Capacity at Peak – July 2016

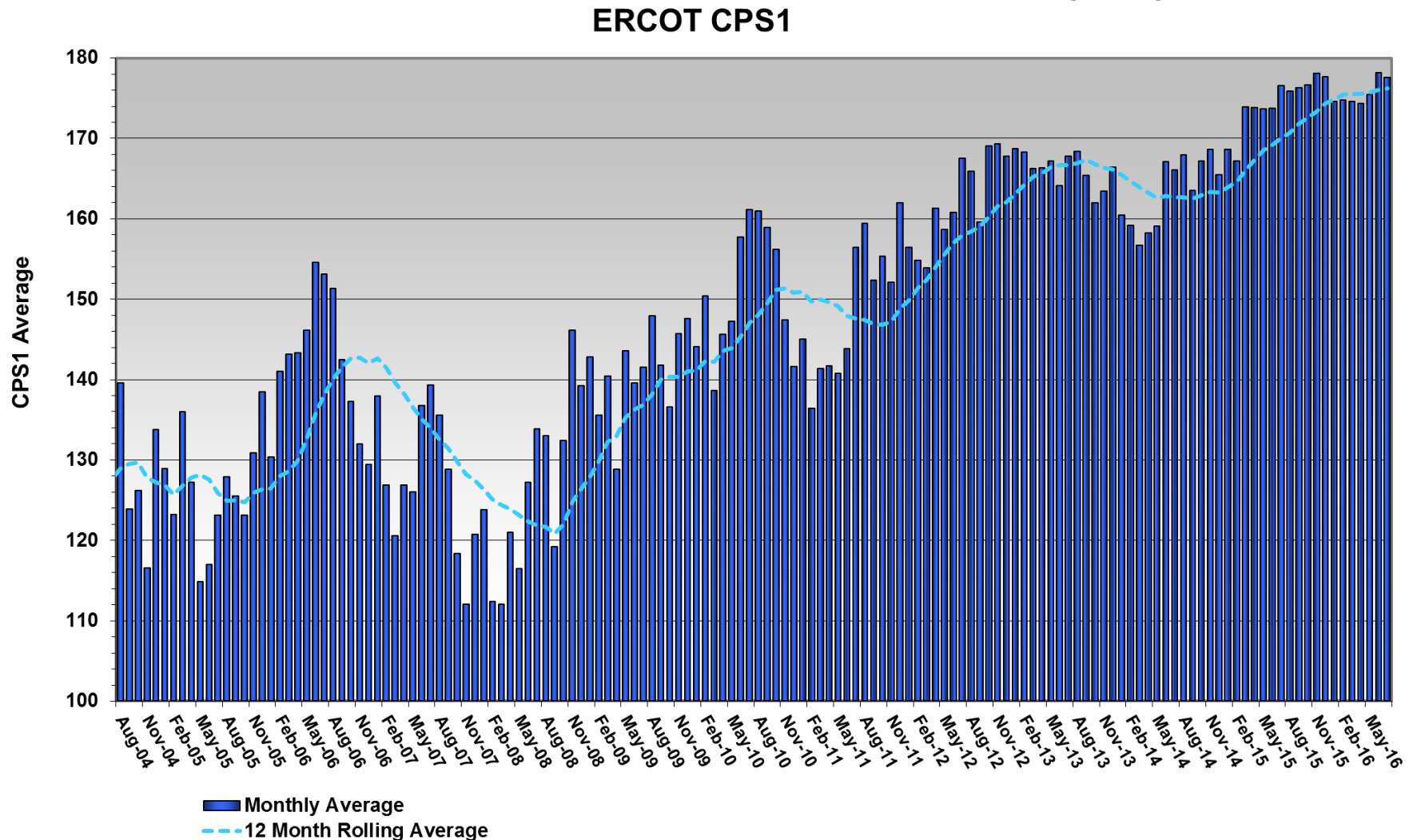


# Actual Wind Output plus Curtailments vs. Wind Day-Ahead COPs for All Hours – July 2016

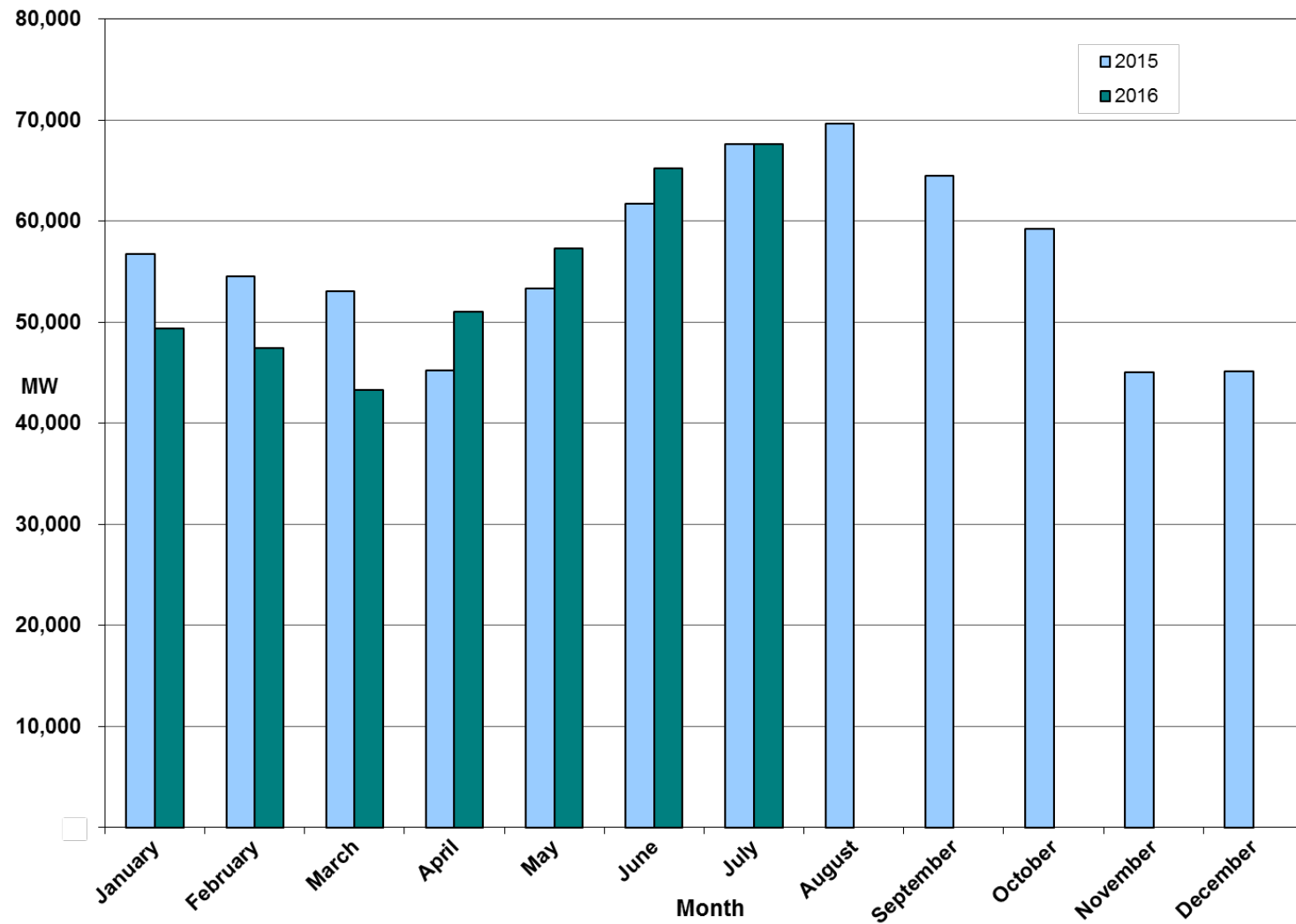


# ERCOT's CPS1 Monthly Performance – July 2016

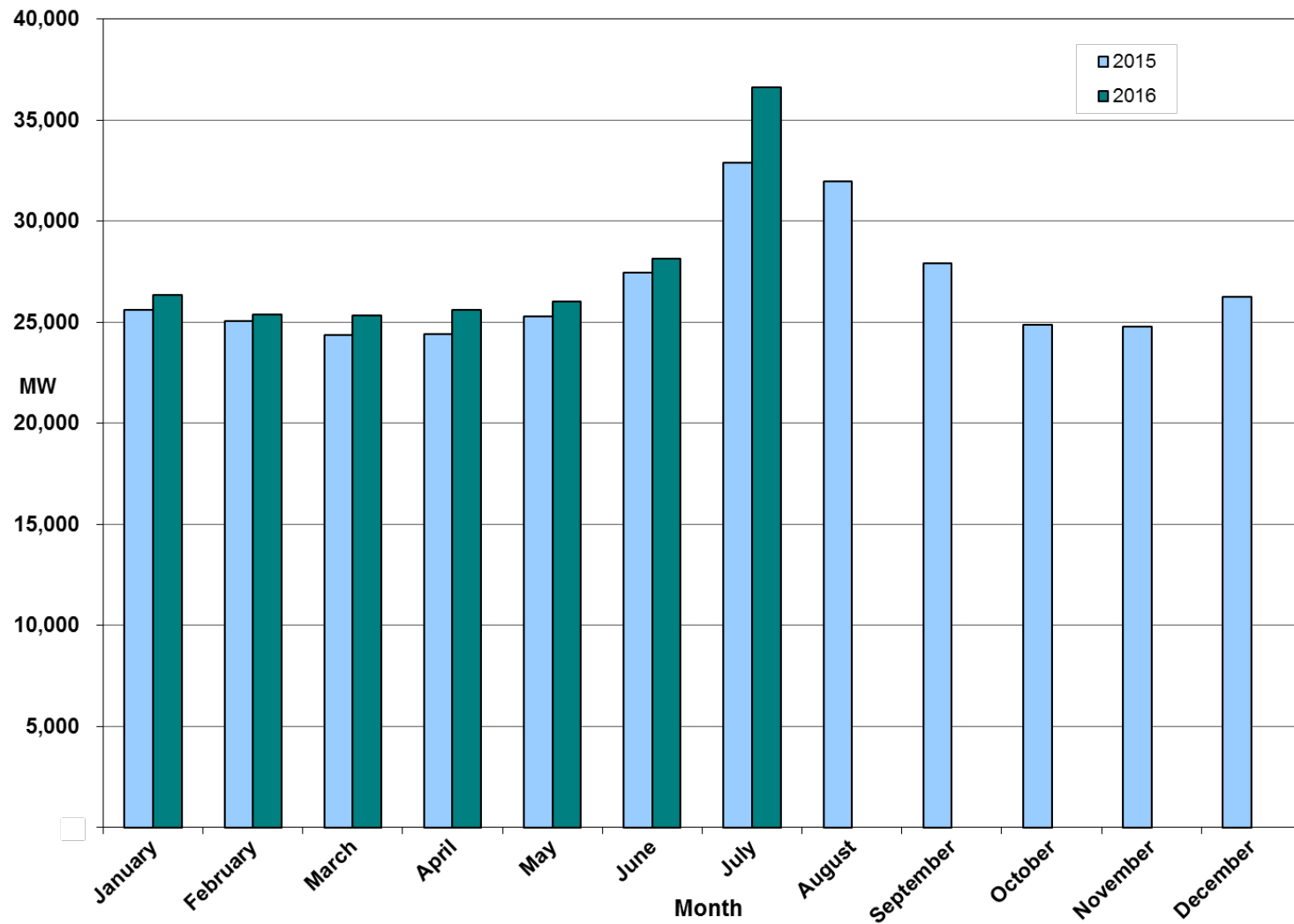
CPS1 12 Month Rolling Average = 176.18%



# Monthly Peak Actual Demand – July 2016



# Monthly Minimum Actual Demand – July 2016



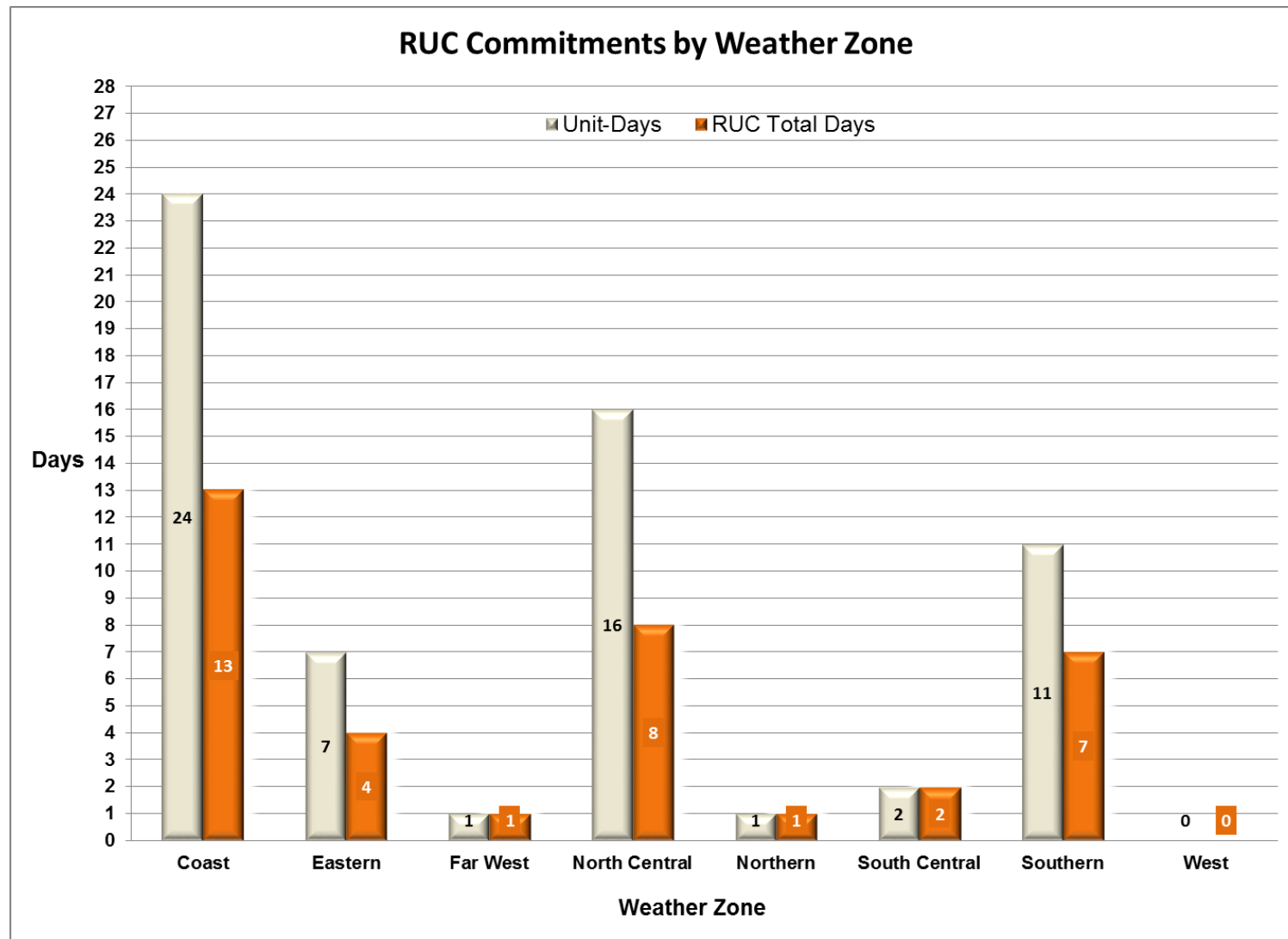


# Day-Ahead Load Forecast Performance – July 2016

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

	2013 MAPE	2014 MAPE	2015 MAPE	2016 MAPE	July 2016 MAPE	
<b>Average Annual MAPE</b>	2.86	2.83	2.86	2.75	1.94	
<b>Lowest Monthly MAPE</b>	2.07	2.15	1.89	1.94	<b>Lowest Daily MAPE</b>	0.56 July 8
<b>Highest Monthly MAPE</b>	3.50	3.70	3.81	3.86	<b>Highest Daily MAPE</b>	5.20 July 26

# Reliability Unit Commitment (RUC) Capacity by Weather Zone – July 2016



# Generic Transmission Constraints (GTCs) – July 2016

GTCs	Jul-15 Days GTCs	May-16 Days GTCs	Jun-16 Days GTCs	Jul-16 Days GTCs	Last 12 Months Total Days (Aug 15 – Jul 16)
North – Houston	1	0	0	0	2
Valley Import	0	3	0	0	7
Zorillo - Ajo	13	12	5	21	103
Panhandle	0	20	8	16	72
Laredo	-	1	0	0	5
Liston	-	24	21	29	173

