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## **Item 4: Review of ERCOT's High-Level Policy Messages**

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# Communicating on reports and policy issues

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## Communication vehicles (vary depending on topic/need)

- News releases and fact sheets
- Contact with policymakers (regulatory, legislative – state/national)
- Media advisories/interviews
- Website updates, social media, etc. (includes written, recorded materials)
- Ongoing responses to public information/media inquiries

## Routine triggers for proactive external communications

- Resource adequacy reports (SARA/CDR)
- Major board actions (no longer routine news release)
- High-impact market reports/developments (e.g., Greenhouse gas updates)
- Other issues of widespread interest (e.g., new records)

# Maintaining Grid Security



A significant disturbance can occur on any electric grid. While no system is 100 percent invulnerable, industry members work continually to keep their systems and protection measures state-of-the-art to ensure that the state's electrical grid remains secure. ERCOT's job is to take appropriate steps to minimize the probability of a significant grid event and to be ready to respond if it does.

We comply with the federal cyber security and critical infrastructure protection standards enforced by the North American Electric Reliability Corporation (NERC), which require bulk power system users, owners and operators in the United States to identify cyber risks and vulnerabilities, establish controls to secure critical assets from physical and cyber sabotage, report security incidents, and establish plans for recovery in the event of an emergency.

ERCOT is prepared for grid emergencies regardless of cause, whether it's a weather event or some other physical or cyber event that might cause multiple failures of power plants or transmission lines.

Our system runs a real-time contingency analysis every five minutes, and normal operation is maintained within first-contingency limits. This helps prevent overloading a line if any piece of equipment fails. Our operators have authority to re-dispatch generation to keep within contingency limits, and can order load shedding, or reduced electric use, to prevent system overload that could potentially lead to cascading outages.

## Potential causes for grid disturbances

- Weather event
- Multiple generator, equipment failures or forced line outages
- Terrorism

## ERCOT is prepared for an emergency, regardless of cause

### Prevention and Mitigation

ERCOT performs real- and near-real-time operations and long-term planning to provide reliable electric service at the bulk power level, working with its market participants to:

- Maintain loading on transmission lines to safe levels.
- Maintain balance between load and generation.
- Maintain adequate reserves to provide for unexpected situations.
- Add sufficient infrastructure to meet the future needs of the grid.

### System Operations Tools

- Real-time contingency analysis runs every five minutes.
- Normal operation is maintained within first-contingency limits.
- Operators have authority to re-dispatch generation to keep within limits.
- Advisories, Watches and Alerts are used if unable to operate within first contingency.
- Operators have authority to order load shedding to prevent equipment damage or cascading outages.

## Emergency Procedures

ERCOT's emergency procedures are a progressive series of steps that allow the system operators to maintain the balance between load and generation during a capacity shortage by bringing on additional generation, and, if necessary, dropping firm load through temporary rotating outages.

- ERCOT will first bring on uncommitted generation and power from other grids.
- If the situation does not improve, operators will drop load resources — a market-based demand response program — and other resources under contract to be interrupted during an emergency, and ask the public to reduce electricity use.
- If necessary to maintain the security of the grid, ERCOT will ask utilities to reduce demand by dropping load through temporary, controlled outages — or rolling blackouts.

## Under-Frequency Firm-Load Shedding

If the emergency procedures are not successful at restoring frequency to 60 Hz, the final tool to balance the available generation and load to avoid a total system collapse or widespread blackout is under-frequency load shedding. Up to 25 percent of ERCOT's load would be shed automatically as the frequency dropped to certain levels:

- 5 percent dropped at 59.3 Hz
- 10 percent at 58.9 Hz
- 10 percent at 58.5 Hz

## Black-Start Procedures

In the event of a major system disturbance, ERCOT has “black-start” procedures in place and black-start units under contract to assist in restoring the system to a normal state as quickly as possible:

- These units must be able to start up on their own without support from the grid and then be able to pick up their own internal load. The units will be required to build a stable island with the ultimate goal of reaching synchronization points with other neighboring black-start islands. Their operators will contact ERCOT when the islands are ready to be synchronized, and ERCOT will coordinate frequency control.
- ERCOT's goal is to restore load and the active market as soon as possible.
- ERCOT contracts every two years for black-start units and holds an annual drill with the black-start unit providers to test the black-start procedures.

## Security Alert Plan

In response to homeland security issues, ERCOT has developed a Security Alert Plan. ERCOT communicates alert-level changes to the Security Response Group (Transmission Operators and Scheduling Entities).

