

AUTEUR**Sarah Stanford-McIntyre**

Assistant Professor
Herbst Program for
Engineering, Ethics & Society
University of Colorado
Boulder
Sarah.Stanfordmcintyre@
Colorado.edu
@sarahthestan

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The Saudi Arabia of Wind: Deregulation and the Rise of Wind Power in Texas

Résumé

Cet article retrace l'histoire de l'essor de l'industrie éolienne au Texas à travers l'étude de la construction du parc de Roscoe en 2010, dans l'ouest de cet Etat des Etats-Unis. Il s'appuie sur une documentation provenant d'agences locales, étatiques et fédérales ainsi que sur des archives pour affirmer que l'essor de l'énergie éolienne au Texas au début du 21^e siècle est le produit de grandes tendances liées à la déréglementation à l'œuvre à partir des années 1970. Cette dernière a eu deux effets. Premièrement, les décisions politiques des États et du gouvernement fédéral ont affaibli les anciens monopoles des services publics. Deuxièmement, les conséquences économiques et sociales de la déréglementation ont incité les habitants à s'intéresser au vent. À l'échelle nationale, la déréglementation et la mondialisation ont représenté un changement radical par rapport aux modes antérieurs de gestion des infrastructures par la loi. Au Texas, ce changement a accéléré le déclin des communautés rurales et fragilisé un ressort du nationalisme aigu texan. Cela a transformé les communautés rurales en défenseuses inattendues de l'énergie éolienne. La montée en puissance de l'énergie éolienne au Texas suggère que la tendance mondiale à la déréglementation et à la privatisation post-1970 a produit des effets variés sur les individus, les communautés et la cohésion de l'État.

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- "The Saudi Arabia of Wind"
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- A Grassroots Operation in Global Context
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1 Since 2010, the rapid expansion of US green energy has taken place in unexpected places. While environmentally conscious California was initially the nation's leader in wind development, the Plains states have seen the most growth in twenty-first century wind production. In particular, oil-rich Texas has risen to the forefront of turbine installation and electricity generation. This article explains how this came about, focusing on a single case study. The Roscoe Wind Farm, located in central West Texas and between 2009 and 2012 the largest on-shore windfarm in the world, illustrates that the success of Texas wind development was the result of energy policy decisions and also the product of localized social and economic responses to the deregulatory trends of the late-twentieth century. In Roscoe, as in other agricultural communities, reductions in farm subsidies and international trade agreements in the 1980s exacerbated land consolidation and population decline. Twenty years later, energy deregulation dismantled a regulatory system that had killed renewable electricity generation for decades and incentivized the rise of new alternatives. Agriculturalists in Rosco, as in many other Plains communities, were eager to become wind energy entrepreneurs.

2 This narrative is indicative of a broad shift in American understandings of infrastructure development and economic policy in the twentieth century. In 1935 the first Federal Power Act increased federal oversight over electricity infrastructure development and the industry's business practices. The ascendancy of Keynesian economics at the same moment meant that policymakers understood big government projects as job creators and drivers of economic growth. For forty years, key energy systems, including hydropower, the rural electricity grid, and nuclear energy, were highly publicized, public-private collaborations. Simultaneously, federal oversight held popular support as the best way to reign in business excess and for much of the century. Consumer electricity and fuel prices were heavily regulated.¹

This changed in the mid 1970s. After a midcentury peak, state funding for American infrastructure development began to dry up. This coincided with a push to diversify American energy production along with calls for deregulation and market competition which spurred the roll-back of government-mandated utility monopolies. In 2005 Texas incentivized green energy sales, arguing that competition would reduce consumer prices. Such trends made space for wind industry development just as turbine technology improved dramatically. By the twenty-first century, wind energy installations in the US were international operations with hardware development and financing spanning the globe. Competition was encouraged in wholesale electricity markets and publicly funded energy development was no longer a go-to strategy to legitimate state power or shore up the economy.²

While historians have chronicled nineteenth-century wind entrepreneurs and documented the federal push for renewable research and development during the 1970s energy crisis, historical scholarship on American wind energy remains extremely limited.³ This article fills a long-standing gap in the literature by connecting the rise of wind to broader historical trends. First, this story adds to our understanding of deregulation and its legacy. While scholars have correctly linked the impact of deregulation and privatization to the decline of the social safety net and the globalization of pollution, the ways in which these policy trends have also become unlikely vehicles for green energy development and localized rural revitalization has been overlooked.⁴

Press, 2016); Sarah T. Phillips, *This Land, This Nation: Conservation, Rural America and the New Deal* (New York: Cambridge University Press, 2007).

² Richard Hirsh, *Power Loss: The Origins of Deregulation and Restructuring in the American Electric Utility System* (Boston: MIT Press, 1999); Robert Lifset (ed.), *American Energy Policy in the 1970s* (Norman: University of Oklahoma Press, 2014).

³ Robert Righter has the sole historical monograph on the topic. Robert W. Righter, *Wind Energy in America: A History* (Norman: University of Oklahoma Press, 2008).