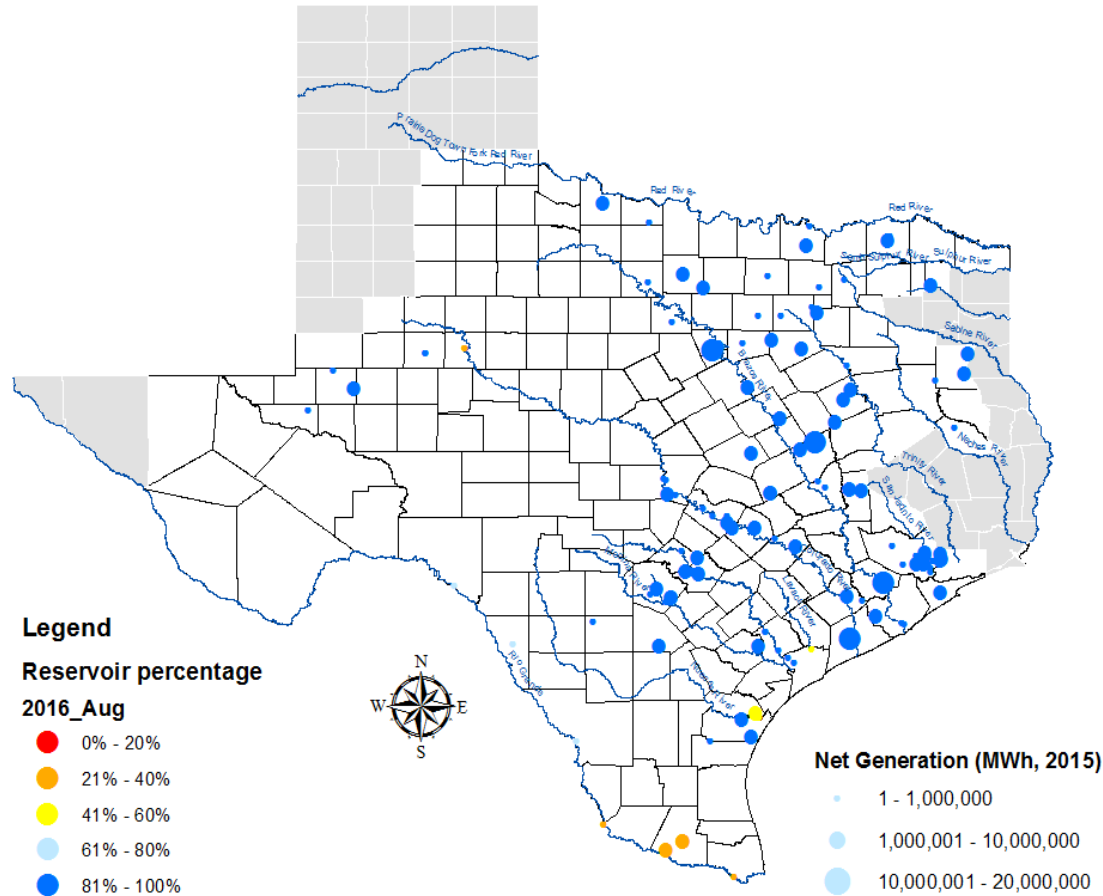
**GTC:** A transmission flow limit more constraining than a Transmission Element's normal limit established to constrain flow between geographic areas of the ERCOT Transmission System that is used to enforce stability and voltage constraints that cannot be modeled directly in ERCOT's transmission security 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 – July 2016

- One OCN Issued due to the forecasted probability of a 4,000 MW down-ramp in the next 180 minutes
  - Issued on 7/12
- One OCN issued due to capacity insufficiency
  - Issued on 7/25
- One Advisory issued due to ERCOTs State Estimator/RTCA being unavailable.
  - Issued on 7/7
- Two Advisories issued due to ERCOTs Voltage Security Assessment Tool being unavailable.
  - Issued on 7/7, 7/13
- Nine Advisories issued due to Physically Responsive Capability being less than 3,000MW.
  - Issued on 7/14, 7/16, 7/21, 7/22, 7/23, 7/24, 7/25, 7/29, 7/30
- Two Watches were issued due to HRUC not completing due to failure
  - Issued 7/23 HE07, HE08
- One Emergency Notice due to the failure of SCED/RLC being unavailable.
  - Issued on 7/7

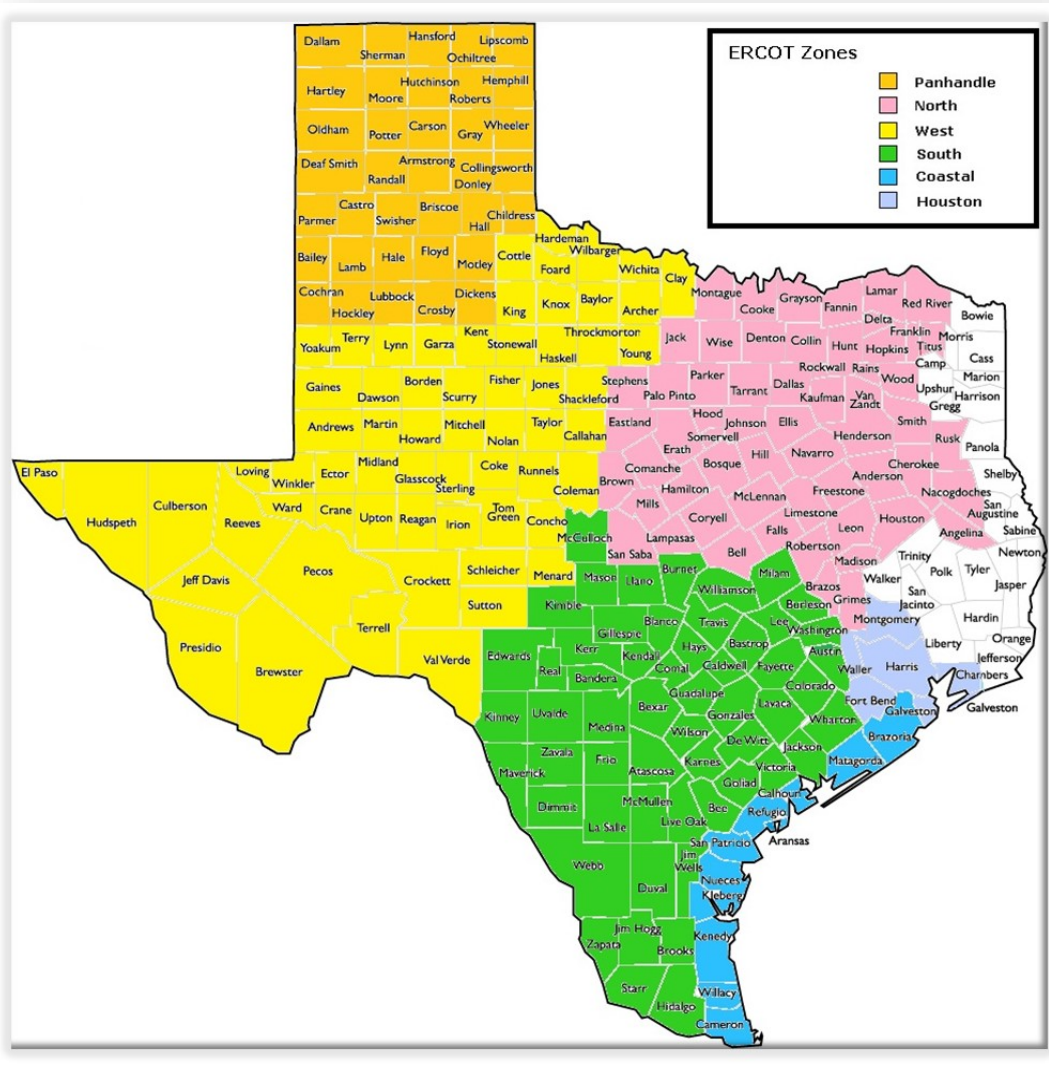
# Lake Levels Update – August 1, 2016



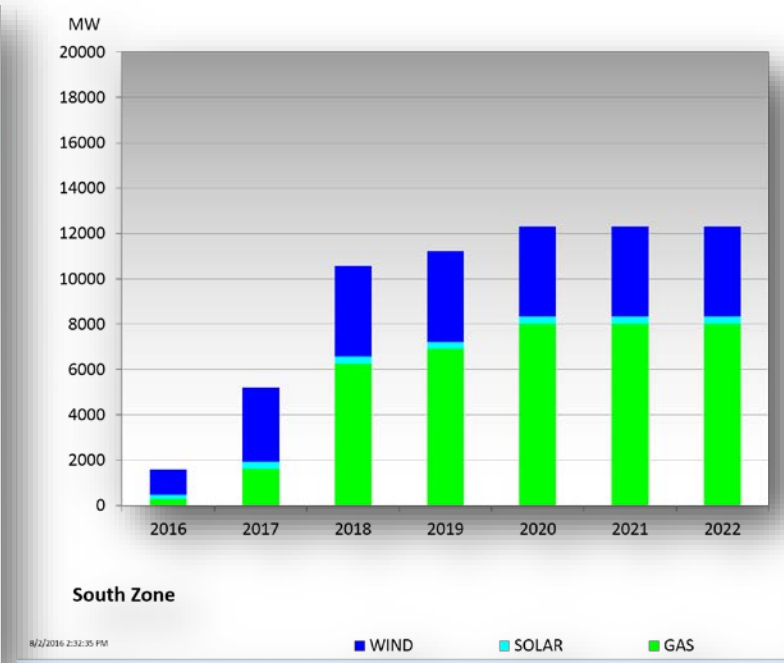
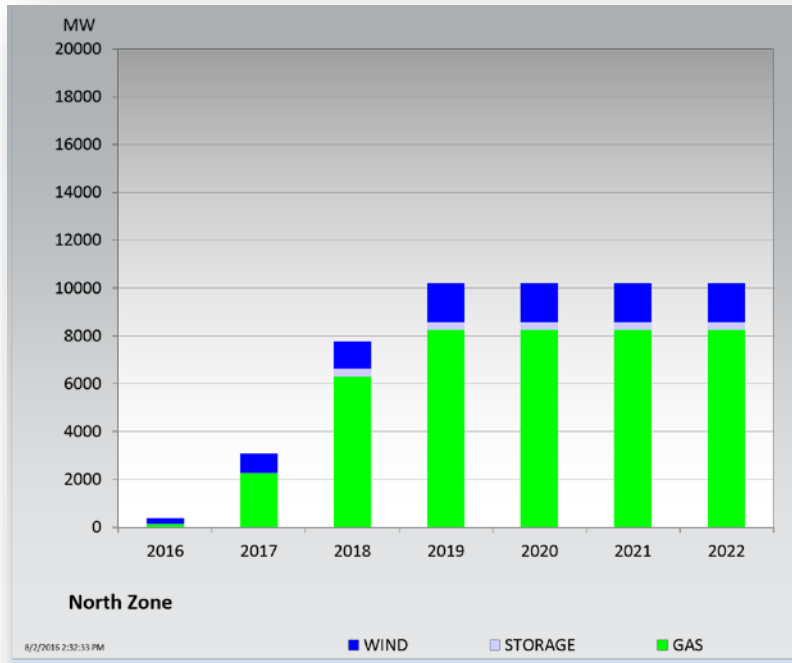
## Planning Summary – July 2016

- ERCOT is currently tracking 230 active generation interconnection requests totaling 56,600 MW. This includes 25,078 MW of wind generation.
- ERCOT is currently reviewing proposed transmission improvements with a total cost of \$732 Million.
- Transmission Projects endorsed in 2016 total \$271 Million.
- All projects (in engineering, routing, licensing, and construction) total approximately \$6.61 Billion.
- Transmission Projects energized in 2016 total about \$1.26 Billion (as of June 1, 2016).

# Mapping of Counties to ERCOT Zones – July 2016

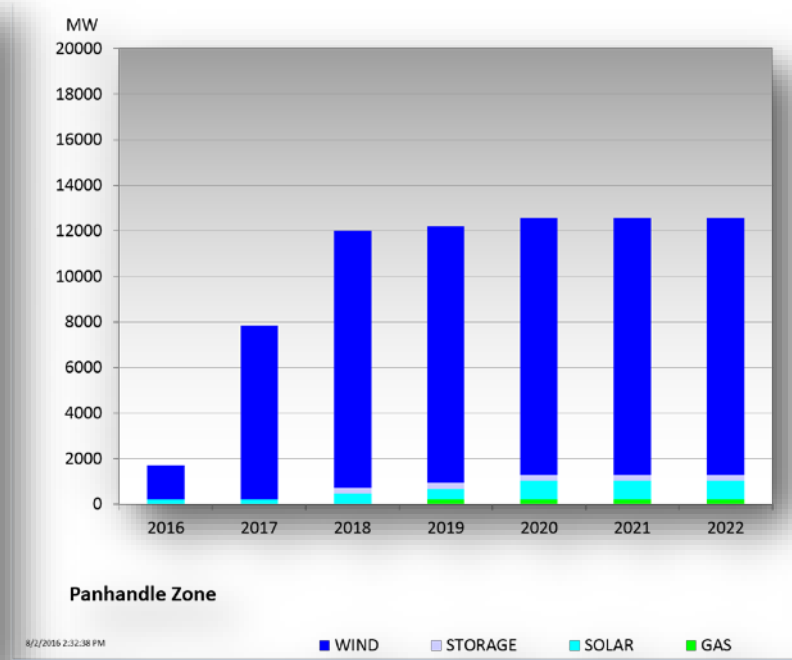
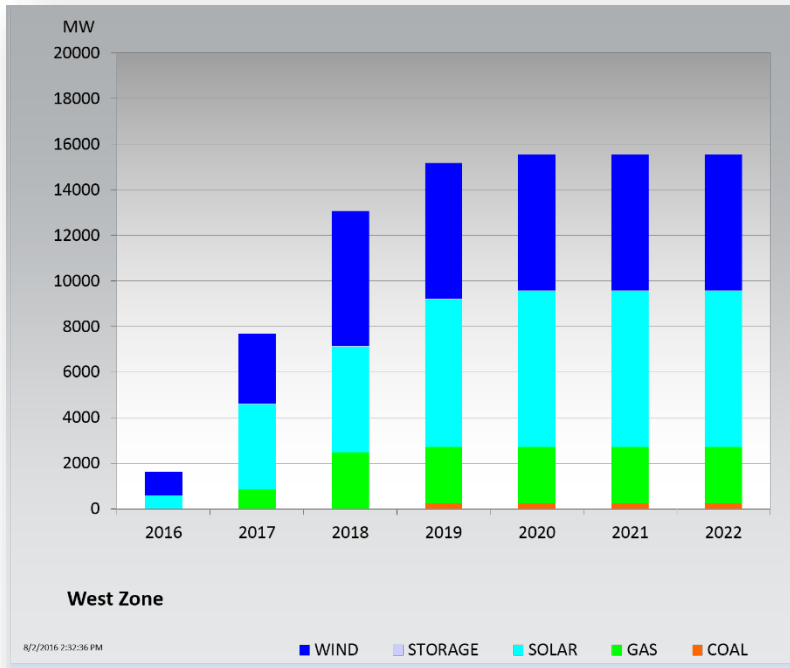


# Cumulative MW Capacity of Interconnection Requests by Zone – July 2016

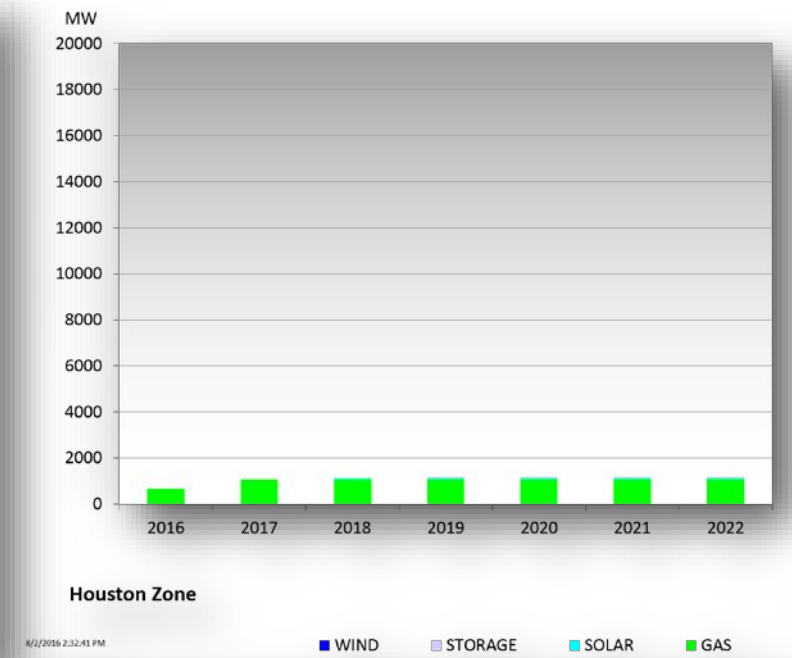
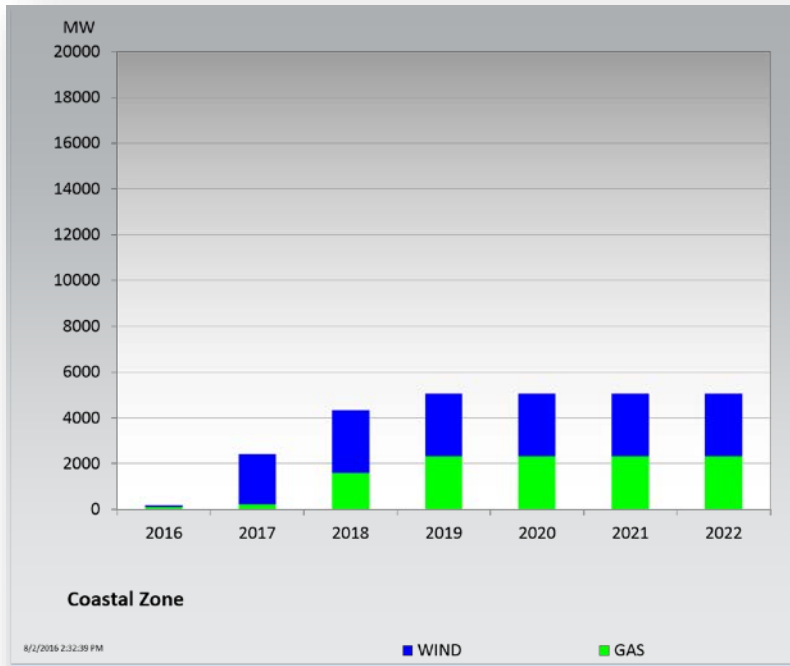




