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## Examining the 2021 Texas Power Grid Crisis

Dean Jepsen

### INTRODUCTION

In February 2021, Texas' entire power grid was nearly pushed to its breaking point during an unusually frigid winter storm, Winter Storm Uri, resulting in deadly blackouts across the state. At the time of writing this article, investigations are still being conducted to determine exactly what went wrong and which entities (if any) are culpable for the calamitous power grid failure that occurred roughly nine months ago.<sup>1</sup> The lack of coordination and preparation across overseers and utility companies exacerbated the crisis. There are some policy areas in desperate need of bolstering via laws and mandates by the Texas state government. This article will provide an overview of the Texas power grid, describe the extent of Winter Storm Uri's destruction, and discuss potential underlying causes for the grid failure. This article will also assess whether emerging Texas legislation could mitigate the threat posed by a future sub-zero weather event.

### THE TEXAS ELECTRICITY GENERATION SYSTEM

Texas' power grid is "deregulated," meaning that various companies own the different generating stations, transmission lines, and distribution networks—as opposed to one entity controlling all of those separate functions.<sup>2</sup> The majority of electricity customers in Texas are able to choose from different retailers in an open market system.<sup>3</sup> Grid operators, typically nonprofit agencies regulated by the state, oversee the price of energy and balance the supply and demand of electricity as it is generated and distributed.<sup>4</sup> Power companies generate electricity and then sell that energy to retail electricity providers and distribution companies, who in turn send that power to customers.<sup>5</sup> Texas grid operators answer primarily to a state agency called the Public Utility Commis-

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<sup>1</sup> Erin Douglas, *Wind Power a Smaller Contributor to Texas Electricity Crisis than Initially Estimated*, *ERCOT Analysis Shows*, TEX. TRIB. (Apr. 28, 2021), <https://www.texastribune.org/2021/04/28/texas-power-outage-wind/>.

<sup>2</sup> Darla Cameron et al., *How Texas' Power Grid Works*, TEX. TRIB. (Feb. 25, 2021), <https://www.texastribune.org/2021/02/25/texas-power-grid-ercot-puc-greg-abbott/>.

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

<sup>5</sup> *Id.*

sion (PUC).<sup>6</sup> The PUC enforces compliance with statutes and rules for electric utilities, as well as telecommunications and water utilities.<sup>7</sup>

The Electric Reliability Council of Texas (“ERCOT”) is the dominant power grid system operator in the state. ERCOT manages the circulation of roughly ninety percent of Texas’ annual generated electricity, servicing over 26 million customers across the state – including the Houston, Harris County area.<sup>8</sup> ERCOT schedules power on an electric grid (“Texas Interconnection”), which is comprised of over 46,500 miles of transmission lines and over seven hundred generating plants.<sup>9</sup> ERCOT collaborates with various energy generating and distributing companies to monitor the operation of the power grid.<sup>10</sup>

The North American Electric Reliability Corporation (“NERC”) is a non-for-profit regulatory authority that seeks to improve the reliability of power grids by setting performance standards and providing operation recommendations for energy generators and distributors.<sup>11</sup> NERC provides safety education and training material for industry personnel, and also, completes local audits and assessments.<sup>12</sup> NERC is thus central to regulating the weatherization measures taken by industry actors, a role whose importance will be discussed, *infra*.

#### WINTER STORM URI

From February 14 to 17, 2021, Winter Storm Uri wreaked havoc on Texas with many cities experiencing deadly subzero temperatures. As a result of the frigid temperatures, the demand for electricity skyrocketed beyond that which the grid was capable of supplying.<sup>13</sup> ERCOT’s projected maximum electricity demand in a ‘winter disaster scenario’ is 67.2 gigawatts (GW); on February 14,

<sup>6</sup> *Id.*

<sup>7</sup> Memorandum from the Comm. on Energy and Com. Staff to the Subcomm. on Oversight and Investigations Members and Staff (Mar. 19, 2021) [hereinafter memorandum], <https://energycommerce.house.gov/committee-activity/hearings/hearing-on-power-struggle-examining-the-2021-texas-grid-failure>.

<sup>8</sup> ERCOT, *About ERCOT*, <http://www.ercot.com/about> (last visited Oct. 1, 2021).