⁴ Neoliberalism and the rollback of government regulatory systems have been heavily critiqued by scholars. See Naomi Klein, *This Changes Everything: Capitalism vs. The Climate* (New York: Simon & Schuster, 2014); David Harvey,

¹ John C. Neufeld, *Selling Power: Economics, Policy, and Electric Utilities Before 1940* (Chicago: University of Chicago

Political scientists have assessed green energy's ability to compete economically with established fossil fuel systems and the efficacy of government subsidy programs.⁵ However, as this article points out that, in the case of Texas, the success of the wind industry was as much the result of local reactions to the hardships produced by broader economic and political trends as it was the result of coherent policy decisions or technological innovation.

- 5 Second, this story expands the geographic scope of green energy scholarship to include Texas, a most unlikely renewables center. To do this, it builds upon a rich literature on American electrification, highlighting that economic and legislative trends have been key to the trajectory of wind development.⁶ Historians have long identified electrification as central to twentieth-century state-making. Widespread, reliable electrification has historically been a national symbol of prestige and its interruption indicative of social decline. Scholars have identified how inclusion or exclusion from the electricity

A Brief History of Neoliberalism (Oxford: Oxford University Press, 2007); Jörg Friedrichs, *The Future Is Not What It Used to Be: Climate Change and Energy Scarcity* (Cambridge, Mass.: MIT Press, 2013); Matthew T. Huber, *Lifeflood: Oil, Freedom, and the Forces of Capital* (Minneapolis: University of Minnesota Press, 2013).

⁵ Robert Bradley, *Edison to Enron: Energy Markets and Political Strategies* (New York: Wiley, 2011); Fereidoon P. Sioshansi, *Evolution of Global Electricity Markets: New Paradigms, New Challenges, New Approaches* (New York: Academic Press, 2013); Leah Stokes, *Short Circuiting Policy: Interest Groups and the Battle Over Clean Energy and Climate Policy in the American States* (Oxford: Oxford University Press, 2020).

⁶ Abby Spinak, "'Not Quite So Freely as Air': Electrical Statecraft in North America," *Technology and Culture*, vol. 61, n° 1, 2020, 71-108; John C. Neufeld, *Selling Power: Economics, Policy, and Electric Utilities Before 1940* (Chicago: University of Chicago Press, 2016); Julie Cohn, *The Grid: Biography of an American Technology* (Boston: MIT Press, 2018); Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: The Johns Hopkins University Press, 1983), 324-362; Richard Rudolph and Scott Ridley, *Power Struggle: The Hundred-Year War Over Electricity* (New York: Harper Collins, 1986); David Nye, *Electrifying America: Social Meanings of a New Technology 1880-1940* (Boston: MIT Press, 1990); *Consuming Power: A Social History of American Energies* (Boston: MIT Press, 1997); Jane Griffith, "Hoover Damn: Land, Labor, and Settler Colonial Cultural Production," *Cultural Studies*, vol. 17, n° 1, 2016, 30-40.

grid denoted citizenship and state acknowledgement. At the consumer level, differences in electricity voltage and safety standards were often the result of competing regulatory systems and the boundaries of the electrical grid helped to denote the borders between one geopolitical entity and another.⁷ This article provides a needed epilogue to these histories, tracking how deregulation disrupted older systems of state control and boundary-making. As wind power becomes increasingly important to the global economy, this Texas case study suggests that green energy has become a bellwether for the globalization of infrastructure and the changing relationships between communities, energy producers, and the state.

This article is organized into four sections. The article begins by explaining the major actors involved in the establishment of the Roscoe Wind Farm, contextualizing the local story within global trends. In the second section, the article explains the long, intertwined history of electrification and wind power in the US. The third section examines the role of infrastructure as a political tool and the origins of deregulation in Texas. It describes the role that deregulation played in Texas's support for green energy production. The final section returns to the Roscoe Wind Farm and a discussion of the mixed impact globalized wind energy has had on the local economy and Texas politics. 6

"THE SAUDI ARABIA OF WIND"

In early 2017 Texas oil executive T. Boone Pickens predicted that "Wind and solar prices are going to continue to drop, and the middle of America is the Saudi Arabia of wind."⁸ Ten years earlier Pickens 7

⁷ Daniel MacFarlane, *Fixing Niagara Falls: Environment, Energy, and Engineers at a Famous Border Waterscape* (Pittsburg: UBC Press & University of Pittsburgh Press, 2020); Marianna Dudley, "The Limits of Power: Wind Energy, Orkney, and the Post-war British State," *Twentieth Century British History*, Vol. 31, n° 3, September 2020, 316-339.

⁸ T. Boone Pickens, "T. Boone Pickens has a two-part energy plan for Trump starting with don't screw up," *Dallas News*, January 2017, <https://www.dallasnews.com/opinion/commentary/2017/01/05/t-boone-pickens-two-part-energy-plan-trump>. Accessed 9/25/2019.

