A "Black Start" for Electricity Regulation: A Right-of-Way for Interstate Transmission Lines

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Abstract

The impacts of climate change and the energy transition are revealing the historical complexity of electricity regulation. United States residents have recently experienced unprecedented power outages as the grid weathers extreme winter storms. Additionally, the energy transition, while providing positive benefits for the environment, presents challenges for the American electric grid. One proposed solution to alleviate the stress on the grid due to extreme weather events and the implementation of renewable energy sources is to increase interstate transmission interconnections across geographically diverse areas.

However, this solution is difficult to realize. While there appears to be a will for more transmission interconnection throughout the United States, there is currently no way to guarantee that the necessary grid updates will occur. This article explores the feasibility of federal legislation, modeled after the Natural Gas Act, which would allow the Federal Energy Regulatory Commission to delegate federal eminent domain authority for interstate transmission line projects. This legislation would ensure that interstate transmission lines are given a guaranteed right-of-way to form a strong and resilient grid.

Introduction

It is now widely recognized that the burning of fossil fuels contributes to global climate change.[2] To be more precise, the burning of coal, oil, and gas causes over 75 percent of global

[2] *Causes and Effects of Climate Change*, UNITED NATIONS, https://www.un.org/en/climatechange/science/causes-effects-climate-change#:~:text=Fossil%20fuels%20%E2%80%93%20coal%2C%20oil%20and,they%20trap%20the%20sun's%20heat (last visited Dec. 10, 2023).

greenhouse gas emissions and 90 percent of carbon dioxide emissions.[3] These emissions trap heat on Earth, causing the warming of our planet and changes in weather patterns.[4] This recognition has led to the energy transition, which is the shift away from fossil fuels and towards renewable energy sources like wind and solar for energy.[5]

Mitigating the effects of climate change is significant for electricity generation, as electricity production accounts for 25 percent of greenhouse gas emissions in the United States, second only to transportation which contributes 28 percent. [6] Currently, the majority of electricity in the United States is generated through the burning of fossil fuels like coal and natural gas.[7] With persistent reliance on fossil fuels, renewable energy sources have big shoes to fill to effectuate the United States' goal of achieving net-zero emissions by 2050 and a net-zero power sector by 2035.[8]

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[3] *Id.*

[4] *Id.*

[5] *What is Energy Transition?,* S&P GLOB. (Feb. 24, 2020), https://www.spglobal.com/en/research-insights/articles/what-is-energy-transition, ("Energy Transition refers to the global energy sector's shift from fossil-based systems of energy production and consumption—including oil, natural gas, and coal—to renewable energy sources like wind and solar, and well as lithium-ion batteries.").

[6] *Sources of Greenhouse Gas Emissions*, U.S. EPA, https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions (last visited Dec. 10, 2023).

[7] *Id.* ("In 2021, 60% of our electricity comes from burning fossil fuels, mostly coal and natural gas.").

[8] *FACT SHEET: President Biden to Catalyze Global Climate Action through the Major Economies Forum on Energy and Climate*, WHITE HOUSE BRIEFING ROOM, https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/20/fact-sheet-president-biden-to-catalyze-global-climate-action-through-the-major-economies-forum-on-energy-and-

The impacts of climate change and the energy transition are revealing the historical complexity of electricity regulation. United States residents have recently experienced unprecedented power outages as the grid weathers extreme winter storms. Two examples I will elaborate more on below include Winter Storm Uri, which occurred in February 2021, and Winter Storm Elliott, which occurred in December 2022.[9] Uri and Elliott were two of five recent cold weather-related power outages severe enough to threaten grid reliability.[10] One proposed solution to lessen the impact of these extreme weather events on our electric grid is to increase interstate transmission interconnections across geographically diverse areas.[11]

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climate/#:~:text=Putting%20the%20Power%20Sector%20on%20a%20Path%20to%20Net%20Zero%20Emissions&text=President%20Biden%20has%20set%20an,by%20no%20later%20than%202050 (last visited Dec. 10, 2023); Susan Tierney & Lori Bird, *Setting the Record Straight About Renewable Energy,* WORLD RESOURCES INST. (May 12, 2020), https://www.wri.org/insights/setting-record-straight-about-renewable-energy ("For example, an NREL study found that generating 35% of electricity using wind and solar in the western U.S. would reduce CO2 emissions by 25-45%.").

[9] *The February 2021 Cold Weather Outages in Texas and the South Central United States | FERC, NERC, and Regional Entity Staff Report*, FERC 8 (Nov. 16, 2021), https://www.ferc.gov/media/february-2021-cold-weather-outages-texas-and-south-central-united-states-ferc-nerc-and [hereinafter *FERC Winter Storm Uri Report*]; *FERC, NERC Release Final Report on Lessons from Winter Storm Elliott*, FERC (Nov. 7, 2023), https://www.ferc.gov/news-events/news/ferc-nerc-release-final-report-lessons-winter-storm-elliott [hereinafter *Winter Storm Elliott Report*].

[10] *FERC Winter Storm Elliott Report, supra* note 9, at 5-6.

[11] *The Value of Transmission During Winter Storm Elliott*, AM. COUNCIL ON RENEWABLE ENERGY 5 (Feb. 2023), https://acore.org/wp-content/uploads/2023/02/The-Value-of-Transmission-During-Winter-Storm-Elliott-ACORE.pdf, ("[E]xpanded [transmission] ties between Texas and the Southeast would

The energy transition, while providing positive benefits for the environment, also poses challenges for the U.S. electric grid. The current electric grid was designed to transport electricity generated by fossil fuels, rather than electricity generated by intangible and intermittent renewable energy sources.[12] The federal government,[13] states,[14] courts,[15] utilities,

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have helped keep the heat on in Texas during Winter Storm Uri and in the Southeast during Winter Storm Elliott."); *Transmission & Distribution*, PJM, https://learn.pjm.com/electricity-basics/transmission-distribution, (last visited Dec. 10, 2023) (describing that electricity transmission refers to moving electricity from its generation point to the end consumer and operates as "the 'interstate highway' of electricity delivery'"); *Learn More About Interconnections*, U.S. DEP'T OF ENERGY OFFICE OF ELECTRICITY, https://www.energy.gov/oe/learn-more-about-interconnections (last visited Dec. 7, 2023) (describing an interconnection as a unit that is "electrically tied together during normal system conditions and [operates] at a synchronized frequency.").

[12] Alexandra B. Klass & Jim Rossi, *Reconstituting the Federalism Battle in Energy Transportation*, 41 HARV. ENVTL. L. REV. 423, 439 (2017).

[13] *National Transmission Needs Study*, DEP'T OF ENERGY, https://www.energy.gov/gdo/national-transmission-needs-study (last visited Nov. 30, 2023) ("Yet, today's grid cannot adequately support 21st Century challenges – including the integration of new clean energy sources and growing transportation and building electrification – while remaining resilient in the face of extreme weather exacerbated by climate change.").

[14] Olivera Jankovska, *Texas CREZ Lines: How Stakeholders Shape Major Energy Infrastructure Projects*, BAKER INST. (Nov. 17, 2020), https://www.bakerinstitute.org/research/texas-crez-lines-how-stakeholders-shape-major-energy-infrastructure-projects (describing how Texas incentivized investment in more transmission lines to integrate renewable energy sources onto the electric grid);

[15] *Illinois Commerce Comm'n v. Fed. Energy Regulatory Comm'n*, 721 F.3d 764, 771-772 (7th Cir.

Regional Transmission Organizations,[16] and scholars[17] have acknowledged this stressor and stated that interregional and interstate transmission lines are needed for the U.S. to competently rely on renewables for electricity generation.

While there appears to be a will for more transmission interconnections in the U.S., there is currently no way to guarantee that the necessary grid updates will occur. This is due to a decision made by Congress in 1935 through the passage of the Federal Power Act ("FPA"), which split jurisdiction over transmission line regulation between the federal and state

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2013).

[16] Mike Hughlett, *Utilities plan power line project across Minnesota that could cost nearly $700M*, STAR TRIB. (October 3, 2023), https://www.startribune.com/utilities-plan-power-line-project-in-minnesota-that-could-cost-nearly-700-million-xcel-otter-tail/600309516/.

