



ERCOT Monthly Operational Overview
(March 2019)

ERCOT Public
April 15, 2019

Grid Planning & Operations

Summary – March 2019

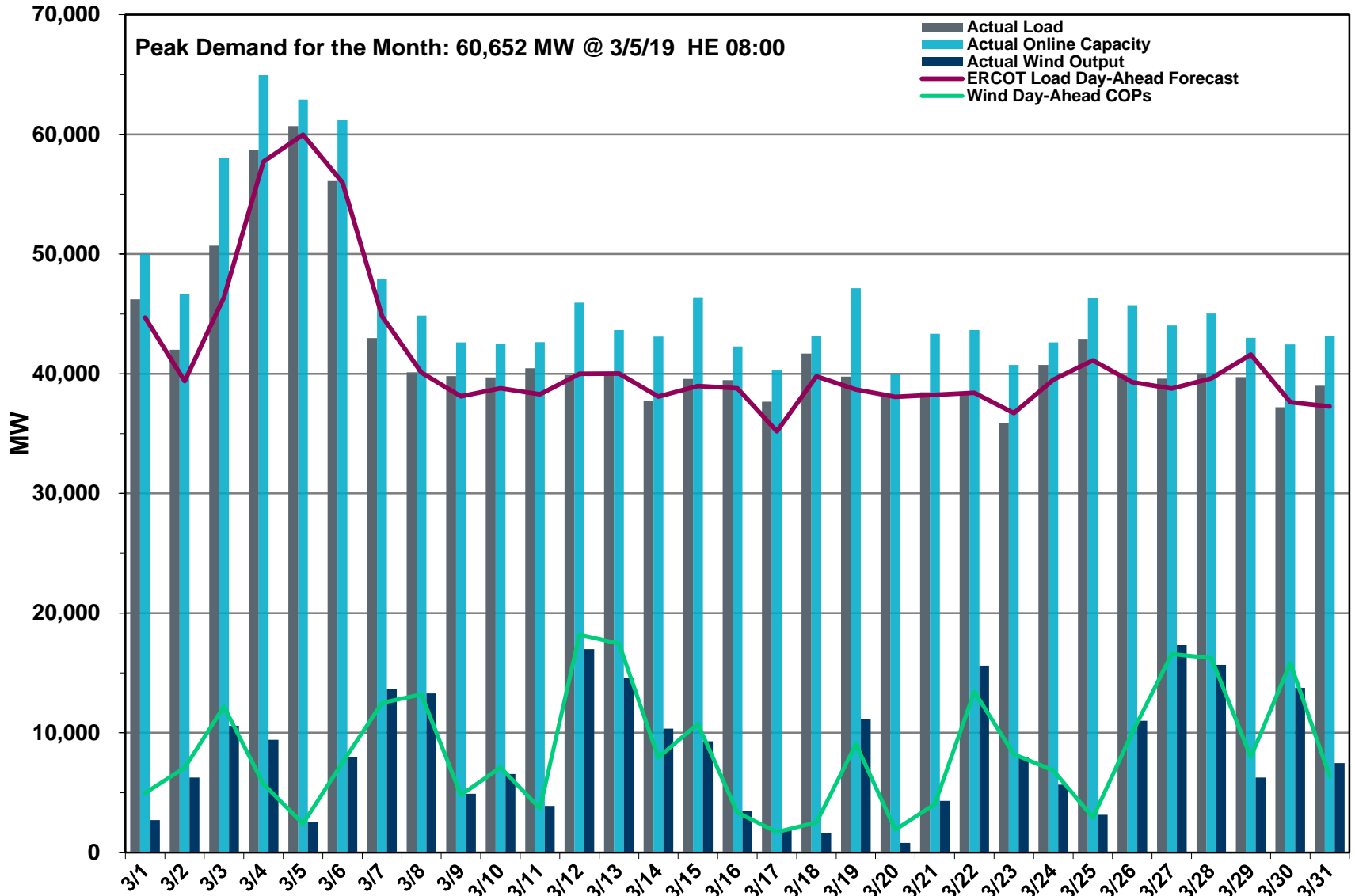
Operations

- The preliminary Settlements hourly peak demand of 60,652* MW on March 5 was higher than the day-ahead mid-term load forecast peak of 59,984 MW for the same operating hour.
 - The operational instantaneous peak demand was 61,564 MW (telemetry).
- Day-ahead load forecast error for March was 2.74%
- ERCOT issued four notifications:
 - One OCN issued for potential extreme cold weather system-wide
 - One Advisory due to severe weather in the Central and North Texas areas
 - One Watch for HRUC timeline deviation
 - One Advisory issued for postponement of the deadline for the posting of the DAM Solution

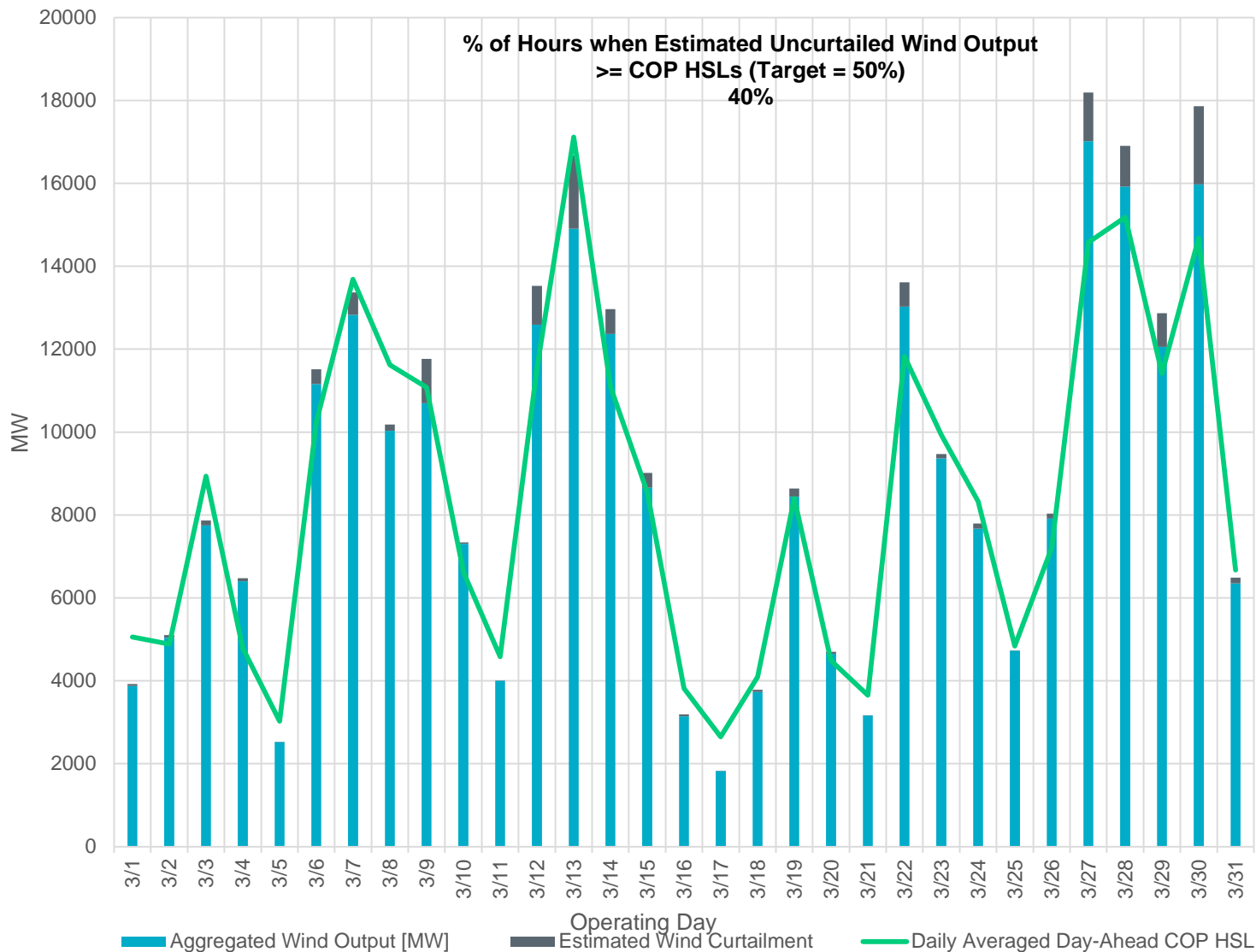
Planning Activities

- 505 active generation interconnection requests totaling 100,844 MW, including 35,555 MW of wind generation, as of March 31, 2019. Twelve additional requests and an increase of 2,398 MW from February 28, 2019.
- 22,051 MW wind capacity in commercial operations as of April 1, 2019.

Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs & On-Line Capacity at Peak – March 2019



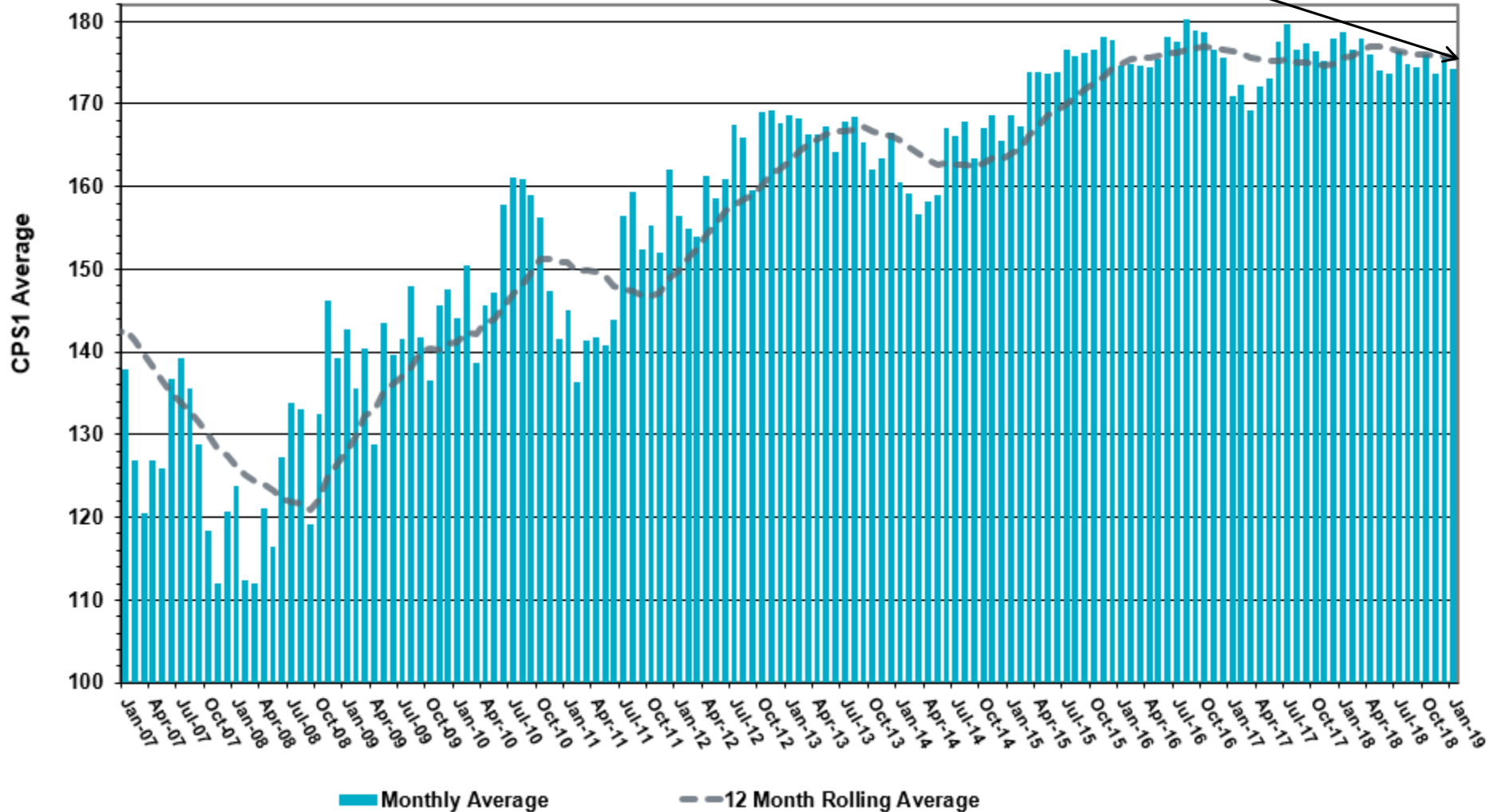
Actual Wind Output plus Curtailments vs. Wind Day-Ahead COPs for All Hours – March 2019



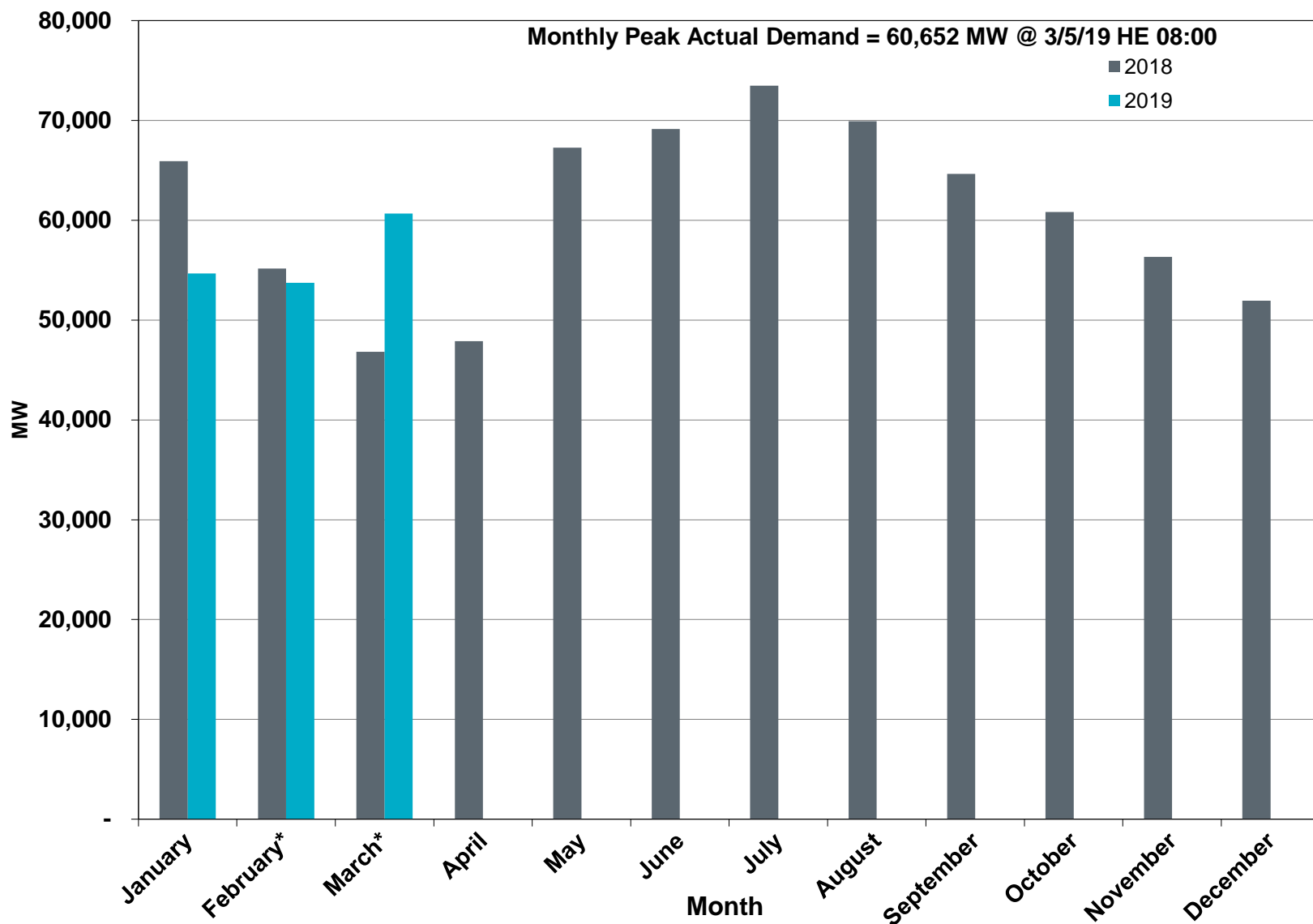
ERCOT's CPS1 Monthly Performance – March 2019