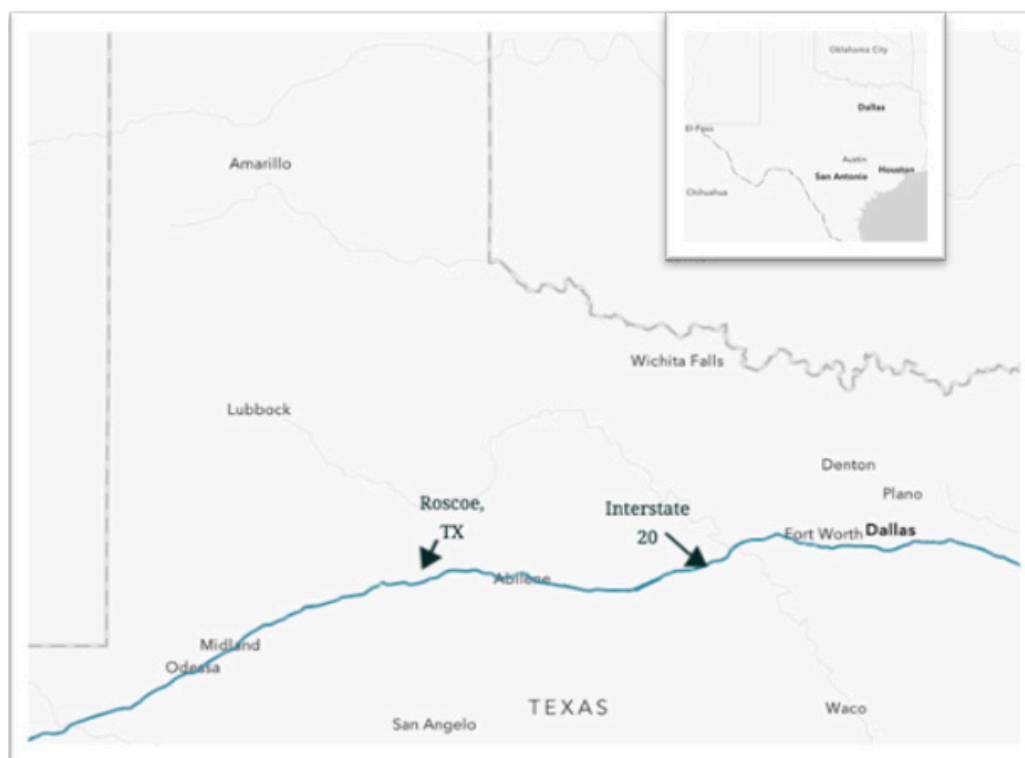


Figure 1: Map of Texas locating the town of Roscoe in relation to major cities. Source: Sarah Stanford-McIntyre.

had publicly announced a plan to build the world's largest wind farm in the Texas Panhandle, the isolated, northern-most region of the state. Pickens encountered what had long been one of the industry's main challenges: a lack of high-voltage transmission lines. Since the 1980s, an inability to transport electricity generated at isolated wind farms had slowed development.⁹ In 2009 Pickens was quick to highlight the problem of insufficient infrastructure, saying that "It doesn't mean that wind is dead. It just means we got a little bit too quick off the blocks."¹⁰ In reality, Pickens's – CEO of the Dallas-based energy investment firm BP Capital – had already been beaten to the punch. He was not the only player imagining a Texas wind empire. That same year the German electricity giant E.ON completed the world's largest wind farm 237 miles to the south.

- 8 The Roscoe Wind Farm, located near the small town of Roscoe in north-central Texas, was a massive undertaking. Approximately one wind

turbine was installed each day until project completion. The turbines ranged in size from 350 feet to 415 feet tall, the size of an approximately 38-story skyscraper.¹¹ A single blade spanned from 100 to 150 feet. Once assembled, the wind farm encompasses 634 turbines standing approximately 900 feet apart on 100,000 acres of working cotton farmland. Electricity production started in 2010, just one year after construction began. As of 2019, the wind farm generated approximately 782 megawatts of electricity (enough to power approximately 250,000 homes) which E.ON sold to Texas energy companies and, in turn, Texas energy consumers.¹²

Unlike Pickens, E.ON was willing to pursue the project without the benefit of existing infrastructure. This was due to a combination of geography and economics. Roscoe sat at a transition point between the wet, sub-tropical climate of East Texas and the state's arid, western regions. Although the area was populated by a

⁹ Righter, *Wind Energy in America* (cf. note 3).

¹⁰ AP, "T. Boone Pickens Calls Off Massive Texas Wind Farm," CNBC, July 7, 2009, <https://www.cnbc.com/id/31785977>. Accessed 9/25/2019.

¹¹ "The Roscoe Wind Farm Project, Texas, USA," Power Technology, <https://www.power-technology.com/projects/roscoe-wind-farm/>. Accessed 9/25/2019.

¹² Id.

mix of cotton farmers and cattle ranchers, lack of surface water and the constant wind made it ill-suited for agriculture. In Roscoe, wind speeds averaged at least twenty miles per hour, every day, year-round.¹³ Like the Panhandle, Roscoe was in need of economic stimulus. However, Roscoe was close enough to urban centers to make the construction of new high voltage lines an economically viable option.

