Roadmap to Improving Grid Reliability

July 2021

ercot

July 13, 2021

Dear Governor Abbott, Texas Legislators and Public Utility Commission of Texas Commissioners:

On behalf of the Electric Reliability Council of Texas (ERCOT), I present this "Roadmap to Improving Grid Reliability," which details a variety of improvements to enhance the reliability and adequacy of the power grid.

In creating this Roadmap, recent legislation, such as Senate Bill 2 and Senate Bill 3, have provided us direction. We are working with the Public Utility Commission to implement Governor Abbott's directives[1] to ensure the continued reliability of the Texas electric grid. We also gathered ideas from many Texans including customers, city leaders, state leaders, current and former regulators, environmental advocates and market participants to help us identify important improvements.

The employees of ERCOT are committed to using this as a foundation – adding and adjusting as necessary to keep up with regulatory requirements and the needs of a fast-changing electric grid.

Our promise to you and the people of Texas:

- Cooperate and communicate thoughtfully and purposefully through multiple channels.
- Ensure reliability and restore trust and confidence in ERCOT.
- Evaluate technical processes within ERCOT and then innovate through dialog.

On behalf of all the employees at ERCOT, we want you to know we are putting more emphasis on listening and engaging with you, ERCOT customers and market partners. We will successfully implement this Roadmap and do our part to ensure that we continue to provide reliable electric service for all Texans.

Sincerely,

Brad Jones
Interim President & Chief Executive Officer
ERCOT

1 Letter from Governor Abbott to Public Utility of Texas Commissioners, July 6, 2021.
https://gov.texas.gov/uploads/files/press/SCAN_20210706130409.pdf
Letter from Brad Jones to Governor Abbott, July 8, 2021
http://www.ercot.com/content/wcm/lists/219694/Gov_Abbott_LTR_070821Final.pdf

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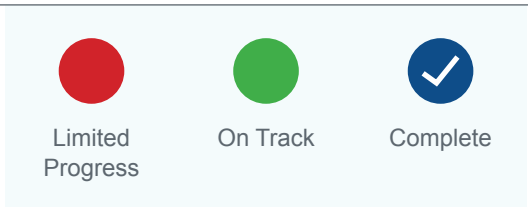

	Progress	Action
1	On Track	Work with the Public Utility Commission of Texas (PUC) to implement new laws passed in the 87th Legislative Session. These laws reform the governance of ERCOT and reorganize how the power grid is managed.
2	On Track	Complete the analysis of generation outages in February. This will inform future discussions with the PUC and lawmakers. A preliminary analysis is available at www.ercot.com/content/wcm/lists/226521/ERCOT_Winter_Storm_Generator_Outages_By_Cause_Updated_Report_4.27.21.pdf
3	Complete	Propose a new market rule requiring generators to report all forced outages and automatically release outage information if there is a grid event. This will allow ERCOT to more quickly communicate about grid conditions.
4	Complete	Propose a new market rule for generators to provide operational updates more frequently. This will improve situational awareness for grid operators.
5	On Track	Require all market participants who own or operate generation resources and/or transmission/distribution power lines to submit a letter signed by their CEO twice a year attesting that their companies have completed their weatherization preparations to protect the electric grid for the summer and winter respectively.
6	Complete	Adopt a more aggressive approach to operating the grid. This will impact outage approval, commitment of resources, conservation alerts and the communication of system risks as well as wholesale prices. ERCOT will work with the PUC to account for reliability impacts and make necessary adjustments to ensure proper price formation.
7	Complete	Revise market processes to continuously run planning assessments needed to bring resources back online in anticipation of tight grid conditions. This will allow grid operators to better coordinate generation outages.
8	Complete	Perform 30+ on-site power plant spot-checks to ensure they are following their weatherization plan in preparation for the hot Texas summer. We previously only performed these types of checks in advance of the winter season. ERCOT does not own or operate any power plants.

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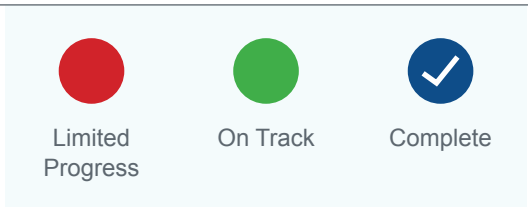