[17] Klass, Alexandra B., and Macey, Joshua and Welton, Shelley and Wiseman, Hannah Jacobs, *Grid Reliability Through Clean Energy* (August 5, 2021), 74 STAN. L. REV. 969, 977 (2022), ("[Interstate] transmission lines are critical to supporting the large amounts of new renewable energy infrastructure that will be necessary to meaningfully reduce U.S. carbon emissions."); Avi Zevin, Sam Walsh, Justin Gundlach, & Isabel Carey, *Building a New Grid Without New Legislation: A Path to Revitalizing Federal Transmission Authorities*, 48 ECOLOGY L. Q. 169, 171 (2021) ("There is now broad agreement (if not a consensus) that new, long-distance, high-voltage transmission lines will be indispensable if the United States is to integrate enough renewable generation to decarbonize the electric system in a timely manner, and to do so cost-effectively."); Klass & Rossi, *supra* note 12, at 443-444; James W. Coleman & Alexandra B. Klass, *Energy and Eminent Domain*, 104 MINN. L. REV. 659 (2019) (describing that "The US will need a massive build-out of long-distance transmission lines to integrate this renewable energy into the electric grid" even with greater reliance on distributed energy and micro-grids).

governments.[18] The boundaries erected by the FPA grant absolute authority to the states in designating the location of transmission lines, whether the line is located within a single state (*intra*state lines), or whether the line crosses several states (*inter*state lines).[19] This delegation of authority is significant, because states have the power to, and have successfully thwarted,[20] interconnection efforts by denying approval for the location of interstate transmission lines.[21]

The result of this split authority? "A world where players have enough power to block everyone else's initiatives but no one has the power to impose its preferred course of action, [which] is a world where decisions are not taken, taken too late, or watered down to the point of

[18] Alexandra Klass, *The Electric Grid at a Crossroads: A Regional Approach to Siting Transmission Lines*, 48 UC DAVIS L. REV. 1895, 1914 (2015).

[19] *Id.* at 1897.

[20] *PUCT withholds certificate of convenience for 525 kV Pecos West Intertie Project*, GLOB. TRANSMISSION REP., https://globaltransmission.info/puct-withholds-certificate-of-convenience-for-525-kv-pecos-west-intertie-project/, (last visited Dec. 10, 2023) (describing the Texas Public Utilities Commission's decision to deny an interstate transmission line that would have connected ERCOT to the Western Interconnection); *See Illinois Commerce Com'n v. Federal Energy Regulatory Com'n*, 721 F.3d 764 (7th Cir. 2013).

[21] Klass & Rossi, *supra* note 12 at 428-429, ("This distinction [between federal and state approval of interstate energy transport projects] has important implications today, when more infrastructure projects are needed to integrate new sources of energy supply, such as wind and solar energy, into interstate energy markets.").

ineffectiveness."[22] For example, as mentioned, players in the complex electricity regulation landscape have long recognized that our electricity system needs greater interstate connections to remain reliable.[23] However, each of these players lacks the power to unilaterally implement change. We are instead left with a disorganized regulatory system where no player's preferred course of action is implemented. Further, attempts to strengthen the reliability of the grid through an increase in interstate transmission lack effectiveness due to decision-making authority being dispersed across various governments and entities.[24] As such, a redistribution of authority across electricity regulation players is necessary for the electric grid to be resilient through climate change and energy transition-related challenges. Perhaps a more appropriate suggestion would be a "black start" for electricity regulation in the United States.[25]

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[22] Moisés Naim, *The End of Power: From Boardrooms to Battlefields and Churches to States, Why Being In Charge Isn't What It Used to Be* (Mar. 11, 2014), https://www.google.com/books/edition/The_End_of_Power/9JOLAgAAQBAJ?q=&gbpv=1#f=false.

[23] *Supra* notes 13, 14, 15, 16, 17.

[24] Klass, Macey, Welton, & Wiseman, *supra* note 17 at 979 (describing energy policy as siloed between various levels of state, federal, and public-private actors, which contributes to the ineffectiveness of energy policy to "adequately harmonize climate change and reliability concerns").

[25] *Black Start*, NREL, https://www.nrel.gov/grid/black-start.html#:~:text=Black%20start%20is%20the%20ability,form%20an%20interconnected%20system%20again, (last visited Dec. 7, 2023) ("Black start is the ability of generation to restart parts of the power system to recover from a blackout. This entails isolated power stations being started individually and gradually reconnected to one another to form an interconnected system again.").

Preempting state authority over the location of interstate transmission lines could be a way to increase interstate transmission interconnections throughout the country. In this article, I advocate for federal legislation, modeled after the Natural Gas Act ("NGA"),[26] which would allow the Federal Energy Regulatory Commission ("FERC") to delegate federal eminent domain authority[27] for interstate transmission line projects. By granting this power to FERC, these necessary transmission projects can be given a guaranteed right-of-way over a state's objection. With both the will and a way for interstate transmission lines, this legislation can assist in keeping the power on during extreme weather events, ensure reliability throughout the energy transition, and resolve regulatory inconsistencies to ensure effective policymaking.

Rich commentary exists on this topic. Scholars have previously proposed the NGA as a possible comparative model for federal legislation to facilitate the construction of interstate transmission lines, but ultimately view this as an impossible endeavor due to the political

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[26] Natural Gas Act, § 7(h), 15 U.S.C. § 717(f), ("When any holder of a certificate of public convenience and necessity cannot acquire by contract or is unable to agree with the owner of property to the compensation to be paid for, the necessary right-of-way to construct, operate, and maintain a pipeline or pipelines for the transportation of natural gas, and the necessary lard or other property, in addition to the right-of-way, for the location of compressor stations, pressure apparatus, or other stations or equipment necessary to the proper operation of such pipeline or pipelines, it may acquire the same by the exercise of the right of eminent domain in the district court of the United States...").

[27] *Eminent Domain*, CORNELL L. SCH. LEGAL INFORMATION INST., https://www.law.cornell.edu/wex/eminent_domain#:~:text=Overview,referred%20to%20as%20a%20taking, (last visited Dec. 12, 2023) ("Eminent domain refers to the power of the government to take private property and convert it into public use, referred to as a taking.).

climate.[28] As such, there is extensive scholarship on solutions for the lack of interstate interconnections that fit into the current regulatory status quo.[29] My perspective is novel in that I contend that a complete overhaul of electricity regulation in the form of NGA-like legislation is necessary, appropriate, and feasible. Additionally, in anticipation of resistance by states, I also raise the suggestion that this legislation includes a state-input option modeled after Section 401 of the Clean Water Act.[30]

This article proceeds in five parts. Part I begins with a brief description of the current status of electricity regulation in the United States. Part II explores the negative impacts of climate change on the electric grid through the lens of recent cold-weather-related reliability failures. Through inspection of these events, Part II demonstrates how greater transmission interconnections are invaluable during severe winter weather. Part III discusses the challenges renewable energy sources present for our electric grid and further underscores the need for an increase in interstate interconnections. Part IV surveys current interconnection efforts and their

[28] Coleman & Klass, *supra* note 17, at 703 ("Although there are certainly benefits to a federal or regional approach, there appears to be no will in Congress to make such a dramatic change, which would meet with strong resistance by virtually every state."); Alexandra B. Klass and Elizabeth J. Wilson, *Interstate Transmission Challenges for Renewable Energy: A Federalism Mismatch*, *65* VAND. L. REV. 1801, 1859 (2012) ("Ultimately, we conclude that complete federal preemption of state siting authority for transmission lines is simply not politically feasible at the current time and will not be unless and until the nation has a major transmission crisis with significant blackouts.").

[29] *See* Klass, Macey, Welton, & Wiseman, *supra* note 17 (discussing eminent domain issues and transmission); Zevin, Walsh, Gundlach, & Carey, *supra* note 17.

[30] Clean Water Act § 401, 33 U.S.C. § 1341.

likelihood of success. Part V concludes with a thorough description and analysis of the proposed NGA-like legislation to provide a right of way for interstate transmission lines.

I. The Current Status of Electricity Regulation

The genesis of the regulatory complexity of electricity transmission began in 1935 with the passage of the FPA.[31] As mentioned, the FPA created two separate spheres of regulatory jurisdiction for the states and the federal government. FERC (then, the Federal Power Commission) was delegated authority to regulate interstate transmission and wholesale interstate transactions.[32] The states maintained the authority to approve the physical location of transmission lines, whether intrastate or interstate, within their respective territories.[33]

The influence of this split-jurisdiction has shaped the U.S. grid into its current existence. The grid has been described as a "patchwork of state-authorized facilities," a direct result of states' authority over the construction of transmission lines.[34] Further, the concept of a singular and unified electric grid in the United States is a misnomer. The U.S. electric grid consists of three distinct electric grids that are mostly isolated from one another.[35] These grids, referred to as

[31] Klass, *supra* note 18, at 1914.

[32] *Id.*

[33] *Id.*

[34] *Piedmont Env't Council v. FERC*, 558 F.3d 304, 310 (4th Cir. 2009).

[35] *See Learn More About Interconnections*, *supra* note 11.

interconnections, include the Eastern Interconnection,[36] Western Interconnection,[37] and Texas Interconnection.[38] Electricity is transported within these regions via alternating current ("AC")[39] and direct current ("DC") transmission lines.[40] Power flows across state borders on interstate transmission lines in the Eastern and Western Interconnections, subjecting those regions to

[36] *Id.* ("The Eastern Interconnection reaches from Central Canada Eastward to the Atlantic coast (excluding Quebec), South to Florida and West to the foot of the Rockies (excluding most of Texas).").