10 Wind development was a lucrative alternative in a region hit hard by rural economic decline. E.ON leased land from a network of approximately 300 local cotton farmers, many of whom had worked the land for decades. Although the nearest small city was only fifty miles to the east, Roscoe was 114 miles from Lubbock, the nearest urban hub and it had been historically hard to draw industry or investment to the rural community. Making matters worse, in the early 1980s engineers rerouted Interstate 20 to bypass the town, consigning Roscoe's economy to a creeping decline. According to the 2010 census Roscoe's population was only 1,322, down from a peak of 1,628 in 1980. Reflecting these problems, the 2010 median income in Roscoe and the surrounding area was low, at \$23,816 annually.¹⁴ In contrast, the wind farm's unitized lease payments averaged around \$100 per acre per year. According to some reports, this was twice what agriculture could produce. Depending upon the size of the turbine and total acreage leased, individuals received between \$3,000 and \$5,000 dollars per year. For some, this reached as high as \$15,000.¹⁵ This represented an instant source of income

for landowners and an attractive boost to the local tax base.¹⁶

Beginning in 2010, the wind farm's impact on both the Roscoe landscape and the global electricity industry was significant.¹⁷ Texas had comparatively lax environmental restrictions and since windfarms were still relatively new, most county governments did not have zoning requirements or require public hearings before beginning construction. Residents used their own discretion when signing leases. According to industry representatives, wind farm operators liked large landholders best. As Jeff Clark, director of the industry group Wind Coalition put it, "The advantage is the bigger geographic footprint you get, the better the odds the wind is blowing at some point somewhere."¹⁸ And the larger the wind-farm, the better. As a result, carefully spaced turbines towered over the region's flat and arid landscape.¹⁹ The turbines were visible for miles, dwarfing Roscoe's cotton fields and cotton gins. According to General Electric, up-close a single wind turbine was about as loud as a lawn mower and, by law, turbines were required to be spaced at least 300 meters from the closest residential building. At that distance, a turbine was louder than a refrigerator but quieter than a window

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¹⁶ At the federal level, wind farms benefit from the Renewable Electricity Production Tax Credit (PTC) which credits 2.3 cents for every mega-watt hour of energy produced for the first ten years. At the local level, wind farms are contributors to local property taxes. Lease payments are also taxed. "Wind Vision: A New Era for Wind Power in the United States, Office of Energy Efficiency and Renewable Energy, US Department of Energy Office of Scientific and Technical Information, 2015, https://www.energy.gov/sites/prod/files/2015/03/f20/wv_full_report.pdf. Accessed 9/25/2019.

¹⁷ In 2012 the Roscoe Wind Farm was dethroned by the Alta Wind Energy Center in California.

¹⁸ James Osborne, "Country's Largest Wind Farm Planned in Texas Panhandle," *Dallas News*, September 24, 2013, <https://www.dallasnews.com/business/energy/2013/09/24/countrys-largest-wind-farm-planned-in-texas-panhandle>. Accessed 9/25/2019.

¹⁹ As legal scholars and scientists hash out the optimal conditions for wind production, turbine placement, "wind stealing" is poised to become a source of logistical and regulatory conflict. J. K. Lundquist et al., "Costs and consequences of wind turbine wake effects arising from uncoordinated wind energy development," *Nature Energy*, vol. 4, 2019, 26–34.

¹³ National Weather Service, "West Central Texas Climate Data," <https://www.weather.gov/sjt/ClimateViewer>. Accessed 9/25/2019.

¹⁴ US Census, 2010, Selected Economic Characteristics, American Community Survey, Nolan County, Texas, Washington: Government Printing Office, 2017.

¹⁵ Lease royalty contracts are confidential, making exact statements about payments impossible. However, anecdotal information is available. See Christian Brannistrom et al., "Spatial Distribution of Wind Power Royalties in West Texas," *Land*, vol. 4, n° 4, 2015, 1182–1199 and Sarah Mae-Nelson, "Cliff Etheredge – Wind Farmer: Switch Energy Project," *Climate Interpreter*, September 10, 2013, <https://climateinterpreter.org/resource/cliff-etheredge-wind-farmer-switch-energy-project>. Accessed 9/25/2019.



Figure 2: Wind turbines tower over cotton fields along State Highway 84, northwest of Roscoe, Texas on December 27, 2012. Source: Sarah Stanford-McIntyre.

air conditioner.²⁰ All together the 634 turbines at the Roscoe Wind Farm produced a constant background hum that could be heard from passing cars on Interstate 20 and inside area homes.

- 12 The decision to transform the local economy and local environment reflected big changes at E.ON and in the electric power industry. E.ON, the largest electricity provider in Germany and third largest in Europe, used Roscoe and other wind farms to redefine itself as a green energy producer. In 2016, six years after completing the project in Roscoe, E.ON proudly reported that it had sold all of its fossil fueled energy holdings, publicly committing to renewable power. By 2018 the company maintained twenty three wind farms in Texas.²¹ This was an expensive transition. The Roscoe Wind Farm alone cost over one billion dollars to complete, but E.ON had partners. The Roscoe Wind Farm was financed

²⁰ Thomas Kellner, “How Loud is a Wind Turbine,” GE Reports, August 2, 2014, <https://www.ge.com/reports/post/92442325225/how-loud-is-a-wind-turbine/>. Accessed 9/25/2019.