ERCOT CPS1

CPS1 12 Month Rolling Average = 175.26%



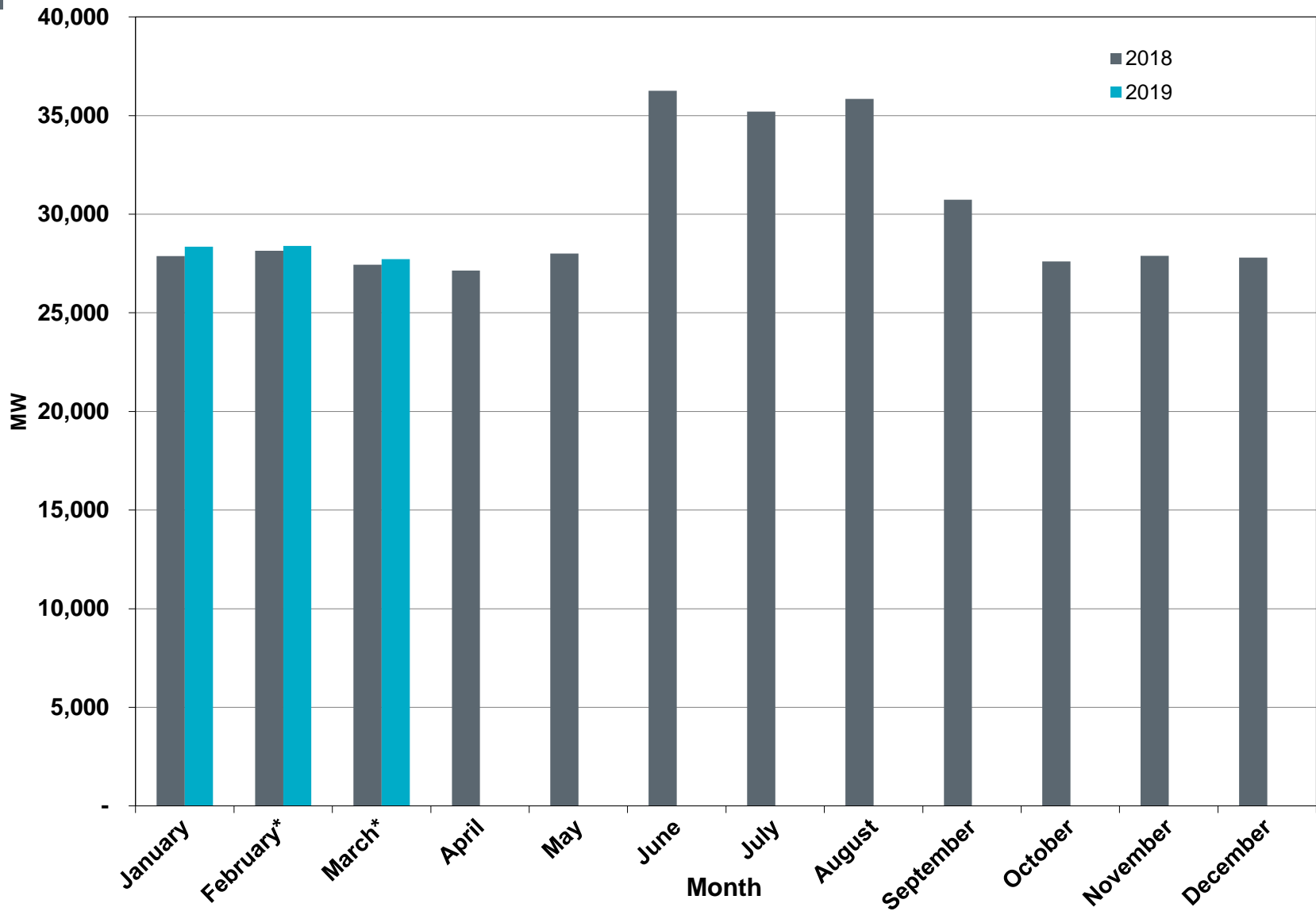
Monthly Peak Actual Demand – March 2019



*Preliminary for latest two months of the current year



Monthly Minimum Actual 15-Minute Demand – March 2019



*Preliminary for latest two months of the current year



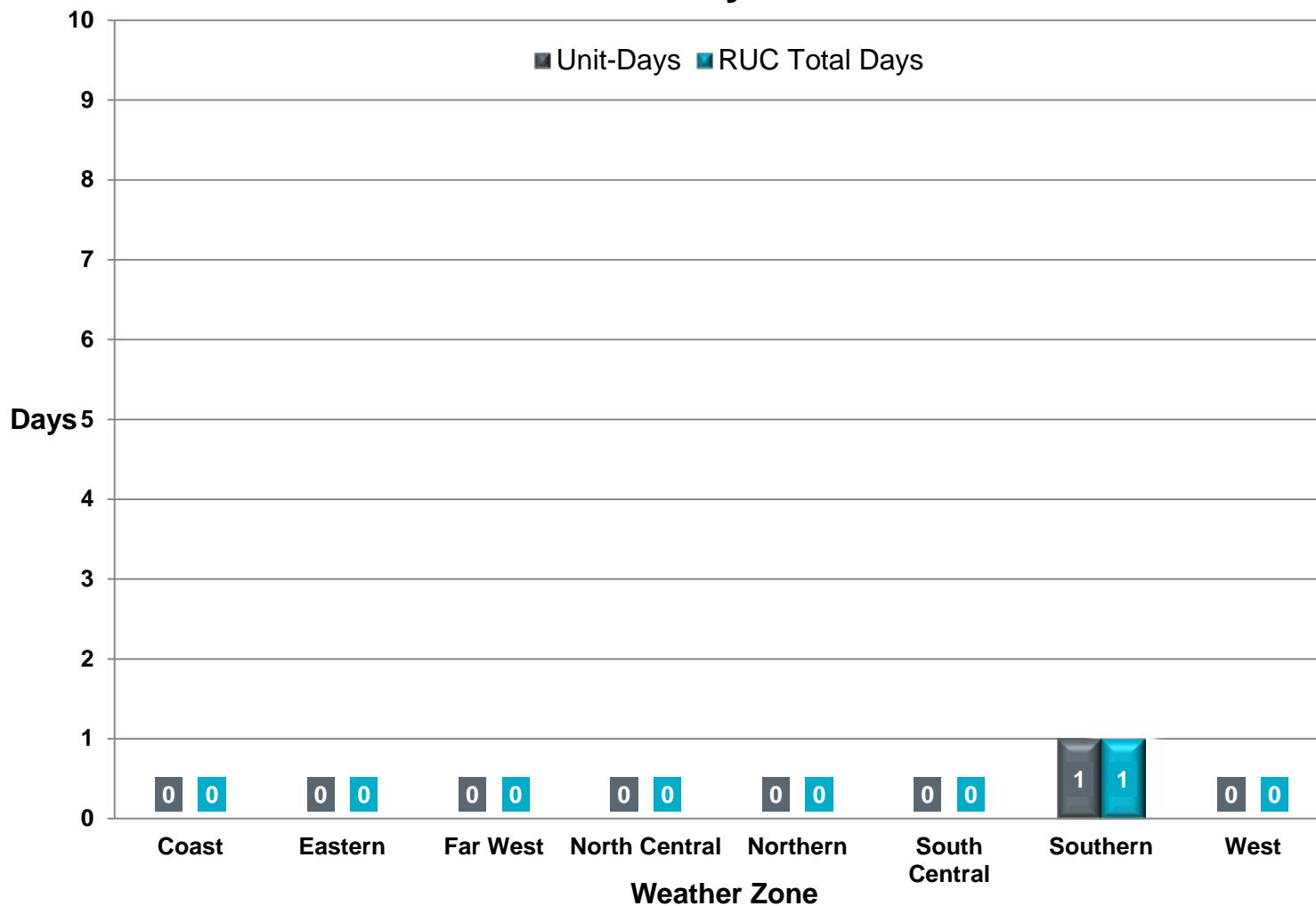
Day-Ahead Load Forecast Performance – March 2019

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

| | 2016 MAPE | 2017 MAPE | 2018 MAPE | 2019 MAPE | March 2019 MAPE | |
|-------------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------|-----------------|
| Average Annual MAPE | 2.62 | 2.55 | 2.34 | 2.70 | 2.74 | |
| Lowest Monthly MAPE | 1.94 | 1.69 | 1.64 | 2.65 | Lowest Daily MAPE | 0.62 Mar. 28 |
| Highest Monthly MAPE | 3.86 | 4.07 | 3.66 | 2.74 | Highest Daily MAPE | 9.12 Mar. 3 |

Reliability Unit Commitment (RUC) Capacity by Weather Zone – March 2019

RUC Commitments by Weather Zone



Generic Transmission Constraints (GTCs) – March 2019

| GTCs | Mar-18 Days GTCs | Jan-19 Days GTCs | Feb-19 Days GTCs | Mar-19 Days GTCs | Last 12 Months Total Days (Apr 18 – Mar 19) |
|------------------------------|------------------------|------------------------|------------------------|------------------------|---|
| North – Houston | 2 | 0 | 0 | 0 | 5 |
| Valley Import | 1 | 0 | 0 | 0 | 5 |
| Panhandle | 29 | 21 | 22 | 16 | 215 |
| Red Tap | 0 | 0 | 0 | 0 | 8 |
| North Edinburg – Lobo | 0 | 0 | 0 | 0 | 0 |
| Nelson Sharpe – Rio Hondo | 16 | 0 | 0 | 0 | 14 |
| East Texas | 0 | 0 | 0 | 0 | 0 |
| McCamey | 0 | 0 | 0 | 1 | 1 |
| Treadwell | - | 0 | 0 | 0 | 0 |

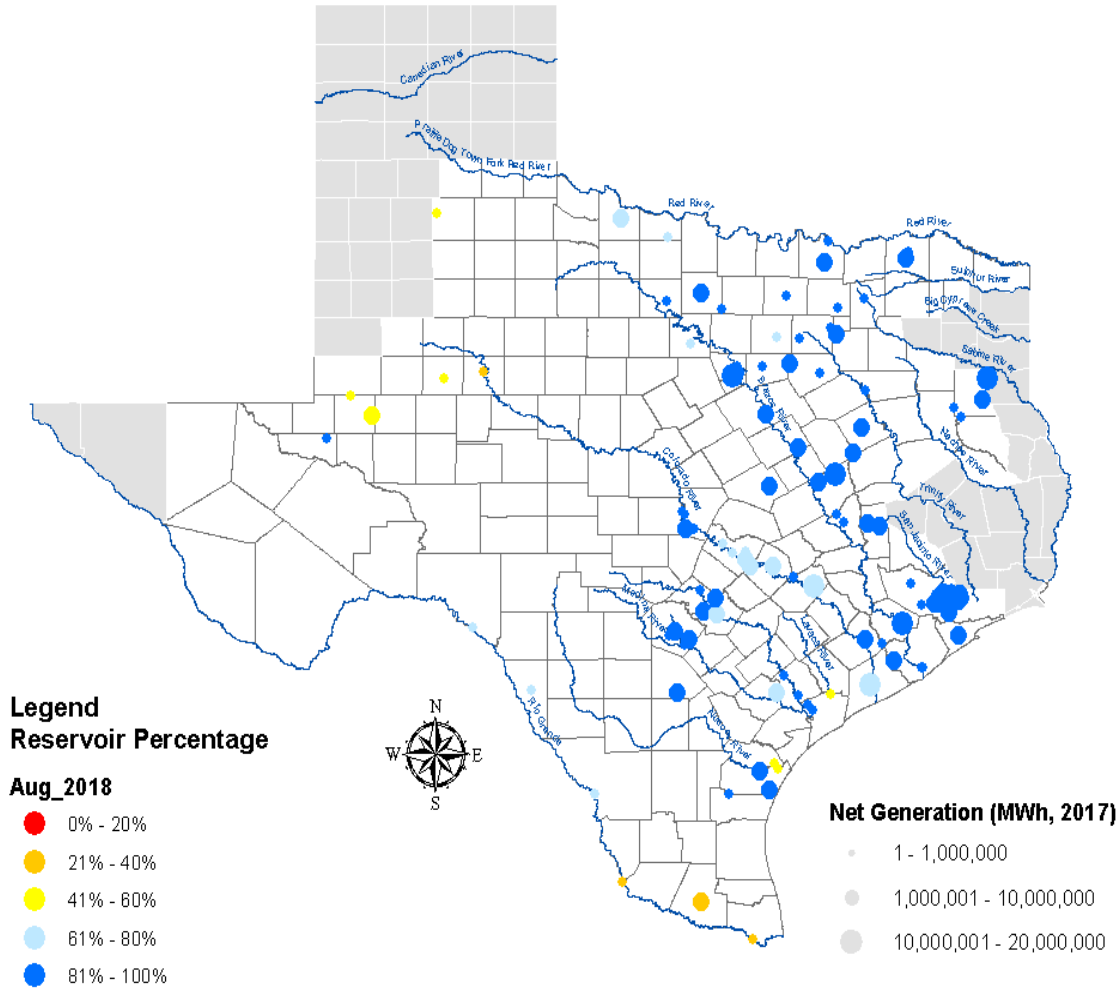
GTC: A transmission flow limit more constraining than a Transmission Element's normal limit established to constrain flow between geographic areas of the ERCOT Transmission System that is used to enforce stability and voltage constraints that cannot be modeled directly in ERCOT's transmission security 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 – March 2019

- One OCN issued for potential extreme cold weather system-wide for operating days 3/3/2019 – 3/7/2019
 - Issued 2/27
- One Advisory due to severe weather in the Central and North Texas areas
 - Issued 3/13
- One Watch issued for HRUC timeline deviation for HE02
 - Issued 3/20
- One Advisory issued for postponement of the deadline for the posting of the DAM Solution for OD 03/27/2019
 - Issued 3/26

