



## Item 4.3: Operations Report (July – August 2016)

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ERCOT

Board of Directors Meeting

ERCOT Public  
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# Summary – July 2016

## Operations

- The peak demand of 67,445 MW on July 14 was less than the day-ahead mid-term forecast peak of 67,935 MW for the same operating period. It also was less than the July 2015 actual peak demand of 67,650 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

# Summary – August 2016

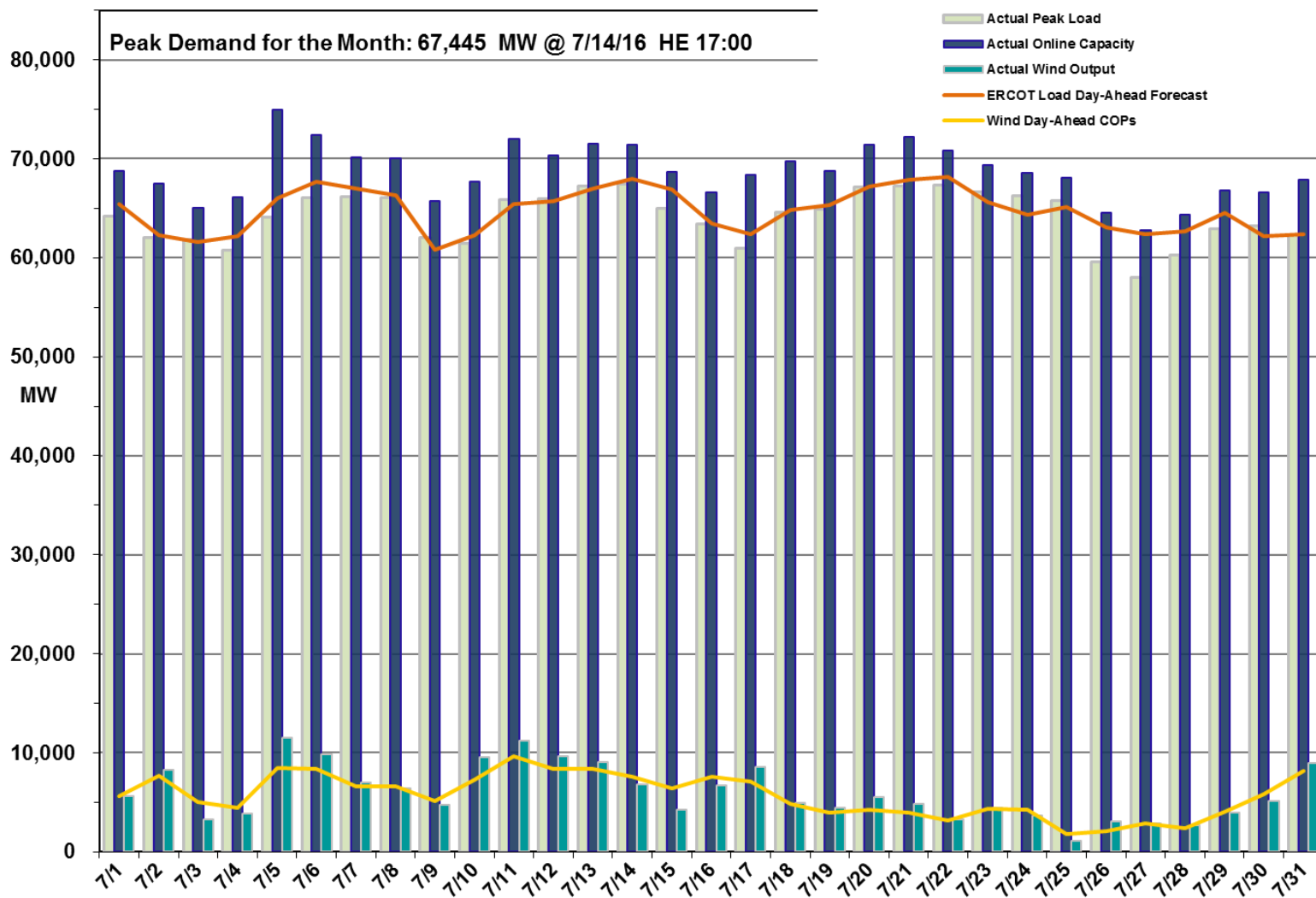
## Operations

- The preliminary Settlements hourly peak demand of 71,093 MW on August 11 was greater than the day-ahead mid-term load forecast peak of 70,718 MW for the same operating hour.
  - The operational instantaneous peak demand was 71,338 MW (telemetry).
- Day-ahead load forecast error for August was 2.22%
- ERCOT issued 15 notifications:
  - One OCN issued due to capacity insufficiency
  - Eleven Advisories issued due to Physical Responsive Capability being less than 3,000 MW
  - One Advisory due to postponed DAM Solution
  - One Watch due to a SCED failure
  - One Watch due to Physical Responsive Capability being less than 2,500 MW