²¹ Johannes Teyssen, “2011 Annual Report,” E.ON, Druckpartner, Essen, 2011; Johannes Teyssen, “2017 Annual Report”; “E.ON Druckpartner, Essen, 2017. “E.ON starts construction of a new wind farm in Texas and makes important progress in US business,” E.ON, January 11, 2018, <https://www.eon.com/en/about-us/media/press-release/2018/eon-starts-construction-of-a-new-wind-farm-in-texas-and-makes-important-progress-in-us-business.html>. Accessed 9/25/2019.

through a partnership between E.ON and two American backers: GE Energy Financial Services and a subsidiary of the banking giant Wachovia Corporation.²² This represented a global investment trend that would continue for the next decade. Wind was an emerging industry and investors were interested in cashing in. By 2019 a growing number of American multinationals not traditionally in the energy business began investing in wind power. For example, the online retailer Amazon and medical supplier Johnson & Johnson announced plans to build wind farms in Texas.²³ In the twenty-first century electricity production and distribution – previously key to federal policy and the source of widespread public debate – had become an often-overlooked site for investment diversification and good publicity.

WIND POWER AND THE STATE

Privatized Texas wind development was the result of a century-long battle between entrepreneurs, policy-makers, and regulators over the best ways to regulate, distribute, and generate electricity. Nationally, the early-twentieth century had been marked by the rise of utilities holding companies and financial speculation in electrification, followed by a crackdown on corruption in the utilities industry. In this context, inventors marketed the earliest wind-powered electricity as an alternative to an exploitative system strangled by expensive, unprofitable municipal transmission technology and corrupt utilities companies. Wind power was too expensive and inefficient to become a viable alternative to transmission monopolies. Instead, federal electrification projects ultimately provided electricity to unprofitable markets. This increased the presence of the federal government in the daily lives of rural Americans.

²² “E.ON starts construction of a new wind farm in Texas” (cf. note 22).

²³ Angel Gonzales, “Amazon’s largest renewable project to date: a Texas wind farm,” *Seattle Times*, September 15, 2016, <https://www.seattletimes.com/business/amazon/amazons-largest-renewable-project-date-a-texas-wind-farm/>. Accessed 9/25/2019.

- 14 In the US, electricity was first harnessed for commercial use in the late-nineteenth century. A wave of entrepreneurs including Thomas Edison and Charles Brush sold electrical equipment to municipal governments, individual firms, and private citizens.²⁴ Home electricity became a status symbol for wealthy bankers such as J. P. Morgan who helped finance early electrification projects.²⁵ Because upfront costs were high and profit margins were low, experimentation continued in the best way to manage large-scale energy production and delivery. Cities were the first to become interconnected and, at first, municipalities offset construction costs by giving local utilities territorial franchises.²⁶
- 15 Others sought out alternative sources of fuel. New urban electricity systems were powered by noisy coal plants, by necessity located in city centers. Coal-powered electricity contributed to urban pollution and demand often outstripped supply. A nascent wind industry hoped to solve these problems. Beginning in the 1850s Daniel Halladay experimented with commercial windmill sales in the US, selling thousands to prospectors, farmers, and railroads traversing the arid west. These windmills pumped water for farms and steam-powered trains.²⁷ In the early-twentieth century, new entrepreneurs applied similar technology to electricity production and imagined integrating the versatility and portability of wind power into the municipal power grid.
- In 1888 wealthy Ohio electrical pioneer Charles Brush built the first wind-powered generator which he used to electrify his home. Others had bigger plans. In the 1920s, Dew Oliver, a real estate developer in San Geronimo Pass, east of Los Angeles, California built the first wind-powered electrical generator designed for commercial sale. His design was very different from Brush's. Oliver envisioned a ten-ton, 70-foot long "giant metal tube that sat on a circular track atop a concrete foundation."²⁸ The wind shifted the tube, which moved internal turbines. Oliver planned to position these tubes around the Los Angeles area and power the resort town of Palm Springs. Before he could implement this plan, Oliver was arrested for tax fraud.²⁹ However, his ideas had some merit. Once installed, wind generation was cheap, and it did not produce the foul-smelling smoke produced by burning coal.
- But wind remained less reliable. If the wind was not blowing, turbines did not produce electricity and battery storage and long-distance transmission networks were in their infancy. Municipal wind development continued in Europe through the mid-twentieth century but it stalled in the US. There was a small market for off-the-grid electrification, and entrepreneurs developed a niche industry selling portable, wind-powered generators to explorers and some wealthy agriculturalists.³⁰ However, wind power could not offset expenses for utility companies or municipalities wrestling with the cost of electrification.
- ²⁴ "Brush System of Electrical Power Distribution," Catalog, ca. 1887, Box 29, Folder 24, Subseries 2: Brush Electric Company, 1880s-1898, Charles F Brush Sr. Papers, Case Western Reserve University Kelvin Smith Library Special Collections.
- ²⁵ Nye, *Electrifying America*; Nye, *Consuming Power* (cf. note 6).
- ²⁶ For example, Cleveland, OH was the first US city to install electric streetlights in 1879. Charles Brush, "The Development of Electric Street Lighting," *Journal of the Cleveland Engineering Society*, vol. IX, 1916, Charles F. Brush Sr. Papers, Kelvin Smith Library Special Collections, Case Western Reserve University.
- ²⁷ Halladay's Self-Governing Windmill was more efficient than previous designs -- turning automatically to face the direction of the wind. It was also cheap -- around \$50 for the windmill and \$25 for pumps and piping -- and easy for a single individual to construct. Settlers ordered Halladay windmills from mail-order catalogues, and the Union Pacific and other railroads installed them at water stops. "Windmills and Wind Engines," *Farm Implement News* vol. 8, February 1887, 12-17.; The town of Roscoe, TX began as a Texas and Pacific Railroad water stop in 1881. For more on the role of the windmill in US westward conquest see Richard White, *Railroaded: The Transcontinentals and the Making of Modern America* (New York: W. W. Norton, 2012); __, *It's Your Misfortune and None of my Own: A New History of the American West* (Norman: University of Oklahoma Press, 1991); Frida Knobloch, *The Culture of Wilderness: Agriculture as Colonialization in the American West* (Chapel Hill: University of North Carolina Press, 1996).
- ²⁸ Robert W. Righter, "Wind Energy in California: A New Bonanza," *California History*, vol. 73, n° 2, 1994, 142-155.
- ²⁹ *Ibid.*
- ³⁰ Robert W. Righter, "Reaping the Wind: The Jacobs Brothers, Montana's Pioneer 'Windsmiths'," *Montana: The Magazine of Western History*, vol. 46, n° 4, Winter, 1996, 38- 49.

