

Student Commentary to “Paying for Energy Peaks: Learning from Texas’s February 2021 Power Crisis”

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Extreme weather events are a growing threat to power grids across the country.¹ Climate change is leading to an increase in the frequency, intensity, and duration of storms and other climate hazards.² While many electric utility companies are investing billions of dollars into upgrading and hardening their electric grid infrastructure,³ the “energy-only” market in Texas provides little to no incentives to power companies to make “costly, upfront power investments when the financial payoffs of these investments depend upon an uncertain future.”⁴

While there was no single cause of the February 2021 blackouts across Texas, the two leading causes were Texas’s failure to account for climate change in the setup and maintenance of its power grid and its

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¹ MELISSA R. ALLEN-DUMAS ET AL., EXTREME WEATHER AND CLIMATE VULNERABILITIES OF THE ELECTRIC GRID: A SUMMARY OF ENVIRONMENTAL SENSITIVITY QUANTIFICATION METHODS 5 (2019).

² *Id.*

³ *Grid of Tomorrow*, TENN. VALLEY AUTH., <https://www.tva.com/energy-system-of-the-future/grid-of-tomorrow> (last visited Mar. 28, 2022) (announcing that Tennessee Valley Authority (“TVA”) is “investing more than \$2 billion over 5 years to ensure we continue to provide clean, low-cost, reliable power across the Tennessee Valley.”); *PG&E Announces 7 Recipients of \$400,000 in Resilience Hubs Grants to Help Communities Withstand Extreme Weather Events*, PG&E (Dec. 22, 2021), https://www.pge.com/en_US/about-pge/media-newsroom/news-details.page?pageID=c5894643-d63b-405e-a4dc-04efef0690a5&ts=1644352988067; Ivan Penn, *How PG&E Is Racing to Improve Safety as Fire Season Approaches*, N.Y. TIMES (Apr. 6, 2021), <https://www.nytimes.com/2020/07/18/business/energy-environment/pge-wildfire-california-summer.html> (“[PG&E] has committed to spending \$9.5 billion from 2020 to 2022 on its wildfire mitigation plan”); *Improving Our Systems*, FPL, <https://www.fpl.com/reliability/system-improvements.html> (last visited Mar. 28, 2022); *ConEd Makes \$1.5 Billion Investment in Grid Modernization*, SMART GRID OBSERVER (June 3, 2021), [https://smartgridobserver.com/current/ConEd%20Makes%20\\$1-5%20Billion%20Investment%20in%20Grid%20Modernization.htm](https://smartgridobserver.com/current/ConEd%20Makes%20$1-5%20Billion%20Investment%20in%20Grid%20Modernization.htm).

⁴ Colleen Baker & James Coleman, Discussion at The Tennessee Journal of Business Law Symposium, *Paying for Energy Peaks: Learning from Texas’ February 2021 Power Crisis* (Sept. 24, 2021).

disconnect from the national grid.⁵ In the year since Texas's power crisis, the state has tweaked some statutes and appointed new regulators, but despite the death, economic disaster, and embarrassment it suffered last year, very little has actually changed.⁶

The Texas power crisis is an excellent example of the benefits of governmental regulations. The electric grid is a complex system, linking electricity producers with consumers who use it for their daily needs. These systems begin on a local level and are interconnected to form larger, more dependable networks stretching thousands of miles and connecting millions of businesses and homes.⁷ The continental U.S. power grid consists of three primary interconnections—the Eastern, Western, and Texas (ERCOT)—which operate largely independent of each other with minimal transfers of electricity between them.⁸ The Eastern and Western Interconnections are also linked with the Canadian power grid to increase redundancy, helping to maintain the reliability of the grid and preventing blackouts caused by transmission line or power plant failure.⁹ The Texas Interconnection, however, is maintained as a separate grid. The grid does not cross state lines, meaning Texas is not subject to federal regulation by

⁵ See UNIV. OF TEX. AT AUSTIN, THE TIMELINE AND EVENTS OF THE FEBRUARY 2021 TEXAS ELECTRIC GRID BLACKOUTS 8–9 (2021) (explaining that the impacts of extreme weather were underestimated and some power generators were inadequately weatherized); Herman K. Trabish, *Texas Must Increase Ties to the National Grid and DER to Avoid Another Power Catastrophe, Analysts Say*, UTILITY DIVE (Mar. 2, 2021), <https://www.utilitydive.com/news/texas-must-increase-ties-to-the-national-grid-and-der-to-avoid-another-powe/595845> (implying that Texas could avoid future power outages if its energy infrastructure were connected to nearby states).