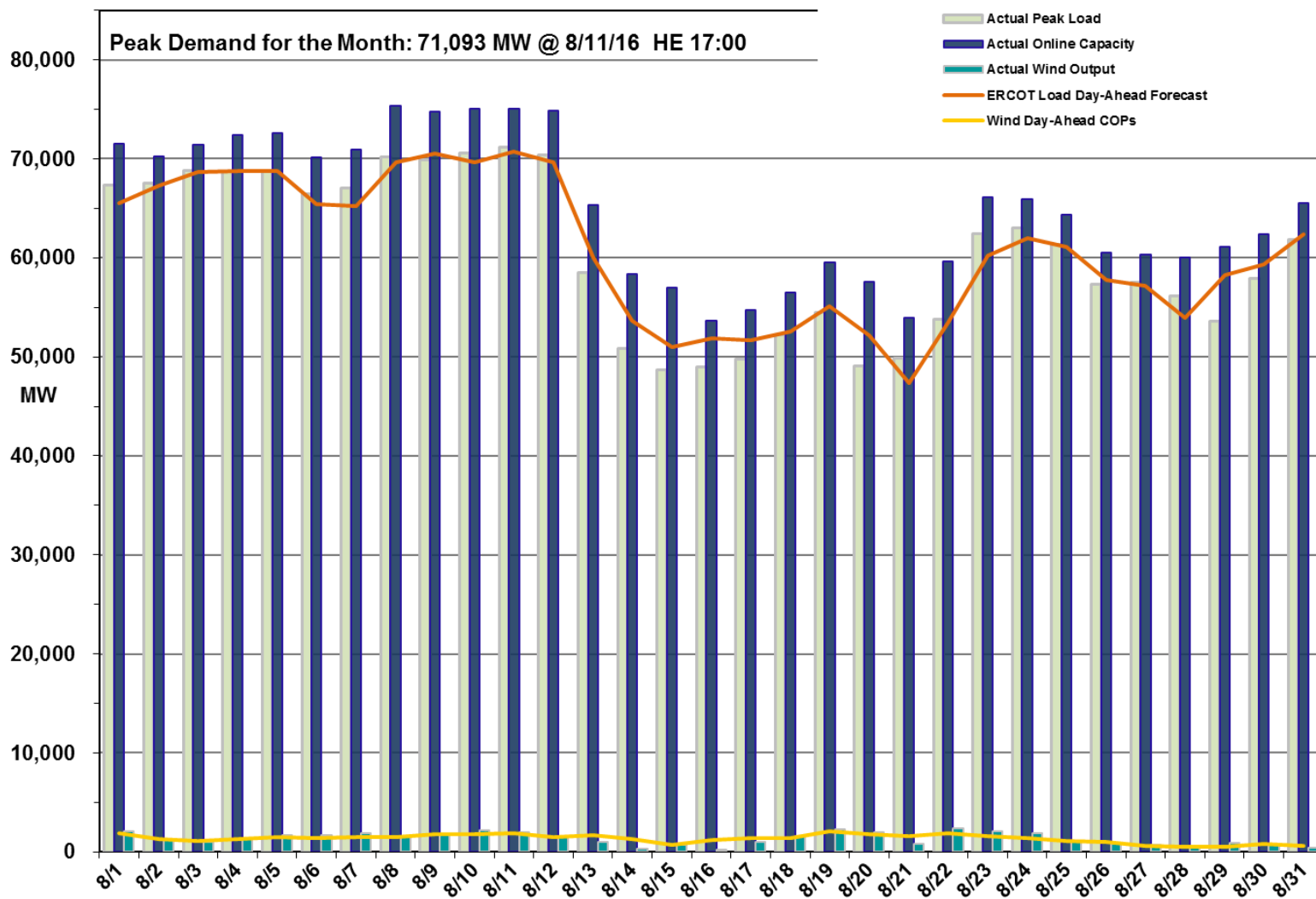
## Planning Activities

- 236 active generation interconnection requests totaling 57,931 MW, including 26,038 MW of wind generation, as of August 31, 2016. Six additional requests and an increase of 960 MW from July 30, 2016.
- 16,631 MW wind capacity in commercial operations on August 31, 2016.

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



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



# Market Statistics – July 2016

Market Statistics	July 2015	July 2016	2015 Average	2016 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	123.26%	114.39%	131.26%	123.50%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market (\$/MWh)	32.22	29.29	28.38	21.76
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time (\$/MWh)	29.13	27.29	26.05	20.61
Average East Houston Fuel Index Price (\$/MMBtu)	2.83	2.71	2.57	2.09

# Market Statistics – August 2016

Market Statistics	August 2015	August 2016	2015 Average	2016 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	124.74%	116.07%	131.26%	122.57%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market (\$/MWh)	54.68	34.50	28.38	23.72
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time (\$/MWh)	37.40	32.36	26.05	22.42
Average East Houston Fuel Index Price (\$/MMBtu)	2.74	2.73	2.57	2.18

# Operational Performance Measures – July & August 2016

Performance Measure	Target Met	Further Information
Retail Transaction Performance (Target 98%)	Yes	<ul style="list-style-type: none"><li>• Retail transaction processing performance was nearly 100%.</li></ul>