18 Instead, these problems would be addressed through industry restructuring. In the name of efficiency and to defer the risk associated with building infrastructure, between 1890 and 1930 American electricity companies consolidated themselves into a pyramidal system of holding companies. By the 1920s, a few holding companies, exemplified by the infamous Insull Group in Chicago, controlled most of the American electricity grid. Holding companies defrauded investors and electricity customers alike. After public outcry and a lengthy Federal Trade Commission investigation, the Federal Power Act of 1935 dissolved this system and dramatically increased federal oversight over any power company that operated across state lines.³¹ After this shake-up, from the 1930s to the 1950s electricity development was dominated by massive state-funded electrification projects and vertically and horizontally integrated regional energy monopolies.³² Born out of the sweeping federal programs of the New Deal, such projects identified government oversight and regulation as reigning in business excess. They also reflected the belief that without state-backed regional monopolies, electricity development was prohibitively expensive for private industry. This assumption would govern federal energy policy for the next 40 years.

19 In Texas and in other southern states, the increased federal role in infrastructure construction brought electricity to many communities for the first time. Before 1930, seven major utility companies operated in Texas. However, none of these extended beyond the metropolitan

areas of Austin, San Antonio, and Houston.³³ In rural Texas, homes generally did not have grid access. Often, small communities might maintain a single electric light, powered by a portable generator. The massive series of hydroelectric dams of the Tennessee Valley Authority (TVA) was the showpiece of New Deal electrification and a similar program was enacted in Texas.³⁴ Future president Lyndon Johnson was appointed head of the Lower Colorado River Authority (LCRA) and the program brought cheap hydro-powered electricity to much of central Texas by damming the Colorado River.³⁵ Overseen by the Texas Legislature and funded by the Public Works Administration, the LCRA also helped build an interconnected grid system of high-voltage transmission lines.³⁶ It subsidized loans to newly-developed rural electric cooperatives which serviced an unprecedented 31,000 square miles by 1939.³⁷ The program was extremely popular with rural communities and solidified Johnson's political power in Texas.

Such projects amplified the role of the federal government in the lives of individuals. Both the TVA and the LCRA sponsored extensive public outreach programs teaching rural communities how electricity could improve their lives and integrating them into a larger consumer economy.³⁸ The LCRA built waterfront business districts, municipal parks, and campgrounds. It provided flood and erosion control. In these projects, the TVA, the LCRA, and others used

³¹ Thomas W. Mitchell and Albert A. Hartley, "Report on the Examination of the Accounts and Records of Corporation Securities Co. of Chicago," 1932, Series 10: Federal Trade Commission Report on Corporation Securities Company of Chicago, Box 58. Samuel Insull Papers, Loyola University of Chicago. See also. Public Utility Act of 1935, S. 2796, 74th Congress, Session 1, Ch 687, (1935).

³² Insull became a household name synonymous with greed and corruption. Correspondence, Series 14: Extradition and Trials Period, 1932-1935, Boxes 66-72, Samuel Insull Papers, Loyola University of Chicago. The utilities scandal of the 1930s has been well-covered by historians. Julie Cohn, *The Grid*; Hughes, *Networks of Power*, 324-362; Rudolph and Ridley, *Power Struggle* (cf. note 6).

