FOCUS report

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Addressing grid reliability and oversight after Winter Storm Uri

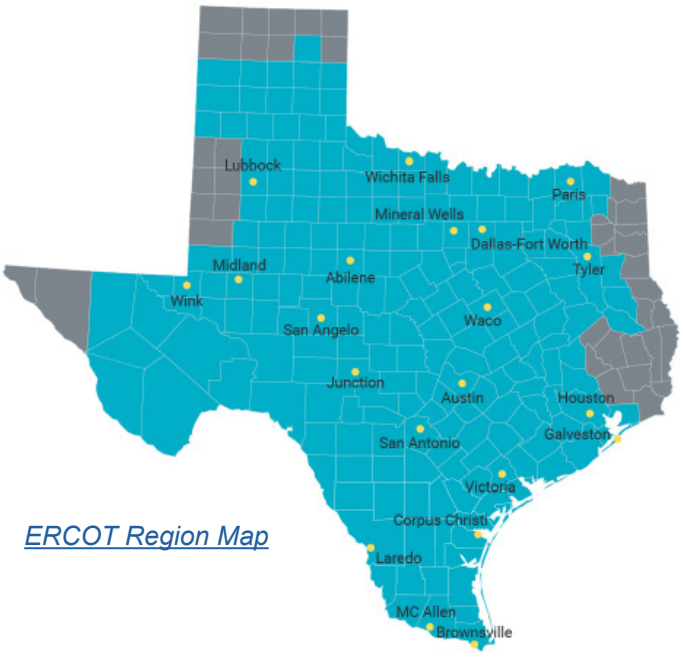
In recent years, grid reliability has been a priority in the Texas Legislature as the state's population grows and high-demand industries interconnect with the Texas electric grid. In particular, focus on the reliability of the state's power grid grew significantly in the aftermath of widespread and ultimately deadly power outages caused by Winter Storm Uri in February 2021. The effects of the storm highlighted an ongoing debate around the tension between maintaining a competitive, deregulated electricity market and the need to ensure a stable energy supply, which could require some level of regulation.

In response, the 87th Legislature in 2021 passed legislation that aimed to reform the governance of the Electric Reliability Council of Texas (ERCOT), the independent organization that operates the grid, and mandated weatherization of critical energy infrastructure.

The 88th Legislature in 2023 continued to focus on grid reliability by revising policy surrounding the Public Utility Commission of Texas (PUCT) and proposing market-based solutions to encourage new energy generation. Lawmakers enacted HB 1500, which extended PUCT oversight of ERCOT, increased opportunities for public comment on agency actions, and added guardrails to the Performance Credit Mechanism, a market-based reliability program proposed by PUCT during the previous interim. SB 2627 and SJR 93 established the Texas Energy Fund to finance the construction of dispatchable generation facilities.

While the Legislature designed these measures to enhance reliability, these new laws also sparked debate about the role of the state in a deregulated market, with critics warning of potential market distortions.

As Texas faces growing electricity demand, the 89th Legislature continued to consider proposals aimed at maintaining grid reliability while preserving competition in a deregulated energy market.



ERCOT Region Map

Major players in the Texas electricity market

The Electric Reliability Council of Texas (ERCOT) is a nonprofit organization that manages the Texas power grid covering 213 of the 254 Texas counties. Texas is the only one of the 48 contiguous states that maintains its own power grid, with ERCOT providing power to over 27 million customers. ERCOT is responsible for maintaining power reliability, ensuring unrestricted access to transmission lines, and facilitating the competitive market.

The Public Utility Commission of Texas (PUCT) is the state agency responsible for the economic regulation of Texas' electric, telecommunication, and water and wastewater utilities. It oversees ERCOT as well as the state's competitive utility markets, implementing utility legislation and enforcing market rules.

The Office of Public Utility Counsel (OPUC) represents the interests of residential and small commercial consumers in utility proceedings that come before PUCT, ERCOT, and the State Office of Administrative Hearings. OPUC provides legal representation and technical expertise to protect and promote consumer interests, including reasonable utility rates.

The Railroad Commission of Texas (RRC) is the state agency responsible for regulating the oil and natural gas industry, pipeline transporters, and coal and uranium surface mining operations.

