

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

2017 Long-Term Reliability Assessment

DRAFT





Texas RE-ERCOT

The Electric Reliability Council of Texas (ERCOT) is the ISO for the ERCOT Interconnection and is located entirely in the state of Texas; it operates as a single Balancing Authority. ERCOT is a summer-peaking Region that covers approximately 200,000 square miles, connects 40,530 miles of transmission lines, and 566 generation units, and serves 23 million customers. The Texas Reliability Entity (Texas RE) is responsible for the RE functions described in the *Energy Policy Act of 2005* for the ERCOT Region.

Highlights

- Based on a peak load forecast of 71,012 MW for 2018 and 1.4% average annual growth rate thereafter, the TRE-ERCOT Region is expected to have sufficient capacity planning reserves based on a 13.75% Reference Reserve Margin.
- The TRE-ERCOT Region plans to add or upgrade almost 3,600 MW of 138-kV and 345-kV transmission circuits during the LTRA forecast horizon.
- To address the increasing share of wind and solar generation, ERCOT established a new control room renewable reliability risk desk focused on reducing wind and solar forecast errors, and improving monitoring and real-time analysis of net load ramps, low inertia conditions and variable Ancillary Service needs.

Planning Reserve Margins: The Anticipated Reserve Margin falls below the Reference Margin Level by the summer of 2024. Project developers typically submit interconnection requests to ERCOT no more than three to four years before the facility is expected to enter commercial operations. As a result, the Texas RE-ERCOT Region will always show a flat level of capacity additions and typically declining reserve margins starting four to five years into the LTRA forecast period. This is not indicative of a future resource adequacy problem, but rather that ERCOT does not receive resource planning information from project developers sufficient to develop a long term resource expansion forecast.

Demand: ERCOT's current peak load forecast (developed in fall 2016), is higher than the 2016 LTRA forecast, primarily due to a projected increase in economic growth driven oil and gas exploration, a Gulf Coast petrochemical plant expansion, and overall stronger employment outlook over the forecast horizon. Demand growth in the Coastal zone is significantly above ERCOT's average growth, due to the expected addition of LNG plant and petrochemical industry loads over the next five years. The forecast also shows continued strong load growth in the South and Far West weather zones, primarily due to oil and gas production. The Coastal and Far West annual average peak demand growth rates are forecasted to grow at 2% and 2.1%, respectively from 2017-2022.

Demand-Side Management: The DSM forecasted for 2018 comes from dispatchable resources in the form of Non-Controllable Load Resources providing Responsive Reserve Service¹ (1,191 MW), Emergency Response Service (1,743 MW), and load management programs administered by Transmission/Distribution Service Providers (203 MW).² ERCOT also assumes that these DSM amounts remain constant thereafter. ERCOT develops its own energy efficiency forecast using annual reports of verified incremental peak load energy efficiency impacts from the Public Utility Commission of Texas and Texas State Energy Conservation Office.³

Distributed Energy Resources: Installed solar DER capacity forecasted for the five-year horizon (ending 2022) is 322 MW. Based on current capacity growth and market trends, ERCOT believes that DER does not pose near-term reliability issues for the grid. Nevertheless, it intends to prepare for a future scenario in which a larger share of the regional generation mix may come from the distribution system. Recommended actions involve mapping all existing registered DERs (>1 MW) to the Common Information Model (CIM) at their load points. Once in the model, the DG locations will be known to ERCOT operators, improving situational awareness, and allow for incorporating into power flow, state estimator, and load forecast programs. The schedule for this DER mapping project has not been determined, however, ERCOT and Texas RE have met to review DER-related challenges and propose actions to verify these resources meet requirements for maintaining system reliability.