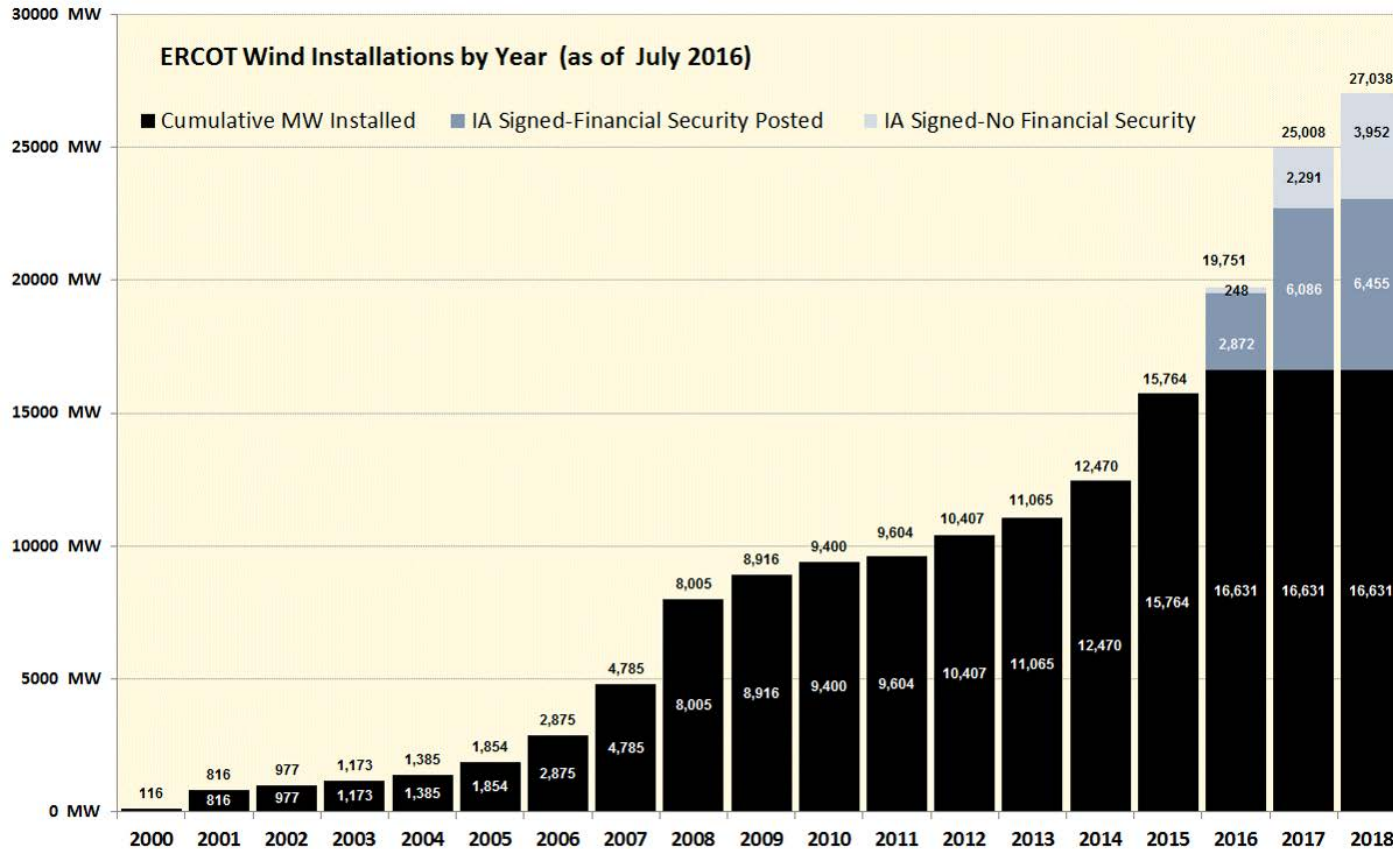
# Cumulative MW Capacity of Interconnection Requests by Zone – July 2016



# Cumulative MW Capacity of Interconnection Requests by Zone – July 2016



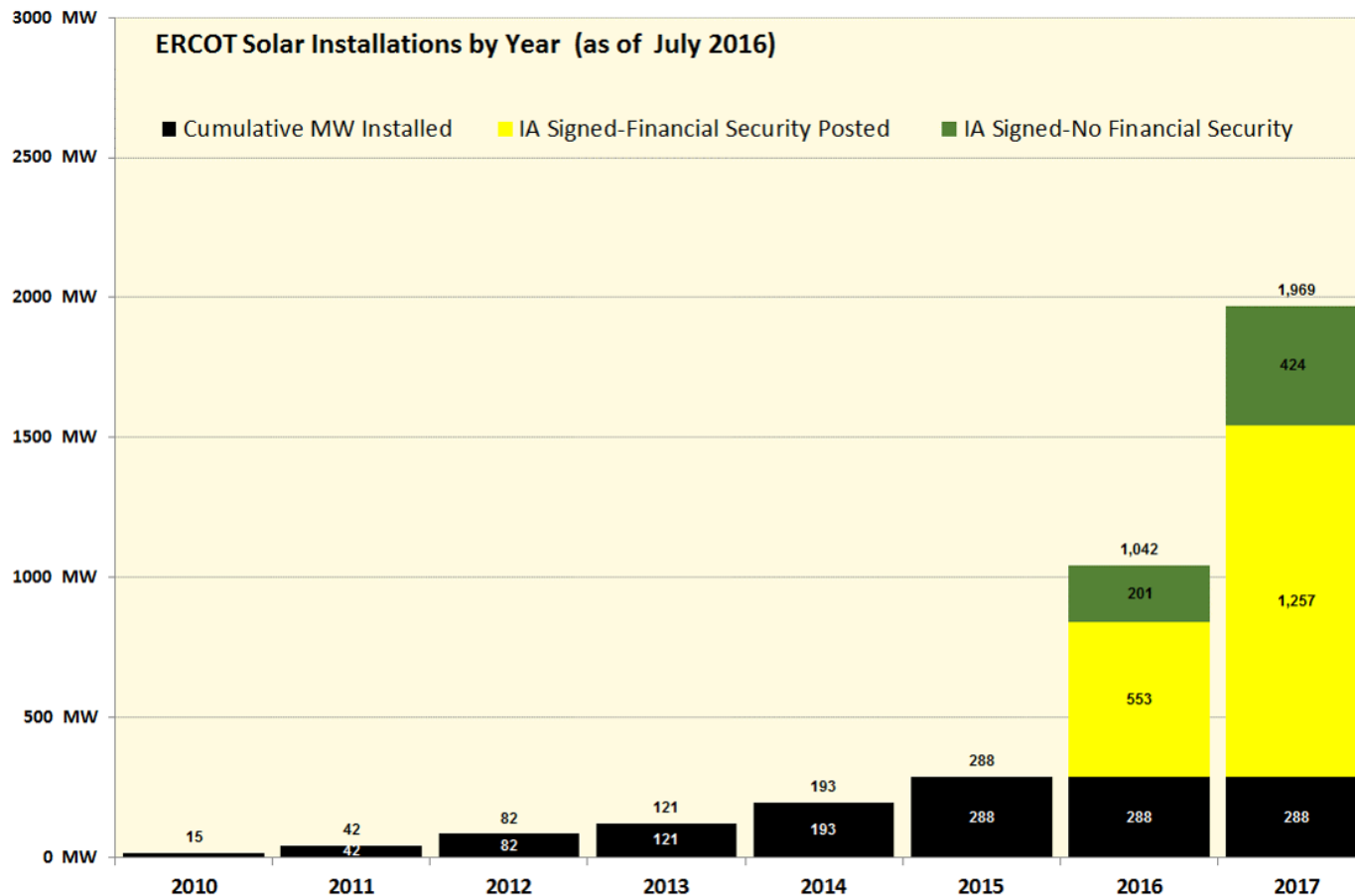
# Wind Generation – July 2016



The data presented here is based upon the latest registration data provided to ERCOT by the resource owners and can change without notice. Any capacity changes will be reflected in current and subsequent years' totals. Scheduling delays will also be reflected in the planned projects as that information is received. This chart reflects planned units in the calendar year of submission rather than installations by peak of year shown.

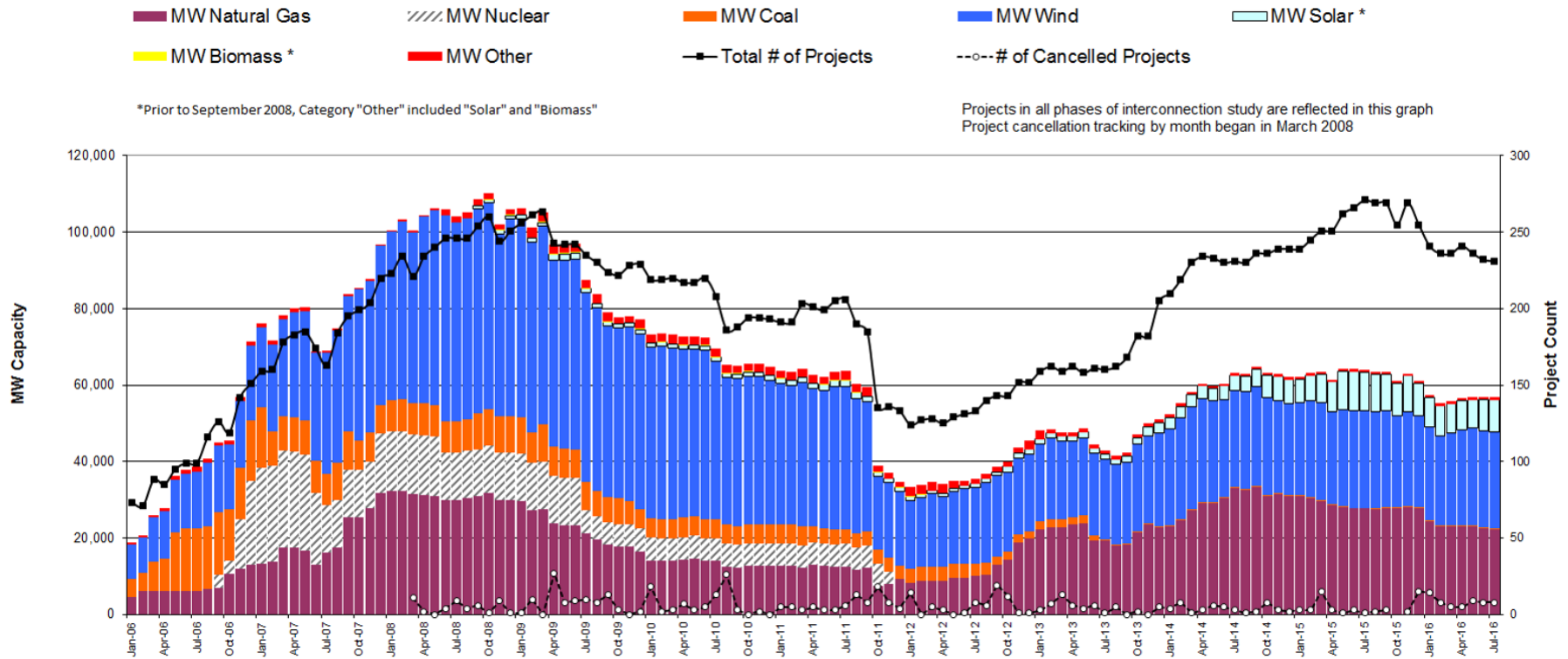
Financial security posted for funding interconnection facilities does not include CREZ security deposits, which are refunded to the Interconnecting Entity when an IA is signed.

# Solar Generation – July 2016

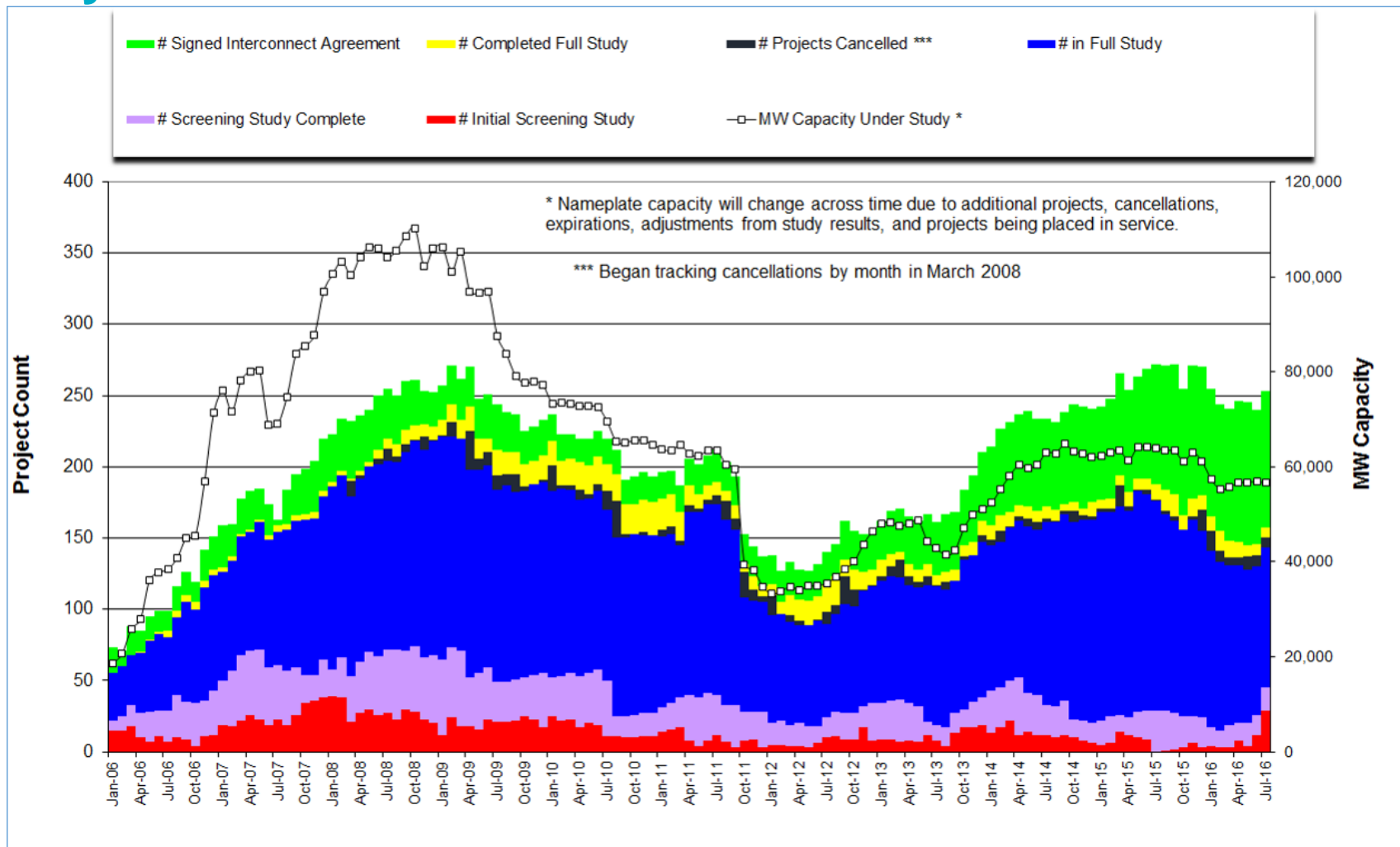


The data presented here is based upon the latest registration data provided to ERCOT by the resource owners and can change without notice. Any capacity changes will be reflected in current and subsequent years' totals. Scheduling delays will also be reflected in the planned projects as that information is received. This chart reflects planned units in the calendar year of submission rather than installations by peak of year shown.