	Progress	Action
9	✓	Improve the assessment and communication of extreme low-probability, high-impact weather scenarios, including temperatures, durations, precipitation, humidity, and wind. Propose updated methodologies for the Seasonal Assessment of Resource Adequacy (SARA) for the ERCOT Region and other resource adequacy studies. This will improve public awareness about the potential high impacts of low-probability severe situations.
10	✓	Assign a senior staff member to staff the State Operations Center as needed. This will improve the working relationship with state agencies during major events.
11		Review energy delivery procedures for controlled outages in the event an energy emergency occurs. This will improve coordination and emergency response.
12		Improve government agency alignment through responsiveness to the PUC and a partnership with the Texas Division of Emergency Management, Railroad Commission of Texas Energy Reliability Council, and others, including exchange of ideas, improved communications, and training.
13	✓	Create a Texas Municipal Officers ERCOT Advisory Board that will increase dialogue and create communications channels with counties, cities and other political subdivisions such as water districts, for the benefit of Texas residents.
14	✓	Revise market protocols so that firm load shed (when utilities reduce power on the electric system) is accounted for in market scarcity pricing signals. This will align pricing with operational conditions.
15	✓	Revise market protocols to limit ancillary services prices to the System-Wide Offer Cap. This makes the ERCOT market more predictable and stable for market participants, creating a better market for customers.
16		Improve and expand toolsets to manage short-supply situations. This includes facilitating additional voluntary load reductions and procuring additional ancillary or reliability services from resources with unique capabilities to operate during extreme weather conditions.

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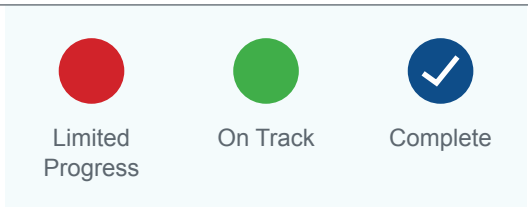

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17	✓	Establish a new Vice President of Corporate Strategy and PUC Relations role. This will ensure a strong working relationship with the PUC as we vigorously participate in their processes to improve ERCOT.
18	●	Initiate a process, both at ERCOT and the PUC, to address the Lower Rio Grande Valley transmission limitations, up to and including the construction of new transmission capacity. This will provide increased market access for resources in the Valley, improving reliability for customers during both normal conditions and high-risk winter events.
19	●	Eliminate barriers to distributed generation, energy storage, and demand response/ flexibility to allow more resources to participate in the ERCOT market while also maintaining adequate reliability.
20	●	Expand the Transmission Process to include items such as transmission over longer distances with low inertia, a technical term to describe complex transmission challenges.
21	✓	Add short-term solar forecasts into existing models as solar power expands in Texas. This will improve reliability and help lower costs.
22	✓	Launch an initiative to identify when ERCOT forecasts have high variability and consider whether additional reserves need to be procured during that period. This will help limit operational risks.
23	✓	Integrate the majority of Lubbock Power & Light customers into the Texas grid – the largest single transfer of customers in ERCOT's history. The new substations and transmission lines enabling this change also increase the available transmission capacity for generation resources in the Panhandle region.
24	●	Test large industrial customers who are paid to reduce their power during an emergency. These resources help preserve system reliability and it is important to test them to ensure performance.

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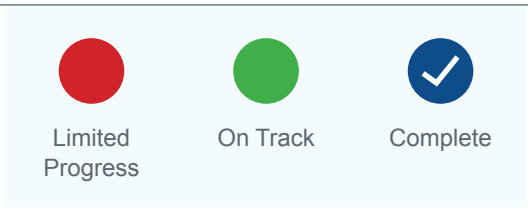
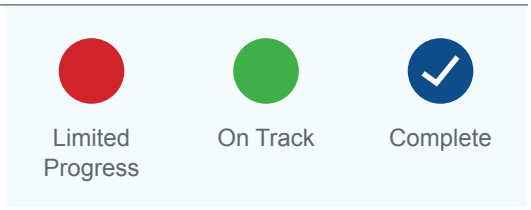


	Progress	Action
25	✓	Create new financial trend dashboards to more effectively monitor and report on items including collateral total potential exposure and excess collateral.
26		Perform unannounced testing to validate maximum sustained energy production from generators. This verifies information that generation owners have provided.
27		Review reliability of current and projected resource mix and evaluate market changes to incentivize sufficient dispatchable resources.
28		Biannually test end-to-end grid and market communications to verify energy emergency communications status flows from the control room to the public. This helps ensure the public will immediately know if an energy emergency occurs.
29	✓	Host virtual pre-summer communications meeting with PUC and market participants and distribute summer 2021 communications manual. This will help market participant communicators prepare for the hot summer months. Repeat process in advance of winter.
30	✓	Develop a long-term remote work policy focused on flexibility and employee choice for jobs that are not required to be onsite.
31	✓	Continue active participation in Real Time Operations Subcommittee (NERC) meeting with other grid operators. This helps ensure best practices are used.
32		Conduct a study of credit best practices to reduce the risk of future under collateralization while avoiding uneconomic barriers to entry.
33		Educate public and news media about energy emergencies and operational notices. Review and update existing communication practices around “conservation alerts’ to minimize false alarms and public fatigue. This will help ensure familiarity with grid operations.