Generation: There are a number of challenges that ERCOT is addressing with respect to increasing amounts of wind and solar generation on the ERCOT grid. In particular, improved accuracy of wind/solar forecasting and dynamic consideration of the reliability risks that wind and solar introduce is becoming more

¹ This value reflects a 95% confidence level based on historical data for the hours 1500 through 1800 during the months of June through September over the last three years. The hourly participation is capped at 50% of the system-wide obligation for Responsive Reserve Service where the system-wide obligation can range from 2,300 to 2,800 MW.

² Includes a 2 percent gross-up adjustment for avoided transmission line losses.

³ Verified impacts are derived through an Evaluation, Measurement & Verification (EM&V) framework approved by the PUCT. The statutory EM&V framework is outlined in the Commission's Substantive Rule 25.181, available at <https://www.puc.texas.gov/agency/ruleslaws/subrules/electric/25.181/25.181.pdf>, subsection (q). The verified savings are estimated by a third-party contractor selected by the PUCT. Information on the EM&V program, including the associated Technical Reference Manual, is available at <http://www.texasefficiency.com/index.php/emv>. Growth trends in the annual verified MW amounts are used to develop the forecast. A 2017 change to the forecast methodology is to incorporate energy efficiency estimates from municipal and cooperative utilities reported to the Texas State Energy Conservation Office. This resulted in a significantly higher energy efficiency impact level for the 2017 LTRA.

important. To address these challenges, ERCOT completed implementation of its new control room renewable reliability risk desk, which went live in January 2017. This reliability risk desk is focused on reducing wind and solar forecast errors, and improving monitoring and real-time analysis of net load ramps, low inertia conditions and variable Ancillary Service needs. ERCOT continues to develop new software tools and data collection systems to support these risk mitigation objectives. In addition to implementing the new risk desk and supporting tools and procedures, ERCOT is working with wind facility owners to address wind forecasting problems caused by icing and extreme cold weather. Better communications (telemetry updates and control room notifications) regarding icing and extreme weather events are being fostered.

There have been four unit retirements since the release of the 2016 LTRA, totaling 128 nameplate MW. Three of the units were old gas-fired steam turbine units at the same plant (Pearsall Plant), while the fourth was a biomass (wood waste) unit whose operations were no longer deemed economic by the unit's owner.⁴ ERCOT developed an environmental regulation scenario to support development of ERCOT's 2016 Regional Transmission Plan (RTP). Assumptions about generation retirements were developed based on the requirements of the Texas Regional Haze Federal Implementation Plan (FIP) and other pending environmental regulations, resulting in approximately 6 GW of generation retirements by 2021. The study results indicated the retirement of the resources would have significant impacts on the ERCOT grid, resulting in exceedances of thermal limitations primarily on the transmission system serving the load in the Dallas-Fort Worth area. A significant amount of transmission system improvements would likely be required to ensure transmission system reliability criteria are met even if a moderate amount of new resources assumed for the study were to be displaced around the region. The actual extent and timing of any coal unit retirements remains uncertain at this time.

There are currently six units that are in mothball status with a total summer-rated capacity of 1,098 MW. None of these currently mothballed units are expected to return to active status during the assessment period.

Capacity Transfers: Due to the small impact of DC tie imports to the TRE-ERCOT Assessment Area, there are no severe scenarios investigated for ERCOT's transmission planning studies.

Transmission: The recently updated ERCOT future transmission projects list includes the additions or upgrades of 3,580 miles of 138-kV and 345-kV transmission circuits, 23,904 MVA of 345/138-kV autotransformer capacity, and 3,706 MVar of reactive capability projects that are planned in the TRE-ERCOT Assessment Area between 2017 and 2025. Additional transmission projects in the ERCOT Assessment Area are summarized in the front section of this report.

⁴ When a unit owner decides to retire a generating unit, they must submit a Notice of Suspended Operations no less than 90 days prior to the planned retirement date. ERCOT has 60 days to complete a reliability impact study and make a final determination regarding whether the unit is required to support system reliability. Confirmed retirements comprise only those units for which ERCOT has determined that the unit is not needed to support system reliability.