



To: Texas State & Local Elected Officials, PUC & ERCOT Leadership
Subject: Policy & Response Recommendations Following Statewide Winter Storm
Date: Feb. 24, 2021

Last week, Texas experienced historic winter weather that resulted in widespread failure of the state's electric grid. This failure, along with a confluence of others related to the state's water and energy systems, endangered the wellbeing and safety of communities across the state.

This crisis has sparked numerous important debates about the politics, technical capabilities, and management of the ERCOT grid. As those debates continue, EDF will provide technical and policy support to help ensure Texas' most critical challenges are addressed.

In the meantime, EDF has developed a list of preliminary policy and technical recommendations we believe can focus Texas' attention on the most significant and longest-lasting solutions. As we all learn more about the causes and consequences of the Texas power and water disaster, we will revise our recommendations accordingly.

The majority of our recommendations would be relevant even if Texas had not just experienced this crisis. They will strengthen the grid, improve the transparency of its management, fortify our systems against the increased frequency and severity of weather crises, and protect our citizens and communities from the consequences of a variety of threats and risks in the years ahead.

This document contains:

[I. EDF Policy Recommendations to Texas](#)

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Section I. EDF Policy Recommendations to Texas

EDF's Policy Recommendations

Our recommendations fall into the following categories:

- Weatherizing Energy and Water Systems
- Improving Weather Crisis Planning
- Expanding Energy Efficiency
- Evening the Outage Burden
- Assessing Interconnection
- Fortifying In-State Transmission
- Examining ERCOT/PUCT

Weatherizing Power, Water and Energy Systems

1. Texas should conduct a detailed forensic analysis of Texas' winter 2021 storm to itemize the already-known failures and uncover yet-unknown weaknesses that should be addressed. This analysis should be supplemented with information about the causes, consequences and recommendations from Texas' prior major winter storms (2011, 2010, 2008, 2006, 2003, 1989 and 1983) to develop and finally implement substantive solutions to reduce the magnitude and consequences of such electric and natural gas system failures.
2. Texas should develop mandatory power plant weatherization requirements for severe weather events that exceed the proposed NERC standards for winterization, while also reflecting the unique weather patterns of Texas. Weatherization requirements should address:
 - The broad array of potential weather crises (wildfires, hurricanes, floods, drought, heat waves, winter storms, etc.).
 - The limitations of blanket "winterization" mandates. For example, NERC's proposed winterization standard requires preparing grid equipment for "minimum demonstrated historical performance during cold weather in the previous 5 years." This would have excluded preparation for the extremely cold conditions that Texas experienced in 2011 and 2021.
 - Texas should impose new rules and contract reformation provisions for natural gas producers and pipeline operators to require that they winterize operations to improve the security of gas production and delivery in cold winter conditions.

Improving Weather Crisis Planning and Infrastructure

3. In addition to examining historic conditions, Texas should consider more extreme climate and weather scenarios to better prepare all critical systems (electricity, gas, water, etc.) from a wide set of potential future extreme weather events. Technical studies such as the National Climate

Assessment 4 (2018) should be used as the benchmark for identifying the range and nature of extreme weather threats.

- ERCOT should use credible, forward-looking, 20- and 30-year extreme weather forecasts for long-term load forecasting and resource planning to inform shorter-term operational planning.
- The PUCT should investigate, with all of the state's utilities, how future extreme weather conditions could affect the adequacy and appropriateness of current power system equipment and design. This investigation should include consideration of where current grid assets (generation, transmission, transformers, etc.) are located and to what degree these assets' physical performance and effectiveness are at risk from growing threats including sea level rise, storm surge, flooding, tornadoes, drought, sustained heat waves, winter storms and other weather extremes. The investigation should also assess whether the nature of such weather threats justifies changing the design of Texas' electrical systems (both system architecture and the nature of specific components), and whether it is appropriate to change the regulatory criteria for evaluations of long-lived used and useful utility assets that we will need to serve reliably over more challenging future weather conditions.