[37] *Id.* ("The Western Interconnection stretches from Western Canada South to Baja California in Mexico, reaching eastward over the Rockies to the Great Plains.").

[38] *Id.* ("The Texas Interconnection covers most of the state of Texas.").

[39] *Id.*

[40] *High Voltage Direct Current Transmission*, AM'S FOR A CLEAN ENERGY GRID, https://cleanenergygrid.org/wp-content/uploads/2014/08/High-Voltage-Direct-Current-Transmission.pdf, (last visited Dec. 9, 2023).

federal regulation by FERC.[41] The Texas Interconnection intentionally does not import and export electricity across state lines to avoid FERC/federal regulation.[42]

There are also a few DC transmission lines that connect the interconnections, but they have limited transportation capacity.[43] For example, the Texas Interconnection has four DC transmission lines connecting the region to other interconnections with an approximate capacity of 1000 megawatts.[44] The Texas Interconnection maintains DC connections with other states and interconnections, and still avoids federal regulation, because of the way electricity is transported across DC lines.[45] FERC has exempted these transmission lines from their regulation because

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[41] *An Overview of the Federal Energy Regulatory Commission and Federal Regulation of Public Utilities*, FERC (June 2018), https://www.ferc.gov/sites/default/files/2020-07/ferc101.pdf ("That is, FERC has exclusive jurisdiction over the "transmission of electric energy in interstate commerce," and over the "sale of electric energy at wholesale in interstate commerce," and over "all facilities for such transmission or sale of electric energy.").

[42] Kate Galbraith, *Texplainer: Why does Texas have its own power grid?,* THE TX. TRIB. (Feb. 8, 2011), https://www.texastribune.org/2011/02/08/texplainer-why-does-texas-have-its-own-power-grid/; *Electric ERCOT*, FERC, https://www.ferc.gov/industries-data/electric/electric-power-markets/ercot ("The transmission grid that the ERCOT independent system operator administers is located solely within the state of Texas and is not synchronously interconnected to the rest of the United States. The transmission of electric energy occurring wholly within ERCOT is not subject to the Commission's jurisdiction under sections 203, 205, or 206 of the Federal Power Act.").

[43] *FERC Winter Storm Uri Report*, *supra* note 9, at 24-25.

[44] *Id.*

[45] *See Frequently Asked Questions*, PECOS WEST INTERTIE, https://pecoswest.com/frequently-asked-questions/ (last visited Dec. 11, 2023).

across DC connections, "the flow of power is controlled (i.e. scheduled) rather than flowing continuously as on [AC] ties."[46]

For additional context, within these regions, Independent System Operators ("ISOs") and Regional Transmission Organizations ("RTOs"), administer and plan the transmission of electricity within their respective territories.[47] These RTOs and ISOs include the California ISO ("CAISO"), the Electric Reliability Council of Texas ("ERCOT"), Southwest Power Pool ("SPP"), Midcontinent Independent System Operator ("MISO"), PJM, New York Independent System Operator ("NYISO"), and New England ISO ("ISO-NE").[48]

Although there is a demonstrated need for more interconnection of the electric grids via interstate transmission lines,[49] the FPA as enacted created an uncheckable veto that can be leveraged by states over any transmission project that crosses their borders. Without a single

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[46] *FERC Winter Storm Uri Report*, *supra* note 9, at 24.

[47] *RTOs and ISOs*, FERC, https://www.ferc.gov/power-sales-and-markets/rtos-and-isos (last visited Dec. 7, 2023); Mathias Einberger, *Reality Check: The United States Has the Only Major Power Grid without a Plan,* RMI (Jan. 12, 2023), https://rmi.org/the-united-states-has-the-only-major-power-grid-without-a-plan/#:~:text=The%20US%20power%20grid%20is,from%20one%20another%2C%20electrically%20speaking.

[48] *US Energy Law: Electricity*, GEO. WASH. L. JACOB BURNS L. LIBR., https://law.gwu.libguides.com/c.php?g=619046&p=6021608 (last visited Dec. 10, 2023).

[49] *Transmission Projects Ready To Go: Plugging Into America's Untapped Renewable Resources*, AM'S FOR A CLEAN ENERGY GRID (April 27, 2021), https://cleanenergygrid.org/wp-content/uploads/2019/04/Transmission-Projects-Ready-to-Go-Final.pdf (explaining that expanding high voltage transmission is necessary, but not currently likely due to "shortsighted regional transmission planning and permitting."); see also *National Transmission Needs Study, supra* note 13.

entity to plan or approve these projects, interstate transmission lines are extremely difficult to build.[50] A proposed transmission line that crosses more than one state must receive approval for the location of the line from each state along the route.[51] These proposed interstate lines are often met with opposition.[52] As such, it is not surprising that a 2023 Clean Energy Grid Report by Americans for a Clean Energy Grid stated that, of the 36 large-scale regional or interregional projects identified, only half will eventually be constructed.[53]

II. Climate Change & Extreme Cold Weather Events

As we continue to experience the effects of climate change, there is an increased likelihood of extreme cold and severe winter weather.[54] More frequent and more intense cold weather is particularly concerning because of its impact on the electric grid. As demonstrated during Winter Storm Uri and Winter Storm Elliott, extreme cold causes 1) dramatic increases in

[50] Klass & Rossi, *supra* note 12, at 425.

[51] *Id.*

[52] Coleman & Klass, *supra* note 17, at 703.

[53] *Ready-To-Go Transmission Projects 2023*, AM'S FOR A CLEAN ENERGY GRID, at 7, 34 (Sept. 20, 2023), https://cleanenergygrid.org/wp-content/uploads/2023/09/ACEG_Transmission-Projects-Ready-To-Go_September-2023.pdf.

[54] *Ice, Snow, and Extreme Cold*, CTR. FOR DISASTER PHILANTHROPY, https://disasterphilanthropy.org/resources/extreme-cold/#:~:text=There%20is%20a%20direct%20connection,air%20into%20non%2Dtraditional%20areas (last visited Dec. 7, 2023).

electricity demand and 2) severe decreases in electricity supply due to infrastructure damage.[55] This supply and demand mismatch leads to power outages,[56] depriving residents of electricity at their most vulnerable.

Below, I will discuss two recent extreme winter storms, Winter Storm Uri and Winter Storm Elliott. Through that discussion, I will highlight the weaknesses of grids with few interstate transmission lines, and explain how increased transmission interconnections could have mitigated the impacts of Uri and Elliott. As mentioned, extreme weather and its demonstrated stress on the grid is one indicator that the U.S. electric grid needs more transmission interconnections to enhance reliability. The wishes of states like Texas to be free from federal regulation should not be sacrificed in exchange for a reliable electric grid.

a. Winter Storm Uri

One of the most widely publicized winter weather events was Winter Storm Uri in February 2021. This winter storm brought an arctic cold front, freezing participation, and snow to large regions of Texas and the South Central United States between February 8th and 20th.[57]

[55] *See generally FERC Winter Storm Uri Report*, supra note 9, ("as temperatures decreased, the number of generating units outaged or derated due to mechanical/electrical issues increased."); *Winter Storm Elliott Report, supra* note 9, at 7, ("In an unacceptably familiar pattern, the cold temperatures ushered in electric generation outages that coincided with winter peak electricity demands.").

[56] *Id.*

[57] *FERC Winter Storm Uri Report, supra* note 9, at 13.

Although 73% of the Lower 48 was covered by snow,[58] Texas took the biggest hit. More than 4.5 million Texans were without power during the storm,[59] and an estimated 246 people died due to power outages.[60] At one point during the storm, the grid in Texas was in dire condition – four minutes and 37 seconds away from total collapse that would have caused residents to be without power for *weeks or longer*.[61]

Ultimately, there were several causes for the disastrous outcomes in Texas. First, electricity generation units were not properly weatherized to withstand extreme winter weather.[62] The lack of weatherization can be traced to Texas's status as a decentralized energy market.[63] Before Uri, investors in Texas were indirectly incentivized to weatherize, because electricity

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[58] *Winter Storm Uri Spread Snow, Damaging Ice From Coast-to Coast, Including the Deep South (Recap)*, THE WEATHER CHANNEL (Feb. 16, 2021), https://weather.com/safety/winter/news/2021-02-14-winter-storm-uri-south-midwest-northeast-snow-ice.

[59] *FERC Winter Storm Uri Report*, *supra* note 9 at 9.

[60] Jaclyn Diaz, *Texas officials put the final death toll from last year's winter storm at 246*, NPR (Jan. 3, 2022, 6:55 PM), https://www.npr.org/2022/01/03/1069974416/texas-winter-storm-final-death-toll.