Security alerts may be triggered by:

- Department of Homeland Security
- NERC (Electric Sector Information Sharing and Analysis Center)
- ERCOT

## Physical and Cyber Security

ERCOT complies with the federal cyber security and critical infrastructure protection standards enforced by the NERC, which require bulk power system users, owners and operators in the United States to identify risks and vulnerabilities, establish controls to secure critical assets from physical and cyber sabotage, report security incidents, and establish plans for recovery in the event of an emergency.

# Addressing Electric Reliability

## Risks in the Lower Rio Grande Valley



### The Valley reliability challenge

The Electric Reliability Council of Texas (ERCOT) is working closely with transmission providers in the lower Rio Grande Valley to address electric reliability concerns associated with growth in the region.

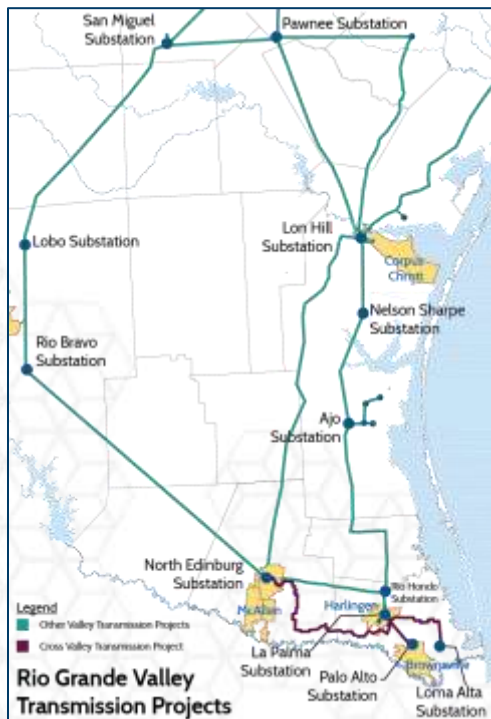
Because there is very limited electric generation and transmission infrastructure serving this area of South Texas, the Valley sometimes experiences a high risk of rotating outages, especially on extremely cold or hot days. These conditions can affect the Valley even when the remainder of the ERCOT grid remains in normal operations, particularly if generation units or transmission lines are out of service.

Two large electric transmission projects are scheduled for completion in 2016 to help address this issue, but more work will be needed to keep up with growing demand for electricity in the Valley. Meanwhile, ERCOT is keeping a close eye on the region to maintain reliability and protect the grid during extreme weather conditions or unexpected outages. Transmission providers also are coordinating with ERCOT to minimize reliability risks during construction of these projects.

### Providing electricity for a growing region

The peak demand for power in the Valley is more than 2,300 megawatts (MW) and is expected to grow to 2,600 MW by summer 2015 and more than 2,900 MW by 2020.

Currently, about 2,300 MW of electric generation capacity is available within the Valley region, including about 600 MW of wind power. Two high-voltage transmission lines provide 1,100-1,500 MW of transmission capacity to import additional power into the region, along with a 170 MW direct current tie that could send power to or from the electric grid in Mexico. Generation and transmission capacity totals assume all facilities are in service and operating safely. About 3,200 MW of additional generation is currently under study in the region, although only a fraction of that total likely will be built. Meanwhile, one company has announced plans to send about 500 MW of existing generation to Mexico in coming years.



About \$1 billion in transmission improvements are under way by Electric Transmission Texas and Sharyland Utilities to improve the electric grid that delivers power to the lower Rio Grande Valley region.

- The Lower Rio Grande Valley project will upgrade and increase capacity of facilities that import power into the Valley from the Corpus Christi area and will provide a new circuit into the Valley from the Laredo area.
- The Cross Valley project will provide a new circuit connecting facilities in Hidalgo County to the facilities at the Brownsville Ship Channel.

The ERCOT Regional Planning Group is evaluating the need for additional improvements and how quickly those improvements will be needed to keep up with growth in the region.