<sup>9</sup> *Id.*

<sup>10</sup> *Id.*

<sup>11</sup> NERC, *About NERC*, <https://www.nerc.com/aboutnerc/Pages/default.aspx> (last visited Oct 1, 2021).

<sup>12</sup> *Id.*

<sup>13</sup> Peter Cramton, *Lessons from the 2021 Texas Electricity Crisis*, 1 (Univ. of Cologne, Working Paper, 2021), <http://www.cramton.umd.edu/papers2020-2024/cramton-lessons-from-the-2021-texas-electricity-crisis.pdf>.

2021, this figure was exceeded when electricity demand rose to 68.8 GW.<sup>14</sup> Demand steadily increased to 76.8 GW, which was a demand that vastly outmatched supply. In response, ERCOT requested that distributors issue “controlled outages” for twenty percent of the system to prevent a complete grid blackout.<sup>15</sup> Importantly, “controlled outages” differ from “rotating outages.” Rotating outages allow for scheduled power to come back on in short alternating “shifts” across an impacted region; whereas controlled outages involve extended outages where power is not intermittently restored.<sup>16</sup> ERCOT administered controlled outages to try and prioritize power supply for critical services such as hospitals and fire departments.<sup>17</sup>

As demonstrated above, electricity supply and demand must remain in balance with one another to avoid blackouts, which in turn keeps “grid frequency” at a sustainable level.<sup>18</sup> The Texas Interconnection needs to maintain a grid frequency of almost exactly 60 Hz to remain stable.<sup>19</sup> On February 15, 2021, the grid frequency dipped to 59.4 Hz for over four minutes.<sup>20</sup> According to ERCOT’s own assessments, had it not issued controlled outages, and had the frequency remained below 60 Hz for more than nine minutes, the entire Texas interconnection would have collapsed; as a result, the entire state would have been subject to extended outages and left in total darkness for an untold amount of time, until the grid could be brought back online somehow.<sup>21</sup>

The extended outages resulted in roughly four million Texans being stuck without power for over forty-eight hours.<sup>22</sup> Without power, citizens were left without basic amenities, such as access to clean drinking water, with about fourteen million Texans placed under “boil water” notices as Texas’ water supply suffered burst pipes, with some citizens even resorting to melting snow.<sup>23</sup>

Texas’ wholesale electricity prices shot up to \$9,000.00 per megawatt hour, whereas the average price under normal conditions being \$50.00 per

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<sup>14</sup> Joshua Busby et al, 77 *Cascading risks: Understanding the 2021 Winter Blackout in Texas*, ENERGY RSCH. & SOC. SCI. (July 2021), <https://www.sciencedirect.com/science/article/pii/S2214629621001997>.

<sup>15</sup> Cramton, *supra* note 13.

<sup>16</sup> Busby, *supra* note 14.

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

<sup>22</sup> Memorandum, *supra* note 7.

<sup>23</sup> *Id.*

megawatt hour.<sup>24</sup> The price for electricity reached the highest amount permitted under Texas state law, and some residential customers in Houston saw their energy bills reach as high as \$10,000.00 for one week of power.<sup>25</sup> In total, the economic damages were estimated to reach over \$130 billion.<sup>26</sup> According to the state, at least 151 people died as a result of Winter Storm Uri. However, that total is believed to be much higher by many experts; an analysis of CDC data and public records suggests that roughly 700 people were killed due to the storm.<sup>27</sup>

### THE POWER GRID FAILURE

Electricity generation and distribution can occur in temperatures lower than Texas experienced during Winter Storm Uri, as evidenced throughout the country (e.g., energy production in the Midwest).<sup>28</sup> This suggests that the Texas power grid failures resulted from inadequate preparation for sub-zero temperatures as well as inaccurate projections for electricity demand.<sup>29</sup> A study conducted by Rice University, the Carnegie Institution for Science, and Columbia University used three distinct datasets to analyze the historical temperature record to determine the relative intensity of Winter Storm Uri. The study found that “the February 2021 event was intense but not without precedent in the historical record.”<sup>30</sup> In fact, while winter weather is “rare” in Texas, it is not absent in the historical record, with notable cold snaps occurring in 1899, 1951, 1983, 1989, and more recently in 2011.<sup>31</sup> When comparing the temperatures and duration of the storms, the December 1989 storm would have resulted in a higher electric heating demand per capita than the February 2021

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> Busby, *supra* note 14.