Power generation companies are companies that use natural resources to generate energy. Electric generating facilities in Texas are primarily coal and natural gas plants, wind and solar farms, and battery storage facilities. Power generation falls into categories based on whether it can be accessed at the flip of a switch (dispatchable), or whether it is based on variable natural cycles (intermittent). Coal, natural gas, and batteries are dispatchable, while wind and solar are intermittent.

Transmission and distribution utilities (TDUs) are responsible for transporting power through an interconnected system of lines, distribution centers, and control systems. Power plants are typically located at points that allow easy access to fuel sources, and as such are often far from the population centers where they are most needed, requiring extensive transmission and distribution systems to deliver power to customers.

Load-serving entities (LSEs) provide electric service to individual and wholesale customers. They include competitive retailers (CRs), which encompass retail electricity providers, municipally owned utilities, and electric cooperatives that sell electricity at retail in the competitive market. CRs also include non-opt-in-entities (NOIEs), which are municipally owned utilities and electric cooperatives that do not operate as CRs and do not offer customer choice.

Retail electricity providers (REPs) purchase electricity directly from generators at wholesale prices and sell it to consumers at retail prices. REPs do not generate electricity or own any electricity infrastructure, and consumers may choose which REP they purchase electricity from.

Municipally owned electric utilities (MOUs) are "full-service" electric utilities that own transmission and distribution infrastructure as well as power plants. Local authorities are responsible for setting rates and policies that are responsive to community priorities. There are 72 MOUs in Texas, providing power to 4.1 million Texans.

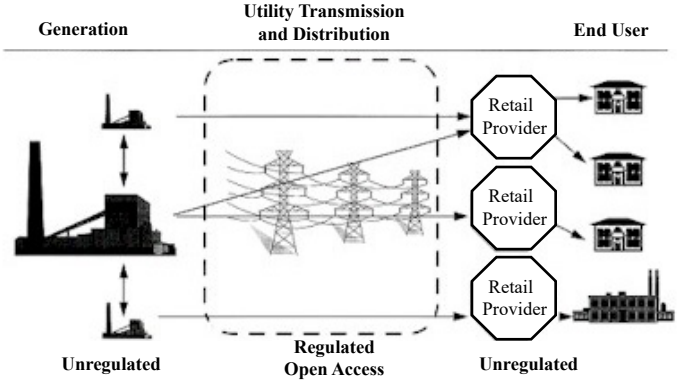
Electric cooperatives (ECs) are nonprofit organizations that are owned and run by members who pay into them and utilize their services. Cooperative members also elect a board of directors. Texas has 76 electric cooperatives, serving 3 million members.

A brief history of the Texas electric market

On June 18, 1999, then-Gov. George W. Bush signed SB 7 into law, deregulating the Texas retail electric market. The bill, authored by Sen. David Sibley, aimed to reduce electricity rates to make Texas more economically competitive and increase household disposable income.

Previously, Texas operated under a regulated monopoly model where a single utility company oversaw all three functions of the electric industry: 1) generation, 2) transmission and distribution, and 3) the sale of electricity to consumers. This model allowed the state to regulate and control utility rates and services.

SB 7, on the other hand, required each electric utility to separate its business activities into these three electric industry functions, ending the electric monopoly. The bill also allowed electric utility customers served by investor-owned utilities to choose their retail electric providers beginning on January 1, 2002. Additionally, electric utilities were required to freeze their rates at the levels in effect on January 1, 1999, then reduce



City of Brady, Texas, "Deregulation"

them 6 percent further when the retail marketplace opened in 2002. This reduced rate, known as the "price to beat," was designed to kickstart competition among utilities for the lowest electricity prices and serve customers who did not choose a different retail provider after the marketplace opened. SB 7 tasked PUCT with continuing to regulate transmission and distribution of electricity, monitoring market power, and preventing market power abuses such as predatory pricing. Under SB 7, the competitive market would be a driving force in setting electricity prices, rather than the state or a single utility company.