Expanding Energy Efficiency

4. Texas should pursue aggressive, widespread energy efficiency measures to reduce the strain on electricity, gas and water systems and our citizens' wallets.
 - Within a few years, aggressive energy efficiency measures will improve the quality of Texas' housing and office stock, keep Texans safer under bad weather conditions, reduce electric and gas bills for Texas energy customers, improve grid reliability under all weather conditions, and help facilitate the integration of growing energy sources such as solar PV, wind, and battery storage, without compromising Texas' grid operations and energy costs.
 - This should start with broad-scale, heavily-funded energy efficiency retrofit requirements for low-income and multi-family housing to make these homes safer and healthier for disadvantaged Texans during weather disasters and power failures.
 - Texas should significantly increase current energy efficiency goals for the state's utilities to deliver energy efficiency to their customers.
 - Texas should adopt ambitious, forward-looking energy efficiency standards and building codes for all new home and building construction.

Evening the Outage Burden

5. Texas should examine how the burden of system outages was shared across the state and among utility customers and implement policy and technical solutions that even the burden of

power outages during such crises.

- All Texas transmission and distribution utilities should assess how their current system designs and equipment allocated the burden of extended outages across their service areas and customers. Utilities should be required to identify and report how long each circuit and outage block within their territory went without power, how many customers were impacted and the demographic and income information of residential customers affected.
- The PUCT should conduct a proceeding to assess the effectiveness and fairness of large event load-shedding by utilities and develop new guidelines for the design and implementation of effective and fair load-shed impacts of large-scale, longer duration outages. The PUCT should then require utilities to design and install greater remote-actuated sectionalization devices across their system to enable operation of these devices in future load-shed events.
- To preserve power availability to residential customers, the PUCT should revise utility terms-of-service for all commercial and industrial customers in non-essential categories (e.g., office buildings and school campuses) and require them to install remote-actuated controls that can turn off at least 60% of facility or campus electricity use. Commercial and industrial customers, even those located on circuits containing critical customers, must use this control capability to shed their own load at the direction of their distribution utilities whenever the relevant distribution utility is required to shed load.

Assessing Interconnection

6. Texas should conduct an independent technical, economic and policy assessment of the costs, benefits, impacts and feasibility requirements of adding significant high voltage AC and DC transmission facilities to interconnect ERCOT to the Eastern, Western and/or Mexico grids.

Fortifying In-State Transmission

7. The PUCT should strengthen the transmission grid in ERCOT to ensure the reliable and robust transmission of energy within the region. During the recent emergency, additional power was available to serve additional customers but was not able to be delivered to them.

Examining ERCOT/PUCT

8. Texas' response to this crisis should include an examination of ERCOT's overall direction from the state Legislature and regulators and of ERCOT's governance, authority and representation to ensure that the grid operator and its Board looks like Texas and can adequately protect and serve the people of Texas. This examination should include whether ERCOT and the PUCT:
 - have the authority they need to meet their responsibilities to the government and people of Texas;

- fairly represent all generation, supply, demand and storage options available to Texans as well as diverse ERCOT customers;
- have the tools and options to effectively manage and protect overall electric system reliably and cost-effectively; and
- fairly protect customers from excessive energy bills resulting from the competitive market.

This examination should also consider whether any of ERCOT's limits or failures to address the causes of this Texas power outage were due to the principles and policies created by Texas' energy- and electricity-related laws and the implementation of those laws, rather than by ERCOT's failure to effectively implement those policies and regulations.

Section II. Guiding Principles for Post-Crisis Action

Texans deserve strategic, long-term and fact-based solutions to weather-energy threats like the winter storm we just experienced.

- Texans deserve a strategic, comprehensive, fact-based analysis of what happened, why it happened, and what state leaders and energy industry participants can do to ensure it never happens again.
- State leaders should resist silver-bullet solutions – there are none. Many issues must be addressed, and some will include tradeoffs.
- Texas leaders should rely on technical experts and fact-based analysis to develop their response. Many public criticisms of the Texas grid have been wildly inaccurate and simplistic.
- This disaster was a broad failure and the result of multiple weaknesses and missed opportunities to prevent it.
- Texas leaders must focus on long-term solutions that prioritize customer-focused reliability and resilience, affordability, equity, and reduced climate and local air quality impacts.
- The Texas electricity market should be improved, not dismantled. Texas’ independent grid and competitive market structure has sparked a number of very good things for Texans and the environment, including the rapid growth of inexpensive, renewable energy. We must strengthen the resilience of our energy system while maintaining swift steps towards decarbonization of the electric grid.
- We should capitalize on Texas’ ability to implement innovative changes quickly.