³³ Kenneth E. Hendrickson Jr., *The Waters of the Brazos: A History of the Brazos River Authority, 1929 -1979* (Waco: The Texian Press, 1981).

³⁴ "Lower Colorado River Authority Act," Texas S. B. 2, 43rd Cong., 4th Called Session, 1934.

³⁵ "The Lower Colorado River Authority," and "LCRA News," Folder: Killen, Florence, Box C-15, Papers of Florence Killen, LBJ Presidential Library, Austin, Texas.; See also Paul-Michael Dusek, "Patronage Power: Rural Electrification, River Development, and Lyndon Johnson (1937-1939)" Dissertation, Southern Methodist University, 2012.

³⁶ Sim Gideon, Oral history interview, by David G. McComb, March 21, 1968, LBJ Library Oral Histories, LBJ Presidential Library, Austin, Texas.

³⁷ "LCRA News," Folder Killen, Florence, Box C-15, Papers of Florence Killen, LBJ Presidential Library, Austin, Texas. Dusek, *Patronage Power*, 13 (cf. note 35).

³⁸ Dusek, *Patronage Power*, 16 (cf. note 35).

eminent domain to acquire land in the name of the public good, at times sparking bitter public outcry.³⁹

21 While at times controversial, by the 1950s and 1960s such infrastructure development was a standard talking point for politicians across the political spectrum. The Cold War only exacerbated an assumption that funding for large-scale projects was the appropriate role for government agencies and electrification in particular became a tool of soft diplomacy. As early as the 1930s, electricity transmission across international borders was curtailed by a federal permit process.⁴⁰ Like early wind experiments, hydropower never came close to outstripping coal-fired plants in total wattage produced. However, policymakers used monumental dam projects such as the Hoover Dam as a tool of American hemispheric dominance.⁴¹ For example, the Hoover Dam increased US control over water from the Colorado River, and in the name of flood control and irrigation for California's Imperial Valley, limited the flow of the river into Mexico.⁴² Indicating an assumption that electrification was an effective political tool, throughout the 1960s electrification was a key component of Cold War international development projects such as the Marshall Plan and Point Four Plan.⁴³

³⁹ "Senate Committee Report," Texas S. B. 2, 43rd Cong., 4th Called Session, 1934. See also Phillips, *This Land, This Nation* (cf. note 1).

⁴⁰ Elizabeth Furlow, "Good Transmission Makes Good Neighbors: The Case for Easing Permitting Processes to Encourage Cross-Border Power Infrastructure Between Mexico and the United States," *Texas Law Review*, vol. 96, n° 6, 2018.

⁴¹ Edgar B. Nixon, ed., *Franklin D. Roosevelt and Conservation, 1911 – 1945*, 2 vol. (New York, 1957), 438–441.

⁴² Norris Hundley Jr., *Water in the West: The Colorado River Compact and the Politics of Water in the American West* (Oakland, CA: University of California Press, 1975); The US fought similar battles to the north. Daniel MacFarlane and Peter Kitay, "Hydraulic Imperialism: Hydroelectric Development and Treaty 9 in the Abitibi Region," *American Review of Canadian Studies*, vol. 47, n° 3, 2016, 380–397.

⁴³ For more on the political impetus behind these programs see Geoff Burrows, "Rural Hydro-Electrification and the Colonial New Deal: Modernization, Experts, and Rural Life in Puerto Rico, 1935–1942," *Agricultural History*, vol. 91, n° 3, 2017, 293–319 and David Ekbladt, *The Great American*

DEREGULATION AND TEXAS SOVEREIGNTY

The ideological and economic assumptions governing electricity generation changed dramatically over the course of the 1970s. In a decade marked by energy shortages, blackouts, and a looming sense of crisis, the dialogue shifted from praise for American energy production to one of concern about US overconsumption. In Texas, this also sowed the seeds of wind preeminence as the state quickly adopted new laws that incentivized green energy competition. 22

By the late 1970s ongoing national concerns about government spending and government bloat solidified into calls for austerity and privatization from both sides of the political aisle.⁴⁴ Government funding for domestic energy development was rolled back under the Carter administration. In 1978 President Carter passed the Public Utility Regulatory Policies Act (PURPA) which encouraged research into alternative energy sources, including wind power. PURPA also amended the Federal Power Act to disincentivize the natural monopoly structure that had governed the utility industry since the 1930s. Throughout the 1980s, energy grid management transitioned from geographic monopolies to competition between providers. This process sped up in the 1990s. In 1992 President George H. W. Bush passed a new Energy Policy Act designed to boost green energy production by encouraging competition. In 1996, under the Clinton administration, the Federal Regulatory Commission (FRC) issued Order 888 and Order 889. These new regulations established competitive wholesale markets for electricity and officially outlawed vertical integration. In practice this meant that electricity 23

Mission: Modernization and the Construction of an American World Order (Princeton: Princeton University Press, 2011).