# Proposed Environmental Regulations and Future Electric Reliability



## Environmental regulations and electricity production

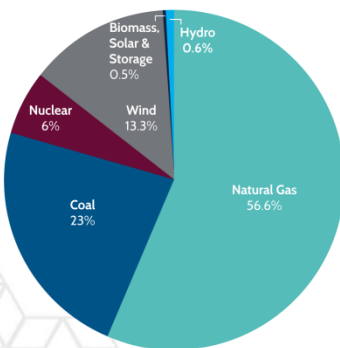
The Clean Power Plan currently under consideration by the U.S. Environmental Protection Agency is one of several pending environmental regulations that could affect how electricity is produced and consumed in the future. The Electric Reliability Council of Texas (ERCOT) is evaluating how proposed carbon regulations, along with other pending changes to air, water and waste regulations, may affect generation facilities in the ERCOT region. ERCOT and its members will monitor these developments closely to determine how future requirements could affect electric reliability — and what steps we need to take to prepare.

## Issues and concerns

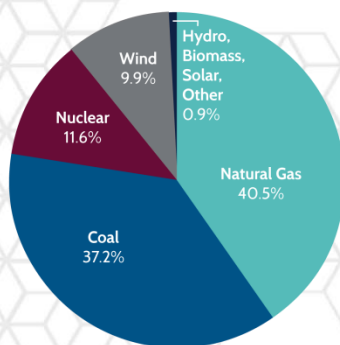
The proposed carbon emissions rules anticipate a multi-tiered “building block” approach to compliance that relies on energy efficiency on the user side, plant operational efficiency, market-based dispatch solutions, and increasing growth in renewable energy resources to achieve targets.

Within the ERCOT competitive market, Texas already does many of these things very well, so there likely are a limited number of stones left unturned using existing resources.

- The energy-only market drives generation providers to operate their plants efficiently.
- Texas continues to lead the nation in wind power generation. Current capacity is well ahead of the Renewable Portfolio Standard set by the Texas Legislature.
- ERCOT relies on a diverse fuel supply, although there are some opportunities for combined-cycle gas units to operate more frequently.



2014 Generation Capacity  
effective May 2014



Energy Use 2013\*  
\*Totals >100% due to rounding

The target reductions for Texas are higher than those for other states. Under the proposed plan, Texas would need to limit carbon dioxide emissions to 791 pounds per megawatt-hour by 2030. This is a 38 percent reduction from 2012 levels. Although the proposed carbon emissions rules allow for state-specific or multi-state regional plans, it is unclear at this point how this might work for Texas. Compliance will be complicated further by the fact that multiple energy markets operate within Texas.

The Clean Power Plan, in combination with other rules targeted at reducing air emissions from power plants, would affect coal-fired power plants most significantly, although it also could affect some natural gas-fired units. The portion of energy that currently comes from potentially affected generating units varies based on market conditions, natural gas prices and other factors, such as emissions limits. It is likely that the combination of anticipated air, water and waste regulations would make it very difficult, if not impossible, for some coal-fired units that currently operate in the ERCOT market to continue operating without significant investment in additional controls or changes to their operations.

ERCOT presentations for the Public Utility Commission of Texas Aug. 15 workshop are available here:

[www.ercot.com/content/news/presentations/2014/GHG\\_Combined\\_C.pdf](http://www.ercot.com/content/news/presentations/2014/GHG_Combined_C.pdf)

# Review of Frontera Facility

Addressing reliability needs for the ERCOT region



The Electric Reliability Council of Texas (ERCOT) has completed its evaluation of a plan to export power to Mexico from the Frontera Facility in the Lower Rio Grande Valley and has reached the following conclusions:

- ERCOT has identified increased concerns related to power supply sufficiency and transmission stability during the 2015-16 timeframe if it cannot rely on this capacity when other generation or transmission facilities serving that region are not available and power demand is high.
- In normal conditions, the system can operate effectively without this capacity.

## Background

The Frontera Facility, a 524-megawatt (MW) combined-cycle natural gas-fired power plant in Mission, Texas, was built in 1999-2000 to provide electricity to the ERCOT grid in the rapidly growing Lower Rio Grande Valley region near the U.S.-Mexico border. It is equipped to send power either to ERCOT or Mexico and has export authorization from the U.S. Department of Energy (DOE) as long as certain reliability and safety criteria are met.

Owners of the plant notified ERCOT in July 2014 of plans to send the power from this switchable generation resource to Mexico, beginning with a 170-MW portion of the plant's capacity in 2015 and increasing exports to 524 MW after ongoing transmission projects in the region are energized in 2016.