# Generation Interconnection Activity by Fuel – July 2016

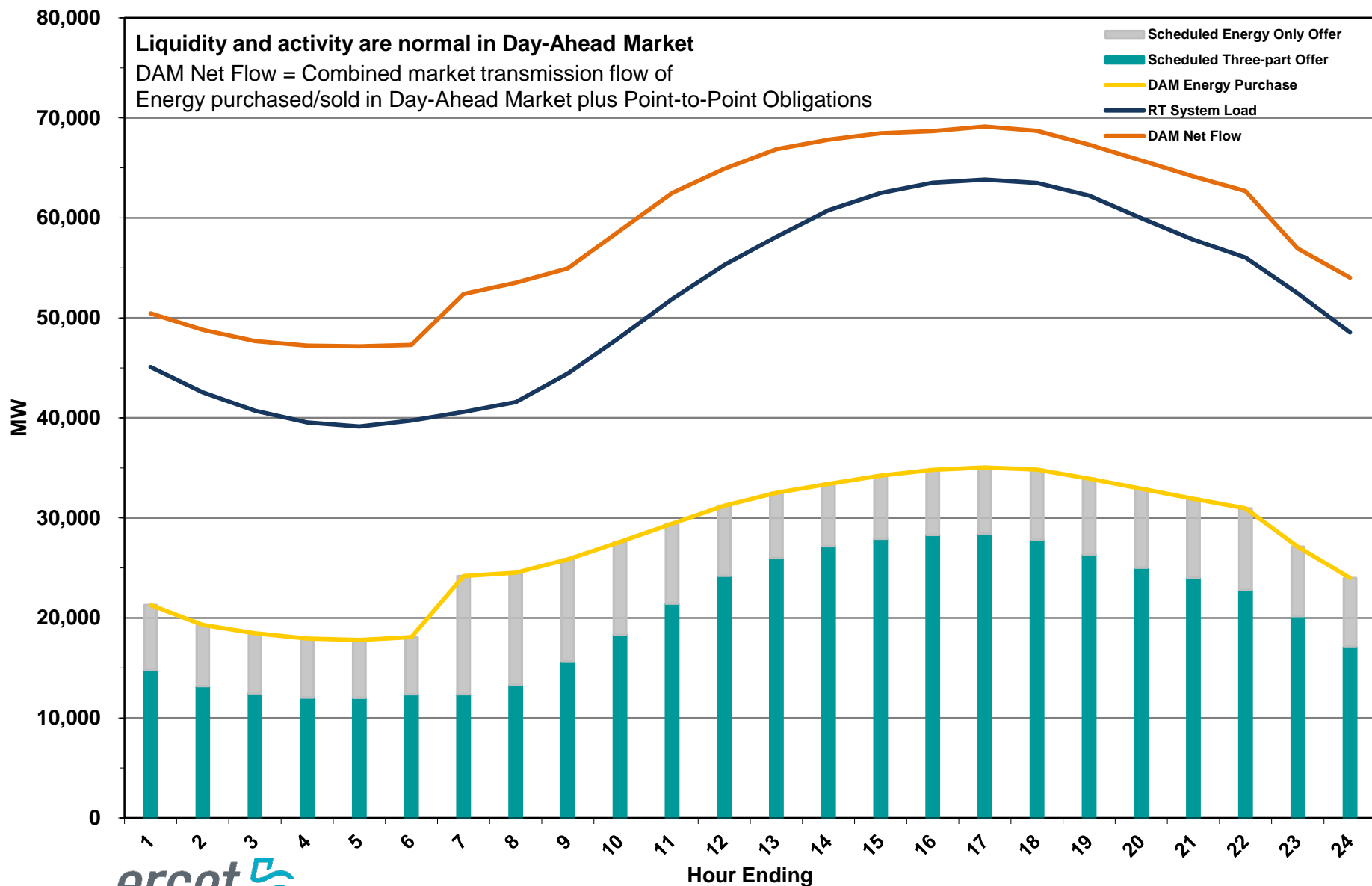


# Generation Interconnection Activity by Project Phase – July 2016



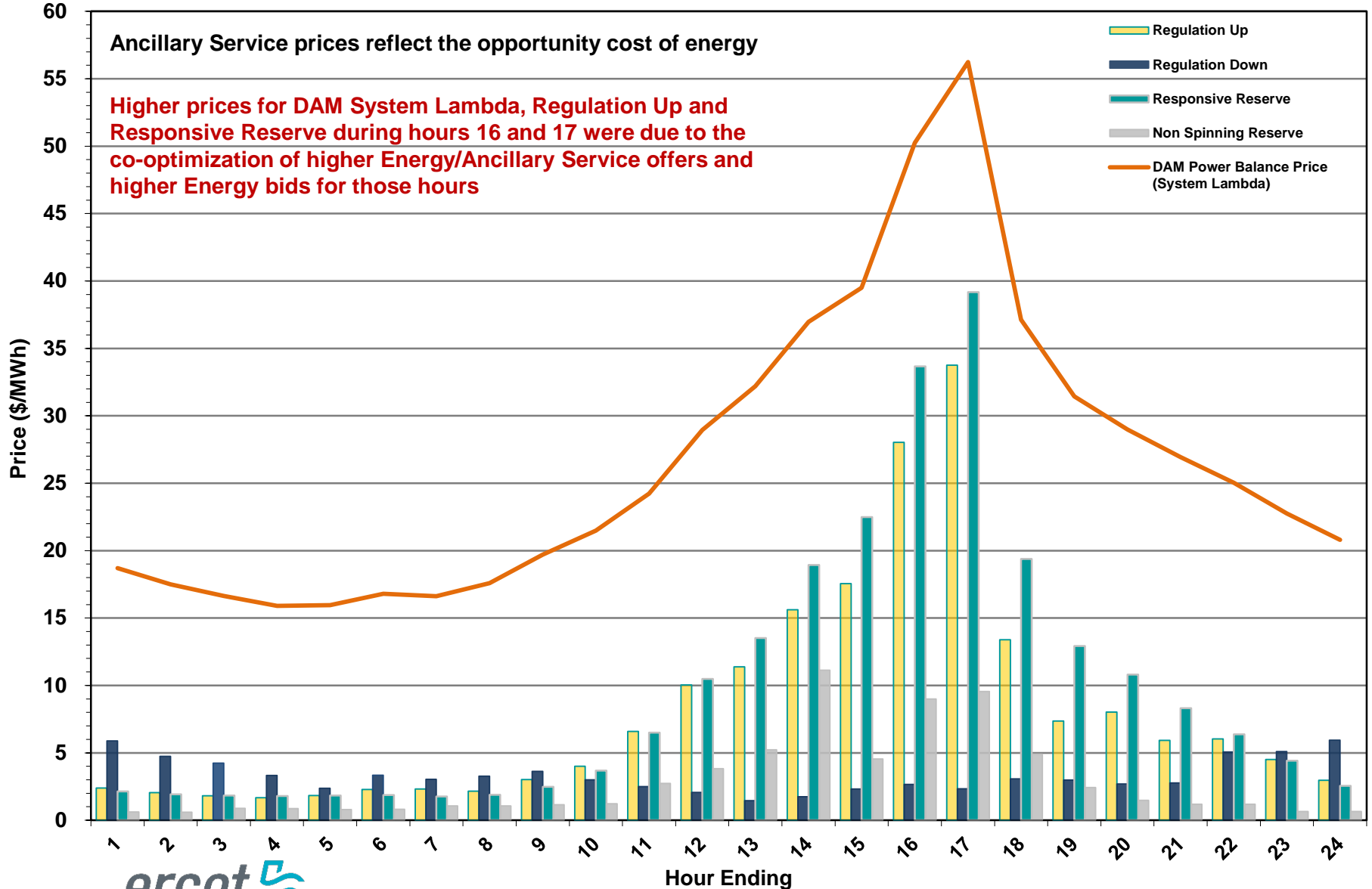
# Market Operations

# Day-Ahead Schedule (Hourly Average) – July 2016

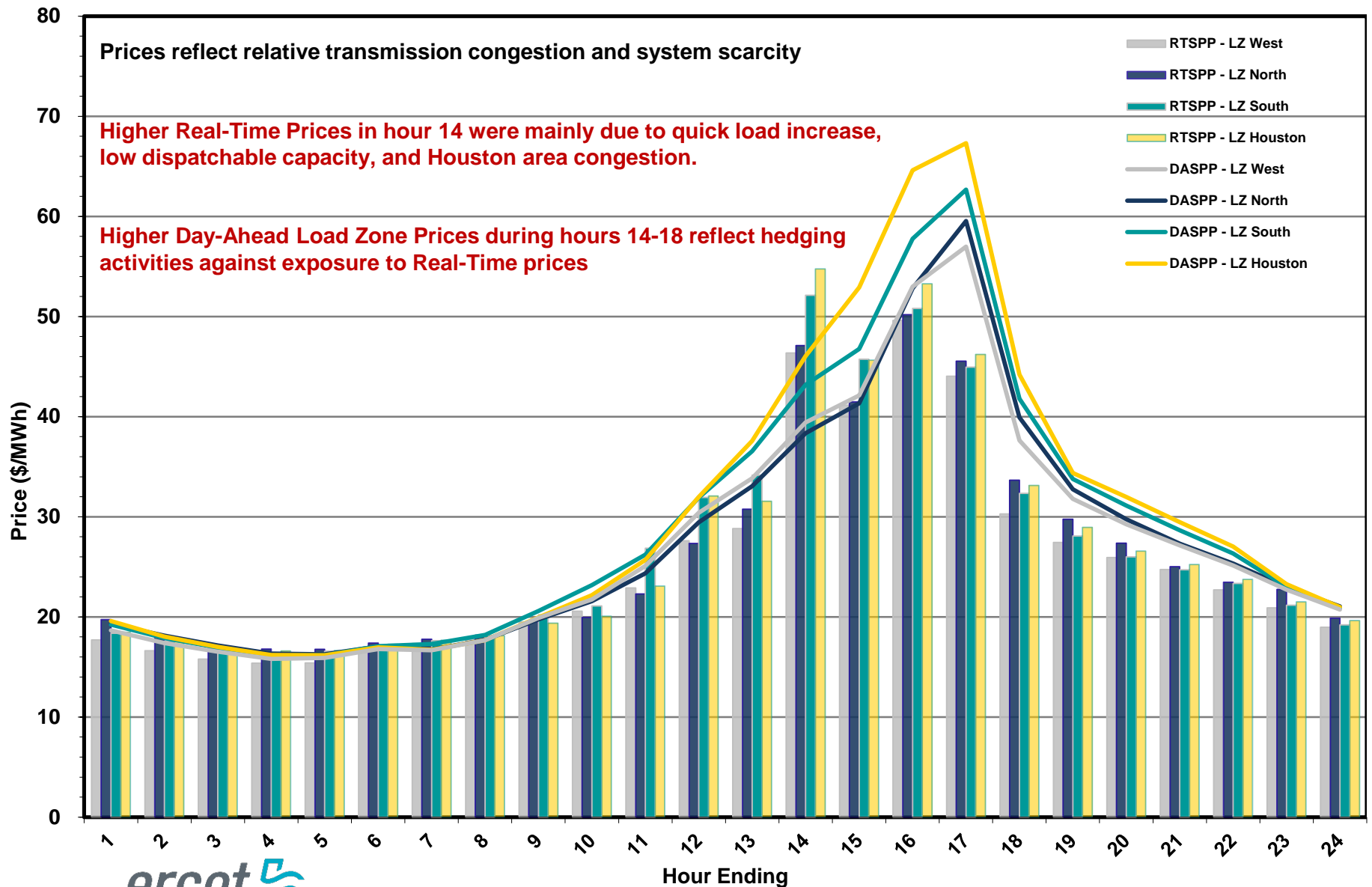




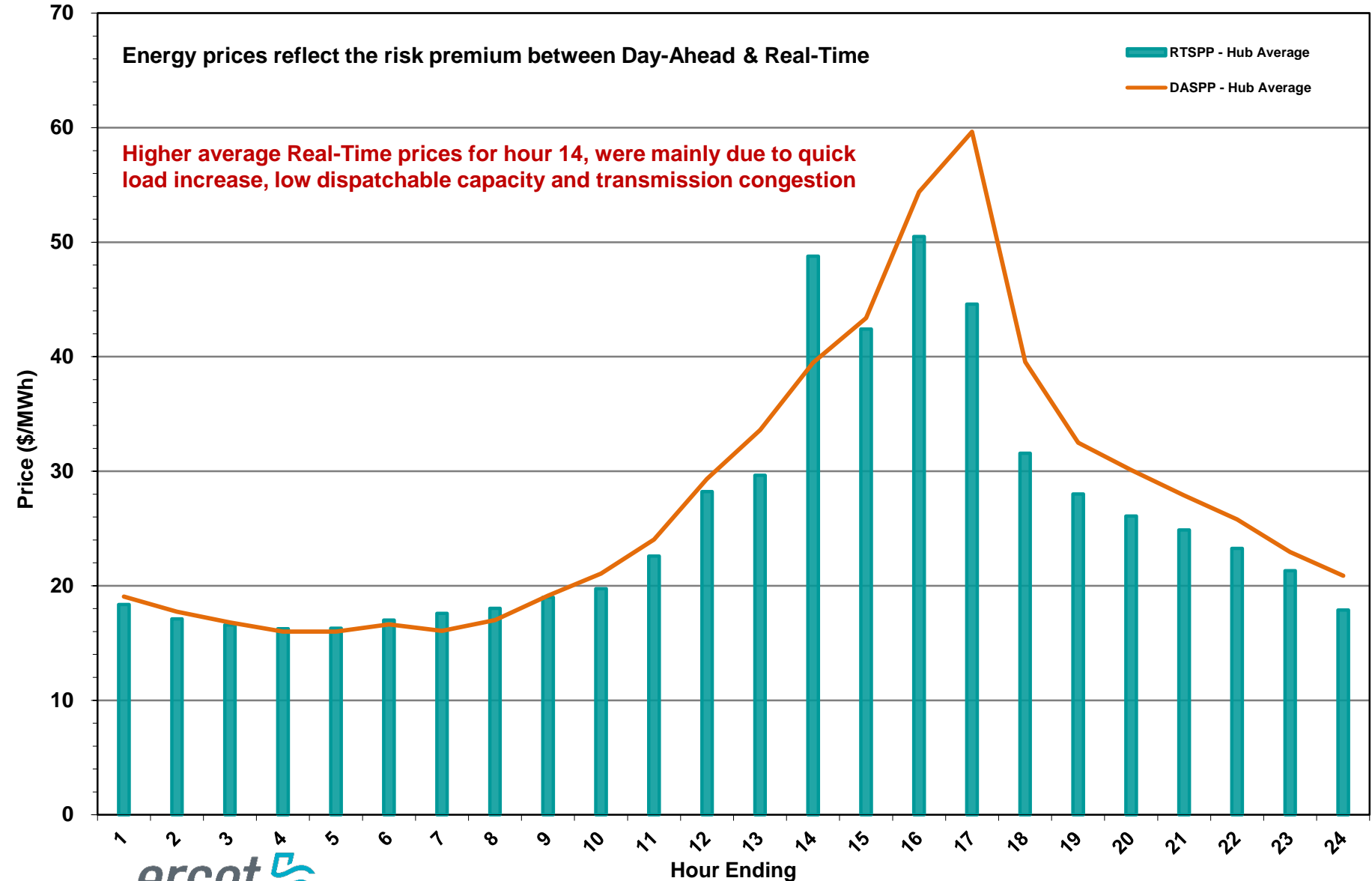
# Day-Ahead Electricity and Ancillary Service Prices (Hourly Average) – July 2016



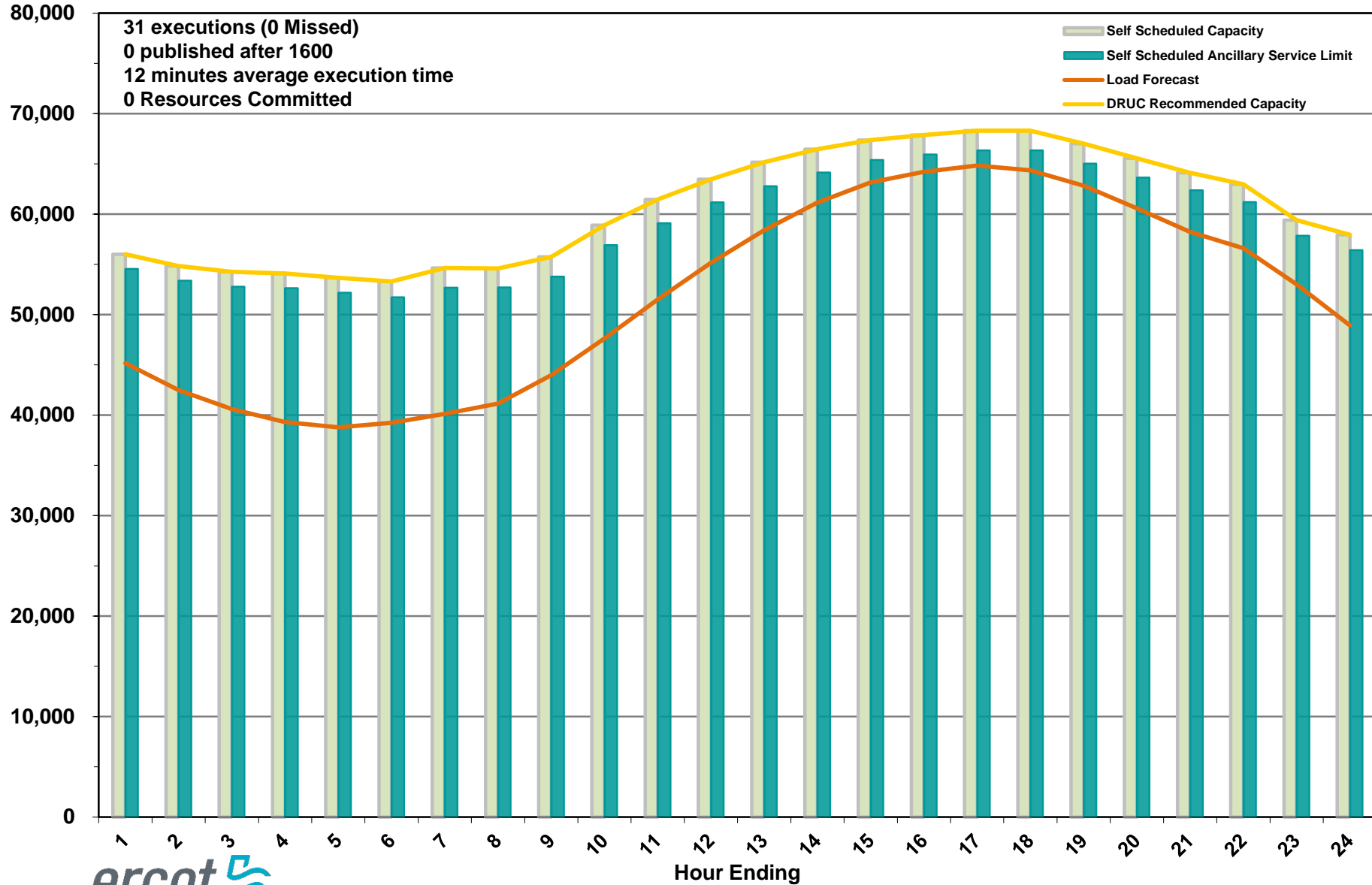
# Day-Ahead vs Real-Time Load Zone SPP (Hourly Average) – July 2016