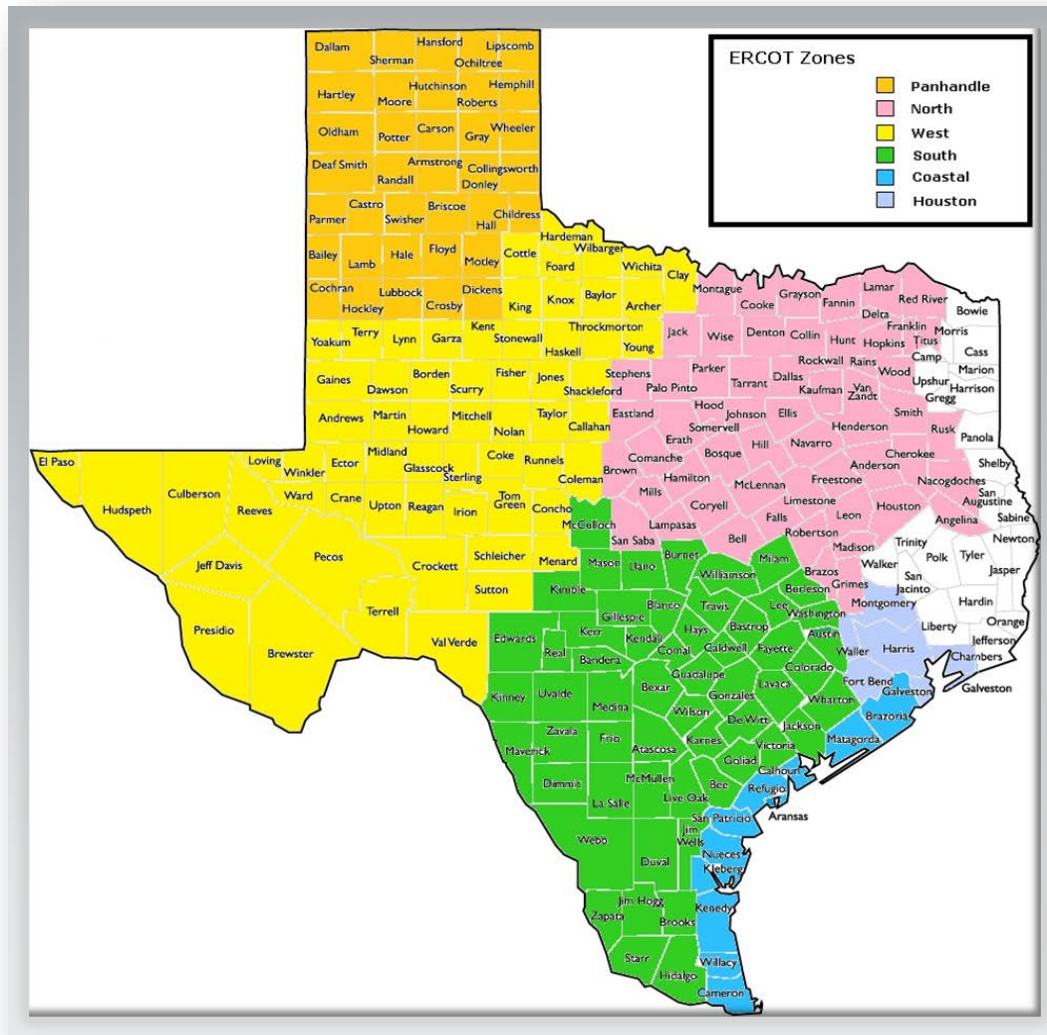
Lake Levels Update – April 1, 2019



Planning Summary – March 2019

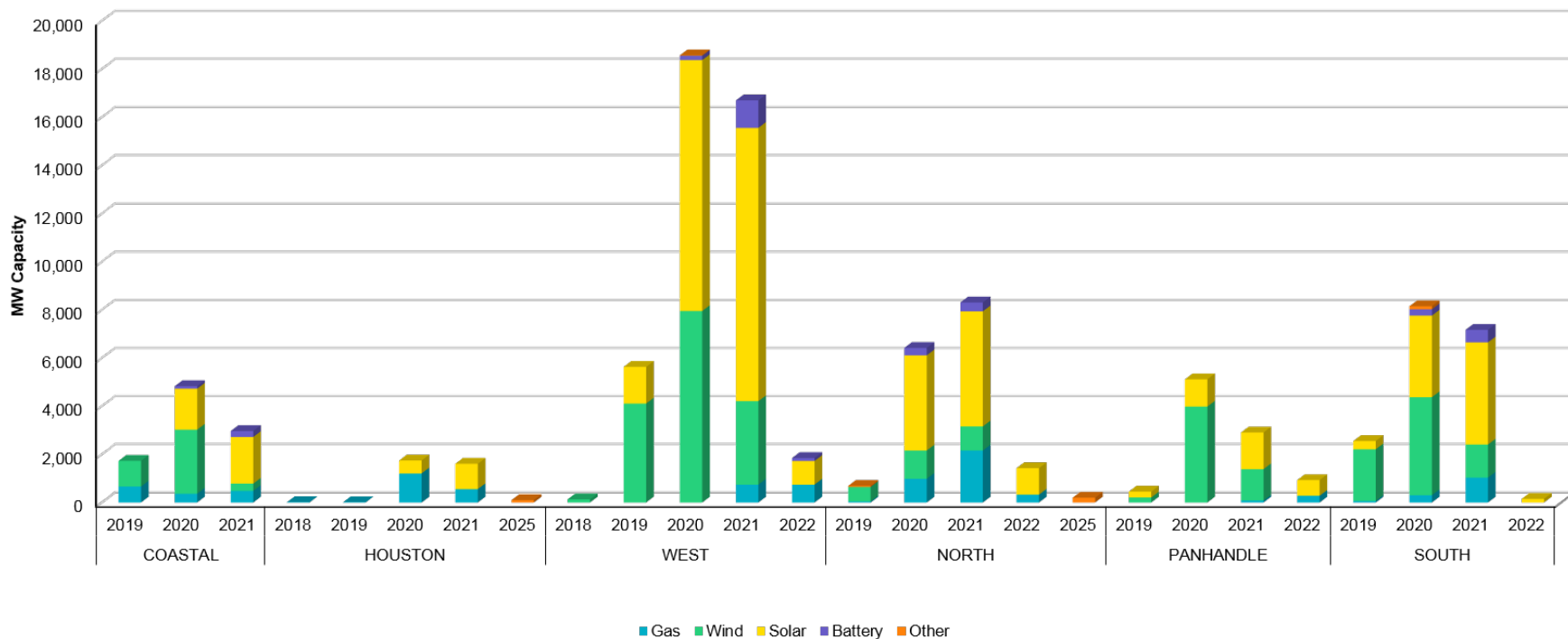
- ERCOT is currently tracking 505 active generation interconnection requests totaling 100,844 MW. This includes 35,555 MW of wind generation.
- ERCOT is currently reviewing proposed transmission improvements with a total cost of \$603.59 million (as of March 31, 2019).
- Transmission Projects endorsed in 2019 total \$73.21 million (as of March 31, 2019).
- All projects (in engineering, routing, licensing, and construction) total approximately \$5.07 billion (as of March 1, 2019).
- Transmission Projects energized in 2019 total about \$89.98 million (as of March 1, 2019).

Mapping of Counties to ERCOT Zones – March 2019



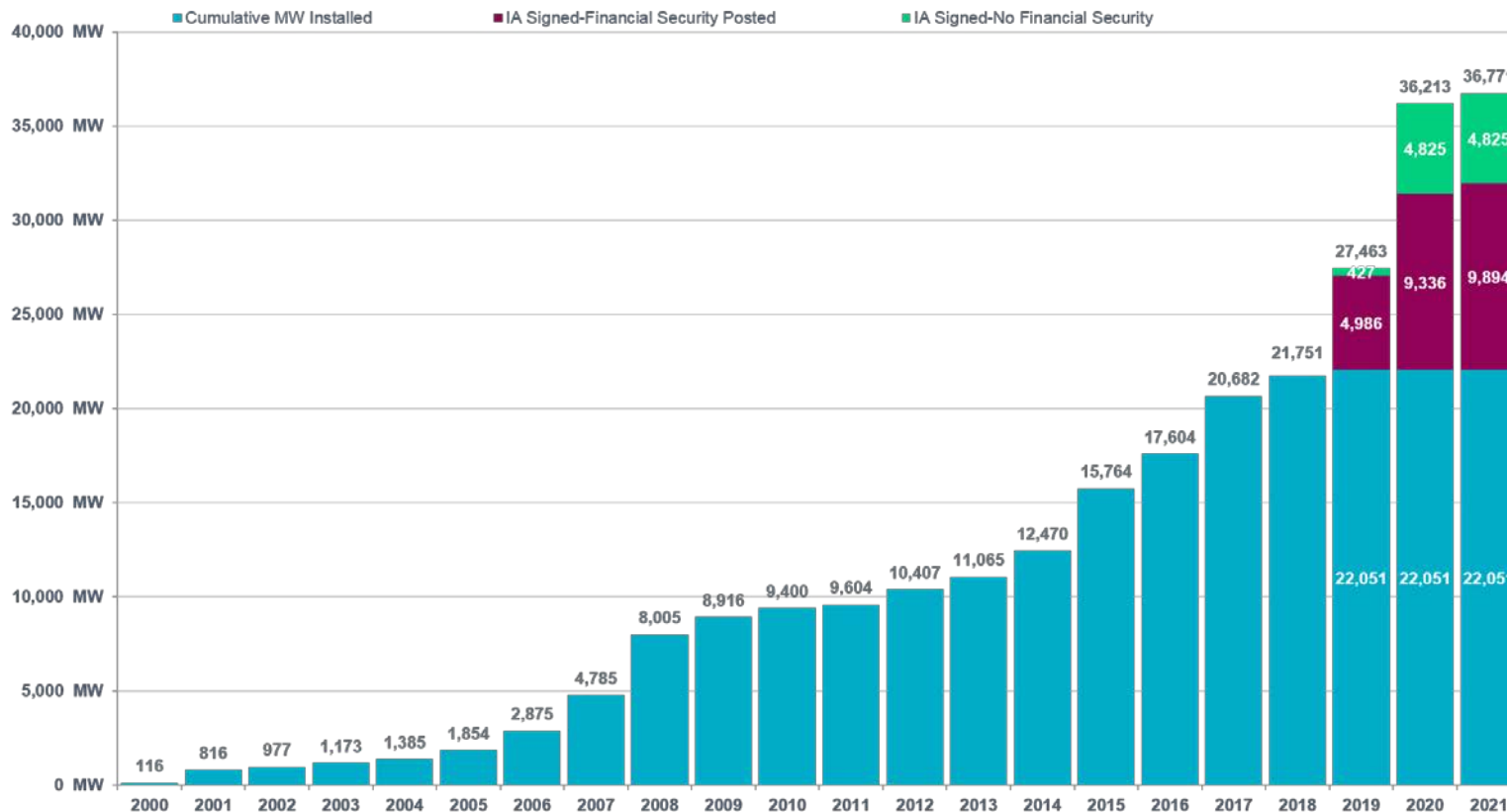
Cumulative MW Capacity of Interconnection Requests by Zone – March 2019

Capacity for Planned Projects by Projected In-service Year and CDR Forecast Zone



Wind Generation – March 2019

ERCOT Wind Additions by Year (as of Mar 31, 2019)

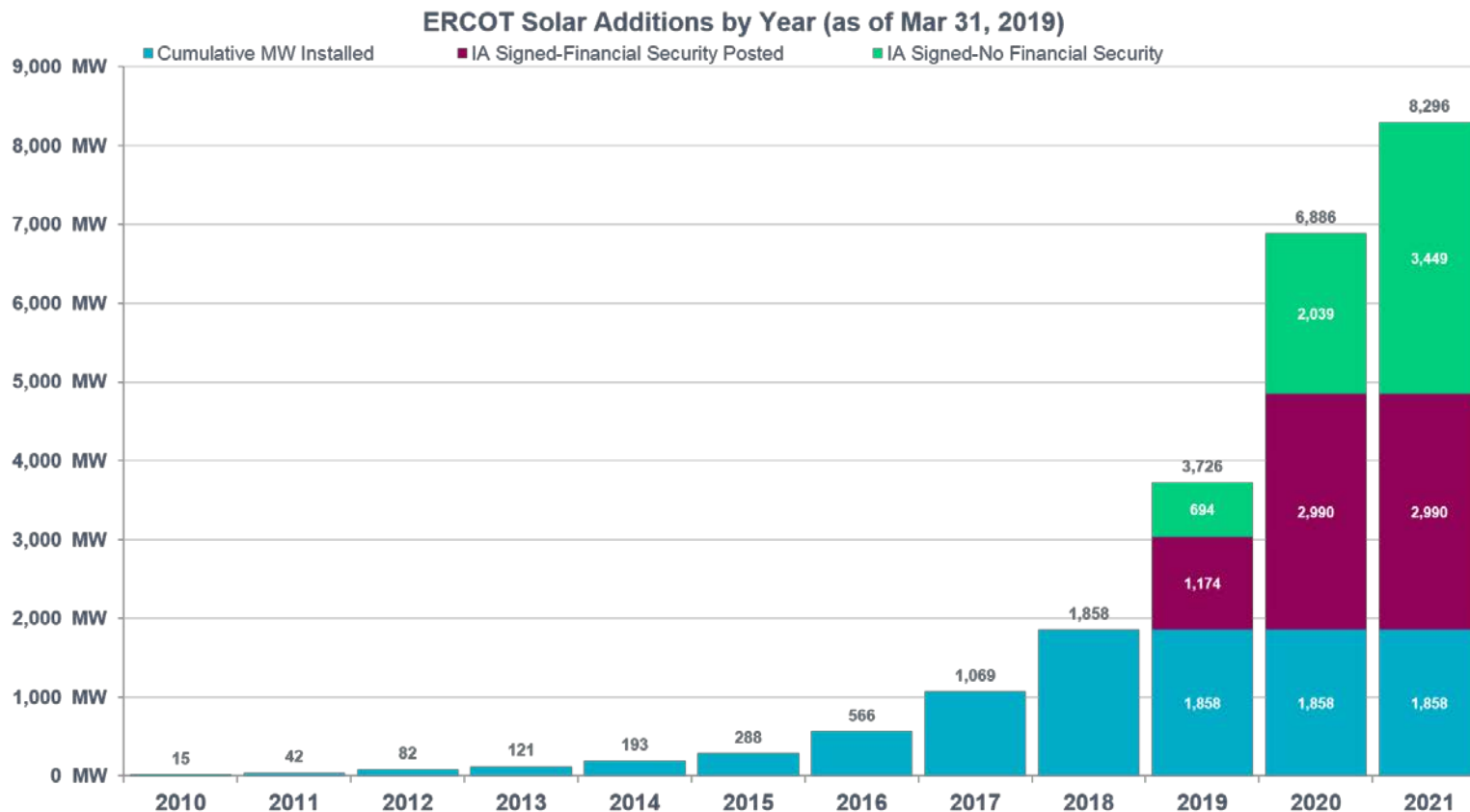


Notes:

- 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 are the original nameplate rating of the generation facilities, and do not reflect retirements or rating changes over time due to facility expansions or repowering.
- 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 – March 2019



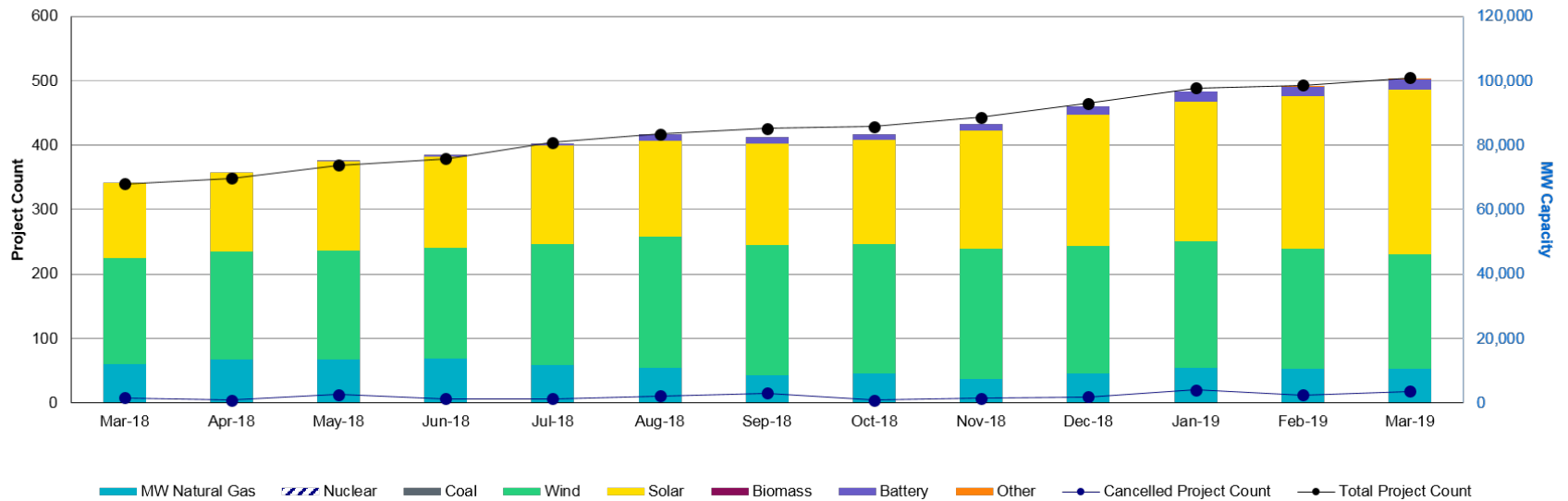
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- This chart reports annual planned units with projected Commercial Operations Dates throughout the calendar year. In contrast, ERCOT's Capacity, Demand and Reserves (CDR) report shows planned capacity projected to be commercially available on or before the start of the Summer and Winter Peak Load seasons.
- Projects that have prior-year Projected CODs that have not been met, and for which ERCOT has not received COD updates, appear as planned projects for the subsequent year.



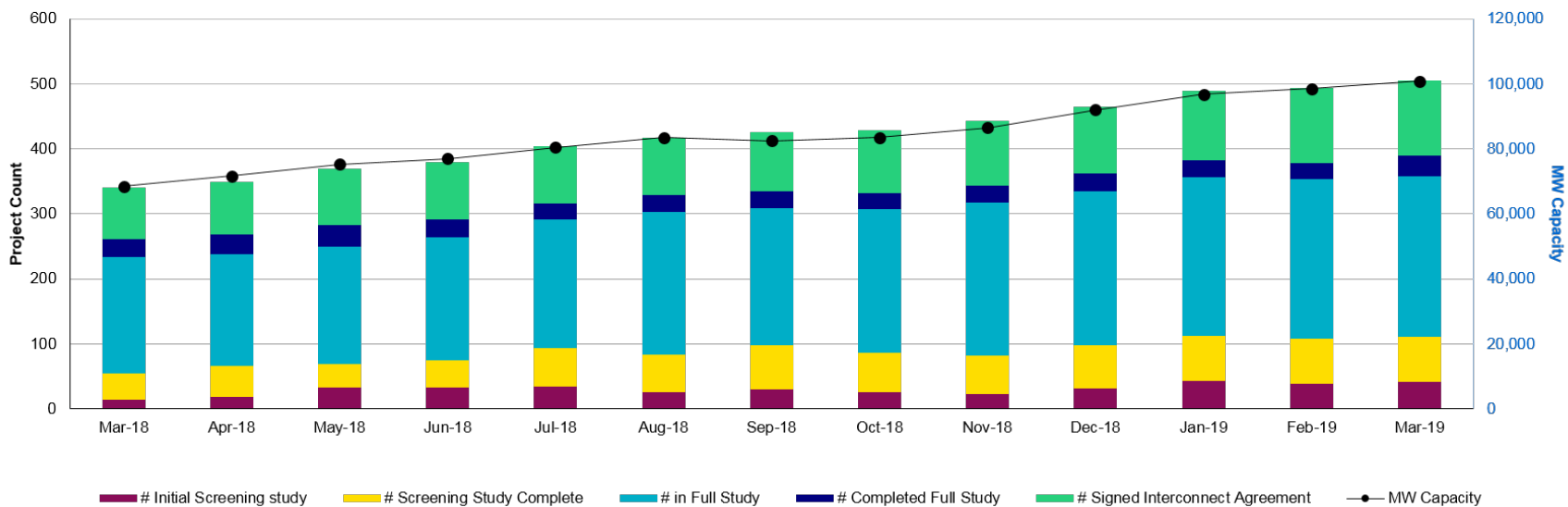
Generation Interconnection Activity by Fuel – March 2019