	Progress	Action
34		Identify preferred channels of communication for each of ERCOT's audiences including government, market participants, and customers – including Spanish language communications. Re-write external communications materials to eliminate industry jargon. This will make ERCOT communications easier to understand and reach a broader audience.
35		Initiate a Listening & Education Tour to hear the perspectives of various communities and provide information about how the grid operates.
36		Ensure the Technical Advisory Committee is comprised of senior-level members from each member organization to promote timely decision-making.
37		Promote and endorse PUC actions to begin work on Black Start Plan improvements. While all the work of this plan is designed to prevent the need for a Black Start process, it is incumbent on responsible grid managers to invest appropriately to minimize the length of the process if it is ever needed. This will protect Texans and the Texas economy in the case of the one-in-a-million event.
38		Review and improve the employee retention plan.
39		Establish a procedure for DOE exemption requests, similar to the Texas Commission on Environmental Quality to avoid delay/uncertainty.
40		Meet with market participants to understand their objectives and priorities; develop an understanding of their pain points and areas for improvement from ERCOT that they believe will help alleviate those challenges.
41		Conduct technology platform reviews and best practices, both inside and outside the grid operations industry. ERCOT is refreshing technology and platforms for the majority of services for 2022-2027. This will improve reliability and operations.
42		Conduct regular review of cyber security plans and defenses to ensure continued electric reliability.

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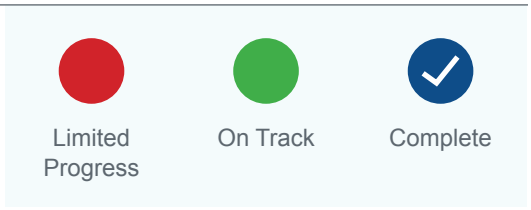
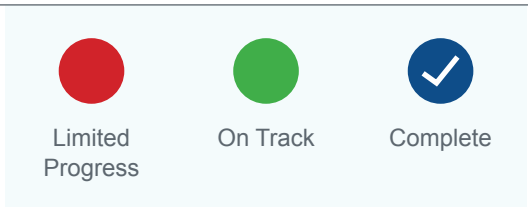


	Progress	Action
43		Evaluate ERCOT, Inc. finances and priorities. – Address financial ratings agencies' concerns. – Secure Board / PUC approval of 2022-2023 biennial budget.
44		Identify and implement new processes to keep market participant communicators informed during a grid event. This will ensure timely and accurate information.
45		Work with Transmission and Distribution Service Providers and customers to expand AMS meter implementation to improve timeliness of accurate meter data for settlements, credit calculations, and load management.
46		Evaluate embedding Transmission and Distribution representatives at ERCOT if multi-day emergencies occur.
47		Review weatherization and emergency operation plans for generation resources. Provide information, technical expertise and analysis to the PUC in support of rulemaking and implementation.
48		Conduct a study to understand key future business drivers such as the integration of battery storage and distributed generation resources.
49		Conduct a comprehensive review of ERCOT communications practices and policies, as well as an in-depth review of crisis communications performance during February 2021 event.
50		Conduct a study to gauge the impact of varying levels of wind and solar penetration, including the impact of energy storage and dispatchable energy, as well as revenue adequacy for each of these levels.
51		Evaluate the adequacy of ancillary services products and quantities to be procured. This helps ensure reliability.



	Progress	Action
52	On Track	Assess and develop a plan to improve the accuracy of generation reporting to ERCOT. Determine whether resource adequacy trips resulted from low frequency require changes to market operations. Review load resource programs and evaluate effectiveness.
53	On Track	Improve system planning, including localized and regional significant growth patterns. This will improve the range of conditions considered in planning studies.
54	On Track	Improve load forecasts in emergency conditions and evaluate accuracy of past predictions. This will help improve reliability.
55	Complete	Deploy new website dashboards and processes to streamline media responses to improve ERCOT communications to the public.
56	On Track	Evaluate market incentives to improve fuel security.
57	On Track	Consider on-site fuel supply including contracts with remote secured supplies.
58	On Track	Evaluate requiring inverter-based resources – such as wind and solar generators – to provide additional reliability attributes such as grid-forming capability to protect Texans in the most dangerous grid conditions.
59	On Track	Assess the potential costs and benefits of increased transmission both internal and external to ERCOT and increase coordination with other power regions.
60	Complete	Fill the vacant executive leadership position in Corporate Communications. This will help improve ERCOT communications.