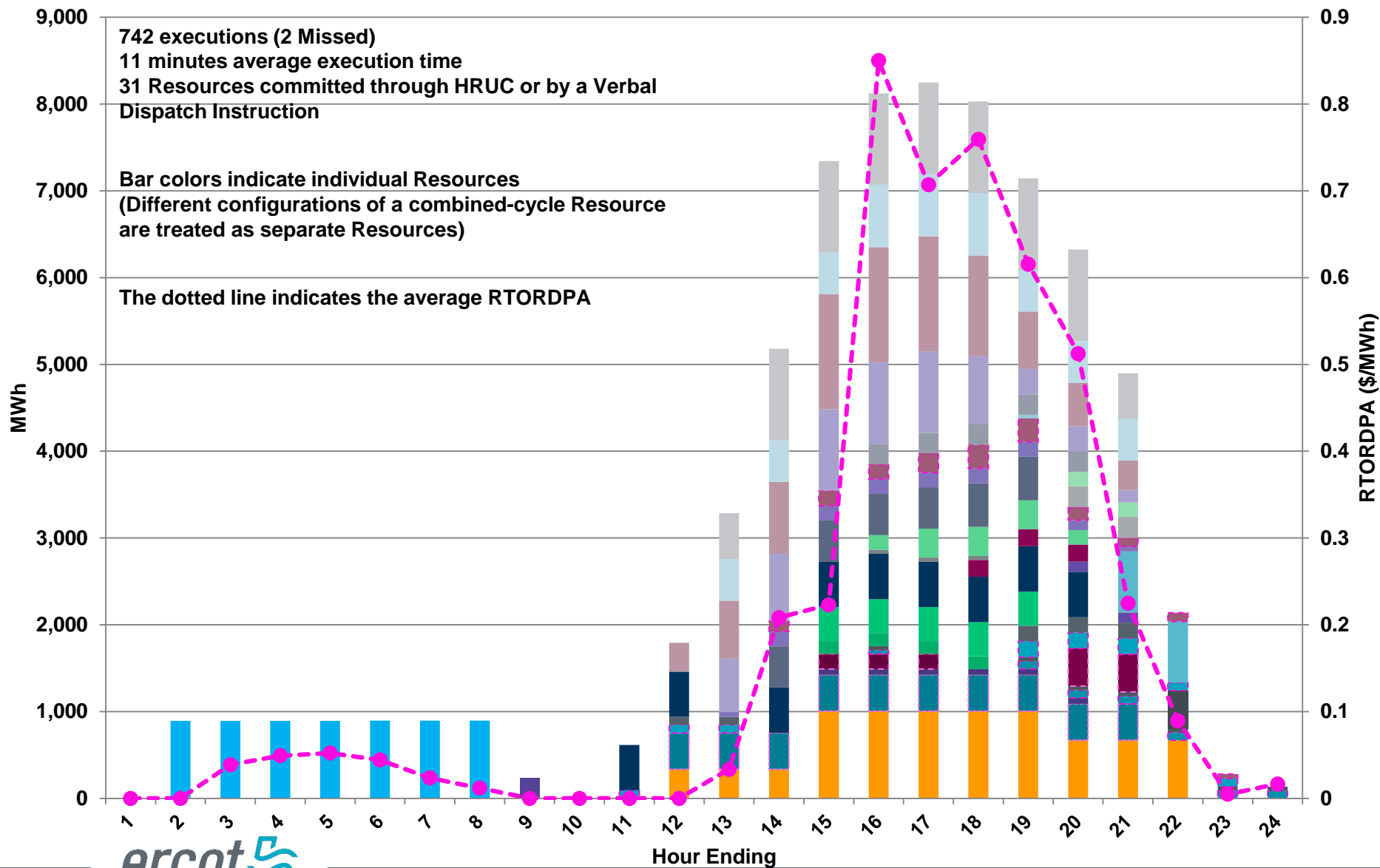
# Day-Ahead vs Real-Time Hub Average SPP (Hourly Average) – July 2016



# DRUC Monthly Summary (Hourly Average) – July 2016



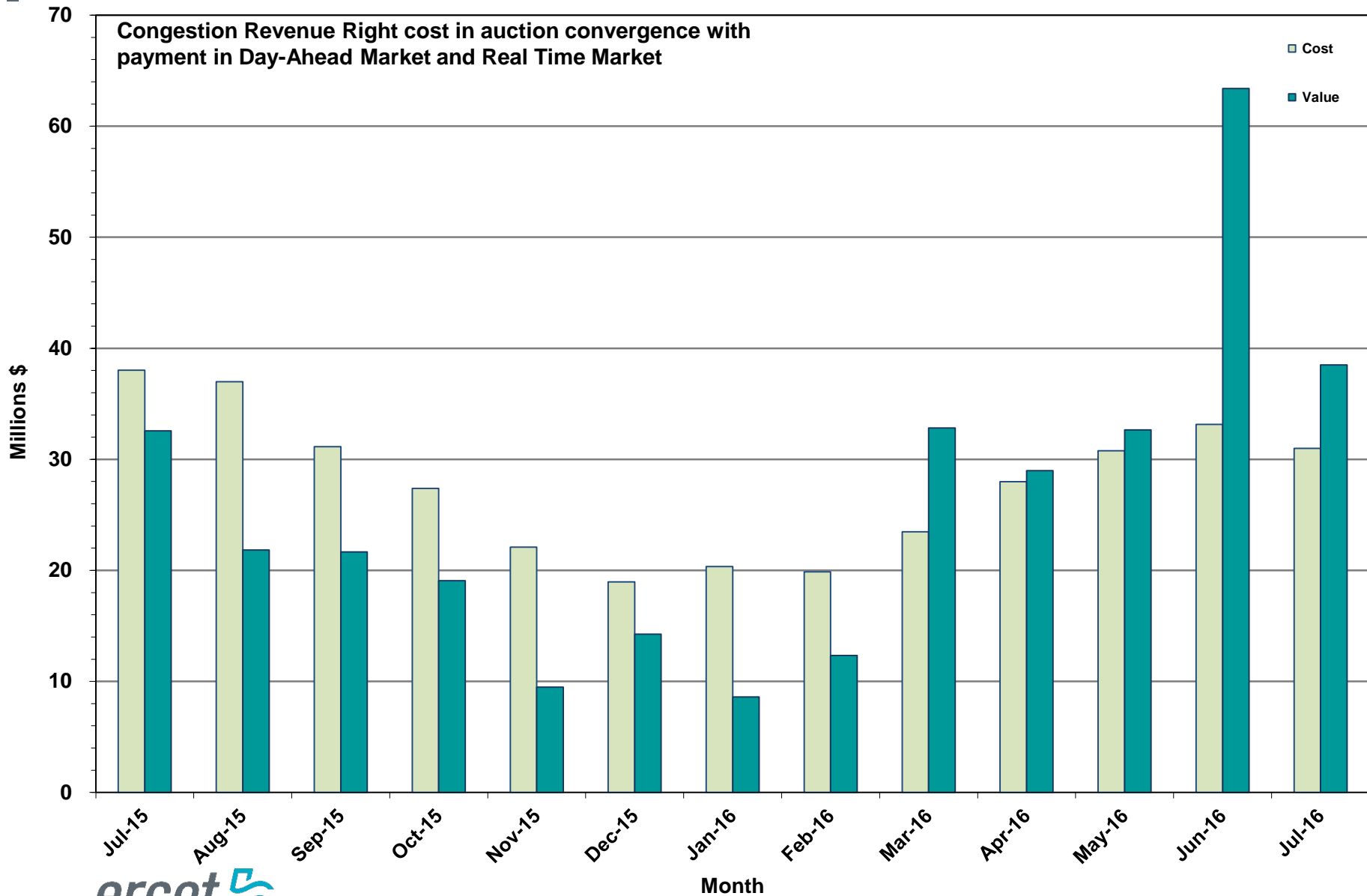
# HRUC Monthly Summary and Real-Time On-Line Reliability Deployment Price Adder (RTORDPA) (Hourly Average) – July 2016



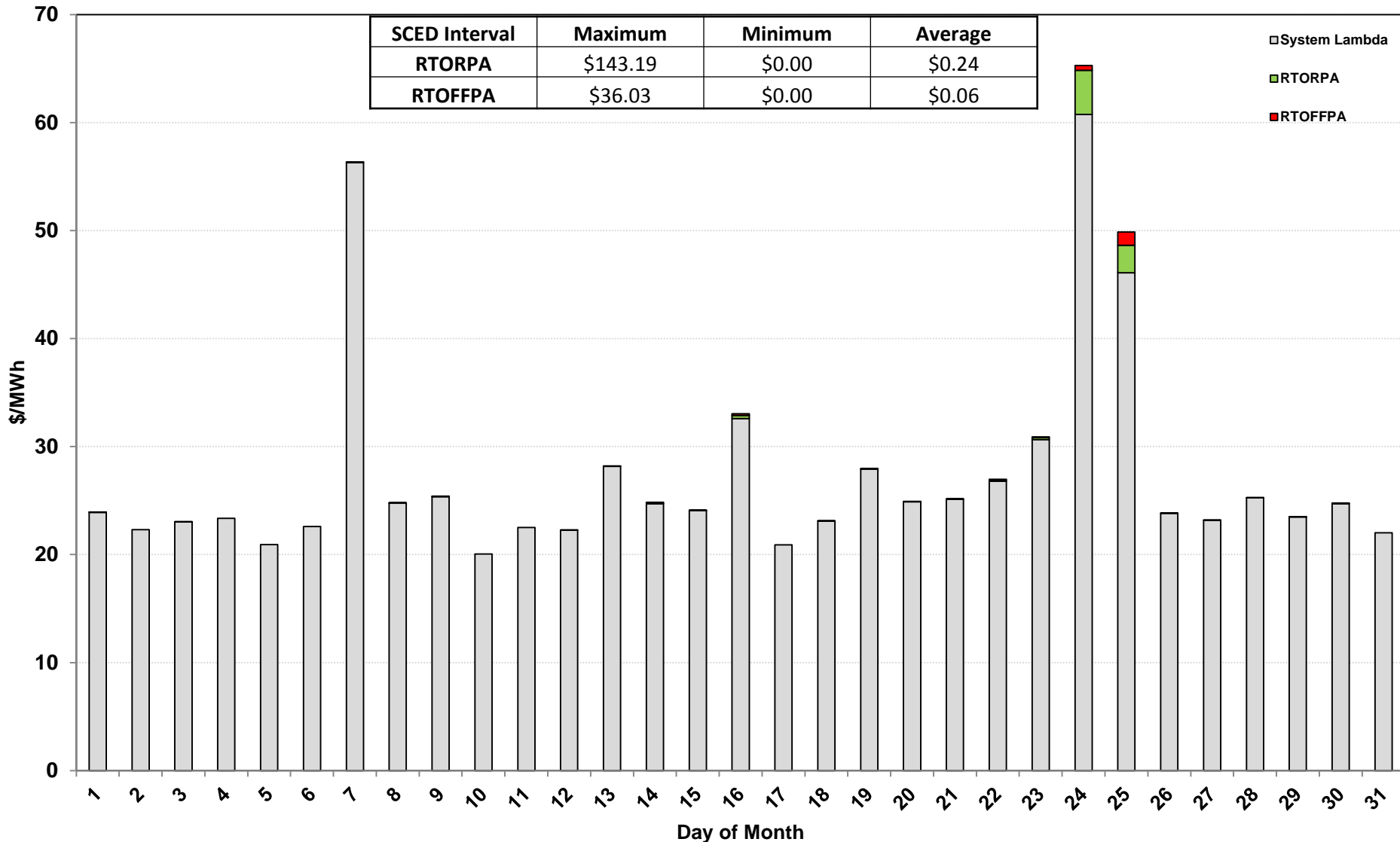
# Non-Spinning Reserve Service Deployment – July 2016

Deployment Start Time	Deployment End Time	Deployment Duration (Hours)	Max Deployment (MW)	Reason
None				

# CRR Price Convergence – July 2016



# Daily Average System Lambda and ORDC Price Adders – July 2016





# ERS Procurement for – June 2016 – September 2016

	TP1	TP2	TP3	TP4	TP5	TP6
Non Weather-Sensitive ERS-10 MW	312.034	319.429	284.399	276.074	310.019	296.224
Non Weather-Sensitive ERS-30 MW	525.101	584.825	551.572	524.872	541.422	474.169
Weather-Sensitive ERS-10 MW	0	0	0	0	0	0
Weather-Sensitive ERS-30 MW	0	0	22.533	22.533	0	0
Total MW Procured	837.135	904.254	858.504	823.479	851.441	770.393
Clearing Price	\$2.12	\$1.98	\$21.21	\$22.32	\$2.08	\$2.36

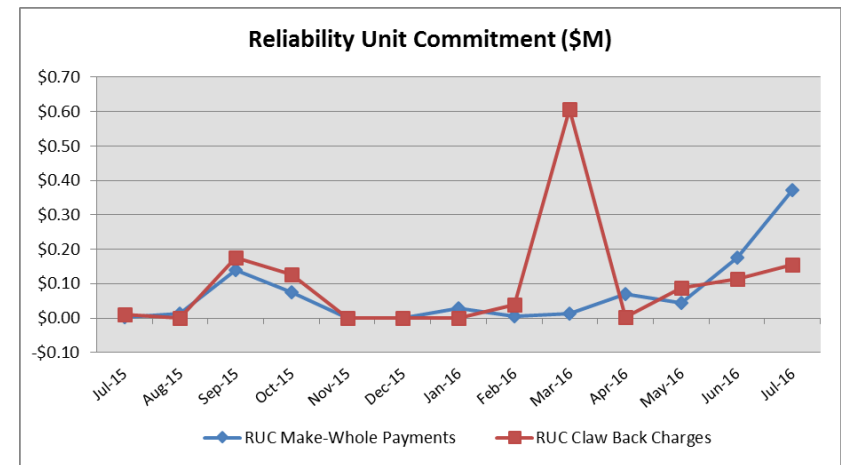
\*Weather-Sensitive Time Periods are TP3 and TP4.

## 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 – July 2016

Reliability Unit Commitment (RUC)	\$ in Millions
RUC Make-Whole Payments	(\$0.37)
RUC Clawback Charges	\$0.16
<b>RUC Commitment Settlement</b>	<b>(\$0.22)</b>
RUC Capacity Short Charges	\$0.37
RUC Make-Whole Uplift	\$0.00
<b>RUC Commitment Cost Allocation</b>	<b>\$0.37</b>
RUC Decommitment Payments	\$0.00



RUC Make-Whole Payments were \$0.37M in July 2016. RUC Clawback Charges were \$0.16M.

There was \$0.16M allocated directly to load in July 2016, compared to:

- \$0.11M in June 2016
- \$0.01M in July 2015

# Capacity Services – July 2016

Capacity Services	\$ in Millions
Regulation Up Service	\$2.03
Regulation Down Service	\$0.86
Responsive Reserve Service	\$16.27
Non-Spinning Reserve Service	\$3.13
Black Start Service	\$0.64
Voltage Services - Reactive Power	\$0.00
Voltage Services - Lost Opportunity	\$0.00
<b>Total Charges</b>	<b>\$22.93</b>

Capacity Services costs increased from last month and decreased from July 2015.

July 2016 cost was \$22.93M, compared to:

- A charge of \$20.17M in June 2016
- A charge of \$40.54M in July 2015

# Energy Settlement – July 2016

Day-Ahead Market Energy Settlement	\$ in Millions
Energy Purchases	\$611.92
Point to Point Obligation Purchases	\$45.73
RMR Day-Ahead Revenue	\$0.00
Energy Sales	(\$613.66)
Day-Ahead Congestion Rent	\$43.99
Day-Ahead Market Make-Whole Payments	(\$0.62)

Day-Ahead Market energy settlement increased from last month and from July 2015.

Real-Time Market energy settlement activity increased from last month and decreased from July 2015.

Real-Time Market Energy Settlement	\$ in Millions
Energy Imbalance at a Resource Node	(\$560.57)
Energy Imbalance at a Load Zone	\$878.47
Energy Imbalance at a Hub	(\$290.95)
Real Time Congestion from Self Schedules	\$0.25
Block Load Transfers and DC Ties	(\$1.36)
Impact to Revenue Neutrality	\$25.84
Emergency Energy Payments	(\$0.05)
Base Point Deviation Charges	\$0.26
Real-Time Metered Generation (MWh in millions)	38.27

# Congestion Revenue Rights (CRR) – July 2016

	\$ in Millions
Annual Auction	(\$23.97)
Monthly Auction	(\$7.01)
<b>Total Auction Revenue</b>	<b>(\$30.98)</b>
Day-Ahead CRR Settlement	(\$38.50)
Day-Ahead CRR Short-Charges	\$1.38
Day-Ahead CRR Short-Charges Refunded	(\$1.38)
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>(\$38.50)</b>
Day-Ahead Point to Point Obligations Settlement	\$45.73
Real-Time Point to Point Obligation Settlement	(\$28.35)
<b>Net Point to Point Obligation Settlement</b>	<b>\$17.38</b>

Congestion Revenue Rights settlement payments were fully funded and excess funds were allocated to Load.