Settlements Performance (Target 99%)	Yes	<ul style="list-style-type: none"><li>• 100% timely statement and invoice posting</li></ul>



# Operational Dashboard – July & August 2016

Metric	Trending as Expected	Further Information
Day-Ahead Schedule	Yes	<ul style="list-style-type: none"> <li>• Normal level of market activity and liquidity.</li> <li>• Loads appear to have hedged against exposure to Real-Time prices.</li> </ul>
Day-Ahead Electricity And Ancillary Service Hourly Average Prices	Yes	<ul style="list-style-type: none"> <li>• Hourly average prices correctly reflect the opportunity cost of energy.</li> </ul>
Day-Ahead vs Real-Time Load Zone Settlement Point Price (Hourly Average)	Yes	<ul style="list-style-type: none"> <li>• Day-Ahead &amp; Real-Time prices for different Load Zones reflect relative transmission congestion.</li> </ul>
Day-Ahead vs Real-Time Trading Hub Settlement Point Price (Hourly Average)	Yes	<ul style="list-style-type: none"> <li>• The average energy price across the system reflects marginal offers and scarcity pricing impacts.</li> <li>• Higher average Day-Ahead energy prices reflect the risk premium between Day-Ahead &amp; Real-Time.</li> </ul>
Day-Ahead Reliability Unit (DRUC) Commitment Monthly Summary	Yes	<ul style="list-style-type: none"> <li>• Capacity committed by the DRUC process indicates the level of out of market activity needed Day-Ahead to maintain reliability.</li> <li>• No resource was committed in DRUC in this period.</li> </ul>