⁶ Mitchell Ferman, *“People Should Probably Be Worried”: Texas Hasn’t Done Enough to Prevent Another Winter Blackout, Experts Say*, TEX. TRIBUNE (Nov. 29, 2021, 4:00 AM), <https://www.texastribune.org/2021/11/29/texas-power-grid-winter-storm/>; Robert T. Garrett, *Texas’ New Set of Electricity Regulators Begins to Take Shape in Wake of Deep Freeze, Power Outages*, DALL. MORNING NEWS (Apr. 12, 2021), <https://www.dallasnews.com/news/politics/2021/04/12/texas-new-set-of-electricity-regulators-begins-to-take-shape-in-wake-of-deep-freeze-power-outages/>.

⁷ See MASS. INST. OF TECH., THE FUTURE OF THE ELECTRIC GRID 3 (2011), <http://web.mit.edu/mitei/research/studies/the-electric-grid-2011.shtml>.

⁸ *Electricity Explained*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/energyexplained/electricity/delivery-to-consumers.php> (Nov. 3, 2021) (“The Eastern Interconnection encompasses the area east of the Rocky Mountains and a portion of the Texas panhandle. The Western Interconnection encompasses the area from the Rockies to the west. The Electric Reliability Council of Texas (ERCOT) covers most of Texas.”).

⁹ *Id.*

the Federal Energy Regulatory Commission.¹⁰ When Texas disconnected from the power grid in 1999, it subjected its citizens to an untested and unproven experiment in deregulation of the energy sector.¹¹ The state handed control of its entire electric system to a patchwork of private generators, transmission companies, and energy resellers.

The energy industry in Texas (lead primarily by Enron) lobbied for deregulation because it provided them the opportunity for far higher profits.¹² Texans supported deregulation because they thought (as many people do) that less regulation is better, that government oversight is bad, and that free market capitalism in the electricity industry would lower monthly rates and give consumers more choices among energy providers. But research has shown this experiment of deregulation has largely failed since the beginning.¹³

Texas touts its independent electric system and limited federal regulatory jurisdiction as the driver behind their unique electricity system, led largely by their seemingly endless supply of cheap natural gas that the state can advertise as “clean energy” without the emissions of coal.¹⁴ While natural gas does *burn* cleaner than coal, the process of extraction and refinement is anything but clean.¹⁵ The process known as fracking uses water mixed with sand and chemicals at high pressures to fracture deep underground rock formations to release trapped oil and gas.¹⁶ Wastewater injection from fracturing wells has resulted in a myriad of environmental impacts in these areas: from causing a spike in earthquakes to contaminating aquifers and major supplies of drinking water.¹⁷

¹⁰ Kate Galbraith, *Explainer: Why Does Texas Have Its Own Power Grid?*, TEX. TRIB. (Feb. 8, 2011), <https://www.texastribune.org/2011/02/08/explainer-why-does-texas-have-its-own-power-grid/> (“Basically, Texas has its own grid to avoid dealing with—you guessed it—the feds.”).

¹¹ JAKE DYER, *THE HISTORY OF ELECTRIC DEREGULATION IN TEXAS* 13 (2009).

¹² *Id.* at 8–9.

¹³ *Id.* at 61.

¹⁴ *See id.* at 13.