Point to Point Obligations settled with a net charge of \$17.38M compared to a net credit of \$0.46M last month.

# CRR Balancing Account Fund – July 2016

<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>	\$6.86
<b>CRR PTP Option Award Charges</b>	\$0.06
<b>Day-Ahead CRR Short-Charges Refunded</b>	(\$1.38)
<b>Load Allocated CRR Amount</b>	(\$5.54)
<b>Total Fund Amount</b>	\$10.00

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

In the month of July 2016, the fund cap remained at \$10M and excess funds of \$5.54M were allocated to Load.

# Revenue Neutrality – July 2016

## Revenue Neutrality Settlement

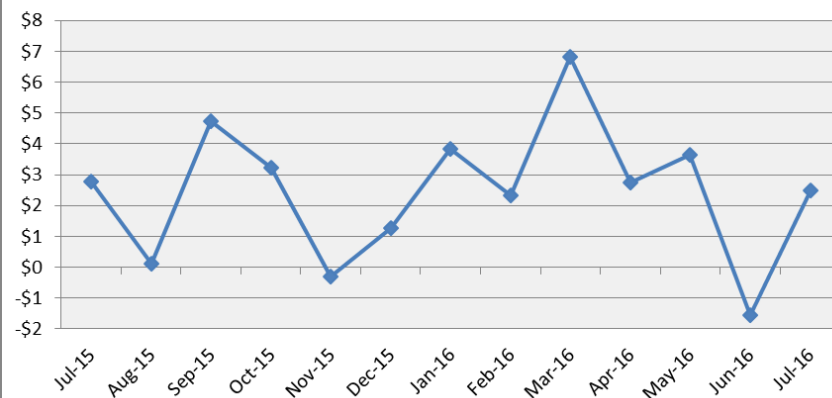
	\$ in Millions
Real-Time Point to Point Obligation Settlement	(\$28.35)
Real-Time Point to Point Options and Options with Refund Settlement	\$0.00
Real-Time Energy Imbalance Settlement	\$26.95
Real-Time Congestion from Self-Schedules Settlement	\$0.25
DC Tie & Block Load Transfer Settlement	(\$1.36)
<b>Charge to Load</b>	<b>\$2.51</b>

Revenue Neutrality charges to load increased compared to last month and decreased compared to July 2015.

July 2016 was a charge of \$2.51M, compared to:

- \$1.55M credit in June 2016
- \$2.79M charge in July 2015

Revenue Neutrality Uplift (\$M)



# Real-Time Ancillary Service Imbalance (ORDC) – July 2016

Real-Time Ancillary Service Imbalance	\$ in Thousands
Real-Time AS Imbalance Payment Amount	(\$176.95)
Load Allocated AS Imbalance Revenue Neutrality Amount	\$176.94
<b>Total Charges</b>	<b>\$176.94</b>

In July 2016, total credits to QSEs w/an Ancillary Service Imbalance were \$176,946, while total charges in June 2016 were \$55,329.

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

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

The highest payment to QSEs w/an Ancillary Service Imbalance occurred on July 24<sup>th</sup> in the amount of \$85,346.



# Net Allocation to Load – July 2016

## Market-Based Allocation

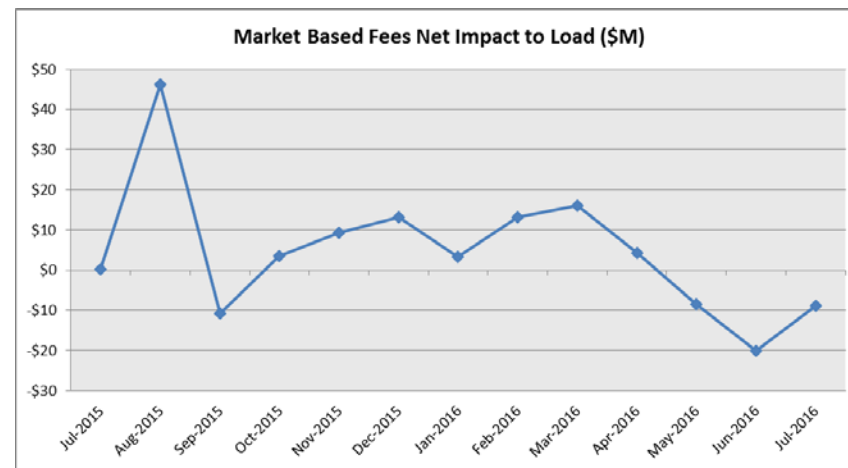
\$ in Millions

CRR Auction Revenue Disbursement Settlement	(\$30.98)
Balancing Account Proceeds Settlement	(\$5.54)
Net Reliability Unit Commitment Settlement	(\$0.16)
Ancillary Services Settlement	\$22.93
Reliability Must Run Settlement (incl. RMR for Capacity)	\$2.37
Real-Time Revenue Neutrality Settlement	\$2.51
Emergency Energy Settlement	\$0.05
Base Point Deviation Settlement	(\$0.26)
ORDC Settlement	\$0.18
<b>Total</b>	<b>(\$8.90)</b>
<b>Fee Allocation</b>	
ERCOT Administrative Fee Settlement	\$21.30
<b>Net Allocated to Load</b>	<b>\$12.40</b>

The charge for the net allocation to Load increased from last month and decreased from July 2015.

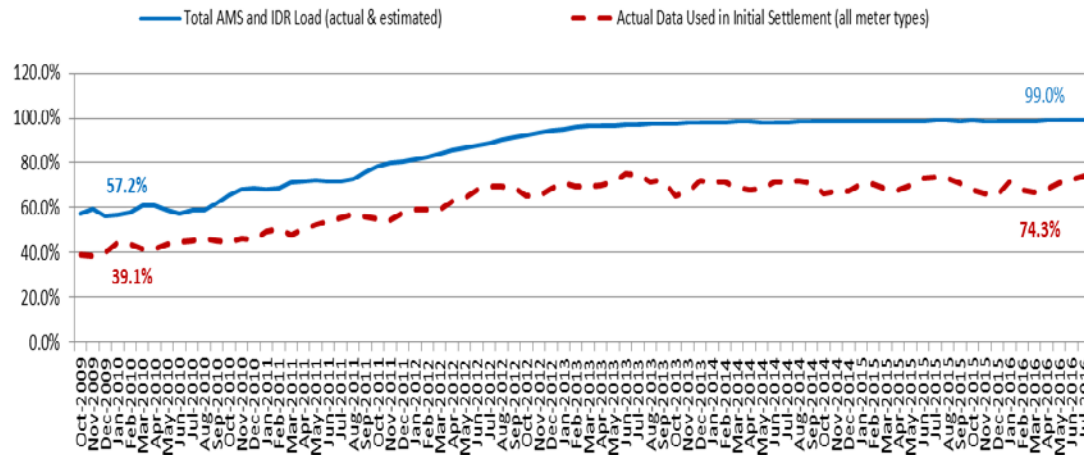
July 2016 was a charge of \$12.40M, compared to:

- A credit of \$1.36M in June 2016
- A charge of \$17.51M in July 2015



# Advanced Meter Settlement Impacts – July 2016

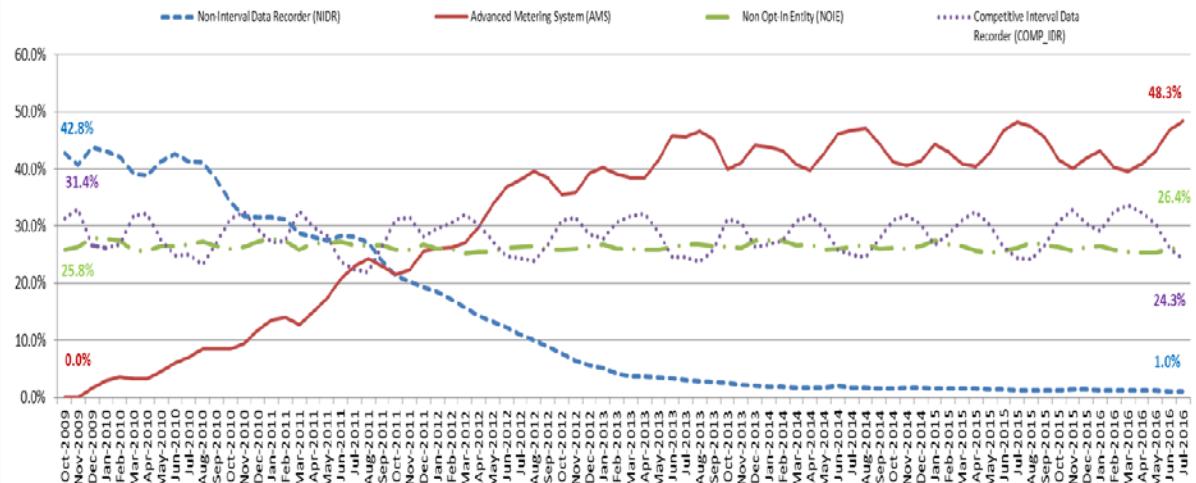
Percent Actual/Percent Interval Data Recorder (IDR)



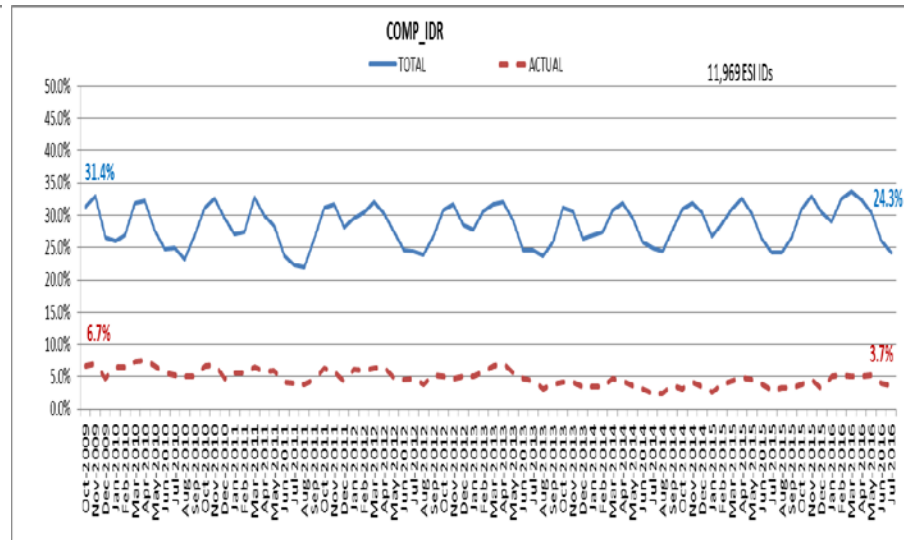
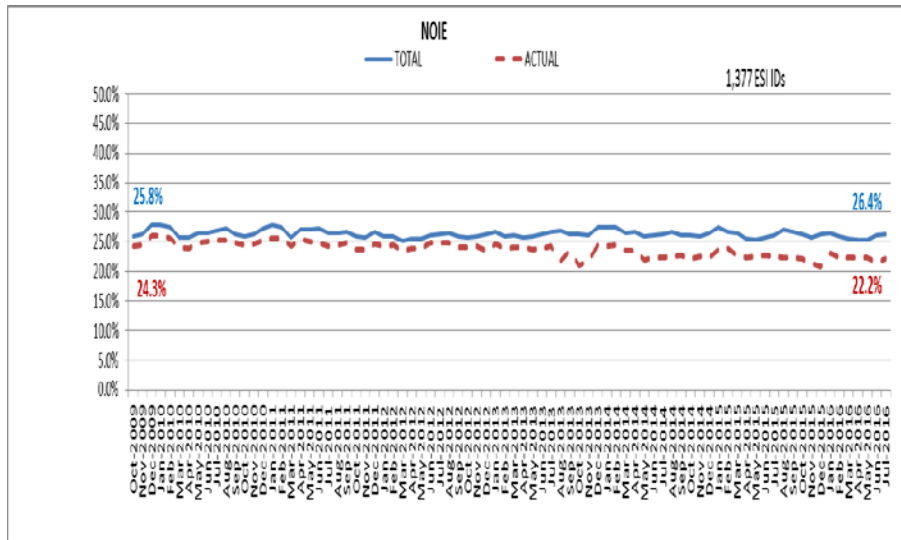
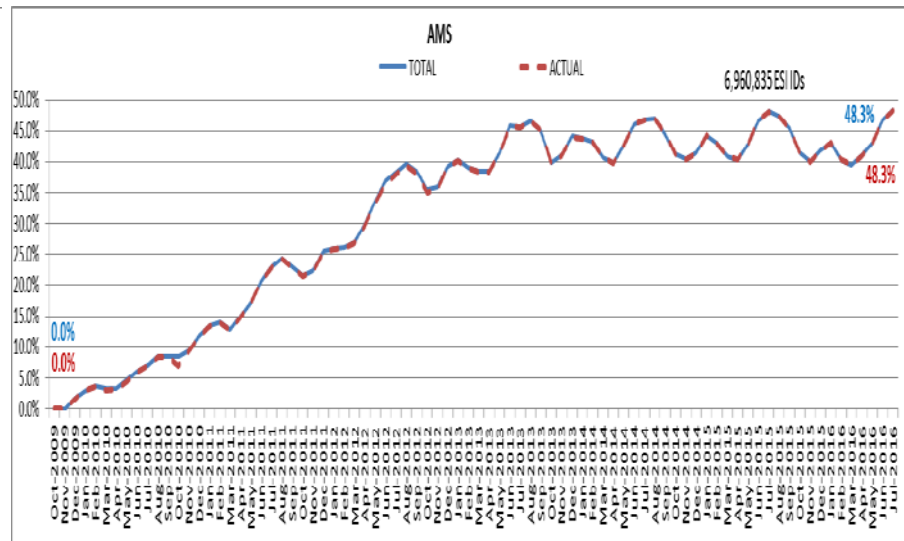
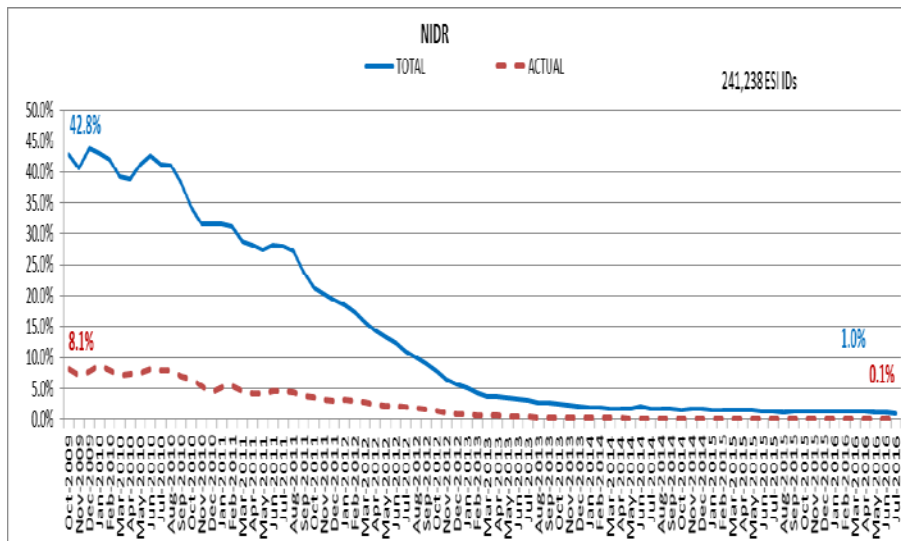
July 2016: At month end, settling 6.9M ESIIDs using Advanced Meter data.