[61] Matt Largey, *Texas' Power Grid Was 4 Minutes And 37 Seconds Away From Collapsing. Here's How It Happened*, KUT NEWS (Feb. 24, 2021, 3:09 PM), https://www.kut.org/energy-environment/2021-02-24/texas-power-grid-was-4-minutes-and-37-seconds-away-from-collapsing-heres-how-it-happened (explaining that there was not enough power on the Texas grid during Uri which caused the frequency to dip below the minimum threshold, significantly enough for the grid to be 4 minutes and 37 seconds away from severe physical damage and complete failure).

[62] *FERC Winter Storm Uri*, *supra* note 9, at 11.

[63] James Dean, *Texas power crisis revealed flaw in market's design*, CORNELL CHRON. (Feb. 8, 2022), https://news.cornell.edu/stories/2022/02/texas-power-crisis-revealed-flaw-markets-design.

prices soar during extreme weather events.[64] This promise of a high return was intended to induce investors to prioritize preparedness.[65] However, Winter Storm Uri revealed a failure in the market's design.[66] "Winterization investment fell short...because the payoff proved too distant and uncertain."[67] The Texas Legislature addressed this market failure during the 2021 Legislative Session and now requires weatherization across the generating and transmitting sectors.[68]

Second, without the proper weatherization measures, the infrastructure supporting electricity generation crumbled. Various types of electricity generators experienced outages due to the storm.[69] Of the generators that went offline, 58 percent were natural gas-powered, 27 percent were wind-powered, 6 percent were coal-powered, and two percent were solar-powered.[70] Of the described outages, 75 percent were caused by freezing issues, with another 31

[64] *Id.*

[65] *Id.*

[66] *Id.*

[67] *Id.*

[68] *Governor Abbott Signs ERCOT Reforms, Power Grid Weatherization Legislation Into Law*, OFFICE OF THE TX GOVERNOR (June 8, 2021), https://gov.texas.gov/news/post/governor-abbott-signs-ercot-reforms-power-grid-weatherization-legislation-into-law ("Texas will now require the weatherization of power generation facilities, natural gas facilities, and transmission facilities to handle extreme weather.").

[69] *FERC Winter Storm Uri Report*, *supra* note 9 at 15.

[70] *Id.*

percent caused by natural gas fuel issues.[71] The trouble began much earlier for natural gas, with some infrastructure suffering unplanned outages due to the cold weather as soon as February 7th.[72] By February 15th, natural gas processing and production had decreased by 80 and 71 percent, respectively.[73]

In sum, without the proper winterization, the Texas grid experienced a comprehensive electricity generation failure. The 300-page Final Report issued by FERC analyzing the disaster proposed 28 recommendations for future prevention of similar catastrophic outages, with most of the emphasis on winterization and cold weather preparedness.[74] FERC also recommended that ERCOT investigate the possible reliability benefits of increasing additional transmission ties with the Eastern and Western Interconnections.[75]

Although not a cause of the outages, data in the aftermath of the storm has demonstrated that significant interconnections with geographically diverse regions could have mitigated the effects of Winter Storm Uri.[76] As mentioned, "[in] its electric grid, as in so many things, Texas

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[71] *Id.* at 15, 29 ("Natural gas wells produce fluids containing water in addition to natural gas...When temperatures fall below freezing, fluid-handling equipment can experience freezing issues and potentially halt the production of natural gas.")

[72] *Id.* at 100.

[73] *Id*. at 101.

[74] *Final Report on February 2021 Freeze Underscores Winterization Recommendations*, FERC (Nov. 16, 2021), https://www.ferc.gov/news-events/news/final-report-february-2021-freeze-underscores-winterization-recommendations.

[75] *FERC Winter Storm Uri Report*, *supra* note 9, at 235.

[76] *The Value of Transmission During Winter Storm Elliott, supra* note 11, at 5.

stands alone,"[77] or at least mostly alone. ERCOT has four DC connections with other grids.[78] A notable feature of these DC connections however is that power transfers into ERCOT are capped at around 1000 megawatts.[79] This feature of Texas' grid was a source of criticism after the storm, with former Texas Governor Rick Perry stating, "Texans would be without electricity for longer than three days to keep the federal government out of their business."[80]

The value of interconnections in emergency conditions can be demonstrated by the outcomes realized by other regions with interstate transmission ties that were affected by Uri. Similar to ERCOT, the SPP[81] and MISO[82] regions experienced generation outages throughout the storm.[83] However, SPP and MISO were able to avoid the magnitude of outages experienced

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[77] *CPS Energy v. Electric Reliability Council of Texas*, 671 S.W.3d 605, 611–12 (Tex. 2023).

[78] *FERC Winter Storm Uri Report, supra* note 9, at 24, 25 (explaining that ERCOT has two DC transmission connections with the Eastern Interconnection and two connections with Mexico's Grid Operator CENANCE).

[79] *Id.* at 14.

[80] Reese Oxner, *Texas could connect to national power grids without losing autonomy, former grid regulator says*, THE TEXAS TRIB. (Feb. 15, 2022), https://www.texastribune.org/2022/ 02/14/texas-national-power-grids/.

[81] *An Overview of the SPP System*, SOUTHWEST POWER POOL, https://www.spp.org/about-us/fast-facts/ (last visited Dec. 5, 2023) ("SPP has members in 15 states: Arkansas, Colorado, Iowa, Kansas, Louisiana, Minnesota, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming.").

[82] *About MISO*, MISO, https://www.misoenergy.org/meet-miso/about-miso/ (last visited Dec. 5, 2023) (explaining that MISO is a balancing authority that spans 15 states).

[83] *FERC Winter Storm Uri Report*, *supra* note 9, at 14.

by ERCOT because of their transmission connections with the Eastern Interconnection.[84] The Eastern Interconnection was particularly valuable throughout the storm because parts of the region were not subject to extreme winter weather.[85] SPP and MISO were both importing 15 times as much power as ERCOT during the storm.[86] MISO was importing around 13,000 megawatts and exporting approximately 7,500 megawatts to other regions.[87] ERCOT imported *800 megawatts*, with 400 from Mexico and the remainder from SPP.[88] Also demonstrating the value of interconnections with geographically diverse areas are the outcomes regarding how long power outages lasted in the respective regions. The ERCOT region experienced outages for over 70 hours, while the SPP and MISO regions experienced outages of around four and two hours, respectively.[89]

The value of electricity ties with geographically diverse locations during extreme weather events cannot be overstated. Extreme weather tends to be the most concentrated in a small area, so a grid with interconnections enduring an extreme weather event can draw on power from a region that may be experiencing the event to a different degree.[90] Likely, had the ERCOT region

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[84] *Id.*

[85] *Id.*

[86] Michael Goggin, *Transmission Makes the Power System Resilient to Extreme Weather*, ACORE 7 (July 2021), https://cleanenergygrid.org/wp-content/uploads/2021/09/GS_Resilient-Transmission_proof.pdf.

[87] *Id.* at 8-9.

[88] *Id.*

[89] *Winter Storm Elliott Report supra* note 9, at 14.

[90] *Transmission Projects Ready To Go: Plugging Into America's Untapped Renewable Resources*, *supra* note 49, at 14.

maintained significant interconnections with other regions, fewer Texans would have been without power and heat during Winter Storm Uri.[91] Texas' decision to remain isolated and free from federal regulation, despite the catastrophic impacts of Winter Storm Uri, has been described by FERC Chair Richard Glick as "cutting off your nose to spite your face."[92]

b. Winter Storm Elliott

Winter Storm Uri is not the only recent severe winter weather event that revealed reliability concerns. Winter Storm Elliott occurred December 21st-26th, 2022, and subjected the eastern half of the United States to frigid arctic air, strong winds,[93] and blizzard-like conditions.[94] Throughout the storm, electricity generation in the Eastern Interconnection was down 13%.[95] It

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[91] *The Value of Transmission During Winter Storm Elliott, supra* note 11, at 5 ("Expanded ties between Texas and the Southeast would have helped keep the heat on in Texas during Winter Storm Uri.").

[92] Edward Klump & Peter Behr, *What a $2B Texas project says about U.S. quest for CO2-free grid*, E&E NEWS BY POLITICO (Oct. 28, 2021, 7:15 AM), https://www.eenews.net/articles/what-a-2b-texas-project-says-about-u-s-quest-for-co2-free-grid/.

[93] *Presentation | December 2022 Winter Storm Elliott Inquiry into Bulk-Power System Operations: FERC, NERC and Regional Entity Joint Team Status Update*, FERC, https://www.ferc.gov/news-events/news/presentation-december-2022-winter-storm-elliott-inquiry-bulk-power-system (last visited Dec. 8, 2023).

[94] *Winter Storm Elliott Intensified Into Bomb Cyclone With High Winds, Blizzard Conditions, Flooding*, WEATHER UNDERGROUND (Dec. 24, 2022), https://www.wunderground.com/article/storms/winter/news/2022-12-23-winter-storm-elliott-bomb-cyclone-midwest-northeast-winds-snow.