Texas’ response must be as comprehensive as the failure we just experienced. The corrective actions Texas undertakes must meet several criteria:

1. Prioritize people, not just the grid, now and for the future.
2. Examine and prepare Texas communities and infrastructure systems for the full scope of extreme weather threats related to a changing climate.
3. Recognize the connection/dependence of our electricity, gas and water systems
4. Focus equally on better management of Texas’ energy supply *and* demand
5. Examine and improve the market, grid management and emergency response
6. Examine ERCOT/PUCT authority, governance and representation

Section III. Comprehensive Issues and Discussion

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1. Prioritize people, not just the grid, now and for the future.

Texans are suffering. They deserve a crisis response that addresses their needs now and protects them from future weather-energy threats.

- The first step is a forensic analysis to identify all the weather, policy, infrastructure and economic factors that caused or contributed to the failure of our electric, gas and water supply systems, identify the Texans who were most affected by electric outages (the order and duration of outages), and the human and financial impacts of these failures.
- All Texans – especially those with variable electricity rates and low-income Texans – should be protected from sky-high bills that result from wide-scale societal failures. Texas should supplement potential FEMA/federal funds to alleviate this cost crisis and require providers to allow payment plans.
- This crisis affected everyone in Texas. But not all Texans were affected equally. As with most weather-related disasters, communities of color were hardest hit by power, gas and water outages. Disadvantaged Texans are more likely to rent than own, more likely to live in poorly insulated homes, and have fewer options to protect themselves from long power outages and water failures and housing damages.
- Prioritizing energy efficiency and weatherization investments for families/homes would reduce overall grid demand and protect families that are most likely to bear the deadliest consequences of power outages.
- Disadvantaged Texans are less likely to live near “critical infrastructure” like hospitals, emergency response centers, or downtown business districts, which means they're more likely to lose their power first and for longer periods.
- Texas experiences many extreme weather and energy emergencies. We must invest in disaster-response centers and measures for Texans who cannot protect themselves.

2. Examine and prepare Texas communities and infrastructure systems for the full scope of extreme weather threats related to a changing climate.

Texas should develop a comprehensive weather-energy threat and response policy.

- Texas's weather-energy threats vary greatly - floods and drought, heatwaves and winter storms, and wildfires and hurricanes. Each of these presents unique challenges and risks, but all of them pose crippling threats to our energy system, other infrastructure, and human health and safety.
- These risks are increasing in frequency and severity due a changing climate.
- After multiple spectacular weather failures, Texas must ensure that our energy infrastructure and providers function better as extreme weather events become more frequent and severe.
- This crisis has underscored the importance of a state-wide weather-energy threat and response policy that examines the full scope of Texas' weather challenges and recognizes the increased risk of weather-energy disasters.
- A great deal of analysis has already been done on this issue. For example, the NERC/FERC report that followed the 2011 winter crisis contains specific recommendations about winterizing generation facilities, many of which were implemented by El Paso Electric, which remained online during the storm. The state's analysis of threats and solutions should include a thorough examination of all reports, research and recommendations that were produced following previous weather-energy disasters in Texas.

3. Recognize the connection/dependence of our electricity, gas and water systems

The state's response to this crisis must acknowledge that in Texas, we need electricity to deliver water, and vice versa. We need to understand how vulnerabilities associated with the gas system can impact our electric power supply.

- Our critical resources are connected. Our water treatment and distribution systems depend on reliable, resilient power. Thermal electricity generation requires large amounts of cool water and reliable fuel supply.
- Texas' response to this crisis should bolster the resilience of our water system against grid outages and reduce the electricity system's reliance on water.
- We need to examine the vulnerabilities of the water/gas/electricity systems brought to light from this crisis – particularly how these systems are interconnected – and how the vulnerabilities can be mitigated through better planning, coordination, and communication.