<sup>27</sup> Peter Wade, *Report: Death Toll from Texas Winter Storm Could be Five Times Higher than State Says*, ROLLING STONE (May 27, 2021), <https://www.rollingstone.com/politics/politics-news/deaths-texas-winter-storm-1175345/>.

<sup>28</sup> Chris Hubbuch, *Built for Cold, Wisconsin Grid Hums Along in Temperatures that Crippled Texas*, WISCONSIN STATE JOURNAL (Feb. 19, 2021), [https://madison.com/wsj/news/local/environment/built-for-cold-wisconsin-grid-hums-along-in-temperatures-that-crippled-texas/article\\_f42cd474-67fc-5fd8-888e-03d69d9ba215.html](https://madison.com/wsj/news/local/environment/built-for-cold-wisconsin-grid-hums-along-in-temperatures-that-crippled-texas/article_f42cd474-67fc-5fd8-888e-03d69d9ba215.html).

<sup>29</sup> James Doss-Golin et al., *How Unprecedented was the February 2021 Texas Cold Snap?*, 16 ENVIRON. RES. LETT., 1 (June 8, 2021), <https://iopscience.iop.org/article/10.1088/1748-9326/ac0278/pdf> (Historical storms suggest that subzero temperatures were known to occur in Texas prior to the 2021 winter storm event).

<sup>30</sup> *Id.* at 5.

<sup>31</sup> *Id.* at 2.

storm. Moreover, a January 1962 storm and the December 1983 storm would have resulted in at least 90% as much electric heating demand per capita.<sup>32</sup> The analysis shows that the temperatures observed during the 2021 cold weather event could have been “expected to occur *a priori*.”<sup>33</sup> Focus on this phenomenon was not limited to research, however, as politicians investigated the situation as well.

The Subcommittee on Oversight and Investigations of the Committee on Energy and Commerce held a hearing on March 24, 2021 titled, “Power Struggle: Examining the 2021 Texas Grid Failure.” During the hearing, prominent leaders from across Texas testified, including the mayor of Houston Sylvester Turner and presidents of entities involved with the Texas Interconnection.<sup>34</sup> Mayor Turner testified that “the combination of no power and low water pressure affected hospitals, police stations, dialysis clinics, people with special needs and the ability of firefighters to fight fires.” Mayor Turner further stated that “the magnitude of the damages was foreseeable and preventable.”<sup>35</sup> Bill Magness, President and CEO of ERCOT, testified that “key issues, [such as] winter preparedness, public safety communications, and the various grid and market issues were brought to light by the [2021] storm.”<sup>36</sup> Chairman of the House Energy and Commerce Committee, Frank Pallone, provided a briefing memo highlighting additional concerns, such as the fact that “lower-income households and areas may have been disproportionately impacted, as low-income individuals often lack access to backup equipment, such as generators, and may reside in poorly insulated homes.”<sup>37</sup>

Experts believe that the lack of adequate weatherization procedures for power plant equipment, natural gas pipelines, and coal piles contributed significantly to the inability of the Texas Interconnection to perform in subzero temperatures.<sup>38</sup> After a cold weather event in 2014, NERC issued a compre-

<sup>32</sup> *Id.* at 6.

<sup>33</sup> *Id.*

<sup>34</sup> Memorandum, *supra* note 7.

<sup>35</sup> *Power Struggle: Examining the 2021 Tex. Grid Failure: Hearing Before the Subcomm. on Oversight and Investigations of the H. Comm. on Energy & Com.*, 117th Cong. (2021) (testimony of Sylvester Turner, Mayor, City of Houston), <https://energycommerce.house.gov/committee-activity/hearings/hearing-on-power-struggle-examining-the-2021-texas-grid-failure>.

<sup>36</sup> *Power Struggle: Examining the 2021 Tex. Grid Failure: Hearing Before the Subcomm. on Oversight and Investigations of the H. Comm. on Energy & Com.*, 117th Cong. (2021) (statement of Bill Magness, President and CEO, ERCOT), <https://energycommerce.house.gov/committee-activity/hearings/hearing-on-power-struggle-examining-the-2021-texas-grid-failure>.