[95] Ethan Howland, *Record 13% of Eastern Interconnect capacity failed in Winter Storm Elliot: FERC, NERC*, UTILITY DIVE (Sept. 22, 2023), https://www.utilitydive.com/news/winter-storm-elliott-ferc-nerc-

was "déjà vu all over again," according to FERC Commissioner Mark Christie.[96] These outages were mainly caused by natural gas generation failures due to freezing, and fuel, electrical, and mechanical issues.[97]

Approximately 1.6 million Americans did not have power due to outages as the RTOs and utilities struggled to match supply with demand.[98] Tennessee Valley Authority ("TVA") and Duke Energy, utilities in Tennessee and the Carolinas, were forced to implement rolling blackouts throughout the storm.[99] However, not all those in the path of Winter Storm Elliot had to cut the lights off. PJM was able to prevent power outages by importing electricity from New York and MISO.[100] Southern Co., a utility operating in Alabama and Georgia, imported a significant amount of electricity from NextEra Energy in Florida.[101] These imports meant that customers within Southern Co.'s jurisdiction did not have to endure blackouts or be forced to

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report-power-plant-outages/694451/#:~:text=via%20Getty%20Images-,A%20record%2Dsetting%2090.5%20GW%2C%20or%2013%25%20of%20the,North%20American%20Electric%20Reliability%20Corp.

[96] *Id.*

[97] *Id.*

[98] Abbie Bennett, *Holiday 2022 Winter Storm Raises Reliability, Generation Diversity Questions*, SP GLOB. (Mar. 27, 2023), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/holiday-2022-winter-storm-raises-reliability-generation-diversity-questions-74685081.

[99] *Id.*

[100] Ethan Howland, *supra* note 95.

[101] Bennett *supra* note 98.

conserve.[102] MISO also exported electricity to TVA and Southern Co., a substantial amount of which was wind-generated energy.[103]

Although the blackouts were caused by natural gas power plant outages, the Eastern Interconnection proved crucial in maintaining electricity service to customers.[104] This can be seen not just in the various electricity imports and exports that occurred during the storm, but also in the data detailing the duration of power outages in the Eastern Interconnection. Residents in the various regions that resorted to outages were without power for a range of two to nine hours.[105] "It wasn't enough to keep the lights on but it certainly helped prevent a bad situation from getting much worse."[106] These transmission interconnections will continue to be vital aspects of our electric grid as the effects of climate change are anticipated to create more frequent and severe winter weather.[107]

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[102] *Id.*

[103] *Id.*

[104] *Id.*

[105] *Winter Storm Elliott Report, supra* note 9, at 14.

[106] Bennett *supra* note 98.

[107] Rachel Licker, *How Is Climate Change Affecting Winter Storms in the US?*, UNION OF CONCERNED SCIENTISTS (Feb. 1, 2023), https://blog.ucsusa.org/rachel-licker/how-is-climate-change-affecting-winter-storms-in-the us/#:~:text=Because%20of%20human%20emissions%2C%20the,cold%20 outbreaks%20last% 20longer%2C%20too, ("Climate change is also indirectly affecting winter storms, making these extreme events happen more often.").

Importantly, the outages in the Eastern Interconnection during Winter Storm Elliott did not last as long as the outages experienced by Texans during Winter Storm Uri.[108] Nevertheless, FERC expressed concern in the aftermath of Elliott because the Eastern Interconnection typically has enough transmission interconnections to other regions to allow for the adequate import and export of excess electricity.[109] This raises the possibility that even more transmission line connections are necessary, possibly between the Eastern, Western, and Texas Interconnections, to keep the power on during extreme weather events. A study conducted by the American Council on Renewable Energy found that expanded ties between the Eastern Interconnection and ERCOT could have assisted in keeping the heat on in the east due to the geographic diversity of weather patterns.[110]

As demonstrated, extreme weather caused by climate change poses a risk to the United States' current electric grid. Recent reliability failures due to extreme weather events emphasize the need for greater electricity interconnections throughout the country. With Texas's intention to remain free of federal regulation, these updates to the grid are unlikely to occur without federal compulsive authority.

III. Renewable Energy: A Challenge that Creates an Opportunity for Progress

Also, a stressor for the U.S. electric grid is renewable energy resources. Transitioning to renewable energy resources is one of the main ways that the nation plans to mitigate climate change. Currently, electricity in the U.S. comes from four main sources, 39.8% from natural gas,

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[108] *Winter Storm Elliott Report, supra* note 9, at 6.

[109] *Id.*

[110] *The Value of Transmission During Winter Storm Elliott*, *supra* note 11, at 5.

21.5% from renewables, 19.5% from coal, and 18.2% from nuclear.[111] However, the transition away from fossil fuels, compounded with the reliability risks of extreme winter weather, places the U.S. electric grid in a vulnerable state. The transition towards reliance on renewable energy sources for electricity poses three types of unique challenges. First, renewable energy sources tend to be weather-dependent,[112] and the amount of electricity produced varies accordingly.[113] Second, renewable energy sources are often located far from the end consumer and inherently require more transmission infrastructure to get the electricity to its desired destination.[114] Third,

[111] *Electricity explained*, EIA, https://www.eia.gov/energyexplained/electricity/electricity-in-the-us.php#:~:text=The%20three%20major%20categories%20of,geothermal%2C%20and%20solar%20thermal%20energy (last updated June 30, 2023).

[112] Dana Ammann, *Winter Storm Elliott Report Highlights the Risk of Natural Gas Failures*, NRDC (July 20. 2023), https://www.nrdc.org/bio/dana-ammann/winter-storm-elliott-report-highlights-risk-natural-gas-failures ("As the climate changes, weather changes have become more sudden and severe at the same time as the energy mix has become more weather-dependent.").

[113] Robert Fares, *Renewable Energy Intermittency Explained: Challenges, Solutions, and Opportunities*, SCI. AM. (Mar. 11, 2015), https://blogs.scientificamerican.com/plugged-in/renewable-energy-intermittency-explained-challenges-solutions-and-opportunities/ (using solar panels as an example to demonstrate that renewable energy sources are intermittent, as solar output varies with cloud coverage and can only be relied upon during the daytime when the sun is shining).

[114] Lauren Bauer, *Ten economic facts about electricity and the clean energy transition*, BROOKINGS (April 27, 2023), https://www.brookings.edu/articles/ten-economic-facts-about-electricity-and-the-clean-energy-transition/ ("In the U.S., solar and wind resources are abundant but are not uniformly distributed and are not generally located near existing fossil fuel power plants and their associated electric transmission lines.

the electric grid will be facing an increase in demand as electrification is implemented to further lessen the impacts of climate change.[115] For example, increased reliance on electric vehicles is anticipated to dramatically increase demand to the point that it may jeopardize reliability in Texas.[116] As emphasized, the construction of more transmission lines connecting diverse regions and states throughout the country has been proposed as a solution to temper these challenges.[117] With that recognition, investors have been inspired to explore the development of new regional and interstate transmission lines to get the electricity produced by renewables to the end consumer.[118] However, states' authority to determine the location of transmission lines is a commonly identified barrier to achieving this goal.[119] Once again, there is a will, just not a way.

How quickly clean electricity production can increase will depend critically on the United States' ability to construct major new interregional electric transmission lines.").

[115] Klass, Macey, Welton, & Wiseman, *supra* note 17 at 986 ("The strategy for mitigating these harms can be summarized in six words: electrify everything and decarbonize the grid.").

[116] Jennifer Hijazi, *Major Questions, Standing to Take Stage for Car Rules Arguments*, BL, (Sept. 13, 2023, 4:30 AM), https://www.bloomberglaw.com/bloomberglawnews/environment-and-energy/XA8LH6N4000000?bna_news_filter=environment-and-energy#jcite (summarizing Texas' argument in upcoming case, *Texas v. EPA*, where the state argues that the EPA's new rule which effectively forces the transition to electric vehicles will jeopardize the reliability of the grid).

[117] Klass & Rossi, *supra* note 12, at 443-444.

[118] Klass & Rossi, *supra* note 12, at 426.

[119] *Id.* at 443-444.

Demonstrating this point are two studies conducted by Americans for a Clean Energy Grid in 2021 and 2023 identifying high-voltage transmission projects throughout the country.[120] The studies described the proposed benefits of the transmission projects, including increasing access to reliable and clean energy.[121] The studies also described the electricity sector's willingness to invest in renewable energy, but that transmission constraints continue to hinder the effectiveness of these efforts.[122] Of the 22 transmission projects identified in 2021, 10 had received approval by the issuance of the 2023 report.[123] Further, Americans for a Clean Energy Grid estimated that half or less of the 36 transmission projects identified in the 2023 report will receive approval.[124] Although there is recognition that more transmission lines are needed to implement renewable electricity sources onto the grid, these studies show that regulatory change is needed to effectively accomplish this goal.