¹⁵ Philip L. Staddon & Michael H. Depledge, *Fracking Cannot Be Reconciled with Climate Change Mitigation Policies*, 49 ENV'T SCI. & TECH. 8269, 8269–70 (2015); Melissa Denchak, *Fracking 101*, NRDC (Apr. 19, 2019), <https://www.nrdc.org/stories/fracking-101>.

¹⁶ *Introduction – What is Hydraulic Fracturing?*, AM. PETROLEUM INST., <https://www.api.org/oil-and-natural-gas/energy-primers/hydraulic-fracturing> (last visited Mar. 29, 2022).

¹⁷ Nala Rogers, *2019: The Year Fracking Earthquakes Turned Deadly*, INSIDE SCI. (Feb. 21, 2020), <https://www.insidescience.org/news/2019-year-fracking-earthquakes-turned-deadly>; M. P. Moschetti et al., *Rupture Model of the M5.8 Pawnee, Oklahoma, Earthquake from*

Additionally, fracking sites often experience explosions and fires.¹⁸ Studies have also linked fracking to “respiratory illnesses, cardiovascular problems, central nervous system damage, birth defects, cancer, [and] premature death”¹⁹ And “[w]hile most states with oil and gas production have rules requiring disclosure of chemicals used in fracking, those rules often contain exclusions for ‘confidential business information’ (CBI), which can be used to shield the identities of chemicals that are considered trade secrets.”²⁰

Natural gas as a “clean energy” source is, in fact, worse than coal in terms of global warming potential.²¹ A study by Cornell showed that the fracking process releases extraordinarily “large quantities of methane, and other harmful gases, yielding twenty percent more global warming per unit than coal.”²² “Methane is over [twenty] times more effective at trapping

Regional and Teleseismic Waveforms, 46 *Geophysical Rsch. Letters* 2494, 2494 (2019); Robert J. Skoumal et al., *Earthquakes Induced by Hydraulic Fracturing Are Pervasive in Oklahoma*, 123 *J. of Geophysical Rsch.* 10,918, 10,918 (2018); Denchak, *supra* note 15.

¹⁸ Sudhanshu Pandey et al., *Satellite Observations Reveal Extreme Methane Leakage From a Natural Gas Well Blowout*, 116 *PNAS* 26,376, 26,376 (2019), <https://doi.org/10.1073/pnas.1908712116>; Paige Pfleger, *A Fracking Explosion In Ohio Created One of Worst Methane Leaks In History*, WOSU PUB. MEDIA (Dec. 19, 2019, 4:57 PM), <https://news.wosu.org/news/2019-12-19/a-fracking-explosion-in-ohio-created-one-of-worst-methane-leaks-in-history>; Ryan Deto, *Fracking-Well Blast 60 Miles from Pittsburgh Leaked More Methane Than Some Countries Emit in a Year*, PITTSBURGH CITY PAPER (Dec. 17, 2019), <https://www.pghcitypaper.com/pittsburgh/fracking-well-blast-60-miles-from-pittsburgh-leaked-more-methane-than-some-countries-emit-in-a-year/Content?oid=16380347>; *Massive Fracking Explosion in New Mexico, 36 Oil Tanks Catch Fire*, ECOWATCH (July 13, 2016), <https://www.ecowatch.com/massive-fracking-explosion-in-new-mexico-1919567359.html>.

¹⁹ Irena Gorski & Brian S. Schwartz, *Environmental Health Concerns From Unconventional Natural Gas Development*, OXFORD RSCH. ENCYCS. (2019).

²⁰ See generally Denchak, *supra* note 15.

²¹ Robert W. Howarth, *A Bridge to Nowhere: Methane Emissions and the Greenhouse Gas Footprint of Natural Gas*, 2 *ENERGY SCI. AND ENG'G* 47, 47 (2014); Xiaochun Zhang et al., *Key Factors for Assessing Climate Benefits of Natural Gas Versus Coal Electricity Generation*, 9 *ENV'T RSCH. LETTERS* 1, 6 (2014); Wojciech Stanek & Ryszard Bialecki, *Can Natural Gas Warm the Climate More Than Coal?*, 136 *FUEL* 341, 348 (2014); David O. Carpenter, *Hydraulic Fracturing for Natural Gas: Impact on Health and Environment*, 31 *REV. ON ENV'T HEALTH* 47, 50 (2016).