<sup>37</sup> Memorandum, *supra* note 7.

<sup>38</sup> *Id.*

hensive report that suggested winterization measures, identified areas of performance improvement, and even provided detailed examples of various types of equipment failure that occurred at power plants.<sup>39</sup> As Committee Chairman Pallone wrote, “state officials and the electric and natural gas industries failed to implement weatherization recommendations from NERC . . . following prior severe cold weather events that could have fortified Texas’ power infrastructure against the most recent storm.”<sup>40</sup> If these recommendations were actually implemented, perhaps the damage from Winter Storm Uri would have been mitigated, but unfortunately they never were.

In addition, there was also a notable lack of communication throughout the duration of the crisis. While ERCOT and various regional electricity providers scrambled to communicate with leaders and the news media, many customers “felt left in the dark” by the messaging during the blackouts.<sup>41</sup> Customers were not provided with uniform information, namely surrounding updates about how long the blackouts would last.<sup>42</sup> Additionally, the communication problems were exacerbated by the fact that “getting important information out to those who need it can be extremely difficult for audiences who primarily depend on electricity, internet and Wi-Fi to power their communications needs.”<sup>43</sup>

Poor internal communication worsened the issue as well, evidenced by the confusion between utilities companies themselves.<sup>44</sup> Power distribution companies, such as CenterPoint, use “critical care customer forms to determine whether a customer is a ‘critical load public safety customer,’” which is defined as a customer for which “electric service is considered crucial for the protection or maintenance of public safety; including but not limited to hospitals, police stations, fire stations, critical water and wastewater facilities, and customers with special in-house life-sustaining equipment.”<sup>45</sup> Many natural gas producers

<sup>39</sup> NERC, *Polar Vortex Review*, 14 (NERC ed., 2014), <https://www.nerc.com/pa/rrm/Pages/January-2014-Polar-Vortex-Review.aspx>.

<sup>40</sup> Memorandum, *supra* note 7.

<sup>41</sup> Nicole Schuman, *Texas Storm Communications Show Stark Messaging Contrasts*, PR NEWS (Feb. 22, 2021), <https://www.prnewsonline.com/texas-storm-communications/>.

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> Erin Douglas, *Paperwork Failures Worsened Texas Blackouts, Sparking Mid-Storm Scramble to Restore Critical Fuel Supply*, TEX. TRIB. (Mar. 18, 2021), <https://www.texastribune.org/2021/03/18/texas-winter-storm-blackouts-paperwork/>.

<sup>45</sup> CENTERPOINT ENERGY, *Critical Load Customer Eligibility Form*, [https://www.centerpointenergy.com/en-us/CustomerService/Pages/CNP\\_Forms/Critical-Care-Customer-Form.aspx?sa=Ho&au=bus](https://www.centerpointenergy.com/en-us/CustomerService/Pages/CNP_Forms/Critical-Care-Customer-Form.aspx?sa=Ho&au=bus) (last visited Oct. 1, 2021).

and processors failed to file the necessary paperwork to be listed as critical infrastructure, which in turn lead to natural gas companies losing power during the storm.<sup>46</sup> As a result, pumps went offline, eliminating the availability of natural gas as a resource, creating a vicious cycle of more blackouts.<sup>47</sup> However, rather than assuming accountability for the blackouts, the PUC placed the onus on customers to fill out their own critical care forms (shifting the burden away from distributors).<sup>48</sup> According to the PUC rule, an application for designation is the responsibility of the customer to submit on their own behalf, something that was unknown to a large number of industry actors prior to Winter Storm Uri.<sup>49, 50</sup> The lack of clarity between key industry actors was therefore a substantial impediment to effective responses to the power outages; this lack of clarity must be corrected by some intervening force, such as the state legislature. This could take the form of state laws regarding procedural requirements for the dissemination of critical service information from utilities companies, or even the creation of new state agencies for weatherization enforcement.