IV. A Survey of Existing Interconnection Efforts

As previously demonstrated, there is a will for more interconnection and interstate transmission of electricity, and there have been several recent attempts to make a way. Below, I will provide a survey of recent attempts by utilities, RTOs, states, and the federal government to enhance the reliability of our electric grid through increased interstate transmission connections.

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[120] *Transmission Projects Ready To Go: Plugging Into America's Untapped Renewable Resources*, *supra* note 49; *Ready-To-Go Transmission Projects 2023*, *supra* note 53.

[121] *Transmission Projects Ready To Go: Plugging Into America's Untapped Renewable Resources*, *supra* note 49, at 10,

[122] *Id*. at 11.

[123] *Ready-To-Go Transmission Projects 2023*, *supra* note 53, at 18.

[124] *Id.* at 34.

I will then analyze the effectiveness of these attempts and describe the limitations of the electricity sector's current approach.

a. Forthcoming Initiatives

First, I will describe two recent examples of attempts from the utility and RTO levels to increase interstate transmission ties. With the recognition that more transmission interconnections are needed to integrate renewable electricity sources onto the grid, six electricity providers filed plans to construct a 200-mile transmission line from Big Stone City, South Dakota to Becker, Minnesota in October 2023.[125] The transmission line is currently pending approval by the respective states' Public Utility Commissions and is anticipated to be completed in 2027.[126]

Additionally, there have been two recent proposals by utilities to connect the ERCOT region to the Eastern and Western Interconnections.[127] Southern Cross Transmission proposed an interstate transmission line, which will be a 2,000-megawatt DC connection between ERCOT and the Eastern Interconnection.[128] The purpose of the line is to serve as an additional source of electricity for the ERCOT region during emergencies, like Winter Storm Uri.[129] However, it is

[125] Mike Hughlett, *supra* note 16.

[126] *Id.*

[127] *Report on Existing and Potential Electric System Constraints and Needs*, ERCOT (Dec. 2022), https://www.ercot.com/files/docs/2022/12/22/2022_Report_on_Existing_and_Potential_Electric_System_Constraints_and_Needs.pdf [hereinafter *ERCOT Report on Electric System Constraints and Needs*]; Klump & Behr, *supra* note 92; *see Frequently Asked Questions*, *supra* note 45.

[128] Klump & Behr, *supra* note 92.

[129] *Id.*

important to acknowledge that 2,000 megawatts of additional electricity is insignificant when compared with the EROCT region's 20,000 megawatt electricity shortage during Uri.[130] Another proposed line is the Pecos West Intertie, which would be a 280-mile, 1,500-megawatt DC line connecting ERCOT to the Western Interconnection.[131] However, unlike Southern Cross' proposal, this project has already reached the end of its life with the Public Utility Commission of Texas' ("PUCT") refusal to issue a certificate of public convenience and necessity for the line.[132] The PUCT denied the certificate because of a Texas law that requires that incumbent utilities receive priority to construct new transmission lines.[133]

Second, the federal government has also recognized the need for more interconnection and interstate transmission of electricity. The Department of Energy ("DOE") announced the Building a Better Grid Initiative, which began on January 12, 2022.[134] This program, facilitated by President Biden's Bipartisan Infrastructure Law, will incentivize the construction of more high-voltage transmission lines to increase the reliability of the electric grid.[135] This initiative

[130] *FERC Winter Storm Uri Report*, *supra* note 9, at 10 ("ERCOT ultimately had to shed 20,000 MW of firm load at the worst point of the Event").

[131] *ERCOT Report on Electric System Constraints and Needs*, *supra* note 127 at 16.

[132] *PUCT withholds certificate of convenience for 525 kV Pecos West Intertie Project*, *supra* note 20.

[133] *Id.*

[134] *Building a Better Grid Initiative*, U.S DEP'T OF ENERGY, https://www.energy.gov/gdo/building-better-grid-initiative (last accessed Dec. 10, 2023).

[135] *Id.*

explicitly recognizes the country's need for more interstate transmission lines to respond appropriately to climate change and the integration of renewable energy sources onto the grid.[136]

Further, the DOE announced on September 28, 2023, that 11 states, 2 territories, and 20 Tribal nations were to receive $167.7 million to mitigate the impacts of climate change on their grids and improve reliability.[137] This was the eighth announcement of funding as part of President Biden's Investing in America agenda and the Grid Resilience State and Tribal Formula Grants.[138]

b. Challenges

The interstate transmission initiatives introduced by utilities, RTOs, and the federal government are laudable strides in the right direction for strengthening the electric grid against climate change and renewable energy-related challenges. However, these initiatives may not be comprehensive enough to effectuate the change that our electric grid requires. One concern is that these initiatives could exacerbate the "patchwork" of the pre-existing grid.[139] Scholars Alexandra

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[136] *Id.*

[137] *Biden-Harris Administration Delivers More than $167 Million in Grid Resilience Formula Grants to States and Tribes Across the Country*, U.S. DEP'T OF ENERGY (Sept. 28, 2023), https://www.energy.gov/articles/biden-harris-administration-delivers-more-167-million-grid-resilience-formula-grants ("These grants will help modernize the electric grid to reduce the impacts of climate-driven extreme weather and natural disasters while also ensuring the reliability of the power sector.").

[138] *Id.*

[139] Klass, Macey, Welton, & Wiseman, *supra* note 17, at 980 ("[A] truly interregional transmission-planning process... [is] essential to the nationally connected grid that must support expanded renewables.").

Klass, Joshua Macey, Shelly Welton, and Hannah Wiseman describe in their article *Grid Reliability Through Clean Energy* the perils that accompany the disjointed efforts of utilities and RTOs.[140] RTOs and utilities, coordinating plans for transmission lines within their region prioritize their region's needs first, effectively eliminating the desire for more comprehensive, interregional planning.[141] Further, if interregional planning were to occur on a utility or RTO initiative, states could still deny approval for the location of the transmission line.[142] With utilities and RTOs left to their own devices, "the result is that virtually no interregional planning occurs today."[143] Most recent transmission project spending has prioritized local needs and ignored regional and inter-regional planning.[144]

Even with a demonstrated need for more interregional and interstate transmission lines, these projects are not likely to be constructed because of the state's ability to deny the location of transmission lines. Congress appears to have acknowledged this and has recently passed legislation aiming to limit a state's ability to deny a transmission line. This recent change was in response to the Fourth Circuit's ruling in 2009, *Piedmont Environmental Council v. FERC*. There, the court considered whether FERC had reasonably interpreted the Energy Policy Act of 2005 ("EPAct of 2005" or "Act").[145]

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[140] *Id.*

[141] *Id.* at 1030-1021.

[142] *Id.*

[143] *Id.*

[144] *Ready-To-Go Transmission Projects 2023*, *supra* note 53, at 26.

[145] *Piedmont Env't Council v. FERC*, 558 F.3d 304, 312 (4th Cir. 2009).

To recognize the significance of *Piedmont*, it is important to understand the EPAct of 2005. That legislation was passed in response to Congress' concerns about the reliability of the country's interconnected patchwork of transmission lines.[146] First, section 1221 of the EPAct of 2005 instructed the Secretary of Energy to designate National Interest Electric Transmission Corridors ("National Corridors").[147] Second, by adding Section 216 to the FPA, the EPAct of 2005 empowered FERC with the authority to permit and designate the location of transmission lines within National Corridors if certain circumstances were met.[148] Those circumstances included when (1) a state did not have the authority to approve the siting of a transmission line, (2) a state did not have the authority to consider the interstate benefits of the additional transmission line, (3) an entity applying for a transmission line permit did not qualify in a particular state because it does not serve customers in that state, (4) when a state commission withheld approval for more than one year after a permit application was filed, and lastly (5) if a state commission conditioned its approval as to render the transmission project economically infeasible or ineffective to achieve the goal of reducing transmission congestion.[149] At issue in *Piedmont* was FERC's interpretation that the "withheld approval for more than one year" circumstance included a state's *denial* of a transmission line permit.[150] The Fourth Circuit

[146] *Id.* at 310.

[147] Energy Policy Act of 2005 § 1221, 16 U.S.C. 824; Federal Power Act § 216(a), 16 U.S.C. 824.

[148] *Id.*

[149] *Piedmont* at 314.

[150] *Id.* at 312.

rejected FERC's interpretation, holding that "the continuous act of withholding approval does not include the final administrative act of denying a permit" by a state authority.[151]

This holding effectively curtailed federal authority over the siting of interstate transmission lines within National Corridors. The Secretary of Energy was empowered to designate areas of need, and FERC was to issue the permits for the transmission lines in those areas of need. However, if a state's public utility commission denied approval for the transmission line, the line would reach its demise and have no avenue for resurrection. This case enhanced the magnitude of the imbalance of power between states and the federal government in this area, as the federal government has identified a problem to be solved, but states ultimately reserve the right to withhold the solution.