Proponents of deregulation said that SB 7 would lead to lower electricity prices, improved service quality, more control for consumers, increased business efficiency, and a more attractive business environment. The bill generally received broad bipartisan support; however, some critics of the bill raised concerns about the potential impact on reliability and noted that Texas already had relatively low electricity rates. Some also raised concerns about passage of the bill in light of an energy crisis taking place in California that many attributed to the implementation of its deregulation law. State officials at the time, however, said that the Texas law and energy market structure differed in ways that would limit the potential for price spikes and prevent issues faced by California.

While some analyses have reported lower consumer prices under the competitive market since 2002, others have suggested that Texas consumers under the deregulated market have paid higher average rates than those in regulated markets. Some advocates also blamed deregulation for increased grid reliability issues and customer complaints in the decade after SB 7 was implemented. However, many energy sector stakeholders have noted that, in addition to cost benefits for many consumers, deregulation has also led to more options for consumers, new technologies and services, advances in energy efficiency and sustainability, and greater consumer education and empowerment around their energy choices.

While legislative efforts since 2002 have generally focused on preserving a competitive electricity market, the state's energy crisis during Winter Storm Uri in February 2021 renewed discussions on increasing grid reliability within a deregulated market structure.

Winter Storm Uri, February 2021

From February 11 to February 21, 2021, Texas experienced a severe winter storm that led to widespread electricity outages and raised questions about the reliability of the ERCOT grid. Gov. Greg Abbott issued a disaster declaration on February 12, warning of imminent threats due to prolonged freezing temperatures. On February 15, ERCOT declared its highest state of emergency, directing transmission operators to cut off more than 10,000 megawatts of electric load to prevent a statewide blackout, as exceptionally high demand exceeded supply. By February 16, the governor had named ERCOT reform an emergency item for the 87th legislative session, calling for legislative action to prevent a repeat of the power outages experienced by millions of Texans during the storm.

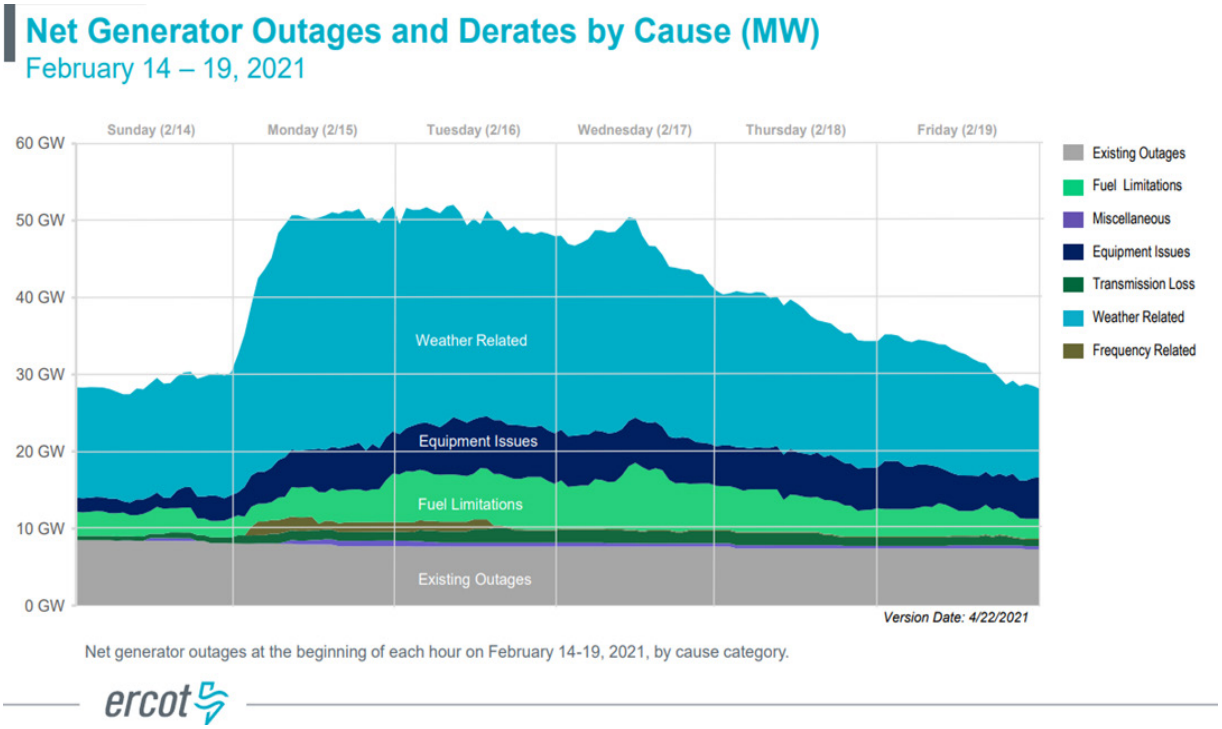
Ultimately, Winter Storm Uri caused more than 40 percent of the state's generation capacity to fail, leaving 69 percent of Texans without power and resulting in more than 200 deaths. Experts estimated the economic impact of the outages at $85.8 to $128.7 billion in lost gross product, with lost income estimates ranging from $56.8 billion to $85.1 billion.