#### EXPERT INSIGHT

Francis Nugent, Senior Director of Legislative Policy for the Harris County Commissioner's Office ("Precinct 2") provided invaluable commentary regarding the 2021 Texas Power Grid failure; specifically, he offered insights into what an appropriate policy response should look like. Nugent is an attorney with expertise in areas such as energy infrastructure, stemming from his work in Texas and African countries, such as Uganda and Rwanda. Nugent is knowledgeable on transmission grid development, energy generation, and the retailing of power.<sup>51</sup> When asked to describe the damage caused by Winter Storm Uri, Nugent gave an honest, human account of his firsthand experience. He said that "the destruction was significantly worse than even a bad hurricane. . . I didn't have power for days. The average household temperature was hitting the mid-forties. . . [t]he county had warming centers and was trying to

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<sup>46</sup> Douglas, *supra* note 44.

<sup>47</sup> *Id.*

<sup>48</sup> *Id.*

<sup>49</sup> 16 Tex. Admin. Code § 25.497, <http://www.puc.texas.gov/agency/rulesnlaws/subrules/electric/25.497/25.497.pdf>.

<sup>50</sup> Douglas, *supra* note 44.

<sup>51</sup> Telephone Interview with Francis Nugent, Senior Director of Legislative Policy, Harris County Commissioner's Office (Precinct 2) (Sept. 19, 2021) [hereinafter Nugent Interview].



respond to issues every minute. . . some county employees went to warming centers and worked for days straight.”<sup>52</sup>

Nugent offered insight into the risks and benefits of an independently owned and operated power grid for the state of Texas. Nugent used the analogy of a “big fish in a small pond” to describe big power companies operating in Texas, remarking that “they do not want to compete on a national level, and in Texas, they do not need to.”<sup>53</sup> By refusing to connect to the western and eastern interconnect, the Texas Interconnection has “freedom and flexibility,” which can lead to benefits for largescale industrial customers.<sup>54</sup> However, “consumers, generally low income consumers, . . . may not see the same level of economic benefit.”<sup>55</sup>

Nugent also delved into the topic of power plant weatherization requirements. “Clearly advisory opinions and recommendations that ‘you should winterize’ are not good enough. . . mandates, not recommendations, will get results,” Nugent stated in the interview.<sup>56</sup> “Why were pipelines not designated as critical infrastructure to keep gas flowing to gas powered plants?” he questioned, seemingly disappointed.<sup>57</sup> Nugent believes that we should move away from running things “in an old school way” because “[t]here is new available technology, such as smart meters, which would more equitably and actively manage limited power reserves in real time.”<sup>58</sup> Finally, Nugent advised that “if we aren’t getting a lot of relief from state law, and another storm leads to mediocre and aesthetic state mandates,. . . we need to consider other tools to mitigate the harm. That’s when you start to look at the local county level.”<sup>59</sup>

According to Nugent, without assistance from state law, more localized efforts may be the next best plan-of-attack. Updated grid technology and local, county level action could be a source for more uniformity between utilities and overseers, and could provide more consistency across the entire interconnection, he says. However, sweeping state legislation would undoubtedly be a more efficient tool for enforcing weatherization projects—and thus should be the goal. The threat of state intervention or hefty sanctions may increase coop-

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<sup>52</sup> *Id.*

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> *Id.*

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

eration from power facilities regarding their winterization and communication practices.

### LEGISLATIVE RESPONSE

State legislation is an avenue for addressing collective-fundamental issues such as accountability, oversight, communication errors, and the winterization of power plants. In June 2021, Texas Gov. Greg Abbott signed two bills into law: “Senate Bills 2 and 3” (TX SB2 & SB3 — 2021-2022 — 87th Legislature).<sup>60</sup> These bills are an attempt to overhaul the state’s power grid by implementing more stringent weatherization requirements and penalties.<sup>61</sup> This new legislation aims to enforce upgrades for power generators and transmission lines to make them more resistant to extreme weather conditions.<sup>62</sup> Governor Abbott announced that ERCOT will undertake the task of conducting weatherization inspections of the plants within its oversight, and will issue weatherization penalties of up to \$1 million against non-compliant facilities.<sup>63</sup> The bills change ERCOT’s leadership structure, by reducing the size of ERCOT’s board of directors.<sup>64</sup> The new laws also allow for the appointment of two government selection-committee members (allowing for more government influence).<sup>65</sup> Electricity providers will be required to inform industrial and residential customers about how to register as “critical.” Additionally, electricity providers will need to implement emergency alert systems to warn Texans of impending weather emergencies and potential power outages.<sup>66</sup>