Monthly Capacity by Fuel Type plus Project Count, 13-Month Rolling Basis



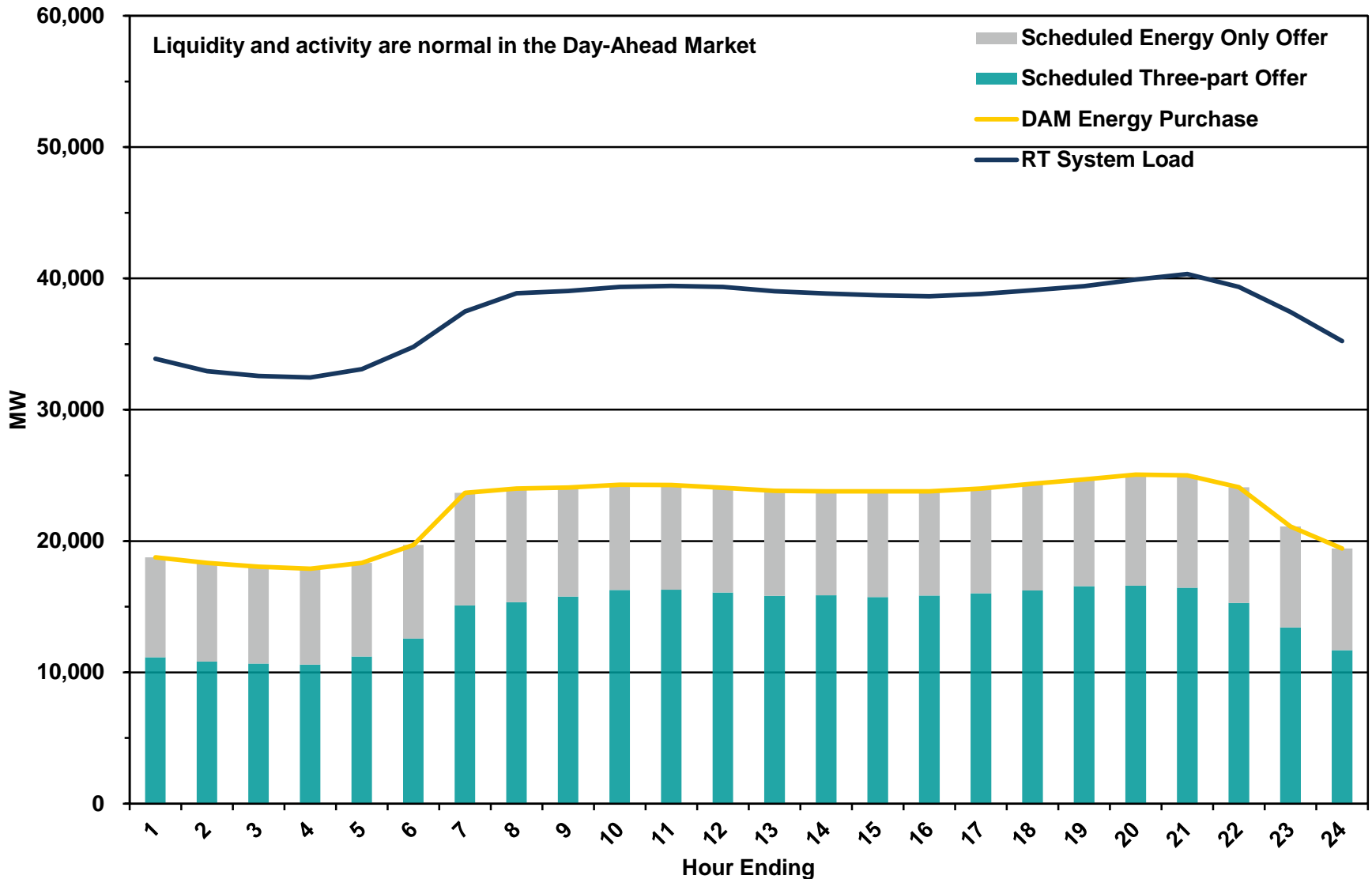
Generation Interconnection Activity by Project Phase – March 2019

Monthly Capacity by GINR Milestone plus Project Count, 13-Month Rolling Basis

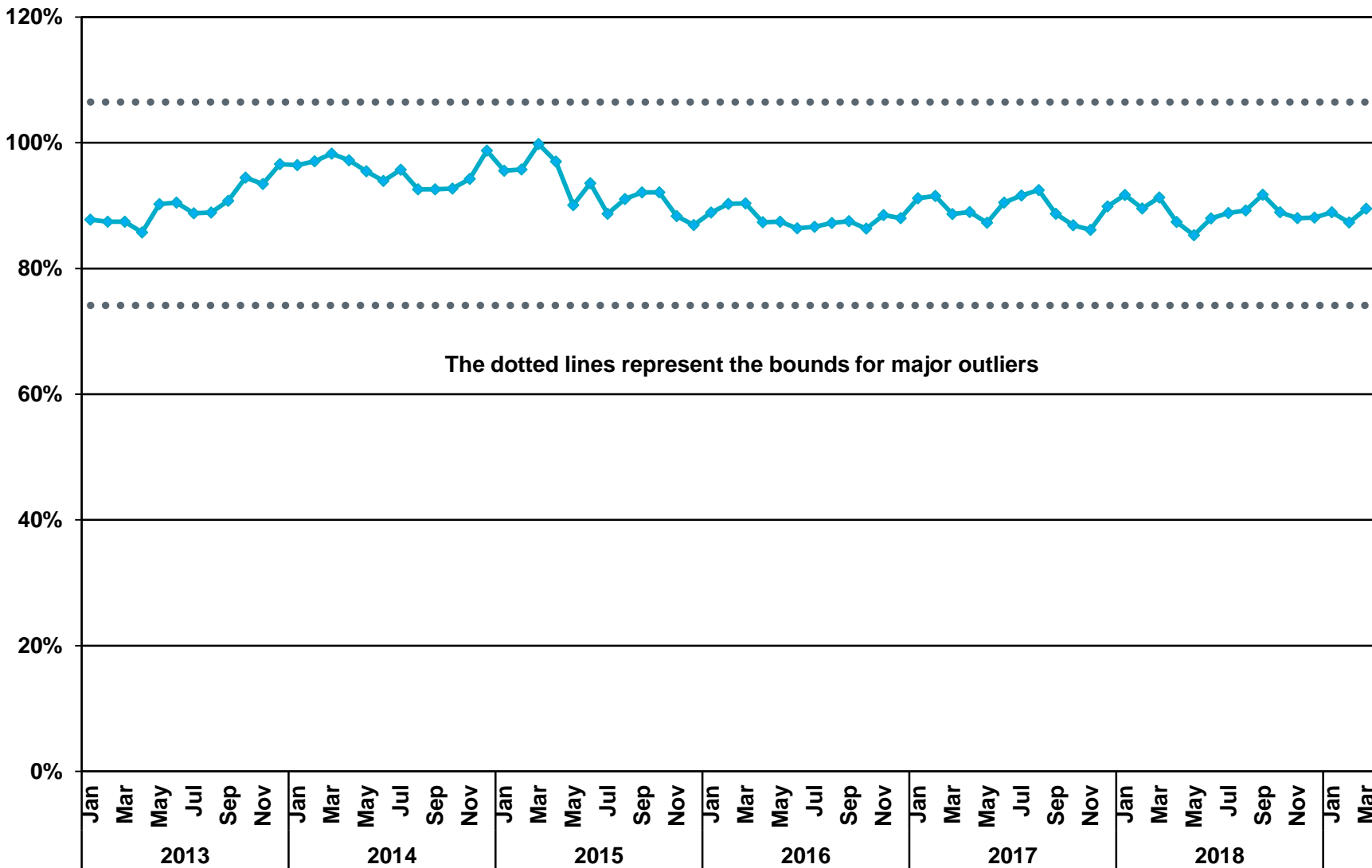


Market Operations

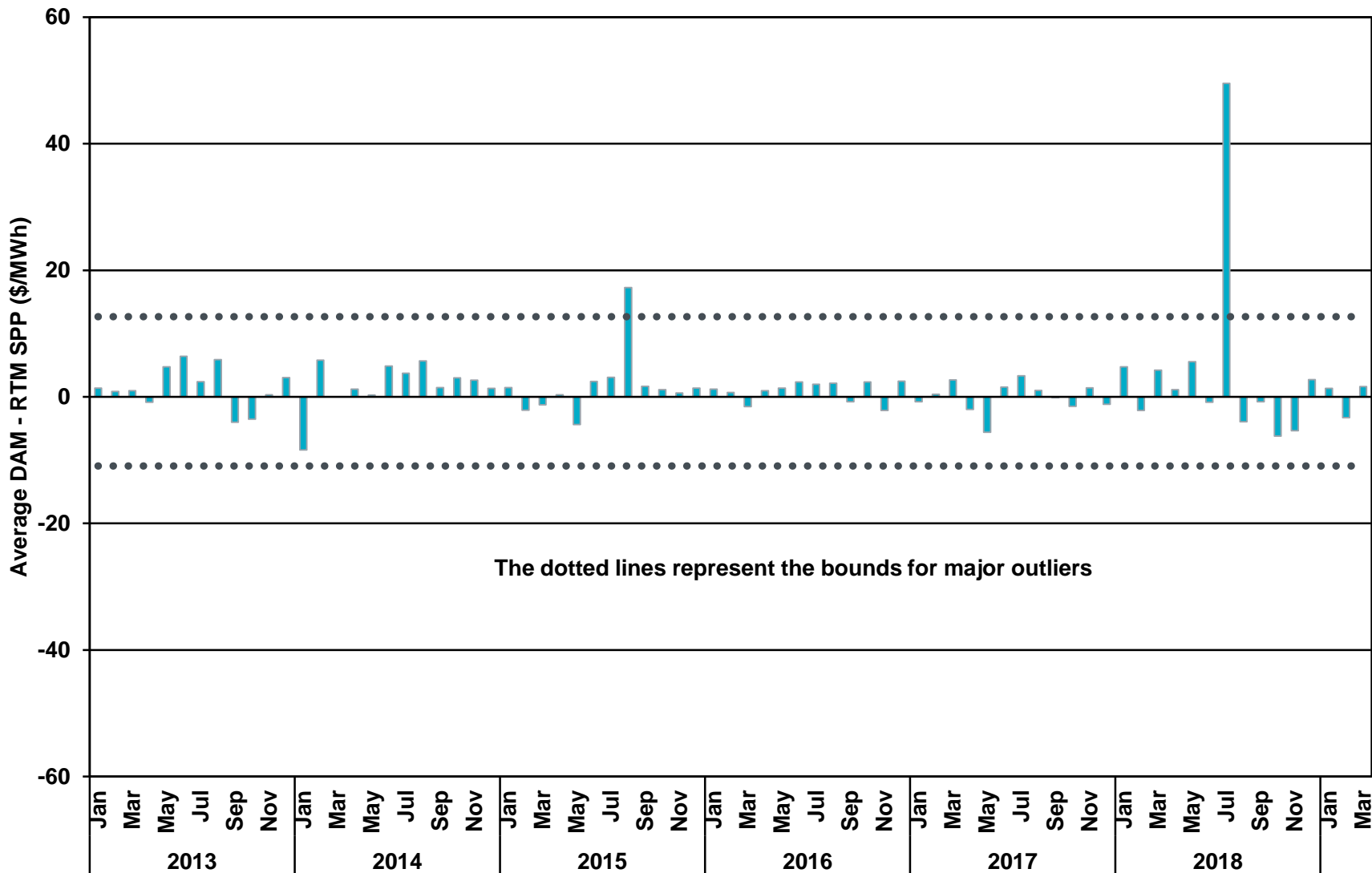
Day-Ahead Schedule (Hourly Average) – March 2019



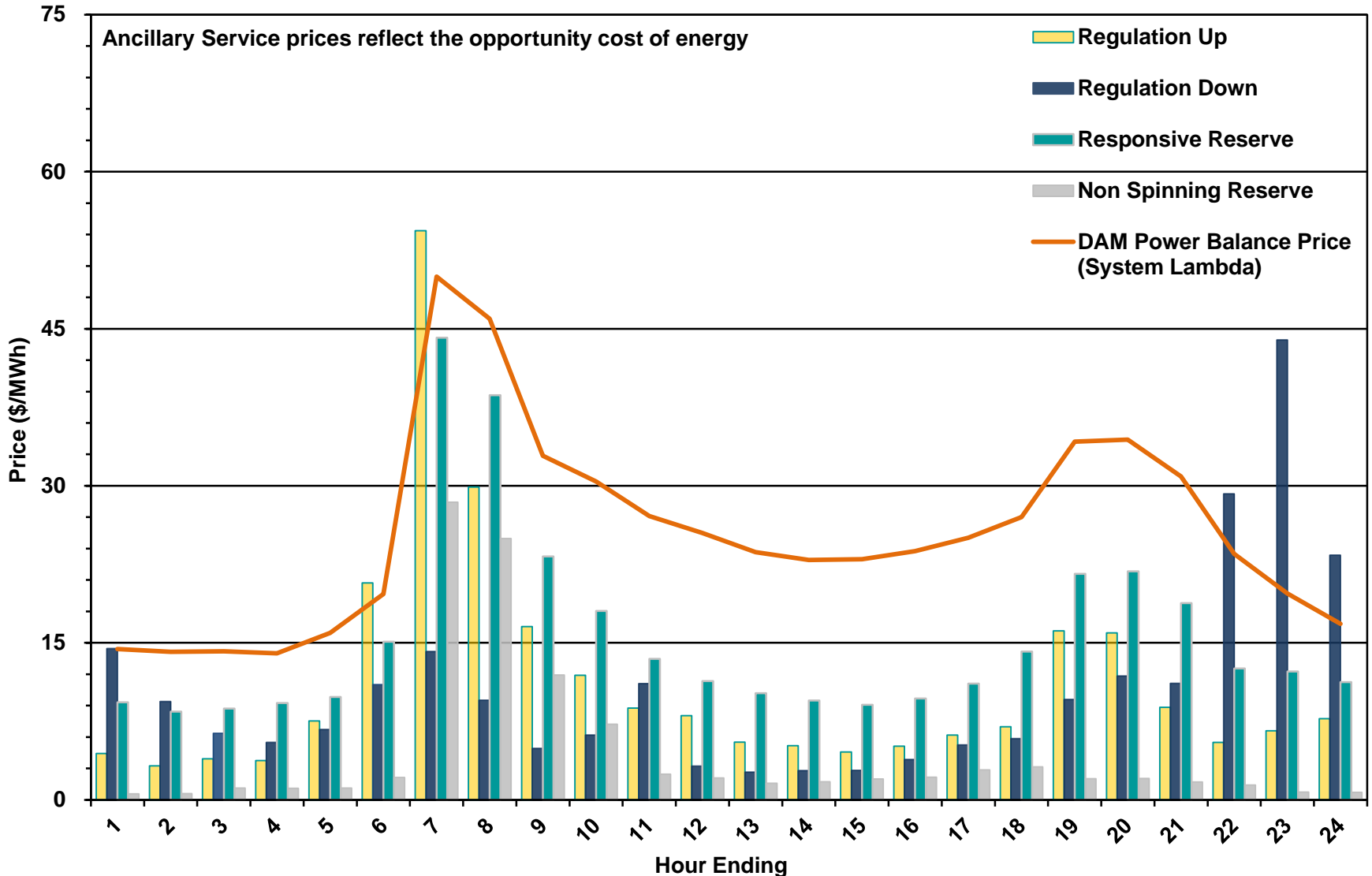
Percentage of Real-Time Load Transacted in the DAM (Counter-Party Level) – March 2019