Wholesale vs. retail markets

In Texas, electricity can be sold either on the wholesale market or through retail electric providers. Most residential electricity customers have fixed-price contracts with retail providers, shielding them from rate fluctuation in times of scarcity. However, retail providers and other types of consumers, particularly large industrial facilities, purchase electricity on the wholesale market, where buyers and sellers agree on prices based on supply and demand. If a retail electric provider is required to pay high prices due to scarcity, it may recoup costs by raising prices for its customers.

Wholesale buyers can purchase electricity ahead of time, but if they fail to purchase enough to meet demand, they may have to buy power as needed on the real-time market. PUCT maintains a cap on the price of electricity that is reserved for periods of extreme scarcity. These peak prices are paid by buyers that have failed to purchase sufficient power in advance and generators that have failed to generate enough power, acting as a penalty.

During periods of extreme scarcity, ERCOT is required to apply the maximum electricity price to wholesale buyers who have not purchased sufficient electricity ahead of time. During the storm, a computer glitch initially prevented the maximum price from being applied to wholesale electricity purchases, prompting PUCT to order ERCOT to manually set prices at the $9,000/MWh cap. In an emergency open meeting on February 21, PUCT issued orders for electricity providers and generators to protect consumers by delaying invoicing, suspending disconnections for non-payment, and offering deferred payment plans when requested, while



PUCT, ERCOT, and the Legislature formulated plans to address the financial aftershocks. A March 2021 investigation by Potomac Economics, the Independent Market Monitor for the ERCOT grid, revealed that ERCOT had overcharged electricity customers by $16 billion by maintaining the $9,000/MWh price cap for 32 hours after the grid was no longer under scarcity conditions. Additionally, in the days following the storm, five ERCOT board members, all of whom lived outside of Texas, resigned.

Following the storm, some state officials and policy experts blamed grid failures on an overreliance on renewables, as a significant portion of the state's wind capacity went offline due to ice forming on wind turbines and equipment. Others pointed to natural gas and coal that became unavailable as natural gas wells, pipelines, and other equipment froze. Some also said that the isolation of the ERCOT grid from the national grid limited the state's ability to import power, exacerbating the crisis.

Many stakeholders also suggested that the grid should have been better prepared, given that federal energy authorities had recommended a variety of changes to grid operations in response to severe winter weather in 2011, which had also caused significant outages. Some argued that the state's voluntary winterization guidelines adopted in 2011 were insufficient, and that the deregulated market structure disincentivized generators from investing in proper weatherization due to the need to keep prices low. ERCOT leaders, however, asserted that the extreme and unusual weather conditions were the problem, not the state's deregulated system. Other advocates said that while the grid was sufficient to manage historically observed climate conditions, severe weather driven by climate change has exposed its vulnerabilities.

87th Legislature responds, 2021

In response to Winter Storm Uri, Gov. Abbott addressed the state on February 24, criticizing ERCOT for its slow response and for falsely assuring Texans of sufficient capacity to meet the state's energy demand. He also announced that the Legislature and the attorney general had launched investigations into ERCOT. Lt. Gov. Dan Patrick released 31 priorities for the 87th legislative session that began on January 12, 2021, including ERCOT reform and power grid stability, while House speaker Dade Phelan announced seven priority grid reform bills.