²² *Study Shows Natural Gas Fracking More Harmful Than Coal*, THE CLIMATE CTR. (Apr. 14, 2011), <https://theclimatecenter.org/study-shows-natural-gas-fracking-more-harmful-than-coal/>; see Robert W. Howarth et. al., *Methane and the Greenhouse-Gas Footprint of Natural Gas from Shale Formations*, 106 *CLIMACTIC CHANGE* 679, 679 (2011).

heat . . . than [carbon dioxide], so it stands to greatly increase the pace of global warming, even over a short period of time.”²³

The majority of methane emissions come from leaks in the extraction process that are largely unseen and unmeasured.²⁴ And while the Environmental Protection Agency and other federal agencies track emissions, ongoing rollbacks of regulations on monitoring and restricting emissions of methane will only worsen the problem.²⁵ Methane leaked from gas wells can stay in the atmosphere for a decade.²⁶ Carbon dioxide from burning it can linger for a century.²⁷ It is imperative to ramp down emissions as quickly as possible. But every new natural gas power plant represents decades of drilling, mining, refining, and using fuel which will continue to produce severe greenhouse gas emissions.

Why is this so important? The true environmental costs of fracking are not reflected in its price, making it difficult for clean, more renewable energy options to compete.²⁸ Natural gas is so inexpensive it makes up about 46% of Texas’s energy supply mix.²⁹ While it’s often hailed as a clean

²³ *Study Shows Natural Gas Fracking More Harmful Than Coal*, THE CLIMATE CTR. (Apr. 14, 2011), <https://theclimatecenter.org/study-shows-natural-gas-fracking-more-harmful-than-coal/>.

²⁴ See Ramon A. Alvarez et al., *Greater Focus Needed on Methane Leakage from Natural Gas Infrastructure*, 109 PNAS 6435, 6438 (2012); Stephen Leahy, *Fracking Boom Tied to Methane Spike in Earth’s Atmosphere*, NAT’L GEOGRAPHIC (Aug. 15, 2019), <https://www.nationalgeographic.com/environment/article/fracking-boom-tied-to-methane-spike-in-earths-atmosphere>; Adam Vaughan, *Fracking Wells in the US are Leaking Loads of Planet-Warming Methane*, NEWSIDENTIST (Apr. 22, 2020), <https://www.newscientist.com/article/2241347-fracking-wells-in-the-us-are-leaking-loads-of-planet-warming-methane>.

²⁵ See Jean Chemnick, *Methane Cloud Sitting Over U.S. Southwest Threatens Indigenous Residents*, SCI. AM. (Aug. 6, 2020), <https://www.scientificamerican.com/article/methane-cloud-sitting-over-u-s-southwest-threatens-indigenous-residents>; Alex Guillen, *EPA’s Methane Rollback Eyes Future Hurdles for Climate Rules*, POLITICO (Oct. 13, 2020), <https://www.politico.com/news/2020/10/13/epa-methane-rollback-climate-rules-429188>.

²⁶ Benjamin Storrow, *Methane Leaks Erase Some of the Climate Benefits of Natural Gas*, SCI. AM. (May 5, 2020), <https://www.scientificamerican.com/article/methane-leaks-erase-some-of-the-climate-benefits-of-natural-gas/>.

²⁷ *Id.*

²⁸ See John Rumpler, *The Costs of Fracking*, ENV’T AM., https://environmentamerica.org/sites/environment/files/exp/reports/costs_of_fracking.html (last visited Mar. 29, 2022).