Despite these important changes, the laws are lenient in some respects. Texas is not requiring companies to weatherize their facilities until 2022 at the earliest, and for some industries that supply power plants – such as the natural gas industry – weatherization will only be required if it is deemed “critical” by regulators.<sup>67</sup> The bills do not mention upgrades to consumer infrastructure, including power meters, pipes, and home insulation.<sup>68</sup> Texans’ energy pay-

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<sup>60</sup> Isabella Zou, *Texas Power Generation Companies Will Have to Better Prepare for Extreme Weather Under Bills Gov. Greg Abbott Signed Into Law*, TEX. TRIB. (June 9, 2021), <https://www.texastribune.org/2021/06/08/greg-abbott-texas-power-grid-ercot/>.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

ments will likely rise under the new legislation, as the bills “attempt to stabilize the state’s energy market by allowing \$6.5 billion in ratepayer-backed bonds for natural gas utilities and electric cooperatives, meaning that those companies can seek state-approved bonds, backed by the state’s assurance that there will be an extra charge on customers’ utility bills to pay back the bonds.”<sup>69</sup> This potential hike in electricity prices comes months after energy bills skyrocketed for individual consumers during the power grid crisis due to energy scarcity.<sup>70</sup>

Prior to signing these senate bills, the legislature was silent regarding state mandated winterization of power plants; the best Texas had were “recommendations” from the NERC and PUC.<sup>71</sup> While this new legislation constitutes a much needed response to many years of calls for sweeping changes to Texas’ power grid, it does not address every reliability concern inherent within an independent power grid, despite what some Texas politicians insinuated.<sup>72</sup> Indeed, Governor Greg Abbott said that “[e]verything that needed to be done was done to fix the power grid in Texas.”<sup>73</sup> Public interest groups that formed in the wake of Winter Storm Uri have criticized the legislative response. Texans for Fair Energy Billing (TXFEB) have urged that “legislative inaction has left the Texas grid unprepared for the upcoming winter.”<sup>74</sup> By not requiring companies to winterize until at least 2022 at the earliest, the risk of another cold weather event overloading the Texas Interconnection this coming winter and beyond remains a very real possibility.<sup>75</sup> By not increasing winter preparedness at the consumer level, lower-income households that cannot afford back-up heating mechanisms or suitable home insulation remain particularly vulnerable to the threat of power outages.<sup>76</sup>

## CONCLUSION

The blackouts caused by Winter Storm Uri endangered human life and caused billions of dollars in damage to the people and the state of Texas. The

<sup>69</sup> *Id.*

<sup>70</sup> *Id.*

<sup>71</sup> NERC, *supra* note 11.

<sup>72</sup> Zou, *supra* note 60.

<sup>73</sup> *Id.*

<sup>74</sup> Texans for Fair Energy Billing, *Six Months After Winter Storm Uri, Texans for Fair Energy Billing Warns that Winter is Coming and Texas’ Energy Grid Still isn’t Prepared*, PR NEWSWIRE (Aug. 25, 2021), <https://www.prnewswire.com/news-releases/six-months-after-winter-storm-uri-texans-for-fair-energy-billing-warns-that-winter-is-coming-and-texas-energy-grid-still-isnt-prepared-301362032.html>.

<sup>75</sup> Zou, *supra* note 60.

<sup>76</sup> *Id.*

weather event that caused these blackouts was not without precedent, and increased precaution and communication among key actors in the Texas Interconnection could have mitigated the harm. Texas needs mandated inspections at power plants, more in-depth advisory guides regarding winter-readiness and disaster preparedness, heightened notification regarding critical customer forms, and increased winterization standards at power plants, alongside stricter penalties for failed compliance. More communication between grid operators, distributors, and generators would make the grid safer and more reliable as well. Coal and gas utilities should not be permitted to avoid adhering to expert recommendations simply because it is a costly endeavor or even a “bad” investment (due to the increasing shift towards green energy).<sup>77</sup> Texas’ power grid cannot continue to fail every time cold weather approaches, and it is time for “recommendations” to be replaced with enforceable mandates from the state legislature.

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<sup>77</sup> Benjamin Storrow, *How Coal Failed in the Texas Deep Freeze*, E&E NEWS (Mar. 18, 2021), <https://www.eenews.net/stories/1063727799>.