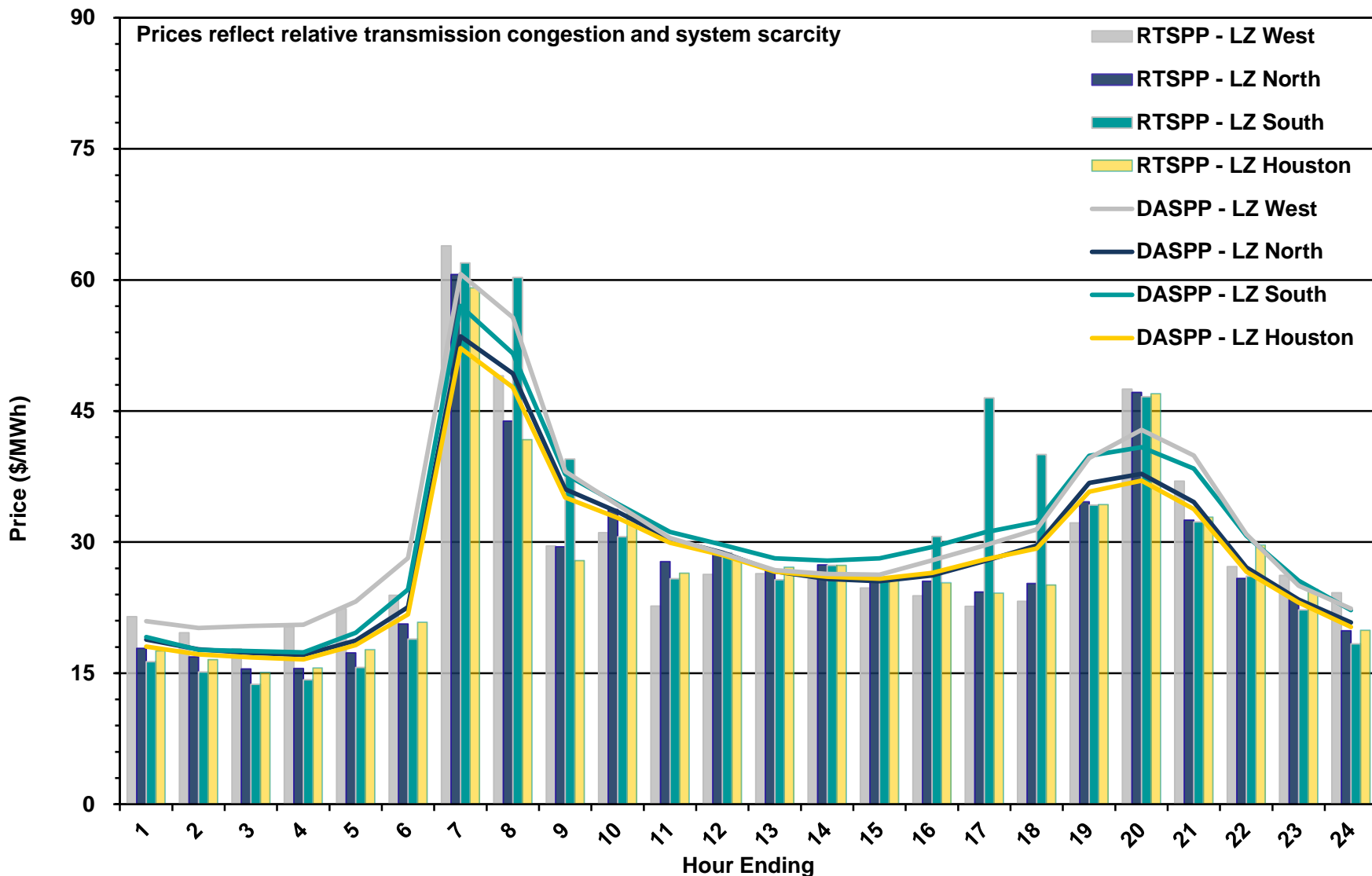
DAM and RTM Price Convergence – March 2019



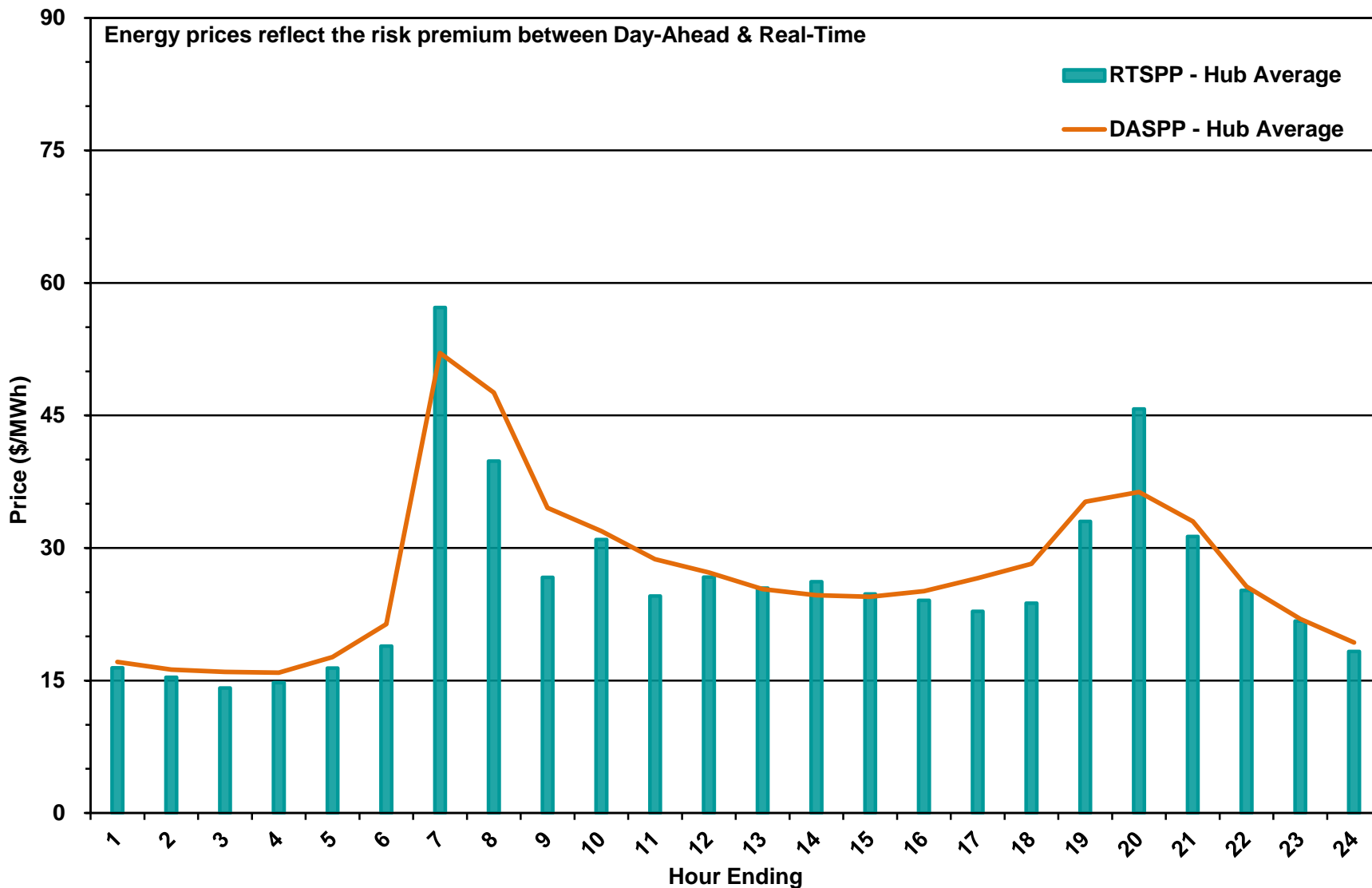
Day-Ahead Electricity and Ancillary Service Prices (Hourly Average) – March 2019



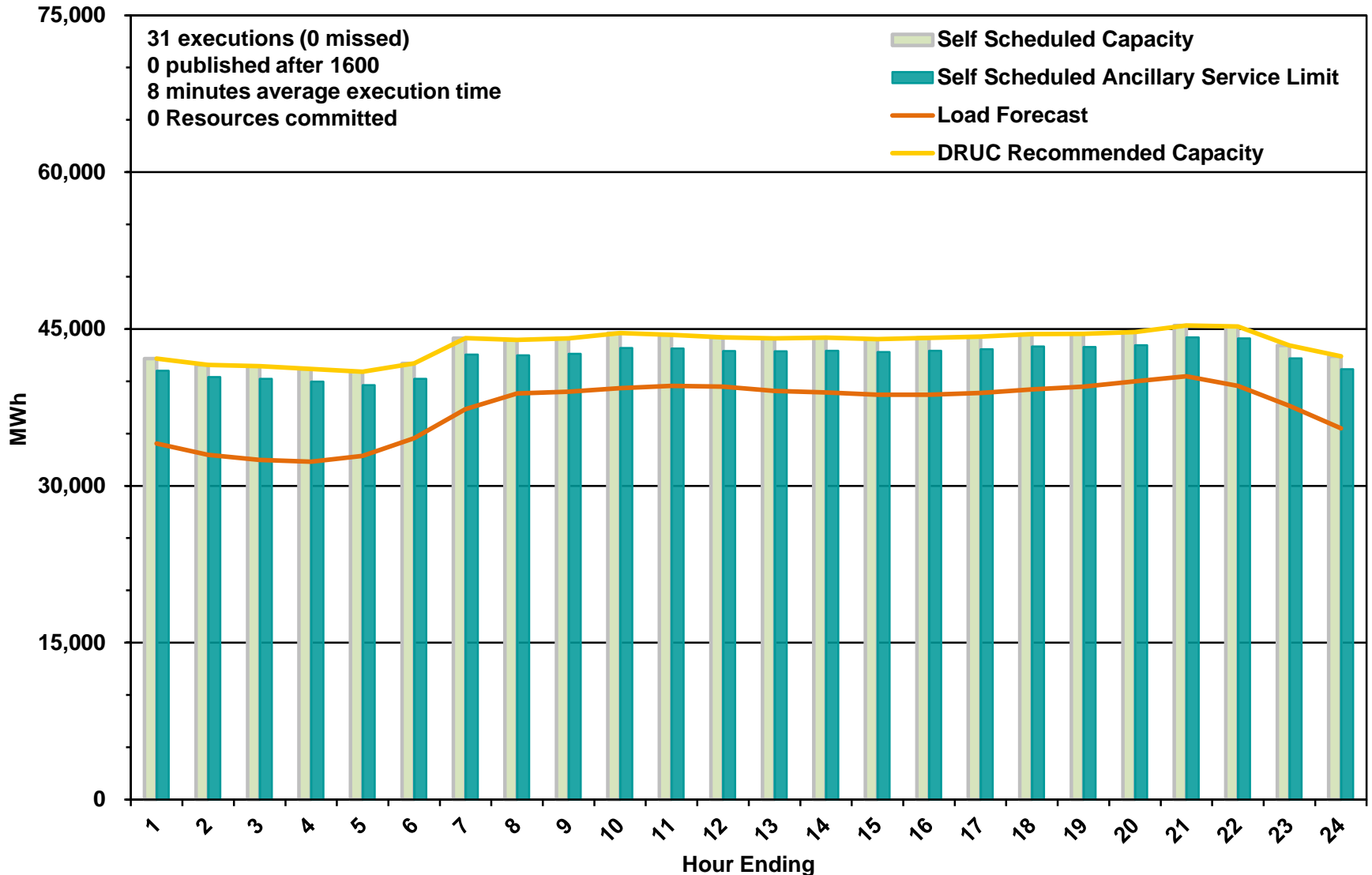
Day-Ahead vs Real-Time Load Zone SPP (Hourly Average) – March 2019



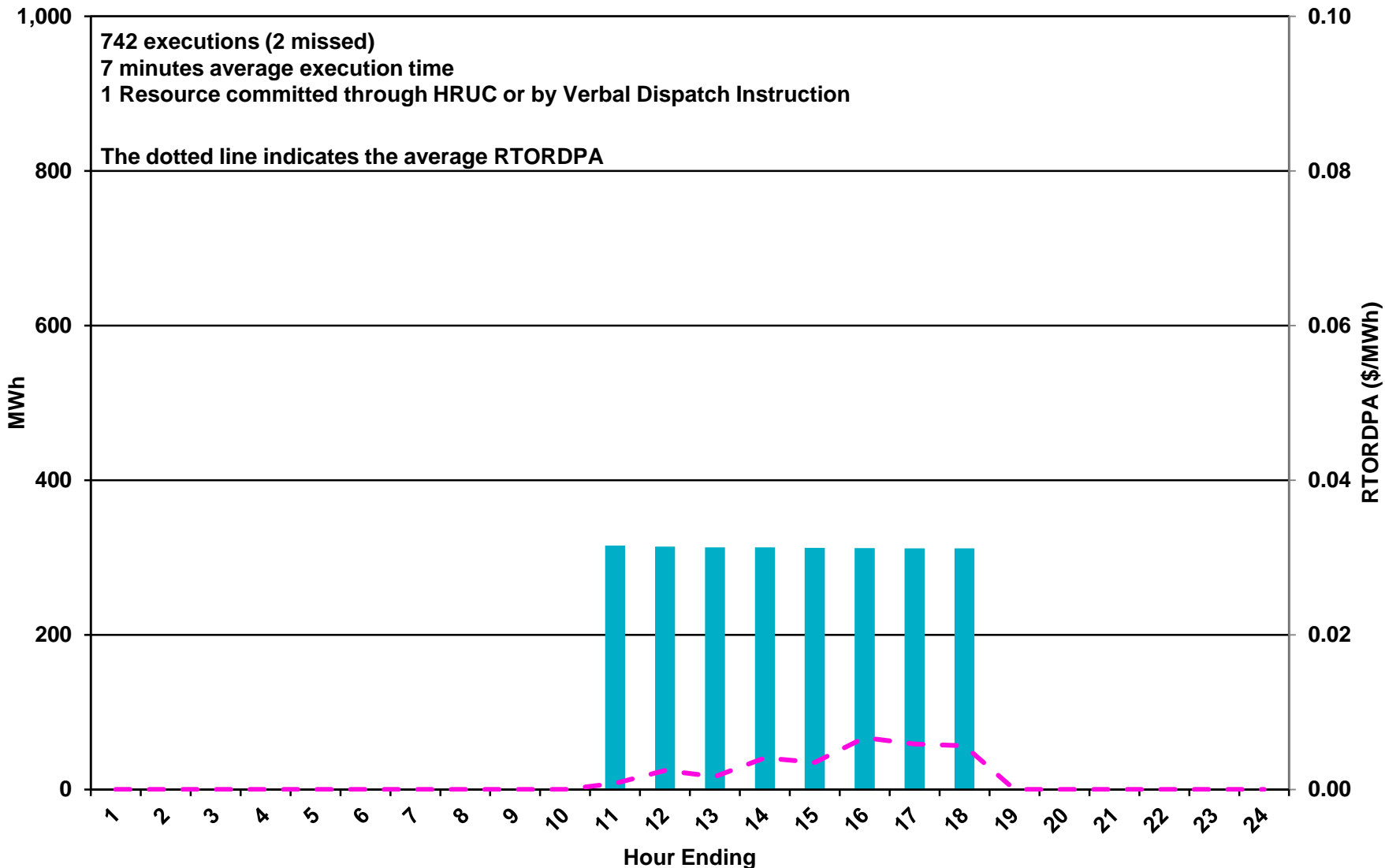
Day-Ahead vs Real-Time Hub Average SPP (Hourly Average) – March 2019



DRUC Monthly Summary (Hourly Average) – March 2019



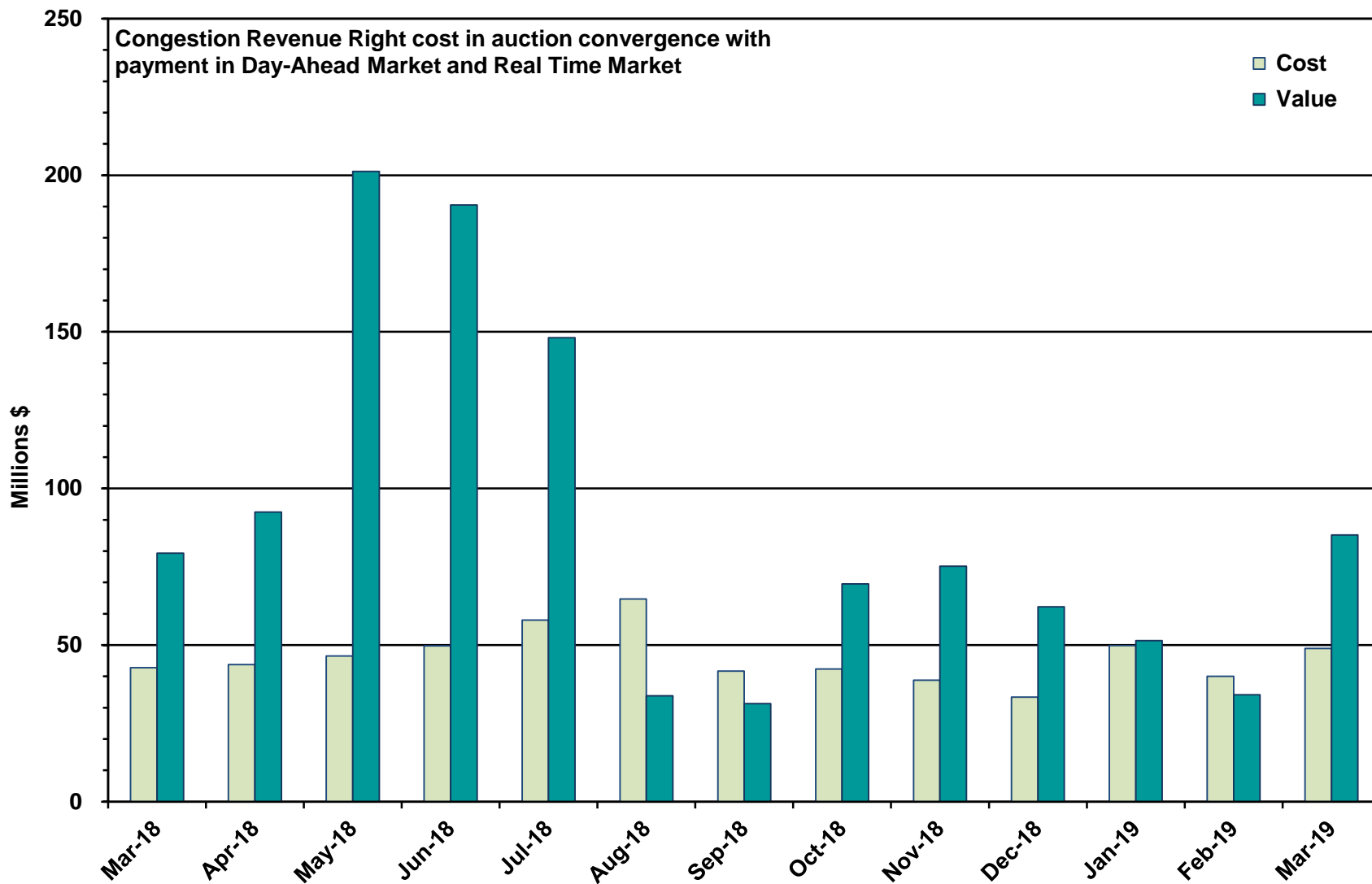
HRUC Monthly Summary and Real Time On-Line Reliability Deployment Price Adder (RTORDPA) (Hourly Average) – March 2019