²⁹ See *Texas State Profile and Energy Estimates*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/state/?sid=TX#tabs-1> (last visited Mar. 29, 2022).

source of energy, the fracking process makes it one of the worst climate producers.³⁰

When Texas withdrew from the national grid and set up their own, their new system was highly deregulated with few safeguards and even fewer enforced rules.³¹ The utilities were competing for consumers, constantly trying to undercut competitors' prices.³² This constant price battle left very little incentive for companies to invest in weather protection and maintenance.³³

During the February 2021 power crisis, renewable energy quickly went offline because wind turbines were not equipped with de-icing equipment routinely installed in colder climates.³⁴ Power lines were installed without insulation.³⁵ The natural gas production process was unprepared—the cold temperatures caused freezeoffs at wellheads, processing facilities, compressor stations, and other natural gas system equipment.³⁶

To make it worse, the cold weather caused failures at power plants that were unprepared, causing several gigawatts of capacity to go offline.³⁷ Then the ERCOT, tasked with overseeing the grid, started turning off power to parts of the gas production and distribution system, making the

³⁰ See Alejandra Borunda, *Natural Gas is a Much 'Dirtier' Energy Source Than We Thought*, NAT'L GEOGRAPHIC (Feb. 19, 2020), <https://www.nationalgeographic.com/science/article/super-potent-methane-in-atmosphere-oil-gas-drilling-ice-cores>.

³¹ See DYER, *supra* note 11, at 8.

³² See *id.* at 15.

³³ Clifford Kraus et al., *How Texas' Drive for Energy Independence Set It Up for Disaster*, N.Y. TIMES (May 13, 2021).

³⁴ Lili Pike, *Wind Turbines Can Handle the Cold Just Fine. Just Look at Iowa.*, VOX (Feb. 19, 2021, 4:10 PM), <https://www.vox.com/2021/2/19/22290512/texas-winter-storm-wind-energy-power-outage-grid-fox-news>.

³⁵ Jeremy Schwartz et al., *"Power companies get exactly what they want": How Texas Repeatedly Failed to Protect its Power Grid Against Extreme Weather*, TEX. TRIB. (Feb. 22, 2021, 5:00 PM), <https://www.texastribune.org/2021/02/22/texas-power-grid-extreme-weather>.

³⁶ Michael E. Webber, *The Texas Power Crisis Didn't Have to Happen*, AM. SOC'Y MECH. ENG'RS (June 15, 2021), <https://www.asme.org/topics-resources/content/the-texas-power-crisis-didn-t-have-to-happen> ("[F]reezeoffs occur when water that is produced with oil and gas freezes, clogging and damaging wells, pipes, and other equipment." This results in a drop in natural gas supply while demand spiked to heat buildings and drive production at power plants.).

³⁷ See UNIV. OF TEX. AT AUSTIN, *supra* note 5, at 8; Nicholas Bogel-Burroughs et al., *Texas Winter Storm: What to Know*, N.Y. TIMES (July 14, 2021), <https://www.nytimes.com/2021/02/20/us/texas-winter-storm-explainer.html>.

supply shortage worse and accelerating the snowball of failures.³⁸ The possibility, and high likelihood, of frequent cold-weather events was never built into infrastructure in a state where climate change is still a highly disputed topic. When the energy grid was overwhelmed by below freezing temperatures, deregulation meant that critical rules regarding power generation and distribution were not set by any laws. Instead, important decisions were left to a vast array of energy companies.

The possible solutions for Texas to prevent deadly events like the February 2021 power crisis in the future is to either reconnect to the national grid and comply with federal regulations or implement strong and enforceable regulations to maintain control of their existing grid. The state must also address increasing climate instability by requiring investment in clean energy research and development, particularly for technologies such as grid-scale energy storage and advanced nuclear. Finally, controlling emissions from fracking is a policy that could be a quick fix to stemming the rise of methane further. Methane is a short-lived gas in our atmosphere and reducing methane emissions would have an almost immediate climate impact. Together, these solutions and policy recommendations can help prevent future energy management disasters while promoting a more sustainable environment.

³⁸ Russell Gold, *The Texas Electric Grid Failure Was a Warm-up*, TEX. MONTHLY (Feb. 2022), <https://www.texasmonthly.com/news-politics/texas-electric-grid-failure-warm-up/>.