4. Focus equally on better management of Texas' energy supply *and* demand.

The state's response to this crisis must focus equally on electricity supply and demand.

Supply

- The greatest contributor during this crisis was the unavailability and/or failure of Texas' electricity generators to operate in winter-storm conditions, especially thermal plants (nuclear, coal and natural gas).

- Texas should require weatherization plans from all Texas electricity generators that address year-round reliability (some winterization strategies create risks in summer months).
- Weatherization plans must consider gas production and processing facilities, not just generation. Natural gas supply was limited due to wellhead and pipeline frozen equipment due to the storm. Generators should have a plan for how their supply can withstand various weather-energy threats.
- The state should examine the water, gas and electric systems to better understand and address interrelated vulnerabilities and opportunities for enhanced performance at every level.

Demand

- Texas electricity supply received the lion's share of attention, but we have failed to adequately manage and reduce Texas' electricity demand.
- Energy efficiency measures reduce the amount of electricity generators and utilities must provide. The cheapest and most reliable electricity is the kind you never have to generate or use.
- Texas has barely tapped the potential of energy efficiency. It is the lowest hanging fruit for reducing overall electricity, water and gas demand and easing stress on the systems that deliver them.
- Beyond energy efficiency, Texas should maximize the use of proven methods to manage and reduce grid demand through increased use of demand-response technology, energy storage, clean microgrids and other distributed energy resources. These resources improve grid reliability and resiliency and can provide economic benefits to consumers.
- These tools will reduce overall demand, help stabilize the grid, integrate more renewable resources into the system, improve overall grid costs, efficiency and reliability, and save Texans money.

5. Examine and improve the market, grid management and emergency response

The state must examine and improve overall grid management, especially during emergencies.

- Texas should conduct a comprehensive analysis of whether high voltage transmission interconnection to adjoining electric regions could have alleviated parts of this disaster, and assess the advantages and disadvantages of potential future transmission interconnection for Texas' long-term reliability, energy economics and human resilience in the face of future weather disasters.
- Texas has not fully exploited its ability to deploy innovative technology and policies that would improve reliability and resilience.
- Individual utilities should redesign and modify their blackout and brownout policies and procedures to manage outages in smaller, more surgical sections for automated, purposeful and fairer rotating outage management that are equitable and just.
- Texas should explore ways to ensure small customers can benefit and be protected from the competitive market.

- Texas should examine the benefits of allowing DER (solar/battery) customers to isolate/island from grid outages.
- Transmission improvements and additions are critical. For example, there are early indications that ERCOT was unable to transport to customers some wind and solar generation that came back online during the crisis.
- Fact-based information during this crisis was scarce and decentralized – not just for citizens, but for city and county leaders. Utilities should be required to develop and implement better predictive and real-time outage information communications with their customers and governmental officials. The state should develop a protocol or strategy for communicating to customers during wide-scale weather and energy emergencies.

6. Examine ERCOT/PUCT governance, authority and representation.

Texas' response to this crisis must extend beyond addressing technology and energy failures. ERCOT's governance, authority and representation should be examined to ensure it looks like Texas and can adequately protect and answer to the people of Texas.

- ERCOT has limited authority to mandate action or changes, and most of ERCOT's actions are directed by policy handed down from the Public Utility Commission of Texas. The state should examine whether ERCOT has the authority it requires to meet its responsibilities to the government and people of Texas and is maximizing the authority it does have.
- ERCOT implements the rules and guidance established by the Texas Legislature and Public Utility Commission. Policy directives from those entities must be closely scrutinized for any contributions they may have made to this crisis, rather than loading blame solely on ERCOT.
- ERCOT's board and leadership are dominated by utilities, power producers and marketers, and large commercial and industrial customers and lacks significant solar, wind, demand response or energy efficiency representation.
- ERCOT's board lacks the diversity of the people of Texas – a state where people of color make up 50% of the population.
- ERCOT's board lacks adequate customer representation and should enhance stakeholder outreach and education efforts.
- The PUCT should act to protect Texas electricity customers from excessive bills associated with this and future widespread weather-related events and from the consequences of potential business failures by retail electric providers, generators and power marketers squeezed out of business by this event.