When generation or transmission facilities are forced out of service during high-demand periods, electricity supply sometimes cannot keep up with consumer demand in the Valley region. Two large transmission projects are under way to enable more electricity to flow into the region beginning in summer 2016. Considering the Valley's limited electric capacity, ERCOT conducted an analysis to evaluate the potential reliability impacts associated with sending this power to Mexico. *(For more information about reliability concerns in the Valley, [see this fact sheet.](#))*

## Study findings

The study identified potential concerns if this generation is not available to the ERCOT grid during emergency situations prior to the completion of ongoing transmission projects in the Lower Rio Grande Valley in 2016. ERCOT would continue to meet current North American Electric Reliability Corporation (NERC) reliability requirements but would not comply with new requirements that go into effect in 2016.

Without the Frontera Facility, there would be increased potential for rotating outages and transmission instability in some scenarios and reduced operational flexibility during construction of the new transmission facilities, which are critical to future reliability. View the [full assessment here](#).

## Next steps

ERCOT and the Frontera Facility's owners have agreed on the reliability safeguards needed to ensure the plant will be available if needed in an emergency and have filed those conditions with the DOE as part of the plant's export authorization. Meanwhile, some additional generation resources, which could help address the supply shortage in the Valley, are in various stages of development. The grid operator will continue to monitor the situation to determine whether additional steps are needed to protect future electric reliability in the Lower Rio Grande Valley and the entire ERCOT region.

**Link to filing with U.S. Department of Energy:**

[www.ercot.com/content/news/presentations/2014/ERCOT%20Frontera%20Letter.pdf](http://www.ercot.com/content/news/presentations/2014/ERCOT%20Frontera%20Letter.pdf)

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# Update on ERCOT's Load Forecasting Methodology



## About the ERCOT load forecast

Electric Reliability Council of Texas (ERCOT) load forecasts are key to understanding future electric generation requirements and planning for the necessary resources to serve those needs, especially during peak demand periods. ERCOT has one of the nation's most modern power grids, and its planners seek to use the best available data to better recognize the diversity that exists across the state and plan for future needs in each region.

In the past, ERCOT has used weather and economic indicators, such as non-farm employment, to forecast future electric demand. However, the relationship between economic growth and electric demand has changed in recent years. While peak demand growth has slowed to about 1 percent annually, the economic forecasts and non-farm employment statistics used in recent load forecasts have resulted in growth forecast estimates of 2 to 3 percent in the two- to three-year outlook.

This recent trend implies a less direct correlation between these economic indicators and electric demand than in the past. To address this decoupling, ERCOT staff has developed a new load forecasting model that uses forecasted growth rates in customer accounts, or premises, to project future growth trends in each region served by the ERCOT grid.

The new forecast model will better capture the relationship between premise counts and specific economic factors, such as number of households, population, housing stock and regional trends, as well as the variations in energy use among residential, business and industrial consumers. A neural network, which ERCOT will use for its new forecasts, offers the flexibility to apply new premise count variables over time as needed to reflect changing conditions that could affect future growth in electric demand.

## Independent review of the load forecast model

The ERCOT Board of Directors and stakeholder groups have reviewed the proposed changes. Additionally, an independent review by Itron, a global technology company, confirmed the proposed premise count approach and provided additional suggestions, which ERCOT has incorporated into its methodology.

As part of the ongoing review process, ERCOT released a preliminary forecast based on its proposed methodology. The resulting forecast anticipates that peak demand, measured in megawatts, will grow by about 1.3 percent a year in the next 10 years, compared to actual increases of about 1.1 percent in the past 10 years and projected growth rates as high as 2.5 percent in some previous forecasts.

ERCOT also uses load forecasts to plan for annual energy consumption, measured in megawatt-hours, in coming years. The new forecast anticipates annual energy use will grow by about 1.8 percent a year in the 10-year horizon, compared to actual growth rates of about 1.5 percent in the past 10 years and previously projected growth rates as high as 2.4 percent.

ERCOT also directed Itron to create model-based premise forecasts for residential, business and industrial classes to address different growth patterns among those consumer groups. Each of those forecasts will reflect the unique characteristics that affect each consumer type.

## Next steps

[Itron's report](#), [premise forecasts](#), and a [preliminary load forecast](#) are now available for review by stakeholders, and a working group will discuss the results on Jan. 27. ERCOT plans to incorporate the new load forecast in the next Capacity, Demand and Reserves (CDR) report. Depending on input from the ERCOT board and stakeholders, the report could be released by late February.

**Access Working Group information and documents here:**

[www.ercot.com/calendar/2014/01/20140127-CDRWorkshop](http://www.ercot.com/calendar/2014/01/20140127-CDRWorkshop)