Adding insult to injury, the Ninth Circuit vacated the designations of two National Corridors in a 2011 decision, *California Wilderness Coalition v. Department of Energy*.[152] Without the National Corridor designation, the federal government loses the ability to fast-track transmission line development in the area and take advantage of federal eminent domain.[153]

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[151] *Id.* at 315.

[152] *Will the Infrastructure Investment and Jobs Act Accelerate Transmission Development?*, WINSTON & STRAWN LLP (Jan. 4, 2022), https://www.winston.com/en/blogs-and-podcasts/winston-and-the-legal-environment/will-the-infrastructure-investment-and-jobs-act-accelerate-transmission-development.

[153] Daniel Firger & Bahrad Sokhansanj, *Ninth Circuit Vacates NIETC Designations in Calif. Wilderness Coalition v. Dept. of Energy*, CLIMATE L. COLUMBIA L. SCHOOL (Feb. 3, 2011), https://blogs.law.columbia.edu/climatechange/2011/02/03/ninth-circuit-vacates-nietc-designations-in-calif-wilderness-coalition-v-dept-of-energy/.

The Infrastructure Investments and Jobs Act ("IIJA"), signed into law by President Biden on November 15, 2021, was passed in part to address the holdings mentioned above.[154] As a result of *Piedmont* and *California Wilderness Coalition*, FERC had not issued a *single permit* under Section 216.[155] The IIJA endeavors to remedy this, amending Section 216 of the Federal Power Act to allow FERC to overrule a state public utility commission that denies a siting permit within a National Corridor.[156]

However, there is criticism that the IIJA's amendments will not be effective in creating the fast and comprehensive change that our grid desperately needs. First, there are still no designated National Corridors for FERC to issue permits within.[157] In October 2023, the DOE released the National Transmission Needs Study,[158] which is the first step before a new round of National Corridor designations.[159] However, this process has existed since 2005 and has yet to yield an interstate transmission line. Second, "the process is a clunky one at best," as described

[154] *Will the Infrastructure Investment and Jobs Act Accelerate Transmission Development?*, *supra* note 152.

[155] *Id.*

[156] *Id.*; Infrastructure Investment and Jobs Act § 40105, 42 U.S.C. 18711.

[157] *Will the Infrastructure Investment and Jobs Act Accelerate Transmission Development?*, *supra* note 152.

[158] *National Transmission Needs Study*, GRID DEPLOYMENT OFF. DEP'T OF ENERGY, (Oct. 30, 2023), https://www.energy.gov/gdo/national-transmission-needs-study.

[159] *Will the Infrastructure Investment and Jobs Act Accelerate Transmission Development?*, *supra* note 152.

by scholars Alexandra Klass, Joshua Macey, Shelly Welton, and Hannah Wiseman.[160] Third, this initiative has a limited reach. Section 216 of the FPA explicitly excludes the ERCOT region from consideration for designation as a National Corridor.[161] Arguably, the region of the country with the greatest need for interconnection is unreachable by this legislation. Lastly, the complexity of constructing a transmission line under Section 216 of the FPA will likely lead to the amended version being litigated in court for years, rather than being put into practice. The *Piedmont* ruling occurred in 2009, and Congress did not respond to this ruling until 12 years later in the IIJA. In the meantime, as mentioned, there have been no designated National Corridors or transmission lines built using this legislation.[162] This process has sat idly while the details stagnated through the courts. It follows that without clear and strong authority from Congress, the amended version of Section 216 will likely spend years being litigated before progress can be made to enhance the reliability of our grid through an increase in transmission interconnections.

V. A Right-Of-Way for Transmission Interconnections

As emphasized, there is a need for greater interconnection of the nation's grid to reduce the negative impacts of climate change and reliance on renewable energy resources. Also previously acknowledged is the largest barrier to achieving this goal – a state's ability to block an interstate transmission project by exercising its authority under the FPA. Congress's recent attempt to curtail the state's authority in this regard is not likely to be effective in creating the

[160] Klass, Macey, Welton, & Wiseman, *supra* note 17, at 1040.

[161] Federal Power Act § 216(k), 16 U.S.C. 824.

[162] *Will the Infrastructure Investment and Jobs Act Accelerate Transmission Development*, *supra* note 152.

comprehensive change that the grid needs. Therefore, a strong grant of federal authority is needed for the grid to be reliable through extreme weather events and the energy transition.

To provide a guaranteed right-of-way for interstate transmission lines, Congress should amend the FPA with legislation modeled after the NGA to apply to the permitting and siting of interstate transmission lines. Section 7 of the NGA allows FERC to grant eminent domain authority to a party wishing to build an interstate *natural gas pipeline*.[163] By giving the same authority to FERC in the context of interstate *transmission* lines, a party wishing to build an interstate transmission line will no longer have to seek approval from a state, or several states, for the location of a line. This legislation, which I will refer to as the "Interstate Transmission Line Act," will remove the largest barrier to interstate transmission line construction – state approval.[164]

Below, I will first describe the NGA, identify the model text to be implemented into the Interstate Transmission Line Act, and explain the grant of eminent domain authority. Second, I will explain why NGA-like legislation is necessary, appropriate, and feasible. Third, I will propose a state-input option to be leveraged by states that may oppose this new legislation.

a. <u>The Interstate Transmission Line Act, as Modeled After the Natural Gas Act</u>

The NGA was passed in 1938 in response to Congress's concerns about the abuse of monopoly power in the natural gas pipeline industry.[165] Initially, the NGA delegated authority to the FERC (then, the "Federal Power Commission") to grant a certificate of public convenience

[163] Natural Gas Act, § 7(h), 15 U.S.C. § 717(f).

[164] Zevin, Walsh, Gundlach, & Carey, *supra* note 17, at 171.

[165] Klass & Rossi, *supra* note 12, at 430-31.

and necessity for interstate natural gas pipelines.[166] These certificates operated as permission slips for a natural gas pipeline constructor who would like to build a natural gas pipeline that crosses through more than one state.[167] After the Act's passage, states began to refuse to grant eminent domain authority to certificate holders.[168] With the will and the permission slip but no right-of-way, natural gas pipeline constructors were effectively being given illusory rights to construct.[169] As a result, the NGA was amended in 1947 to ensure the effectiveness of the federally granted certificates of public convenience and necessity.[170] This amendment authorized certificate holders to use federal eminent domain authority to acquire land for their proposed interstate natural gas pipelines.[171] The 1947 amendments to the NGA ultimately equipped natural gas pipeline constructions with the will, the permission slip, and the right-of-way.

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[166] *Id.*

[167] *See* Natural Gas Act, § 7(h), 15 U.S.C. § 717(f).

[168] Klass & Rossi, *supra* note 12, at 430-31.

[169] *Divided Court Rejects Eminent Domain Challenge Involving Natural Gas Pipeline*, CONST. L. REP., https://constitutionallawreporter.com/2021/08/16/eminent-domain-challengeinvolvingnaturalgaspipeline2/#:~:text=Congress%20remedied%20this%20defect%20in,necessity%20could%20be%20given%20effect (last visited Dec. 10, 2023); *PennEast Pipeline Co., LLC v. New Jersey*, 141 S.Ct. 2244, 2252 (2021).

[170] *Divided Court Rejects Eminent Domain Challenge Involving Natural Gas Pipeline, supra* note 169; *PennEast* at 2253.

[171] *Divided Court Rejects Eminent Domain Challenge Involving Natural Gas Pipeline, supra* note 169; *PennEast* at 2252.

With the will already in existence, the Interstate Transmission Line Act could give possible interstate transmission line constructors the permission slip and the right-of-way to construct a line. As stated in Section 7(h) of the NGA, FERC could make determinations and provide certificates of convenience and necessity for interstate transmission line projects.[172] Consistent with the 1947 amendments to the NGA, certificate holders would then be granted eminent domain authority to take necessary land for the construction of the transmission line.[173] With an understanding of how the NGA would be incorporated into the Transmission Line Act, I will next illustrate the justifications for enhancing federal authority over interstate transmission lines.

b. The Transmission Line Act is Necessary to Enhance the Reliability of the Electric Grid

A source of strong, clear, and compulsive federal authority is necessary to facilitate the constriction of the interstate transmission lines that the U.S. electric grid requires to remain reliable. As mentioned, current attempts to achieve this goal by utilities, RTOs, and the federal government are not likely to be effective in creating the requisite change. In contrast, the Transmission Line Act would be a clear mechanism for these goals to be achieved. This is a result of its model legislation, the NGA, being a clear, strong, and compulsive authority wielded by the federal government to achieve the goal of interstate natural gas pipeline construction.

The NGA is a clear authority because it streamlines the process of approval for interstate natural gas pipelines.[174] The NGA is also a strong authority, where states have little to no say in

[172] *See* Natural Gas Act, § 7(h), 15 U.S.C. § 717(f).