# Operational Dashboard – July & August 2016

Metric	Trending as Expected	Further Information
Hourly Reliability Unit Commitment (HRUC) Monthly Summary	Yes	<ul style="list-style-type: none"> <li>Capacity committed by the HRUC process indicates the level of out-of-market activity needed during the Operating Day to maintain reliability.</li> <li>July commitments totaled 31 resources and August commitments totaled 22 resources. In 2015, ERCOT committed two resources in July and four resources in August.</li> <li>Number of RUC commitments in 2016 is consistent with current system conditions.</li> </ul>
Supplemental Ancillary Service Market Monthly Summary	Yes	<ul style="list-style-type: none"> <li>Normal trend indicates that deliverability was not a major concern.</li> </ul>
Non-Spinning Reserve Service Deployment	Yes	<ul style="list-style-type: none"> <li>Non-Spin was not deployed in July or August.</li> </ul>
Congestion Revenue Rights Price Convergence	Yes	<ul style="list-style-type: none"> <li>Normal trend indicates good ability of market participants to estimate value of hedges</li> </ul>

# Operational Dashboard – July 2016

Metric	Trending as Expected	Further Information
Retail Transactions	Yes	<ul style="list-style-type: none"> <li>Seasonal variations in transaction volumes trending as expected</li> </ul>
Advanced Metering	Yes	<ul style="list-style-type: none"> <li>99% of ERCOT load settled with 15-minute interval data.</li> <li>6.9M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of July 2016.</li> </ul>
Settlement Dollars	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 07/31/2016, the daily average settlement dollars for July are \$14.44M, which is up from \$13.62M in June 2016 and up from July 2015 which had an average of \$12.93M.</li> </ul>
Revenue Neutrality	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 07/31/2016, Revenue Neutrality uplift is a charge of \$2.51M, which is up from a \$1.55M credit in June 2016 and down from a \$2.79M charge in July 2015.</li> </ul>
Market-Based Uplift to Load	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 07/31/2016, the market-based uplift to load is a charge of \$12.40M, as opposed to a \$1.36M credit in June 2016 and a charge of \$17.51M in July 2015.</li> </ul>

# Operational Dashboard – August 2016

Metric	Trending as Expected	Further Information
Retail Transactions	Yes	<ul style="list-style-type: none"> <li>Seasonal variations in transaction volumes trending as expected</li> </ul>
Advanced Metering	Yes	<ul style="list-style-type: none"> <li>99.0% of ERCOT load settled with 15-minute interval data.</li> <li>6.9M Advanced Metering System (AMS) Electric Service Identifier (ESIIDs) included in settlement as of August 2016.</li> </ul>
Settlement Dollars	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 08/31/2016, the daily average settlement dollars for August are \$15.57M, which is up from \$14.44M in July 2016 and down from August 2015 which had an average of \$18.27M.</li> </ul>
Revenue Neutrality	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 08/31/2016, Revenue Neutrality uplift is a charge of \$0.92M, which is down from July 2016 which was a charge of \$2.51M and up from August 2015 which was a charge of \$0.14M.</li> </ul>
Market-Based Uplift to Load	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 08/31/2016, the market-based uplift was a charge of \$15.04M, as opposed to a charge of \$12.40M in July 2016 and an unusually high charge of \$63.44M in August 2015. The charge of \$15.04M is normal within the range of historically observed values for Uplift to Load.</li> </ul>