The 87th Legislature ultimately proposed and passed a variety of bills aimed at improving the electric grid and responding to the issues that caused the outages and price hikes during the storm, the most notable of which were SB 2 by Hancock, which revised ERCOT's governance, and SB 3 by Schwertner, which mandated equipment weatherization.

SB 2, revising ERCOT board. SB 2 made a number of revisions to the ERCOT board, including reducing the number of members, revising the selection process, and requiring members to be Texas residents. The bill also prohibited legislators and lobbyists from serving on the board, replaced five unaffiliated board members with members appointed by a committee selected by the governor, lieutenant governor, and House speaker, and required PUCT approval of ERCOT rules. A related bill, SB 2154 by Schwertner, increased the PUCT membership from three to five governor-appointed commissioners, also requiring them to be Texas residents.

Supporters of SB 2 and SB 2154 argued that residency provisions addressed concerns about board members living out of state at the time of the storm, which they believed reduced these members' personal stake in resolving the outages. They stated that SB 2's requirements related to the makeup of the ERCOT board increased its independence from electric market influence, while requiring PUCT to approve new ERCOT rules further increased oversight. However, critics worried that more political involvement in the selection process could undermine ERCOT's independence and increase political influence over its decisions.

SB 3, preparing grid for weather emergencies. SB 3 was an omnibus bill focused on preparing for, preventing, and responding to extreme weather emergencies. It required PUCT and the Railroad Commission of Texas (RRC) to implement rules mandating weather emergency preparedness for natural gas, electric, and water services entities and established penalties for noncompliance. The bill also created a committee within PUCT to map the state's electricity supply chain and established the Texas Energy Reliability Council (TERC) to increase coordination between the state and the electric industry. Additionally, SB 3 required PUCT to establish an emergency pricing program for the wholesale market and ensure that ERCOT took steps to guarantee that the grid could meet reliability needs during extreme weather.

Proponents of SB 3 believed that it would help ensure grid reliability by improving weather preparedness and coordination between different entities in the electricity supply chain. Critics argued that it did not go far enough with weatherization requirements and focused too much on shoring up supply without giving sufficient attention to reducing energy demand.

Other bills related to grid reliability. Other bills passed during the 87th regular session relating to the grid included:

- HB 16 by Hernandez, prohibiting retail electric providers and certain other entities from offering wholesale energy to residential or small commercial customers;
- HB 2483 by P. King, allowing transmission and distribution utilities to operate facilities that provide temporary emergency power during a widespread outage;
- HB 2586 by Thierry, requiring PUCT to annually audit ERCOT;
- HB 3648 by Geren, requiring PUCT to establish a process to designate certain natural gas facilities as critical during emergencies; and
- SB 1281 by Hancock, requiring ERCOT to conduct a biennial assessment of the grid's reliability in extreme weather.

Several bills also addressed the price hikes and financial aspects of the crisis, including HB 1520 and HB 4492 by Paddie, and SB 1580 by Hancock.

Implementation in the interim, 2021-2022

Following the 2021 legislative session, the speaker of the House of Representatives and the lieutenant governor charged the Senate Business and Commerce, the House State Affairs, and the House Energy Resources committees with evaluating the implementation of new laws related to the grid along with other items relating to Winter Storm Uri and grid reliability, such as studying projects intended to reduce electric transmission congestion and evaluating the impact to the grid of the growth of renewable energy. Through a series of hearings, the committees found that, while the legislation had been largely effective in enhancing reliability and reforming ERCOT, there was still work to be done.

PUCT representatives testified that they had fully implemented SB 2, enabling the new ERCOT governing board to become more independent and reducing conflicts of interest. Other state agency representatives also said, however, that PUCT, ERCOT, and the Office of Public Utility Counsel (OPUC) needed new strategies to attract and retain employees, proposing higher salaries and remote-work options. Regarding SB 3, stakeholders reported that the reliability requirements were working and that generators had fully implemented the new weatherization requirements ahead of winter 2021-22. Since the implementation of these requirements, PUCT reported that the ERCOT grid had been able to meet

record-breaking electric demand without entering emergency conditions.