July 2016: 99.0% 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 – July 2016

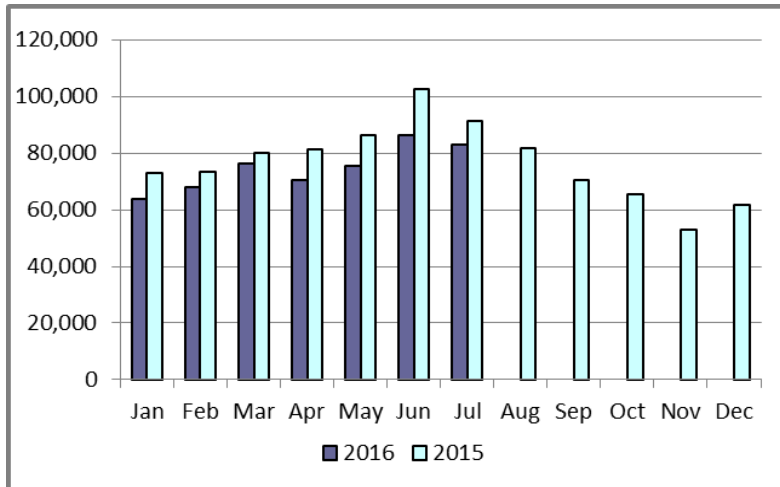


# Retail Transaction Volumes – Summary – July 2016

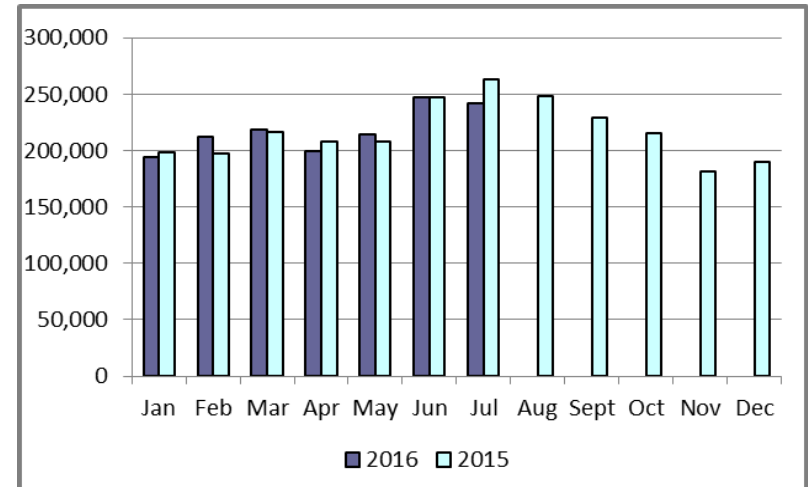
	Year-To-Date		Transactions Received	
Transaction Type	July 2016	July 2015	July 2016	July 2015
Switches	523,168	587,632	82,923	91,211
Acquisition	0	0	0	0
Move - Ins	1,527,947	1,538,160	241,844	263,233
Move - Outs	783,421	792,666	122,932	133,905
Continuous Service Agreements (CSA)	372,756	313,114	48,489	49,489
Mass Transitions	0	0	0	0
<b>Total</b>	<b>3,207,292</b>	<b>3,231,572</b>	<b>496,188</b>	<b>537,838</b>