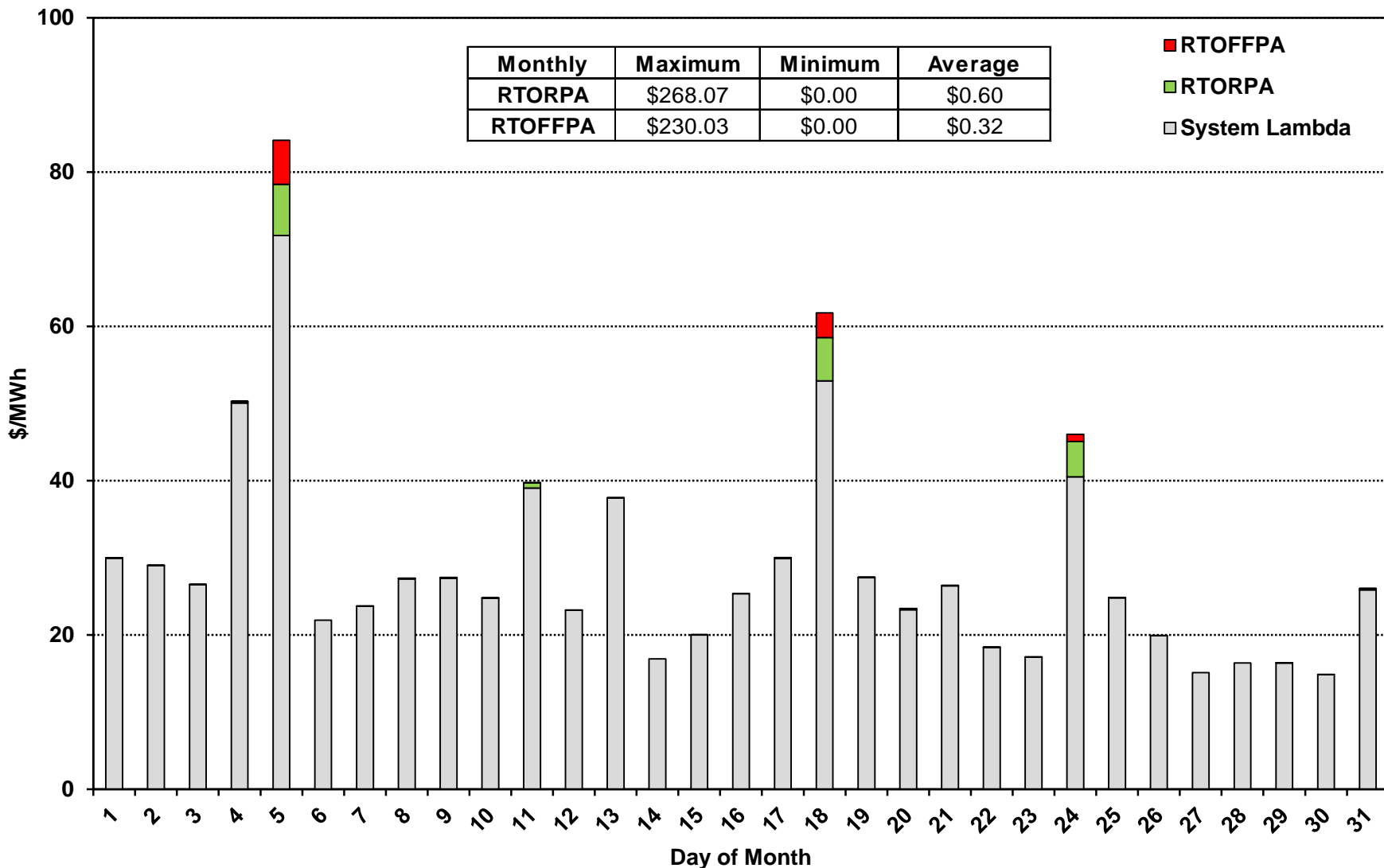
Non-Spinning Reserve Service Deployment – March 2019

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

CRR Price Convergence – March 2019



Daily Average System Lambda and ORDC Price Adders – March 2019



ERS Procurement for February 2019 – May 2019

| | TP1 | TP2 | TP3 | TP4 | TP5 | TP6 |
|---------------------------------|---------|---------|---------|---------|---------|---------|
| Non Weather-Sensitive ERS-10 MW | 139.220 | 144.226 | 139.642 | 140.366 | 137.976 | 131.848 |
| Non Weather-Sensitive ERS-30 MW | 786.588 | 846.479 | 757.357 | 825.464 | 797.227 | 649.134 |
| Weather-Sensitive ERS-10 MW | 0 | 0 | 0 | 0 | 0 | 0 |
| Weather-Sensitive ERS-30 MW | 7.947 | 0 | 4.9 | 7.573 | 0 | 0 |
| Total MW Procured | 933.755 | 990.705 | 901.899 | 973.403 | 935.203 | 780.982 |
| Clearing Price | \$21.80 | \$12.25 | \$1.10 | \$19.98 | \$13.03 | \$0.25 |

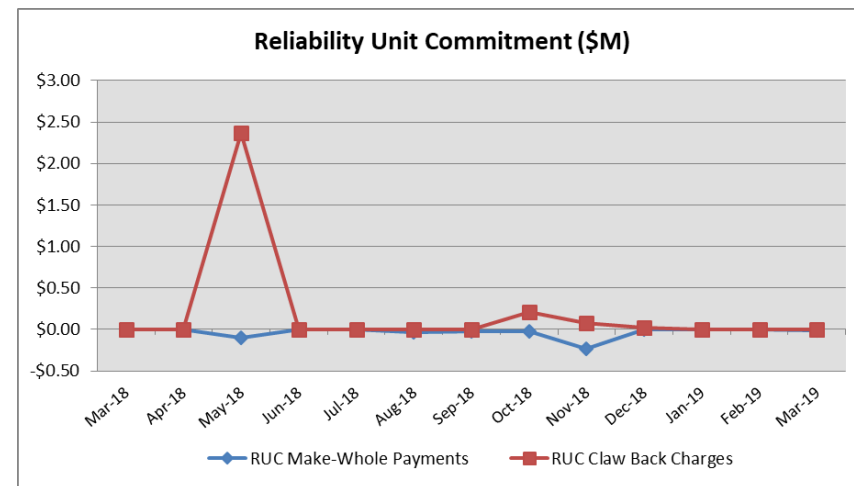
Time Period

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 – March 2019

| Reliability Unit Commitment (RUC) | \$ in Millions |
|---------------------------------------|-----------------|
| RUC Make-Whole Payments | (\$0.01) |
| RUC Clawback Charges | \$0.00 |
| RUC Commitment Settlement | (\$0.01) |
| RUC Capacity Short Charges | \$0.01 |
| RUC Make-Whole Uplift | \$0.00 |
| RUC Commitment Cost Allocation | \$0.01 |
| RUC Decommitment Payments | \$0.00 |
| Total RUC Allocation to Load | \$0.00 |



In March 2019, \$0.00M was allocated to load for RUC compared to:

- A credit of \$0.00M in February 2019
- A credit of \$0.00M in March 2018

Ancillary and Other Services – March 2019

| Ancillary and Other Services | \$ in Millions |
|--|-----------------------|
| Regulation Up Service | \$3.09 |
| Regulation Down Service | \$2.80 |
| Responsive Reserve Service | \$23.45 |
| Non-Spinning Reserve Service | \$5.40 |
| Black Start Service | \$0.61 |
| Voltage Services - Reactive Power | \$0.00 |
| Voltage Services - Lost Opportunity | \$0.00 |
| Total Charges Allocated to Load | \$35.34 |

In March 2019, Ancillary and Other Services was a charge of \$35.34M, compared to:

- A charge of \$19.24M in February 2019
- A charge of \$30.15M in March 2018

Real-Time Ancillary Service Imbalance (ORDC) – March 2019

| Real-Time Ancillary Service Imbalance | \$ in Thousands |
|---|-----------------|
| Real-Time AS Imbalance | (\$226) |
| Real-Time Reliability Deployment AS Imbalance | (\$8) |
| Total RTASI Amount Allocated to Load | \$234 |

In March 2019, Real-Time Ancillary Service Imbalance was a charge to load of \$234K, compared to:

- A charge of \$26K in February 2019
- A charge of \$17K in March 2018

Energy Settlement – March 2019

| Day-Ahead Market Energy Settlement | \$ in Millions |
|--------------------------------------|----------------|
| Energy Purchases | \$514.69 |
| Point to Point Obligation Purchases | \$63.32 |
| Energy Sales | (\$493.03) |
| Day-Ahead Congestion Rent | \$84.98 |
| Day-Ahead Market Make-Whole Payments | (\$0.34) |

Day-Ahead Market energy settlement activity increased from last month and increased from March 2018.

Real-Time Market energy settlement activity increased from last month and increased from March 2018.

| Real-Time Market Energy Settlement | \$ in Millions |
|---|----------------|
| Energy Imbalance at a Resource Node | (\$379.55) |
| Energy Imbalance at a Load Zone | \$665.17 |
| Energy Imbalance at a Hub | (\$224.96) |
| Net Real-Time Energy Imbalance | \$60.66 |
| Real Time Congestion from Self Schedules | \$0.48 |
| Block Load Transfers and DC Ties | (\$6.08) |
| Total Impact to Revenue Neutrality | \$55.06 |
| Load-Allocated Emergency Energy Payments | (\$0.28) |
| Load-Allocated Base Point Deviation Charges | \$0.25 |

Congestion Revenue Rights (CRR) – March 2019

| | \$ in Millions |
|--|------------------|
| Long-Term Auction | (\$44.56) |
| Monthly Auction | (\$4.38) |
| Total Auction Revenue | (\$48.94) |
| Day-Ahead CRR Settlements | (\$85.12) |
| Day-Ahead CRR Short-Charges | \$4.09 |
| Day-Ahead CRR Short-Charges Refunded | (\$4.09) |
| Day-Ahead CRR Short-Charges Net | \$0.00 |
| Total CRR Funding | (\$85.12) |
| Day-Ahead Point-to-Point Obligations | \$63.32 |
| Real-Time Point-to-Point Obligations | (\$68.51) |
| Net Point-to-Point Obligations | (\$5.19) |

Congestion Revenue Rights settlement payments were not fully funded. The additional funding to settle the CRR Short Charges was provided from the CRR Balancing Account Fund.

Point to Point Obligations settled with a net credit of \$5.19M compared to a net credit of \$8.42M last month.

CRR Balancing Account Fund – March 2019

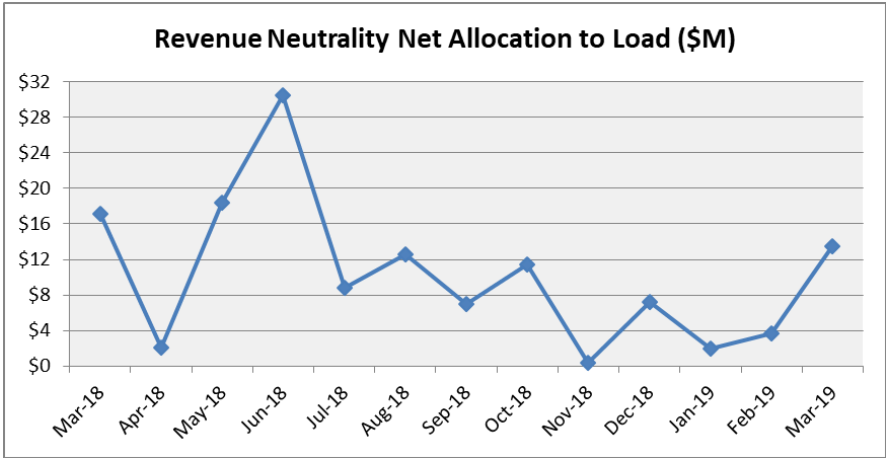
| CRR Balancing Account | \$ in Millions |
|---|-----------------------|
| Monthly Day-Ahead Congestion Rent | \$84.98 |
| Monthly Day-Ahead CRR Settlements | (\$85.12) |
| Monthly Day-Ahead CRR Short -Charges | \$4.09 |
| CRR Balancing Account Credit Total | \$3.96 |
| Beginning Fund Balance for the Month | \$10.00 |
| CRR Balancing Account Credit Total | \$3.96 |
| Day-Ahead CRR Short-Charges Refunded | (\$4.09) |
| CRR PTP Option Award Charges | \$0.05 |
| Load-Allocated CRR Amount | \$0.00 |
| Total Fund Amount | \$9.92 |

Revenue Neutrality – March 2019

| Revenue Neutrality | \$ in Millions |
|--|----------------|
| Real-Time Energy Imbalance | \$60.66 |
| Real-Time Point to Point Obligation | (\$68.51) |
| Real-Time Congestion from Self-Schedules | \$0.48 |
| DC Tie & Block Load Transfer | (\$6.08) |
| Allocation to Load | \$13.46 |

In March 2019, the Revenue Neutrality charge to load was \$13.46M compared to:

- A charge of \$3.71M in February 2019
- A charge of \$17.14M in March 2018

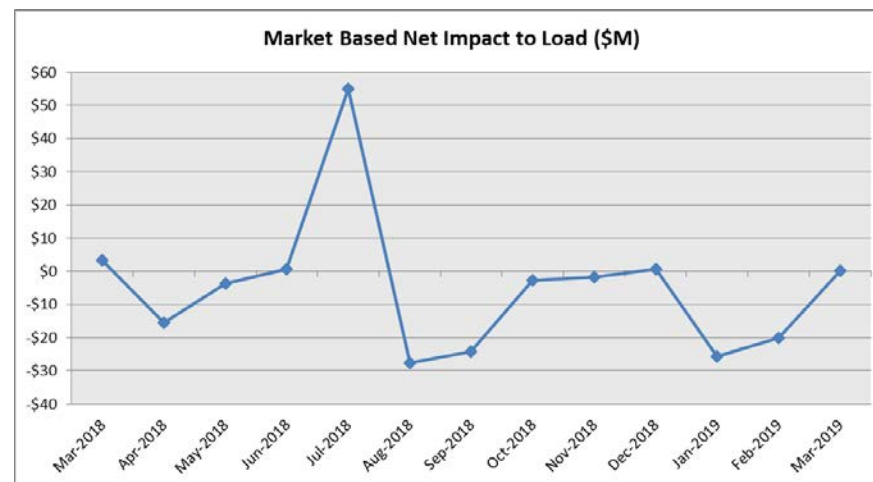


Net Allocation to Load – March 2019

| Market-Based Allocation | \$ in Millions |
|---------------------------------------|----------------|
| Reliability Unit Commitment | \$0.00 |
| Ancillary and Other Services | \$35.34 |
| Real-Time Ancillary Service Imbalance | \$0.23 |
| Emergency Energy | \$0.28 |
| Base Point Deviation | (\$0.25) |
| CRR Auction Revenue | (\$48.94) |
| CRR Balancing Account | \$0.00 |
| Real-Time Revenue Neutrality | \$13.46 |
| Reliability Must Run | \$0.00 |
| Monthly Block Load Transfer | \$0.00 |
| Total | \$0.13 |
| Fee Allocation | |
| ERCOT Administrative Fee | \$15.48 |
| Net Allocated to Load | \$15.60 |