Witnesses in the interim hearings also discussed changes to the electric market implemented since the outages. Phase I of the market redesign included reducing the price cap during emergency operations to $5,000/MWh and increasing incentives for large electricity consumers like manufacturers to reduce power usage in response to prices and grid conditions. PUCT additionally approved new ancillary services, including paying generators for having onsite fuel storage, the ability to respond quickly to changes in grid frequency, and the capacity to react to swings in electricity supply and demand.

Energy-only vs. capacity markets

ERCOT is an energy-only market, which means that wholesale customers only pay power generators for the power that they actually produce.

Certain other states operate a capacity market, which means that wholesale customers also pay power generators for the generating capacity they promise to make available.

Additionally, ERCOT had begun to operate the grid with an abundance of caution, a practice known as "conservative operations." Critics of conservative operations worried that these measures were raising electricity prices and could distort the market, causing reliability needs to be met at the expense of electricity customers. Although conservative operations were intended to allow ERCOT to ensure that there were sufficient energy reserves to meet demand even in times of crisis, some stakeholders expressed concerns that these methods were incompatible with an energy-only market design, which requires that prices reflect the actual reliability needs of the system.

Furthermore, the Senate Business and Commerce Committee recommended that the Legislature consider incentivizing the construction of new dispatchable generation resources, or resources that can provide electricity quickly and on demand, such as natural gas, coal, or batteries. ERCOT also commented on its progress regarding Phase II of the market redesign, the goal of which was to further promote reliability through the construction and expansion of dispatchable generation. PUCT proposed to do this by adopting a load-side reliability mechanism, which would require retail companies to ensure that they procured reliable power for customers. Some stakeholders expressed concerns, however, that such an obligation would too closely resemble a capacity market, as retail electric providers would have to ensure ahead of time that generation facilities could produce sufficient power.

In January 2023, PUCT adopted a load-side reliability mechanism called the Performance Credit Mechanism (PCM), which would allow power generators, in exchange for being available to produce more energy during high-demand periods, to sell credits to electricity retailers. The PCM was designed to provide a market-based solution to incentivize the growth of dispatchable generation, ensuring reliability.

Additional issues addressed in the interim hearings leading up to the 2023 legislative session included concerns by stakeholders that the Legislature had thus far been too focused on short-term reliability instead of long-term planning for the electric market, as well as calls for future legislation to be technology neutral, allowing renewable energy resources and battery storage to participate and benefit.

88th Legislature and PUCT sunset review, 2023

While the 88th Legislature continued to prioritize grid reliability in response to Winter Storm Uri, the approach largely focused on seeking market-based solutions to encourage new generation.

HB 1500, PUCT sunset bill. Passed by the 88th Legislature, HB 1500 by Holland continued the existence of PUCT and OPUC until 2029, following a review by the Sunset Advisory Commission. Initially, HB 1500 primarily reflected the Sunset Commission's recommendations and passed the House with these provisions. However, the Senate version added several amendments containing provisions from other bills considered during the session. The final version established requirements for generation reliability and certain reliability programs, revised provisions related to PUCT's oversight of ERCOT and public participation, and granted PUCT the authority to set certain requirements for renewable generation facilities.

Supporters of HB 1500 emphasized that the bill addressed concerns about a lack of transparency and public trust in PUCT and ERCOT by enhancing PUCT's public communication and oversight of ERCOT. They pointed out that the bill prohibited PUCT from issuing verbal directives to ERCOT except in emergencies, granted PUCT the authority to approve, reject, or remand ERCOT rule changes, expanded

opportunity for public comment during PUCT meetings, and required PUCT to develop a strategic communications plan.

Critics expressed concerns over a provision allowing ERCOT to exclude the PUCT commissioners serving on ERCOT's board from certain executive sessions, worrying that it could hinder effective oversight. Others argued that minimum performance requirements for generators could unfairly impact wind and solar producers, forcing them to purchase electricity from other sources during low production periods, which could reduce their profits. Furthermore, some critics disagreed with the addition of certain provisions that were not discussed during the Sunset Advisory Commission's review.