# Major Project Highlights – (as of 09/29/2016)

Project	Trending as Expected	Further Information
<p><b>NMMS Upgrade Project</b> – Replace the current Siemens NMMS application with the next generation of model management software available from Siemens</p>	<p>No</p>	<ul style="list-style-type: none"> <li>• As reported in August, the 9/22/2016 go-live date was not achievable.</li> <li>• Various mitigation measures implemented: increased on-site vendor presence, co-location of team resources, daily review of defects and progress, and improvements to testing and code release processes</li> <li>• FAT exit criteria were satisfied on 9/8/2016.</li> <li>• Site Acceptance Test (SAT) activities are underway and planned to complete on 11/3/2016.</li> <li>• Market Participants training scheduled to start in November</li> <li>• The schedule remains aggressive to meet the target go-live date. Additional delays may impact market participant training and cutover timelines, particularly with regard to holiday periods and historical extreme weather periods</li> <li>• Approved schedule:               <ul style="list-style-type: none"> <li>○ Target go-live date 12/5/2016</li> <li>○ Alternate go-live date 2/13/2017</li> </ul> </li> </ul>
<p><b>Enterprise Resource Planning (ERP)</b> – Provide a single, integrated software solution for Human Resource, Accounting/Finance, Purchasing, Asset Management and related general business planning, strategy, and reporting functions</p>	<p>Yes</p>	<ul style="list-style-type: none"> <li>• The project had a successful go-live on September 26 for HR-related functions; Finance-related functions are scheduled to go-live on October 3. Costs are tracking to the approved budget.</li> <li>• Operational readiness activities, including training, transition from legacy systems to the new ERP solution, as well as Data Conversion/Loading activities were instrumental to go-live success.</li> <li>• Stabilization period for HR functions continues through October, while Finance stabilization period will go through early December to support two rounds of month-end closing activities.</li> </ul>

# Major Project Highlights – (as of 09/29/2016) – continued

Project	Trending as Expected	Further Information
<p><b>Data Center 4.0 Optimization (DC<sup>4</sup>) Program –</b>                      Replace the aging data center infrastructure with modernized infrastructure technologies to minimize the impact of failures, support future business growth, deliver highly automated next-generation infrastructure services, and ensure sustained reliability</p>	<p>Yes</p>	<ul style="list-style-type: none"> <li>• The DC<sup>4</sup> Program is in Planning and is tracking to the approved schedule and program budget:                             <ul style="list-style-type: none"> <li>◦ The DC<sup>4</sup> procurement of the x86 systems and core network hardware is complete</li> <li>◦ The procurement of DB Storage is underway</li> <li>◦ High-level application migration planning for x86 systems is complete</li> </ul> </li> <li>• Projects under the program:                             <ul style="list-style-type: none"> <li>◦ Compute-DB INF Install and Migration Project – successfully migrated the Commercial systems (Stage 1) and has begun planning to migrate the Grid systems (Stage 2)</li> <li>◦ Network-Core Network Project – installed new firewalls and is in the process of planning the conversion of firewall rules. Preparation for the deployment of core network switches and intrusion prevention systems is underway</li> <li>◦ Telecom-Control Room &amp; Grid Ops Project – in the Planning phase, working to build-out the Operator Training System (OTS), before moving the project into the Execution phase</li> <li>◦ Network-Command &amp; Control Project – in Planning for Stage 1, to begin planning the replacement of network load balancers</li> <li>◦ Compute-x86 Base Install Project – with the hardware procured and on its way, this project is planning the build-out, configuration, and deployment of these x86 systems</li> <li>◦ App Stack Migration Project – is in the concept phase, preparing to initiate and continue the detailed application migration planning to the new x86 systems</li> </ul> </li> </ul>
<p><b>NPRR219 and SCR783, Outage Scheduler Enhancements – Group 2, Usability and Filtering Enhancements –</b> Implements changes to enable Resource Entities to enter outages; restores functionality that existed in the Zonal Market and adds functionality that is needed for the Nodal Market</p>	<p>Yes</p>	<ul style="list-style-type: none"> <li>• The project migrated to production the evening of September 26 and continues to track to the approved budget</li> <li>• Stabilization period is now underway through October.                             <ul style="list-style-type: none"> <li>◦ Some Market Participants (MPs) experienced issues with their browser settings, but the team worked with MPs to provide assistance in configuring settings for optimal performance</li> <li>◦ No issues were reported with outages submitted via the APIs</li> <li>◦ An additional training session will occur on September 29. This will be a refresher of the instructor-led training sessions previously delivered</li> <li>◦ Updated User Guides have been posted on ERCOT.com and a new on-line OS training module will be added to the ERCOT Learning Management System (LMS) by late October</li> </ul> </li> </ul>

The *ERCOT Monthly Operational Overview* is posted on or about the 15<sup>th</sup> of the following month to (<http://www.ercot.com/committees/board/>)