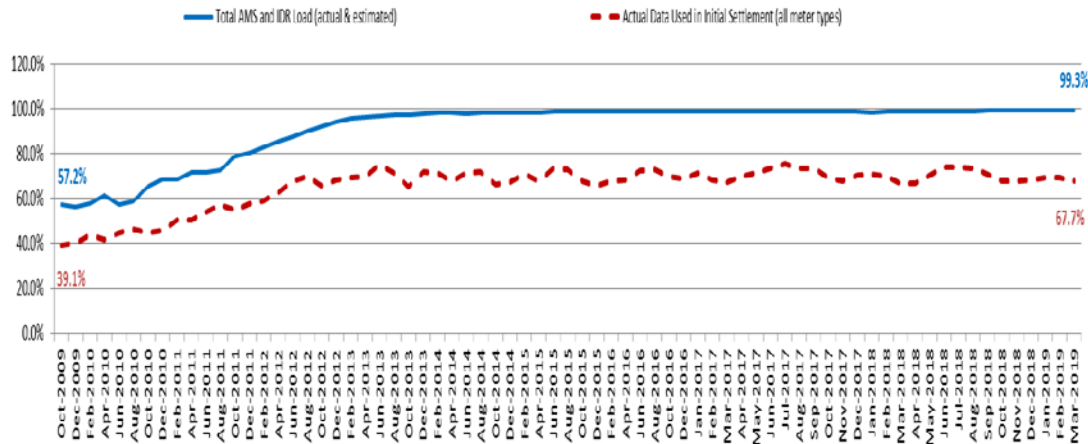
In March 2019, the Net Allocation to load was a charge of \$15.60M compared to:

- A credit of \$5.46M in February 2019
- A charge of \$18.00M in March 2018



Advanced Meter Settlement Impacts – March 2019

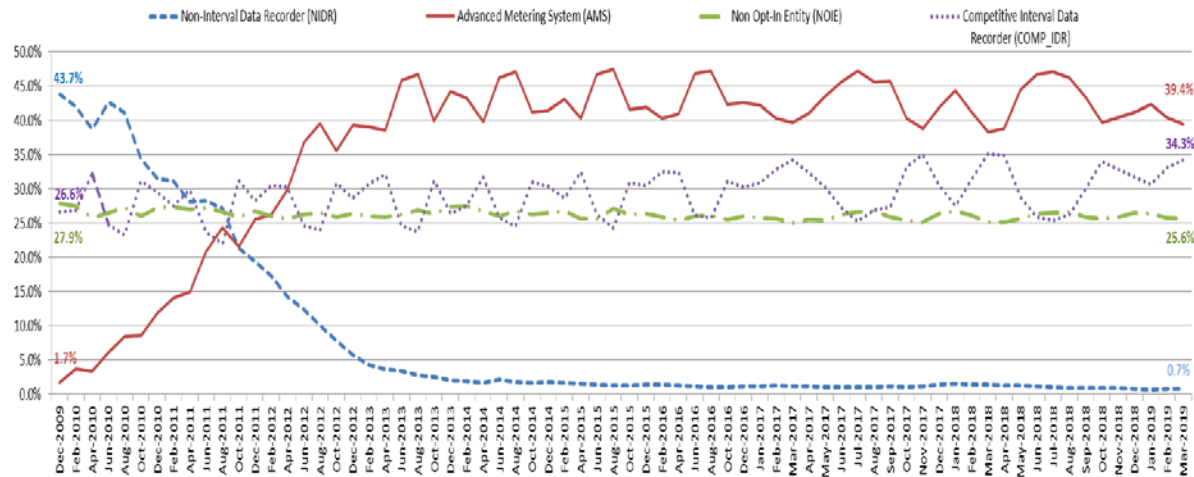
Percent Actual/Percent Interval Data Recorder (IDR)



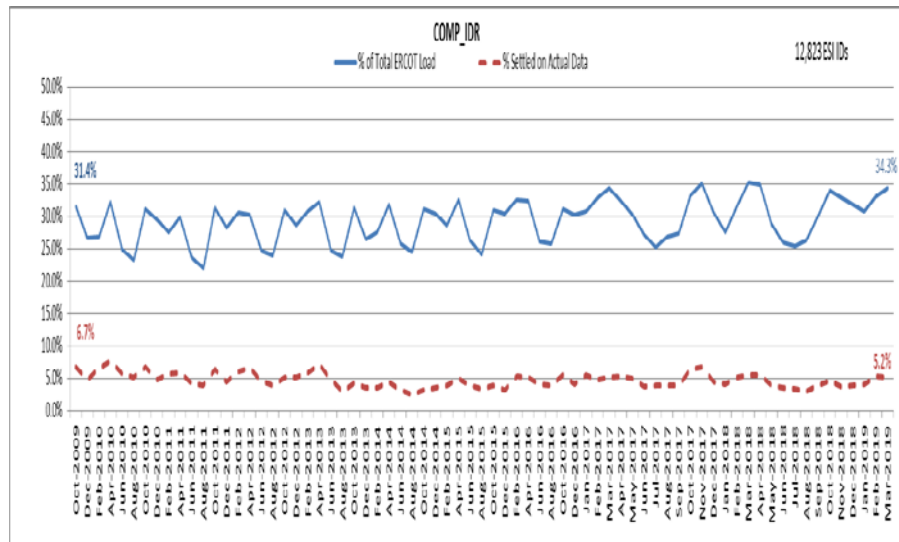
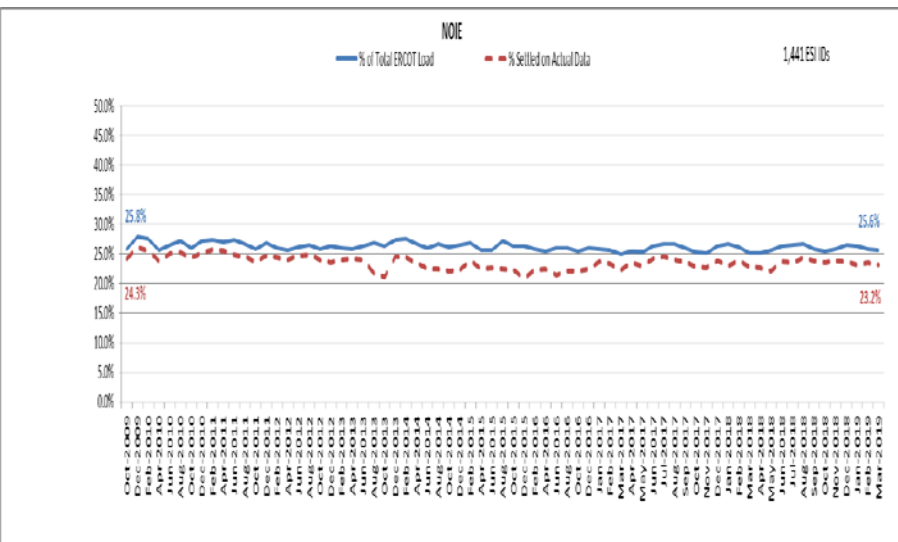
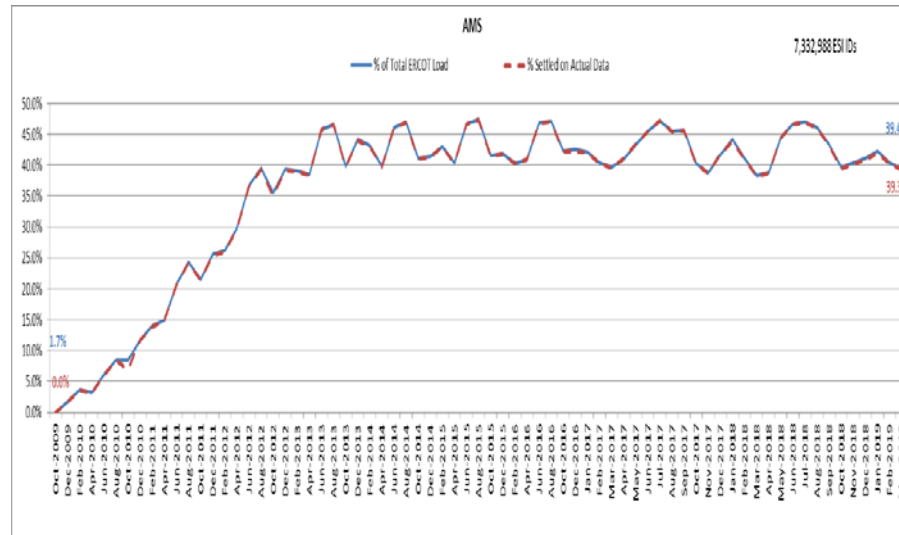
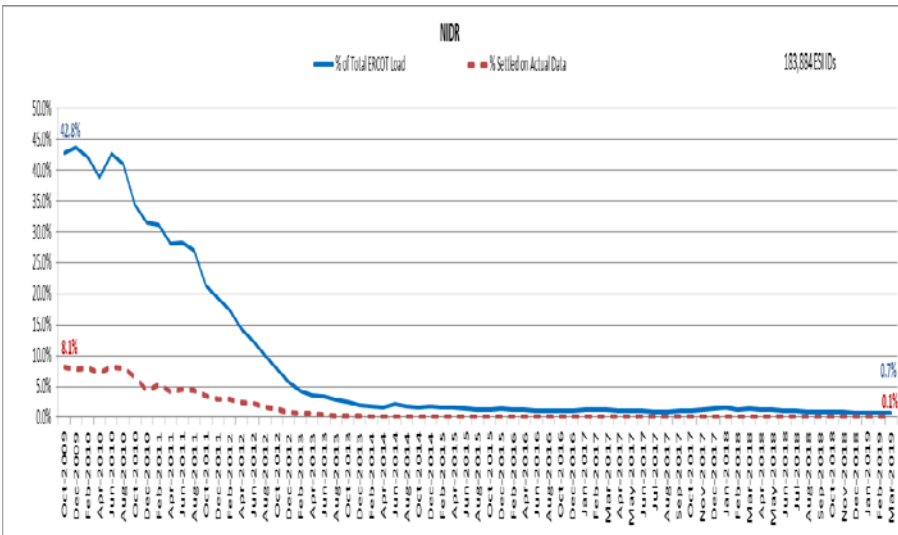
March 2019: At month end, settling 7.3M ESIIDs using Advanced Meter data.

March 2019: 99.3% 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 2019

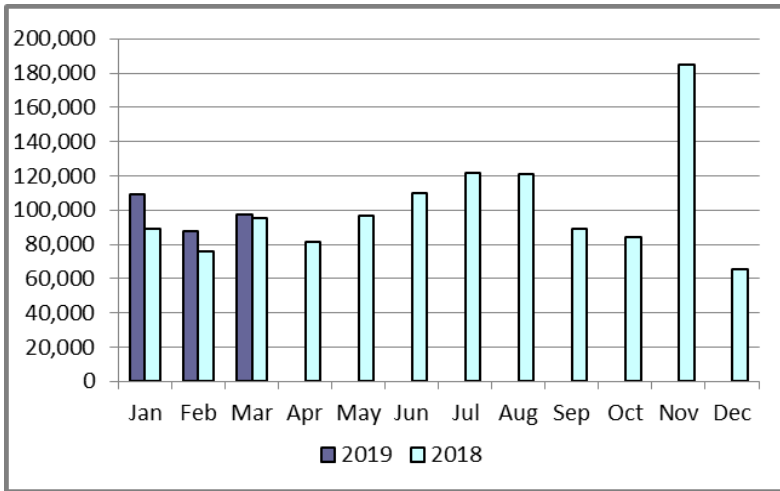


Retail Transaction Volumes – Summary – March 2019

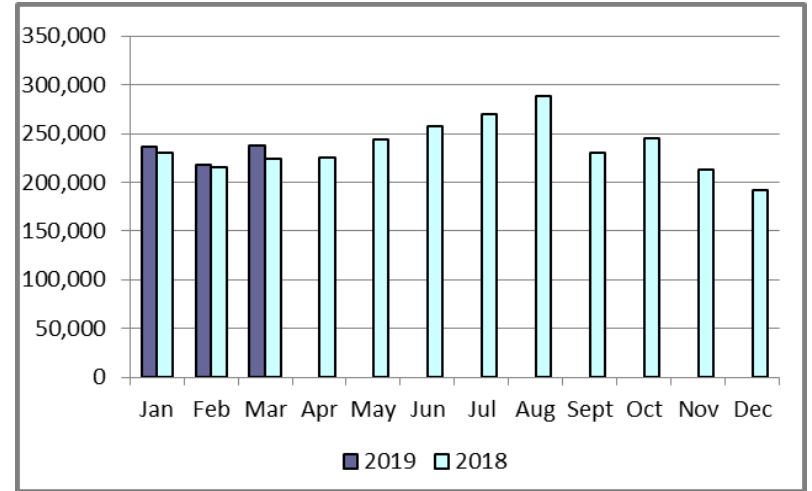
| Transaction Type | Year-To-Date | | Transactions Received | |
|-------------------------------------|------------------|------------------|-----------------------|----------------|
| | March 2019 | March 2018 | March 2019 | March 2018 |
| Switches | 294,062 | 260,211 | 97,148 | 95,159 |
| Acquisition | 0 | 0 | 0 | 0 |
| Move - Ins | 692,729 | 669,979 | 238,133 | 224,289 |
| Move - Outs | 311,800 | 320,701 | 106,464 | 108,753 |
| Continuous Service Agreements (CSA) | 400,476 | 139,047 | 57,211 | 46,720 |
| Mass Transitions | 0 | 0 | 0 | 0 |
| Total | 1,699,067 | 1,389,938 | 498,956 | 474,921 |
| | | | | |

Retail Transaction Volumes – Summary – March 2019

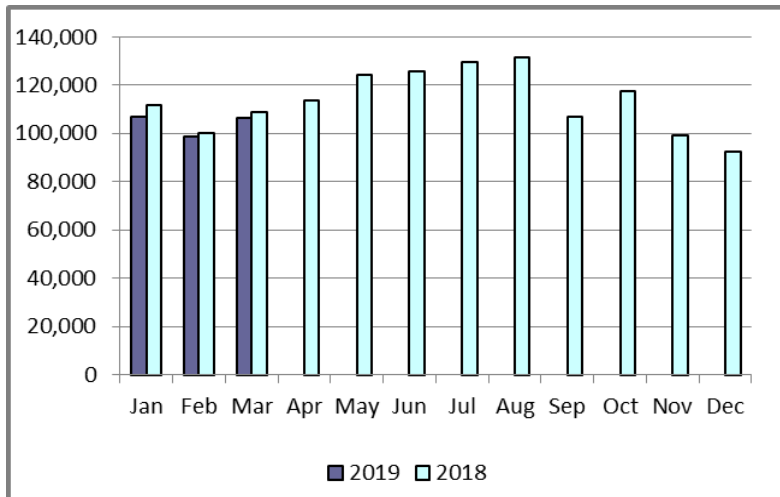
Switches/Acquisitions



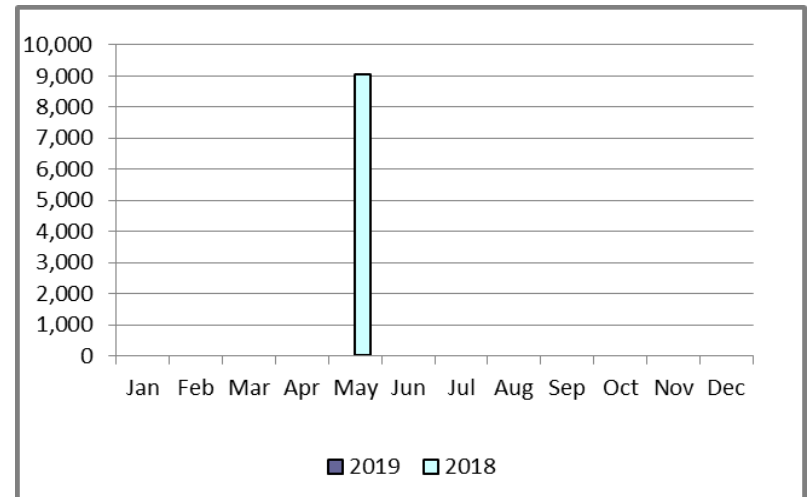
Move-Ins



Move-Outs



Mass Transition



Projects Report

ERCOT Portfolio Stoplight Report – March 2019

| Impact Metric Tolerances | 2019 Project Funding | \$20,400,000 | 2019 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 = 73) | | \$ 17,796,239 |
| | Projects Not Yet Started (Count = 12) | | \$ 1,811,632 |
| | Projects Completed (Count = 26) | | \$ 1,160,872 |
| | Spending Reductions Required to Maintain Capital Budget | | \$ (368,742) |
| | TOTAL | | \$ 20,400,000 |

| Project Number | Projects in Initiation Phase (Count = 4) |
|----------------|--|
| 308-01 | MIS Tech Refresh JBOSS and Linux |
| 306-01 | WAN Refresh |
| 307-01 | Tech Refresh - MMS/OS |
| 170-07 | ECAP - ECMS Implementation Phase 2 |

| 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 |

| Project Number | Projects in Planning Phase (Count = 10) | Phase Start | Baseline Phase Finish | Approved Phase Finish | Scheduled Go-Live Date | Scheduled Phase Finish | Schedule Health | | Budget Health | |
|----------------|--|-------------|-----------------------|-----------------------|------------------------|------------------------|-----------------|----|---------------|-----|
| 134-02 | Privileged Account Management (PAM) Phase 2 | 8/8/2018 | 12/19/2018 | 8/20/2019 | TBD | 8/20/2019 | Green | 0% | Green | 1% |
| DC4 | DC4 Program Control | 9/9/2015 | 6/23/2017 | 4/23/2019 | TBD | 4/23/2019 | Green | 0% | Green | -3% |
| DC4 | DC4 Vendor HW Refresh | 11/28/2018 | 4/23/2019 | 4/23/2019 | TBD | 4/23/2019 | Green | 0% | Green | 42% |
| 286-01 | Java Platform Assessment | 6/20/2018 | 11/21/2018 | 5/7/2019 | TBD | 5/7/2019 | Green | 0% | Yellow | -8% |
| 288-00 | Retail Portfolio Refresh (RPR) Program Control | 9/5/2018 | 3/27/2019 | 9/24/2019 | TBD | 9/24/2019 | Green | 0% | Green | 4% |
| 288-01 | EDI Map and Translator Replacement | 8/29/2018 | 2/27/2019 | 4/9/2019 | TBD | 4/9/2019 | Green | 0% | Green | 0% |
| 292-01 | Additional Branch Limit for Relays | 3/12/2019 | 4/23/2019 | 4/23/2019 | TBD | 4/23/2019 | Green | 0% | Green | -2% |
| 295-00 | Forward Looking Operations Tools (FLOAT) Program Control | 10/17/2018 | 4/17/2019 | 4/17/2019 | TBD | 4/17/2019 | Green | 0% | Green | 92% |
| NPRR873 | Posting of the ERCOT Wide Intra-Hour Wind Power and Load Forecast on the MIS Public | 3/12/2019 | 4/16/2019 | 4/16/2019 | TBD | 4/16/2019 | Green | 0% | Green | 5% |
| SCR796 | Change Validation Rules to Preclude Certain Transactions at Resource Nodes within Private Use Networks | 3/5/2019 | 4/30/2019 | 4/30/2019 | TBD | 4/30/2019 | Green | 0% | Green | 16% |