[173] *Id.*

[174] Klass & Rossi, *supra* note 12, at 471.

the process.[175] The U.S. Supreme Court as recently as 2021 confirmed the strength of the eminent domain authority granted to NGA certificate owners in *PennEast Pipeline Co. v. New Jersey*.[176] There, the Court held that a certificate of public convenience and necessity granted by FERC for an interstate natural gas pipeline permits a private company to acquire both privately owned and state-owned lands.[177] This holding was significant in that it confirmed a private party's ability to take *state-owned lands*.[178] Lastly, the NGA is a compulsive authority, evidenced by its effectiveness in the creation of a national interstate pipeline network. FERC rarely denies certificates of public convenience and necessity,[179] and approximately 217,306 miles of the 300,000 miles of natural gas pipelines in the United States are interstate natural gas pipelines.[180]

c. The Transmission Line Act is Appropriate Given the NGA and the FPA's Shared Origins

Although the NGA includes a grant of federal eminent domain authority to certificate holders while the FPA lacks both a certificate and eminent domain mechanism, the Acts were

[175] *Id.* at 434, 432.

[176] *Divided Court Rejects Eminent Domain Challenge Involving Natural Gas Pipeline*, *supra* note 169; *PennEast* at 2244.

[177] *Divided Court Rejects Eminent Domain Challenge Involving Natural Gas Pipeline, supra* note 169; *PennEast* at 2263.

[178] *PennEast* at 2263 (emphasis added).

[179] Coleman & Klass, *supra* note 17, at 683.

[180] *Estimated Natural Gas Pipeline Mileage in the Lower 48 States, Close of 2008*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/naturalgas/archive/analysis_publications /ngpipeline/mileage.html (last visited Dec. 10, 2023).

modeled after one another at the time of their passage.[181] The FPA does not include a grant of eminent domain authority, because, at the time it was enacted in 1935, there was not a push for federal eminent domain authority over the siting of interstate transmission lines.[182] In 1935, transmission lines were designed to serve local needs, did not often cross state lines, and electricity that was produced did not need to travel very far because fossil-fueled generating plants could be constructed near the ultimate consumer.[183] In contrast, constructors of interstate natural gas pipelines were given federal eminent domain authority because the states were acting as roadblocks to construction,[184] and natural gas was viewed as a critical energy resource for the nation.[185]

There is an argument that the circumstances that triggered a grant of federal eminent domain authority for natural gas pipelines are now present for interstate transmission lines.[186] First, natural gas pipelines and interstate transmission lines are unique in that they both are the only transportation mechanisms for their commodity.[187] Natural gas can only be transported via

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[181] William J. Flittie & James L. Armour, *The Natural Gas Experience – A Study in Regulatory Aggression and Congressional Failure to Control the Legislative Process*, 19. SW L.J. 448, 450 (1965), ("The progenitor of the Natural Gas Act was prepared in 1935 at the direction of Congressman Rayburn and was modeled upon a parallel portion of the already drafted Federal Power Act.").

[182] Klass & Rossi, *supra* note 12, at 437.

[183] *Id.*

[184] *Id.*

[185] Klass, *supra* note 18, at 1897.

[186] *Id.* at 1902.

[187] *Id.*

pipeline, and, particularly relevant for the energy transition, electricity produced by renewable energy resources can only be transported through transmission lines.[188] Second, as mentioned, states can and have exercised their authority to block the construction of interstate transmission lines, similar to what occurred with natural gas pipelines in the 40s.[189] Both of these arguments indicate that the federal government should expand its authority over interstate transmission lines similar to its jurisdiction over interstate natural gas pipelines.

Further, granting eminent domain authority for the construction of interstate transmission lines would be consistent with the power exercised throughout history regarding highways, bridges, railroads, and telecommunications infrastructure.[190] As the U.S. transitions away from reliance on fossil fuels and towards renewable energy sources, the country will be living in a unique time where areas traditionally given eminent domain authority are converging on one another. For example, by encouraging reliance on electric vehicles,[191] the federal government is electrifying the highway. With all of the circumstances present to indicate a need for federal eminent domain authority, it remains to be seen why interstate transmission line constructors do not have access to the authority.

[188] *Id.*

[189] *Id.*

[190] *PennEast* at 2263.

[191] Hijazi, *supra* note 116.

d. The Transmission Line Act is Feasible Because of Recent Indications of Congressional Will

Scholars have previously suggested the need for new legislation to facilitate the creation of a national, interconnected grid.[192] Several have proposed that the legislation be modeled after the Telecommunications Act of 1996,[193] or the NGA.[194] However, James W. Coleman and Alexandra Klass have argued that new legislation is unlikely, as Congress does not seem to be willing to entertain it.[195]

Although Congressional will is an important aspect of reforming the grid, there is evidence of Congress' intent to strengthen the federal government's role in regulating electricity reliability. As mentioned, as recently as 2021, Congress amended the FPA via the IIJA to increase FERC's ability to permit interstate transmission lines when states fail to act or withhold action in National Corridors.[196] Congress, after *Piedmont*, deliberately enhanced federal authority over interstate transmission lines, which demonstrates the body's willingness to consider new legislation to strengthen the reliability of the electric grid.

Scholars Alexandra Klass and Elizabeth Wilson argued in another article, *Interstate Transmission Challenges for Renewable Energy: A Federalism Mismatch*, that something as

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[192] Klass, Macey, Welton, & Wiseman, *supra* note 17, at 723.

[193] Coleman & Klass, *supra* note 17, at 723-724.

[194] *Id.*

[195] *Id.* ("Although there are certainly benefits to a federal or regional approach, there appears to be no will in Congress to make such a dramatic change, which would meet with strong resistance by virtually every state.").

[196] Infrastructure Investment and Jobs Act § 40105, 42 U.S.C. 18711.

significant as an extreme power outage would be necessary to foster the Congressional will to draft new legislation.[197] This pre-requisite for congressional appetite also appears to be met, as the nation has experienced five reliability-threatening power outages in the last 11 years.[198] Further underscoring this need for new legislation is that one of the states the most affected by the severe winter weather, Texas, is exempt from current federal initiatives to strengthen the grid via interstate transmission lines.[199]

e. Upsetting the Federalism Balance – Getting the States on Board

Although a state input option is not necessary for the Interstate Transmission Line Act to accomplish its purpose of facilitating the construction of enhanced interstate transmission lines, the option may be beneficial to induce states' acquiescence and provide a "check" on FERC's authority. The state input option could be modeled after Section 401 of the Clean Water Act ("CWA"). Section 401 of the CWA is an attractive model because it has been successfully leveraged by states to halt the construction of interstate natural gas pipelines approved under the NGA. [200] If a natural gas pipeline harms a state's water supply, the state may deny the CWA certificate, stopping the project.[201]

The state input option under the Interstate Transmission Line Act could require states to certify that a proposed interstate transmission line will benefit its residents and not jeopardize

[197] Klass & Wilson, *supra* note 28 at 1864.

[198] *Winter Storm Elliott Report, supra* note 9, at 5, 6.

[199] Federal Power Act § 216(a), 16 U.S.C. 824.

[200] Klass & Rossi, *supra* note 12, at 446.

[201] *Id.*

grid reliability.[202] These two requirements for certification would be relatively easy to meet, as benefits to a state's residents and grid reliability are easily demonstrated by typical, long-distance high-voltage transmission line projects.[203] However, if a transmission line project fails to offer benefits to residents or to contribute positively to grid reliability, the state can deny the certificate, and effectively have a say in the project.

To summarize, although the Interstate Transmission Line Act would be a dramatic shift of regulatory authority over interstate transmission lines, there are indicators that this legislation could be feasible in our current political climate. To subdue state opposition to this shift in authority, a state input option modeled after the CWA may have the potential to increase the likelihood that this legislation could be passed by Congress.

Conclusion

As emphasized throughout this article, there is currently a will for more interstate interconnections to enhance the reliability of our electric grid, but there is no guaranteed right-of-way. This is concerning as the nation's electric grid is facing reliability stressors due to climate change and the implementation of renewable energy resources onto the grid. One way to ensure that adequate transmission is built to address these challenges is to remove state authority over the siting of transmission lines. This split of jurisdiction over interstate transmission lines, as established by the FPA in 1935, is likely outdated in light of the evolving climate and the energy transition.

[202] *See Illinois Commerce Comm'n v. Federal Energy Regulatory Comm'n*, 721 F.3d 764 (7th Cir., 2013).

[203] *Id.*

As proposed, the Interstate Transmission Line Act would be a grant of federal authority that would ensure that the comprehensive change that the U.S. electric grid requires is accomplished. This would be a clear, strong, and compulsive authority that would provide a guaranteed right of way for interstate transmission lines. Additionally, with the similar origins of the FPA and NGA, as well as recent indications of congressional will to pass this type of legislation, this Act could be the key to preventing future devastating power outages and ensure that the United States can effectively rely on renewable energy sources.