# Retail Transaction Volumes – Summary – July 2016

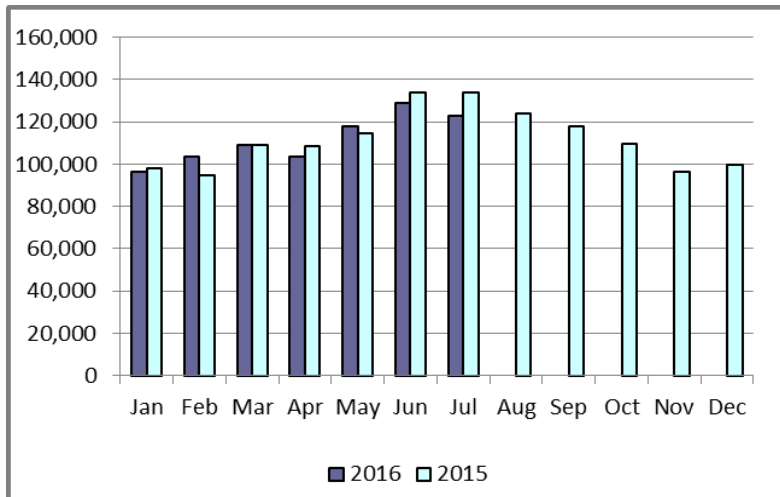
## Switches/Acquisitions



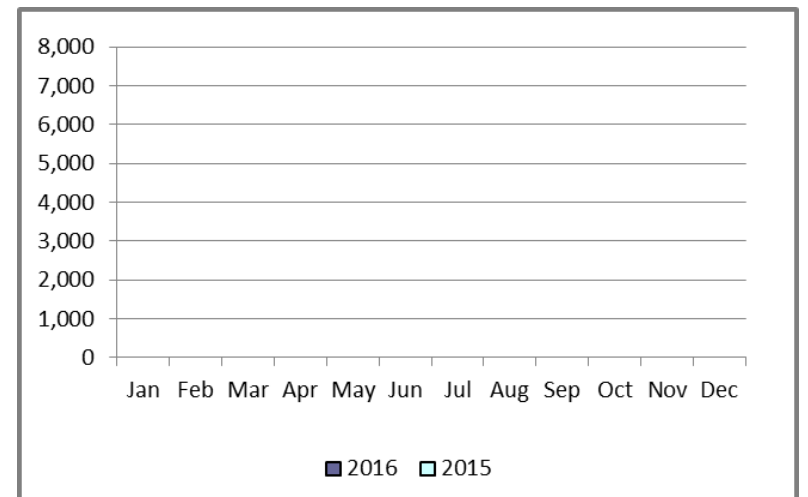
## Move-Ins



## Move-Outs

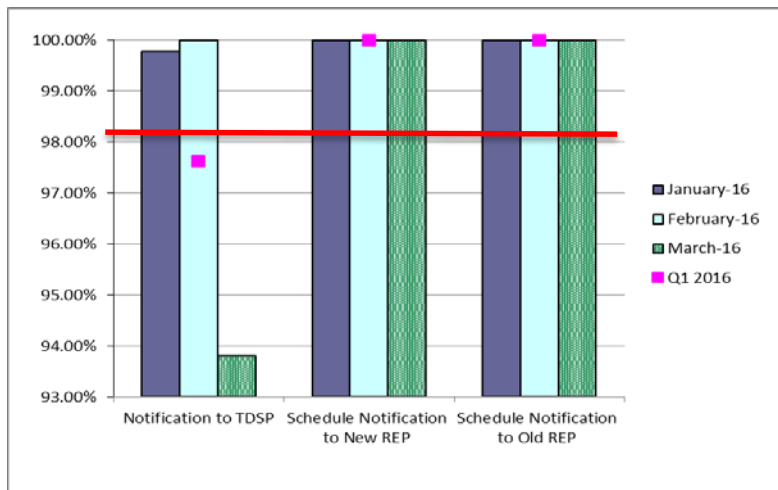


## Mass Transition

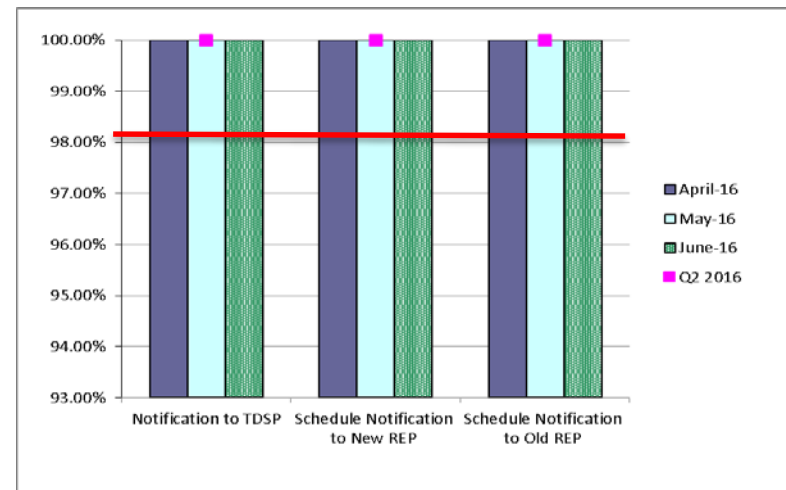


# Retail Performance Measures – Switch – July 2016

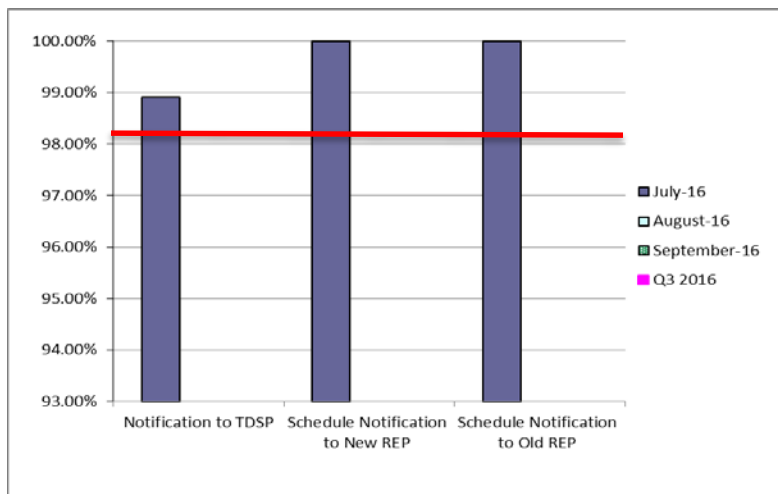
## 1<sup>st</sup> Quarter



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



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

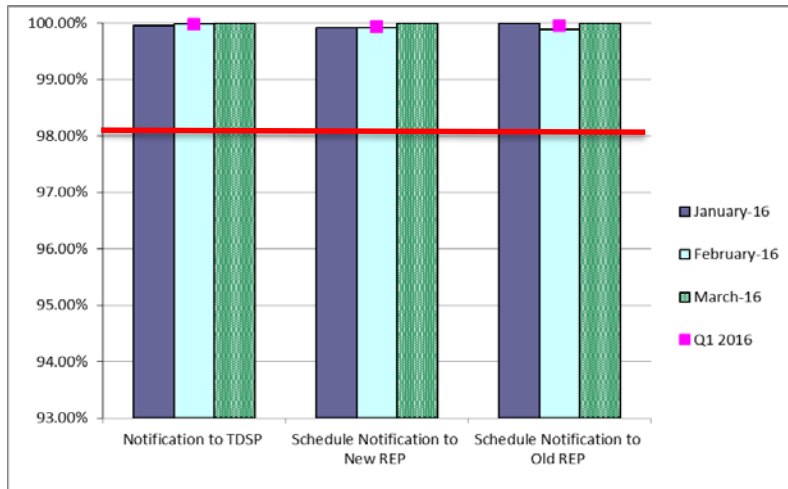


## 4<sup>th</sup> Quarter

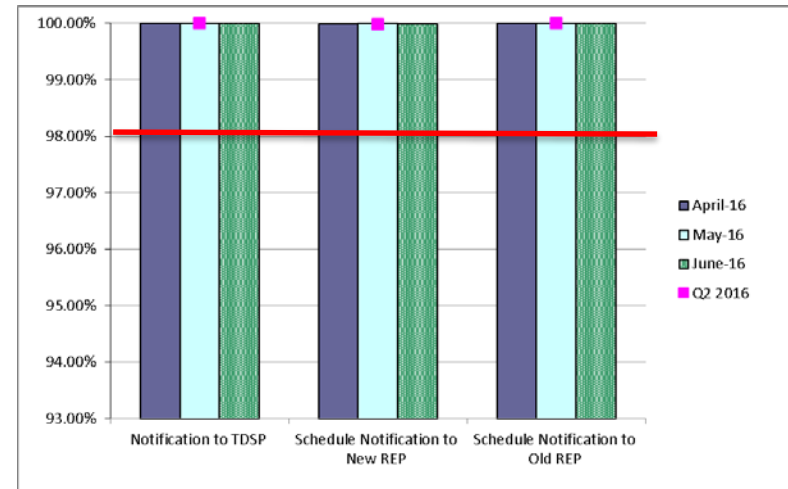


# Retail Performance Measures – Same Day Move-In – July 2016

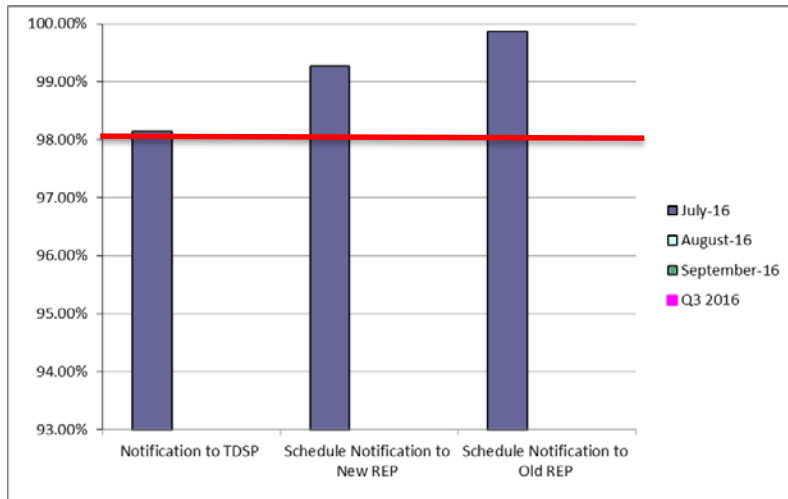
## 1<sup>st</sup> Quarter



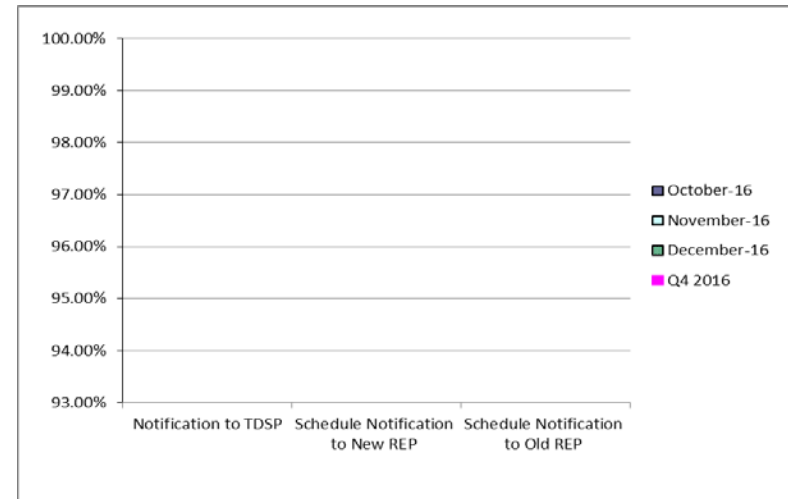
## 2<sup>nd</sup> Quarter



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

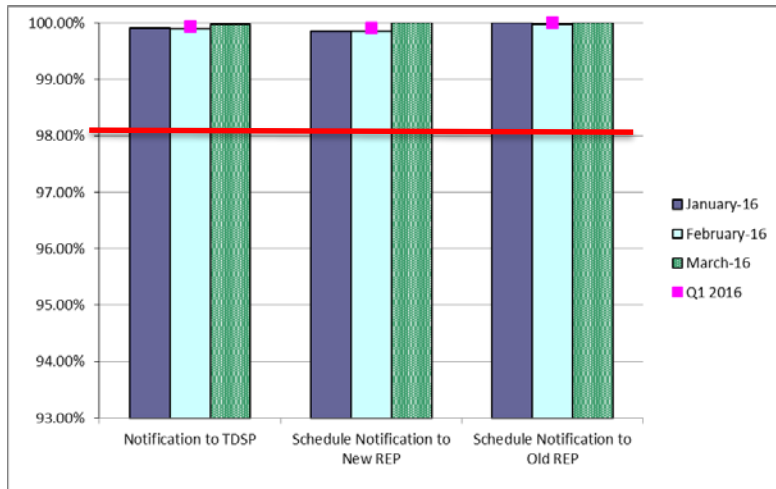


## 4<sup>th</sup> Quarter

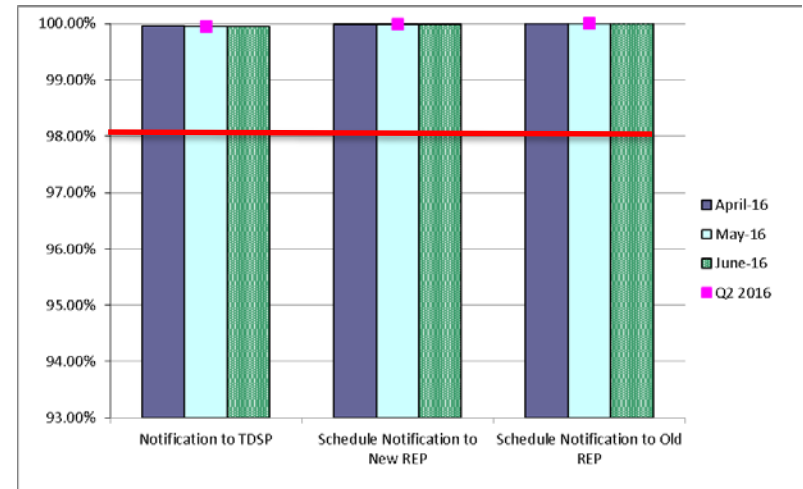


# Retail Performance Measures – Standard Move-In – July 2016

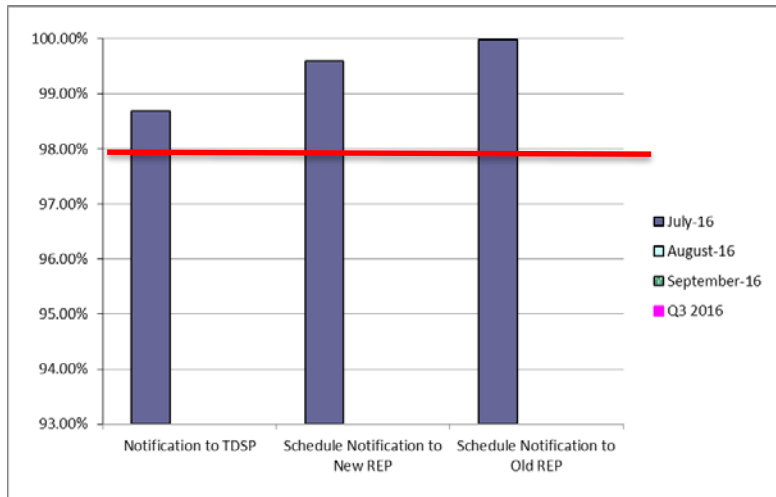
## 1<sup>st</sup> Quarter



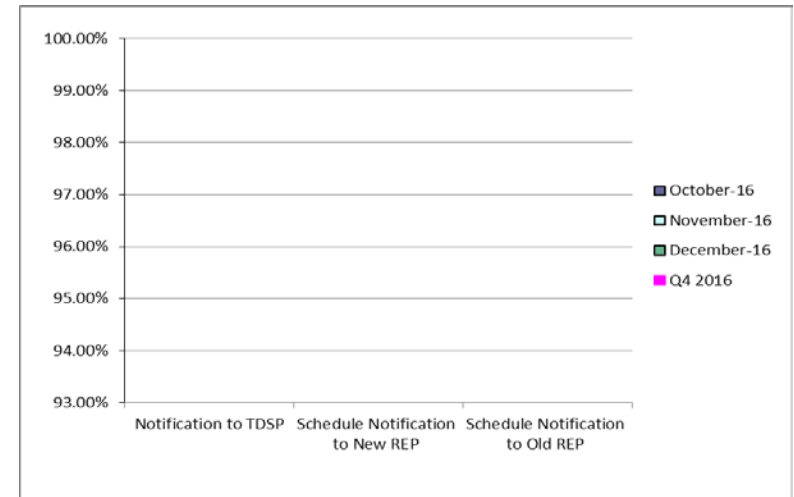
## 2<sup>nd</sup> Quarter



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



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





# Projects Report

# ERCOT Portfolio Stoplight Report – July 2016

Impact Metric Tolerances		2016 Project Funding		\$22,500,000	2016 Portfolio Spending Estimate
<p>Unfavorable variances are represented as negative numbers within the report.</p> <ul style="list-style-type: none"><li>- Green = No more than 4.9% unfavorable variance</li><li>- Yellow = Unfavorable variance between 4.9% and 9.9%</li><li>- Red = Unfavorable variance more than 9.9%</li></ul>		Projects In Flight/On Hold (Count = 68)			\$15,640,383
		Projects Not Yet Started (Count = 15)			\$ 855,977
		Projects Completed (Count = 19)			\$ 1,064,087
		Carryover of Excess 2015 Project Spending			\$ 1,743,545
		Spending Reductions Required to Maintain Capital Budget			\$ -
		TOTAL			\$19,303,992
Note: Approximately \$1.75M in PPL spending was accelerated from 2016 to 2015 This spending is being offset by equivalent reductions in 2016					
Project Number	Projects in Initiation Phase (Count = 6)				
TBD	DW Replication Upgrade				
TBD	Email Gateway Replacement				
Various	2016 RARF Enhancements				
RRGRR003	Modifications to Improve Wind Forecasting				
RRGRR006	Clarification of Descriptions and Alignment with Resource Asset Registration Forms				
RRGRR007	Adding Solar Resource Registration Inputs				
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: <ul style="list-style-type: none"><li>- it is reported at the parent project level, or</li><li>- it is an administrative project</li></ul>					
Change in Spotlight Reporting					

## Change in Stoplight Reporting

Effective with this report, stoplight reporting will be based on latest approved budgets and milestones. Previously this report was based on forecast values with measurement rebaselines approved at the discretion of the ERCOT executives.

# ERCOT Portfolio Stoplight Report – July 2016

Project Number	Projects in Planning Phase (Count = 28)	Phase Start	Baseline Phase Finish	Approved Phase Finish	Scheduled Go-Live Date	Scheduled Phase Finish	Schedule Health	Budget Health
141-01	Production Virtualization	6/1/2016	7/27/2016	7/27/2016	TBD	8/3/2016	1 -12%	1%
158-01	Load Forecast Enhancements	1/14/2015	6/19/2015	6/19/2015	TBD	9/14/2016	2 -290%	20%
170-03	ECAP - Enterprise Content Management System (Proof of Concept)	1/13/2016	5/17/2016	5/17/2016	TBD	8/3/2016	1 -62%	32%
170-04	ECAP - ERCOT Information Governance and Taxonomy	1/13/2016	6/6/2016	6/6/2016	TBD	8/8/2016	1 -43%	25%
173-01	ERCOT Flight Certification Website	7/23/2015	11/2/2016	11/2/2016	TBD	11/2/2016	0 0%	-4%
181-01	CRR Framework Upgrade	12/16/2015	8/31/2016	8/31/2016	TBD	8/31/2016	0 0%	0%
183-01	CMM Tech Refresh	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs
183-01	CMM-FT GUI Integration	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs
185-01	Records Management and eDiscovery	1/28/2016	8/31/2016	8/31/2016	TBD	9/7/2016	-3% 2%	2%
190-01	SharePoint Governance Project	4/27/2016	7/20/2016	7/20/2016	TBD	8/3/2016	2 -16%	64%
193-01	PMU Tool Evaluation and Implementation	5/4/2016	11/9/2016	11/9/2016	TBD	11/9/2016	0 0%	0%
196-01	GINR Project Status Application Replacement	7/27/2016	3/1/2017	3/1/2017	TBD	3/1/2017	0 0%	42%
197-01	AREA - Demand and Energy Report	6/22/2016	7/20/2016	7/20/2016	TBD	8/3/2016	1 -50%	0%
198-01	Reactive Power Coordination	7/13/2016	10/12/2016	10/12/2016	TBD	10/5/2016	7% 2%	2%
Various	2015 CMM NPRRs	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	10%
Various	NOGRR147 and SCR787 NDCRC Enhancement	7/27/2016	9/14/2016	9/14/2016	TBD	9/14/2016	0 0%	0%
SCR777	Bilateral CRR Interface Enhancement	12/16/2015	8/31/2016	8/31/2016	TBD	8/31/2016	0 0%	NA See #181-01
SCR787	Maintain NDCRC Data For Generator Transfer Between Resource Entities	7/27/2016	9/14/2016	9/14/2016	TBD	9/14/2016	0 0%	NA See NOGRR147 & SCR787
NOGRR147	Reactive Power Testing Requirements	7/27/2016	9/14/2016	9/14/2016	TBD	9/14/2016	0 0%	NA See NOGRR147 & SCR787
NPRR484	Revisions to Congestion Revenue Rights Credit Calculations and Payments - Phase 1b / 2	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs
NPRR519	Exemption of ERS-Only QSEs from Collateral and Capitalization Requirements	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs
NPRR620	Collateral Requirements for Counter-Parties with No Load or Generation	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs
NPRR648	Remove References to Flowgate Rights	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs
NPRR660	Remove CRR State Change Adder	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs
NPRR683	Revision to Available Credit Limit Calculation	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 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	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs
NPRR741	Clarifications to TPE and EAL Credit Exposure Calculations	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs
NPRR743	Revision to MCE to Have a Floor For Load Exposure	12/16/2015	8/17/2016	3/15/2017	TBD	3/15/2017	0 0%	NA See 2015 CMM NPRRs

# ERCOT Portfolio Stoplight Report – July 2016

Project Number	Projects in Execution Phase (Count = 25)	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	9/22/2016	TBD	2/1/2017	2	-11%	2	-10%
169-01	Short Circuit Ratio Functionality	1/20/2016	9/19/2016	9/19/2016	9/19/2016	9/30/2016		0%		34%
170-01	Enterprise Content Alignment Program	8/26/2015	11/15/2017	11/15/2017	9/25/2017	9/25/2017		6%	2	-22%
170-05	ECAP - ERCOT Identity Alignment	2/24/2016	7/30/2016	9/18/2016	9/1/2016	11/23/2016		8%		0%
172-01	Physical Security Project #2	6/30/2016	2/13/2017	2/13/2017	2/22/2017	3/8/2017		-3%		0%
174-01	2015 Outage Scheduler Enhancements	12/2/2015	9/14/2016	9/14/2016	9/28/2016	10/20/2016		-4%		1%
177-01	Cyber Security Project #19	4/6/2016	7/13/2016	10/31/2016	10/31/2016	11/16/2016		0%		-1%
179-01	Infoblox Hardware Refresh	2/4/2016	8/12/2016	8/12/2016	8/17/2016	8/17/2016		-2%		6%
180-01	Upgrade of MDM - GEMS	3/30/2016	6/17/2016	8/29/2016	9/12/2016	10/21/2016	1	-9%		27%
187-00	Capital Efficiencies and Enhancements - 2016	1/1/2015	12/31/2016	12/31/2016	12/31/2016	12/31/2016		0%		-3%
188-01	Mass Transition/Acquisition Enhancements (MTAQ)	5/25/2016	4/2/2017	4/2/2017	4/2/2017	5/17/2017		0%		0%
189-01	Enterprise Resource Planning	4/13/2016	9/27/2016	9/27/2016	9/27/2016	11/2/2016		0%		37%
191-01	CRR Auction Improvements	4/27/2016	9/1/2016	9/9/2016	9/9/2016	10/26/2016		0%		2%
191-01	Improved CRR Credit Limit Display and Calculation Triggers	4/27/2016	9/1/2016	9/9/2016	9/9/2016	10/26/2016		0%		See #191-01
191-01	Improved Re-Calculation of CRR Baseloading for CRR Auctions	4/27/2016	9/1/2016	9/9/2016	9/9/2016	10/26/2016		0%		See #191-01
Various	NPRR495 and NPRR736 Changes to Ancillary Services Capacity Monitor	7/20/2016	11/3/2016	11/3/2016	11/3/2016	11/16/2016		0%		0%
SCR786	Retail Market Test Environment	6/22/2016	12/12/2016	12/12/2016	12/12/2016	2/1/2017		0%		4%
RMGRR127	Efficiencies for Acquisition Transfer	5/25/2016	4/2/2017	4/2/2017	4/2/2017	5/17/2017		0%	NA	See #188-01
NPRR219	Resolution of Alignment Items A33, A92, A106, and A150 - TSPs Must Submit Outages for Resource Owned Equipment and Clarification of Changes in Status of Transmission Element Postings	12/2/2015	9/14/2016	9/14/2016	9/22/2016	10/20/2016		-2%	NA	See #174-01
NPRR272	Definition and Participation of Quick Start Generation Resources	8/3/2016	2/9/2017	2/9/2017	2/9/2017	2/28/2017		0%		45%
NPRR495	Changes to Ancillary Services Capacity Monitor	7/20/2016	11/3/2016	11/3/2016	11/3/2016	11/16/2016		0%	NA	See NPRR495 and 736
NPRR662	Proxy Energy Offer Curves	3/2/2016	9/1/2016	9/1/2016	9/1/2016	10/1/2016		0%		10%
NPRR736	Updates to the Ancillary Service Capacity Monitor Display	7/20/2016	11/3/2016	11/3/2016	11/3/2016	11/16/2016		0%	NA	See NPRR495 and 736
NOGRR050	Resolution of Reporting Issues Related to NPRR219	12/2/2015	9/14/2016	9/14/2016	9/22/2016	10/20/2016		-2%	NA	See #174-01
SCR783	Outage Scheduler Enhancements – Group 2, Usability and Filtering Enhancements	12/2/2015	9/14/2016	9/14/2016	9/22/2016	10/20/2016		-2%	NA	See #174-01

# ERCOT Portfolio Stoplight Report – July 2016

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	
052-01	EMS Upgrade	9/24/2014	5/25/2016	5/25/2016	6/16/2016	10/31/2016		-3%		6%
Various	NPRR617 and 700 Implementation	1/27/2016	6/23/2016	6/23/2016	6/23/2016	8/10/2016		0%	2	-5%
NPRR617	Energy Offer Flexibility	1/27/2016	6/23/2016	6/23/2016	6/22/2016	8/10/2016		0%	NA	See NPRR617 / NPRR700
NPRR700	Utilizing Actual Fuel Costs in Startup Offer Caps	1/27/2016	6/23/2016	6/23/2016	6/22/2016	8/10/2016		0%	NA	See NPRR617 / NPRR700
Project Number	Projects On Hold (Count = 5)	Forecast Start Date	Baseline Phase Finish	Approved Go-Live Target	Scheduled Go-Live Date	Scheduled Phase Finish	Schedule Health		Budget Health	
SCR781	MP Online Data Entry - Market Requirements	8/20/2014	11/28/2014	TBD	TBD	TBD			3	See #106-01
NPRR573	Alignment of PRC Calculation	TBD	TBD	TBD	TBD	TBD			3	
106-01	MP Online Data Entry - Ph 1	10/9/2013	3/5/2014	TBD	TBD	TBD			3	
129-01	Access and Roles Management	7/1/2014	10/1/2014	TBD	TBD	TBD			3	
166-01	Jboss Application Monitoring & Management (JAMM)	TBD	TBD	TBD	TBD	TBD			3	
Project Number	Projects Completed (Count = 19)	Baseline Execution Phase Start	Baseline Go-Live Target	Approved Go-Live Target	Actual Go-Live Date	Actual Execution Phase Finish	Schedule Health		Budget Health	
NPRR419	Revise Real Time Energy Imbalance and RMR Adjustment Charge	1/13/2016	4/12/2016	4/12/2016	4/12/2016	6/6/2016		0%		7%
TBD	Monthly BLT Payment and Charge for Presidio Exception	4/9/2015	6/23/2016	6/23/2016	6/16/2016	6/23/2016		1%	NA	See #187-00
NPRR515	Day-Ahead Market Self-Commitment of Generation Resources	10/5/2015	3/31/2016	3/31/2016	6/23/2016	7/13/2016	2	-47%		0%
NPRR556	Resource Adequacy During Transmission Equipment Outage	9/21/2015	10/23/2015	10/23/2015	10/23/2015	12/10/2015		0%		23%
NPRR588	Clarifications for PV Generation Resources	9/16/2015	2/19/2016	2/19/2016	2/9/2016	3/30/2016		6%	NA	See #161-01
NPRR615	PVGR Forecasting	9/16/2015	2/19/2016	2/19/2016	2/9/2016	3/30/2016		6%	NA	See #161-01
NPRR680	Allow QSEs to Self-Arrange AS Quantities Greater Than Their AS Obligation	10/28/2015	12/11/2015	12/11/2015	12/11/2015	12/18/2015		0%		13%
NPRR686	Changing the IRR Forecast from Next 48 Hours to Next 168 Hours	9/16/2015	2/19/2016	2/19/2016	2/10/2016	3/30/2016		5%	NA	0%
RMGRR126	Additional ERCOT Validations for Customer Billing Contact Information File	5/25/2016	7/24/2016	7/24/2016	7/24/2016	5/17/2017		0%	NA	See #188-01
116-01	Collage Replacement	2/6/2014	9/22/2014	9/22/2014	2/29/2016	4/7/2016	2	-230%	2	-45%
120-01	IT Production Hardening	5/21/2015	4/1/2016	4/1/2016	4/14/2016	4/27/2016		-4%		33%
134-01	Privileged Account Management	4/1/2015	9/30/2015	9/30/2015	9/30/2015	1/27/2016		0%		14%
143-01	OSI Pi Visualization Enhancements	1/16/2015	6/19/2015	6/19/2015	1/22/2016	2/18/2016	1	-140%		0%
144-01	OC-48 Replacement with DWDM	2/4/2015	12/22/2015	12/22/2015	1/12/2016	3/2/2016	1	-6%		3%
161-01	NPRRs 588 and 615	9/16/2015	2/19/2016	2/19/2016	2/9/2016	3/30/2016		6%		-1%
163-01	Cyber Security Project #10	7/1/2015	9/15/2015	9/15/2015	9/22/2015	12/16/2015	1	-9%		9%
165-00	Capital Efficiencies and Enhancements - 2015	1/1/2015	12/31/2015	12/31/2015	12/31/2015	12/31/2015		0%		42%
168-01	Configuration Management System Requirements for CIP v5 Readiness	7/6/2015	12/16/2015	12/16/2015	12/16/2015	7/13/2016		0%		3%
171-01	CIP v5 Readiness Project	7/22/2015	4/29/2016	7/1/2016	4/29/2016	7/13/2016		18%		-2%

# ERCOT Portfolio Stoplight Report – July 2016

Project Number	2016 Projects Not Yet Started (Count = 15)	Forecast Start Date
NPRR746	Adjustments Due to Negative Load	Oct-2016
NPRR754	Revise Load Distribution Factors Report Posting Frequency	Aug-2016
NPRR758	Improved Transparency for Outages Potentially Having a High Economic Impact	Aug-2016
SCR788	Addition of Integral ACE Feedback to GTBD Calculation	Aug-2016
SCR790	Wind Resource Power Production and Forecast Transparency	Aug-2016
TBD	Cyber Security Project #20	Aug-2016
TBD	Cyber Security Project #21	Aug-2016
TBD	Multi Station Breaker to Breaker One Lines (Planning)	Aug-2016
TBD	REC Rewrite & Refresh	Aug-2016
TBD	TIBCO BusinessWorks Application Upgrade	Aug-2016
NPRR649	Addressing Issues Surrounding High Dispatch Limit (HDL) Overrides	Sep-2016
NPRR744	RUC Trigger for the Reliability Deployment Price Adder and Alignment with RUC Settlement	Oct-2016
NPRR764	QSE Capacity Short Calculations Based on an 80% Probability of Exceedance (P80)	Aug-2016
NOGRR084	Daily Grid Operations Summary Report	Oct-2016
TBD	Standard Report for Events and Near-Miss Analysis	Oct-2016