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| Project Number | Projects in Execution Phase (Count = 32) | Phase Start | Baseline Go-Live Date | Approved Go-Live Date | Scheduled Go-Live Date | Scheduled Phase Finish | Schedule Health | | Budget Health | |
|----------------|--|-------------|-----------------------|-----------------------|------------------------|------------------------|-----------------|------|---------------|-----------------------------------|
| DC4 | DC4 Telecom - Corp Voice System | | | | | | | | | 21% |
| DC4 | DC4 Telecom - Corp Voice System Stage 2 | 11/14/2018 | 11/20/2019 | 11/20/2019 | 11/20/2019 | 11/20/2019 | | 0% | | See DC4 Telecom Corp Voice System |
| DC4 | DC4 MV90 Communication Hardware Refresh | 7/18/2018 | 5/22/2019 | 8/23/2019 | 8/23/2019 | 9/10/2019 | | 0% | | 0% |
| 170-01 | Enterprise Content Alignment Program | 8/26/2015 | 11/15/2017 | 3/27/2019 | 4/30/2019 | 4/30/2019 | | -2% | | 0% |
| 170-06 | ECAP - ECMS Implementation Phase 1 | 4/25/2018 | 11/30/2018 | 3/28/2019 | 4/30/2019 | 4/30/2019 | 1 | -9% | | -2% |
| 173-02 | ERCOT Flight Certification Website | 11/15/2017 | 2/28/2019 | 6/4/2019 | 6/4/2019 | 7/31/2019 | | 0% | | -1% |
| 183-01 | CMM Tech Refresh | 3/15/2017 | 5/19/2018 | 6/15/2019 | 6/15/2019 | 9/30/2019 | | 0% | NA | See 2015 CMM NPRRs |
| GridGeo | Weather Imaging and Line Observation (WILO) | 5/30/2018 | 2/1/2019 | 4/5/2019 | 4/5/2019 | 5/28/2019 | | 0% | | -3% |
| GridGeo | Study Network (STNET) Integration | 11/28/2018 | 8/28/2019 | 8/28/2019 | 8/28/2019 | 9/25/2019 | | 0% | | 3% |
| 228-01 | Enterprise Database Upgrade | 8/8/2018 | 1/29/2020 | 5/26/2020 | 5/26/2020 | 5/26/2020 | | 0% | | 4% |
| 238-01 | Application Authentication Tech Refresh | 9/6/2017 | 3/19/2018 | 5/31/2019 | 5/31/2019 | 7/30/2019 | | 0% | | 7% |
| 239-01 | Identity and Access Management | 5/9/2018 | 12/15/2018 | 6/19/2019 | 6/19/2019 | 7/30/2019 | | 0% | | -2% |
| 244-01 | Corporate Wireless | 11/29/2017 | 3/28/2018 | 4/2/2019 | 5/17/2019 | 5/23/2019 | 1 | -9% | | 13% |
| 245-01 | 2017 EPS Metering Enhancements | 6/27/2018 | 8/9/2019 | 12/12/2019 | 12/12/2019 | 1/14/2020 | | 0% | | 0% |
| FLOAT | Security Constrained Optimal Powerflow in Study Network Analysis | 12/6/2017 | 10/25/2018 | 2/7/2019 | 5/30/2019 | 6/12/2019 | 1 | -26% | | 12% |
| 263-01 | Market Simulator | 4/11/2018 | 12/13/2018 | 6/21/2019 | 6/21/2019 | 7/30/2019 | | 0% | | 5% |
| 293-01 | Governance, Risk and Compliance (GRC) Replacement Tool | 2/6/2019 | 6/4/2019 | 6/4/2019 | 6/4/2019 | 8/27/2019 | | 0% | | 19% |
| Various | 2015 CMM NPRRs | | | | | | | | | 1% |
| NPRR519 | Exemption of ERS-Only QSEs from Collateral and Capitalization Requirements | 3/15/2017 | 5/19/2018 | 6/15/2019 | 6/15/2019 | 9/30/2019 | | 0% | | See 2015 CMM NPRRs |
| NPRR620 | Collateral Requirements for Counter-Parties with No Load or Generation | 3/15/2017 | 5/19/2018 | 6/15/2019 | 6/15/2019 | 9/30/2019 | | 0% | NA | See 2015 CMM NPRRs |
| NPRR660 | Remove CRR State Change Adder | 3/15/2017 | 5/19/2018 | 6/15/2019 | 6/15/2019 | 9/30/2019 | | 0% | NA | See 2015 CMM NPRRs |
| NPRR741 | Clarifications to TPE and EAL Credit Exposure Calculations | 3/15/2017 | 5/19/2018 | 6/15/2019 | 6/15/2019 | 9/30/2019 | | 0% | NA | See 2015 CMM NPRRs |
| NPRR749 | Option Cost for Outstanding CRRs | 8/8/2018 | 12/13/2018 | 2/7/2019 | 4/4/2019 | 4/23/2019 | 2 | -30% | NA | See NPRR833 |
| NPRR755 | Data Agent-Only QSE Registration | 3/15/2017 | 5/19/2018 | 6/15/2019 | 6/15/2019 | 9/30/2019 | | 0% | NA | See 2015 CMM NPRRs |
| NPRR821 | Elimination of the CRR Deration Process | 12/5/2018 | 4/4/2019 | 4/4/2019 | 4/4/2019 | 5/7/2019 | | 0% | | 15% |
| NPRR833 | Modify PTP Obligation Bid Clearing Change | 8/8/2018 | 12/13/2018 | 5/6/2019 | 5/6/2019 | 5/21/2019 | | 0% | | 1% |



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| Project Number | Projects in Execution Phase (Count = 32) | Phase Start | Baseline Go-Live Date | Approved Go-Live Date | Scheduled Go-Live Date | Scheduled Phase Finish | Schedule Health | | Budget Health | |
|----------------|---|-----------------------|-------------------------|-------------------------|------------------------|----------------------------------|-----------------|-----|---------------|--------------------|
| NPRR847 | Exceptional Fuel Cost Included in the Mitigated Offer Cap | 1/15/2019 | 4/4/2019 | 4/4/2019 | 4/4/2019 | 5/1/2019 | | 0% | | See NPRR817 |
| NPRR865 | Publish RTM Shift Factors for Hubs, Load Zones, and DC Ties | 2/6/2019 | 4/6/2019 | 4/6/2019 | 4/6/2019 | 4/23/2019 | | 0% | | 62% |
| NPRR880 | Publish Real-Time Market Shift Factors for Private Use Network Settlement Points | 2/6/2019 | 4/6/2019 | 4/6/2019 | 4/6/2019 | 4/23/2019 | | 0% | | See NPRR865 |
| NPRR901 | Switchable Generation Resource Status Code | 2/19/2019 | 5/30/2019 | 5/30/2019 | 5/30/2019 | 6/25/2019 | | 0% | | 1% |
| NPRR910 | Clarify Treatment of RUC Resource that has a Day-Ahead Market Three-Part Supply Award | 2/19/2019 | 5/30/2019 | 5/30/2019 | 5/30/2019 | 6/25/2019 | | 0% | | See NPRR901 |
| SCR781 | RARF Replacement | 3/26/2019 | 11/22/2019 | 11/22/2019 | 11/22/2019 | 10/6/2020 | | 0% | | 2% |
| | | | | | | | | | | |
| Project Number | Expedited Projects in Execution (Count = 12) | | | | | | | | | |
| | | | | | | | | | | |
| Project Number | Projects in Stabilization (Count = 10) | Execution Phase Start | Baseline Go-Live Target | Approved Go-Live Target | Actual Go-Live Date | Scheduled Execution Phase Finish | Schedule Health | | Budget Health | |
| NPRR648 | Remove References to Flowgate Rights | 3/15/2017 | 5/19/2018 | 5/19/2018 | 2/6/2018 | 9/30/2019 | | 23% | NA | See 2015 CMM NPRRs |
| NPRR683 | Revision to Available Credit Limit Calculation | 3/15/2017 | 5/19/2018 | 5/19/2018 | 2/6/2018 | 9/30/2019 | | 23% | 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 | 2/6/2018 | 9/30/2019 | | 23% | NA | See 2015 CMM NPRRs |
| NPRR760 | Calculation of Exposure Variables For Days With No Activity | 3/15/2017 | 5/19/2018 | 5/19/2018 | 2/6/2018 | 9/30/2019 | | 23% | NA | See 2015 CMM NPRRs |
| NPRR800 | Revisions to Credit Exposure Calculations to Use Electricity Futures Market Prices | 3/15/2017 | 5/19/2018 | 5/19/2018 | 2/6/2018 | 9/30/2019 | | 23% | NA | See 2015 CMM NPRRs |
| NPRR817 | Create a Panhandle Hub | 1/15/2019 | 4/4/2019 | 4/4/2019 | 4/4/2019 | 5/1/2019 | | 0% | | 4% |
| NPRR845 | RMR Process and Agreement Revisions | 12/19/2018 | 4/4/2019 | 4/4/2019 | 4/4/2019 | 5/7/2019 | | 0% | | 2% |
| 193-01 | PMU Tool Evaluation and Implementation | 12/13/2017 | 8/9/2018 | 8/5/2018 | 8/5/2018 | 9/3/2019 | | 0% | | 3% |
| 229-01 | IT Change and Configuration Management Phase 2 | 8/2/2017 | 6/19/2018 | 2/8/2019 | 12/16/2018 | 6/4/2019 | | 9% | | 0% |
| 266-01 | Remote Email Access Enhancement | 12/13/2017 | 3/7/2018 | 6/6/2018 | 6/19/2018 | 4/16/2019 | 2 | -7% | | 36% |

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| 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 | |
|----------------|--|--------------------------------|-------------------------|-------------------------|------------------------|-------------------------------|-----------------|-----|---------------|-------------------------------------|
| SCR789 | Update NMMS Topology Processor to PSSE 34 Capability | | | | | | | | | 0% |
| 246-01 | iTest Data Refresh | | | | | | | | | 0% |
| 269-01 | Document Repository Redesign and Governance Implementation - Phase 1 | | | | | | | | | 0% |
| FLOAT | Security Constrained Unit Commitment (SCUC) | | | | | | | | | 0% |
| 291-01 | IT Asset Recovery | | | | | | | | | 0% |
| 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 | |
| DC4 | DC4 Telecom - Control Room and Grid Ops | 8/30/2017 | 3/18/2018 | 12/13/2018 | 12/13/2018 | 1/15/2019 | | 0% | | 18% |
| DC4 | DC4 Network - Command and Control Stage 1 | 8/30/2017 | 3/18/2018 | 12/13/2018 | 12/13/2018 | 1/15/2019 | | 0% | | |
| DC4 | DC4 Telecom - Data Center Connectivity | 2/7/2018 | 8/15/2018 | 11/16/2018 | 10/30/2018 | 2/5/2019 | | 6% | | 0% |
| DC4 | DC4 Network - Command and Control | | | | | | | | | 2% |
| DC4 | DC4 Network - Command and Control Stage 3 | 11/29/2017 | 11/28/2018 | 2/28/2019 | 2/28/2019 | 3/19/2019 | | 0% | | See DC4 Network Command and Control |
| 181-01 | CRR Framework Upgrade | 10/26/2016 | 10/2/2017 | 11/19/2018 | 11/19/2018 | 2/26/2019 | | 0% | | 2% |
| 196-01 | GINR Project Status Application Replacement | 12/21/2016 | 9/14/2017 | 2/28/2019 | 3/31/2019 | 4/2/2019 | | -3% | | 0% |
| GridGeo | GridGeo MMAP Assessment | 10/17/2018 | 2/27/2019 | 2/27/2019 | TBD | 3/5/2019 | | 0% | | 0% |
| 210-01 | REC Technology Refresh | 8/30/2017 | 3/18/2018 | 12/13/2018 | 12/13/2018 | 1/15/2019 | | 0% | | 2% |
| 243-01 | Training Facility | 12/6/2017 | 12/12/2018 | 12/12/2018 | 11/6/2018 | 2/26/2019 | | 9% | | 0% |
| 261-01 | Generic Transmission Constraint Calculation | 3/7/2018 | 12/13/2018 | 12/13/2018 | 12/13/2018 | 1/23/2019 | | 0% | | 20% |
| 265-01 | Real-Time Assessment Continuity | 1/31/2018 | 12/13/2018 | 2/8/2019 | 2/8/2019 | 3/19/2019 | | 0% | 2 | -7% |
| 279-01 | Cyber Security Project #24 | 6/27/2018 | 10/26/2018 | 11/30/2018 | 11/30/2018 | 3/5/2019 | | 0% | | 6% |
| 280-01 | Quest Software Portfolio Transition | 4/4/2018 | 6/27/2018 | 11/7/2018 | 11/14/2018 | 11/14/2018 | | -3% | | 0% |
| 282-01 | Synchronous Condenser Outage Modeling | 6/6/2018 | 10/25/2018 | 10/25/2018 | 10/25/2018 | 3/5/2019 | | 0% | | 3% |
| NPRR842 | Study Area Load Information | 10/17/2018 | 2/8/2019 | 2/8/2019 | 2/8/2019 | 3/12/2019 | | 0% | 2 | -10% |
| NPRR843 | Short-Term System Adequacy and AS Offer Disclosure Reports Additions | 7/18/2018 | 10/25/2018 | 12/13/2018 | 12/13/2018 | 1/15/2019 | | 0% | | 0% |
| SCR777 | Bilateral CRR Interface Enhancement | 10/26/2016 | 10/2/2017 | 11/19/2018 | 11/19/2018 | 2/26/2019 | | 0% | NA | See #181-01 |
| SCR795 | Addition of Intra-Hour Wind Forecast to GTBD Calculation | 8/8/2018 | 10/25/2018 | 10/25/2018 | 10/25/2018 | 12/19/2018 | | 0% | 2 | -26% |
| Project Number | Expedited Projects Completed (Count = 7) | | | | | | | | | |



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| Project Number | 2019 Projects Not Yet Started (Count = 12) | Forecast Start Date |
|----------------|--|---------------------|
| NPRR863 | Creation of ERCOT Contingency Reserve Service and Revisions to Responsive Reserve | May-2019 |
| NPRR887 | Monthly Posting of Default Uplift Exposure Information | May-2019 |
| NPRR895 | Inclusion of Photo-Voltaic Generation Resources (PVGRs) in Real-Time Ancillary Service Imbalance Payment or Charge | Jun-2019 |
| OBDRR007 | Revisions to the ORDC Methodology to Include Photo-Voltaic Generation Resources (PVGRs) | Jun-2019 |
| NPRR911 | Improved Calculation of Real-Time LMPs at Logical Resource Nodes for On-Line Combined Cycle Generation Resources | Jun-2019 |
| NPRR920 | Change to Ramp Rate Calculation in Resource Limit Calculator | Jun-2019 |
| TBD | Tech Refresh - Business Intelligence | Jul-2019 |
| NPRR877 | Use of Actual Interval Data for IDR ESI IDs for Initial Settlement - Phase 2 | Jul-2019 |
| TBD | Automation of MP Partnership Deletions, Mothballed Status & Seasonal Operation Period, and other Siebel fields | Jul-2019 |
| TBD | Implement ILM in ISM for Nodal TIBCO Instance | Jul-2019 |
| NPRR856 | Treatment of OFFQS Status in Day-Ahead Make Whole and RUC Settlements | Aug-2019 |
| TBD | Tech Refresh - REC Rewrite | Aug-2019 |