HB 1500 also placed certain restrictions on the PCM, including a $1 billion market cap on the program, which was aimed at preventing the cost of performance credits purchased by retail electric providers from significantly burdening consumers.

SB 2627 and SJR 93, creating the Texas Energy Fund. SB 2627 by Schwertner and its accompanying constitutional amendment, SJR 93, created the Texas Energy Fund to finance loans and grants for maintaining, modernizing, and constructing dispatchable electric generating facilities. Proponents argued that this would improve reliability by increasing electricity supply and balancing the state's energy mix between dispatchable and intermittent generation, such as wind and solar, helping to protect consumers from future severe weather events. Others criticized the bill for excluding renewable energy and battery storage resources from loan and grant eligibility, citing that renewable resources were generally cheaper and cleaner, and could be made dispatchable through the use of batteries.

Debate over SB 2627 also touched on concerns about maintaining a deregulated market. Some critics feared that the bill could lead to reregulation by involving the state government in financing the electric industry, potentially distorting the market by giving a competitive advantage to recipients of state loans or grants. Supporters countered that the bill's impact on the market would be minimal compared to other kinds of state interventions, such as production tax credits or direct power plant subsidies. They considered SB 2627 an in-market solution to reliability concerns because it required repayment of the state loans used to incentivize construction.

89th Legislature, 2025

While stakeholders have generally regarded the bills passed in the 87th and 88th legislative sessions as effective in bolstering grid reliability and oversight, many have remained concerned that rising electricity demand in the coming years may necessitate further adjustments to Texas' energy policy. With the state's population continuing to grow, an influx of new businesses and industries, and record-breaking electricity demand, many have suggested that the grid will likely face future challenges that could require further state intervention. In particular, high-energy-consuming sectors like cryptocurrency mining and data centers are rapidly adding to the grid's load.

During interim committee hearings leading up to the 89th legislative session, some argued that integrating new energy sources into the grid will be critical in meeting this demand. These stakeholders called for the Legislature to invest in researching and incentivizing emerging energy resources like advanced nuclear, hydrogen, geothermal, and energy storage technologies. Others advocated for focusing on the demand side of the electricity market, such as promoting energy efficiency and implementing demand response systems where customers adjust energy usage to align with supply, potentially earning compensation for unused energy.

Additionally, there have been calls to construct more and higher-capacity transmission lines across the state, as growing supply and demand will require moving ever larger amounts of energy from source to consumer. The design of the PCM is also in progress, and its future role in the ERCOT grid remains uncertain, with some questioning whether it is still needed alongside other grid reliability measures. Concerns were also raised prior to the 2025 session about new ancillary services and ERCOT's conservative operations driving up electricity costs.

The 89th Legislature in 2025 continued to address grid reliability by passing legislation aimed at improving state planning for large load interconnection, alongside other measures to support advanced nuclear energy development. SB 6 by King requires PUCT to adopt standards for interconnecting large load customers, such as data centers and cryptocurrency mining, in the ERCOT region. While supporters stated that improved "forecasting" measures would help bolster the grid and allow PUCT to better prepare for incoming loads, critics continued to raise concerns about state

involvement in a deregulated energy market. The Legislature also passed SB 75 by Hall, which created the Texas Grid Security Commission to evaluate hazards to the critical infrastructure of the ERCOT electric grid.

Lawmakers also passed bills aimed at improving grid resiliency and meeting growing energy demands by developing advanced nuclear energy projects in the state, including HB 14 by Harris, creating the Texas Advanced Nuclear Energy Office and associated grant programs, and SB 1535 by Zaffirini, establishing an advanced nuclear workforce development program.

Several other bills related to grid reliability failed to pass, including: HB 2152 by E. Morales, which would have required ERCOT to develop a reliability plan for electric transmission service in the Permian Basin; HB 5600 by McLaughlin, which would have established incentives for clean hydrogen development, and; HB 3778 by Louderback, which would have made geothermal energy resources eligible for Texas Energy Fund grants and loans by considering certain geothermal energy generation facilities to be dispatchable. Measures such as these, particularly those related to the development of electric transmission and emerging energy resources, could elicit further conversation in the interim and the 2027 legislative session.

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