⁴⁴ Jimmy Carter, "Memorandum for the Heads of Executive Departments and Agencies," October 26, 1978, The American Presidency Project, UC Santa Barbara, Santa Barbara, California.; Jimmy Carter, "Anti-Inflation Program," October 24, 1978, American Experience, <https://www.pbs.org/wgbh/americanexperience/features/carter-anti-inflation/>. Accessed 12/17/20.; "Tax Cut Proposals," Box 5, Folder 10: WPC Memos, 1979, Governor William P. Clements, Jr. Official State Papers, 1st Term, 1979–1983, Texas A&M University Libraries, College Station, Texas.

production and electricity distribution could no longer be controlled by the same company.⁴⁵

24 The dismantling of regional electricity monopolies was heralded as encouraging efficiency and free competition. Many environmentalists also applauded this move, hoping that it would make space for alternative fuel sources. However, for decades it seemed as if such support was undeserved.⁴⁶ The simultaneous expansion of domestic oil, gas, and coal production in the 1970s produced an energy glut and a precipitous drop in energy prices in the early 1980s. The easy availability of fossil fuels prevented renewables from catching on with either municipal or private authorities. As the electrical grid aged, concerns mounted about the rising cost of maintenance and its capacity to meet rising demand. Despite these worries, energy prices remained low for the rest of the century and most American electricity remained powered by coal well into the 2010s.⁴⁷

25 In Texas, such trends were exacerbated by existing biases against federal oversight and, ultimately, resulted in the construction of the Roscoe windfarm. Long-standing Texas ambivalence toward federal regulatory power and a strong sense of state nationalism had tempered legislative support for big projects like the LCRA

⁴⁵ Public Utility Regulatory Policies Act of 1978, 95th Congress, H.R. 4018, (1978).; Energy Policy Act of 1992, 102nd Congress, H.R. 776, (1991-1992).; “Promoting Wholesale Competition Through Open Access NonDiscriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities; Final Rule,” Vol. 61, Federal Register 92 Friday (May 10, 1996), 1. Jim Rossi, “The Electrical Deregulation Fiasco: Looking to Regulatory Federalism to Promote a Balance Between Markets and the Provision of Public Goods,” *Michigan Law Review*, vol. 100, n° 6, 2002.

⁴⁶ California’s well-publicized experiment with energy deregulation ended in failure and the ousting of Governor Grey Davis. See James L. Sweeney, “The California Electricity Crisis: Lessons for the Future,” *The Bridge*, National Academy of Engineering, vol. 32, n° 2, 2002.

⁴⁷ Energy Information Agency, “U.S. electricity generation by major energy source, 1950-2019,” <https://www.eia.gov/energyexplained/electricity/electricity-in-the-us.php>. Accessed 12/17/20.; Vaughan Nelson, *Wind Energy – Renewable Energy and the Environment* (Boca Raton: CRC Press, 2009), Chapter 4.

in the 1930s. Over the course of the 1940s and 1950s Texas developed an independent electricity grid and distinct regulatory structure in order to bypass federal intervention. By the 1970s, this fed a push for deregulation that began even before federal efforts. By the 1990s, Texas green energy had space to flourish.

150 years earlier, Texas had joined the United States deeply in debt and dependent on federal funding. This, along with the Civil War, fueled bitterness and suspicion toward the federal government that drove opposition for federal regulation for the next century. Throughout the late-nineteenth and early-twentieth century, Texas politicians were members of the Dixiecrat coalition, rhetorically opposed to federal intervention in everything from rural electrification to school integration.⁴⁸ According to the Texas legislature, infrastructure was something best funded by private industry – or federal money. Despite vocal debates in the Legislature, in the 1930s Texas relied on New Deal public works projects for infrastructure improvements. While public reaction to such programs was generally positive, Texas utility companies remained stridently worried that federal money would bring federal intrusion. And, in a pivotal decision, they circumvented regulation by the Federal Energy Regulatory Commission under the Energy Policy Act of 1935 by agreeing not to sell electricity across state lines.⁴⁹

This informal agreement stood the test of time. 27 At the beginning of World War II, Texas’s hodgepodge network of private electricity lines was organized into the Texas Interconnected System (TIS) which coordinated electrical power toward Gulf industrial centers. Members publicly

⁴⁸ For Texas political context see Max Krochmal, *Blue Texas: The Making of a Multiracial Democratic Coalition in the Civil Rights Era* (Chapel Hill: University of North Carolina Press, 2016) and David O’Donald Cullen and Kyle G. Wilkinson (ed.), *The Texas Right: The Radical Roots of Lone Star Conservatism* (College Station: Texas A&M University Press, 2014).

⁴⁹ Most US electricity in the United States is transmitted via one of three grid systems: the Eastern Interconnection, the Western Interconnection, and the Texas Interconnected System.

boasted that relying on out-of-state electricity would be less reliable than trusting only Texas providers. After the war, local utility companies once again pledged not to sell power to out-of-state customers, allowing Texas to continue to avoid oversight.⁵⁰ In 1970 this agreement was given an official structure and internal regulatory mechanism, the Electric Reliability Council of Texas (ERCOT), made up of volunteer members drawn from Texas utility companies. Some have attributed this grid independence to the success of Texas's wind energy programs.⁵¹ However, for decades such isolation only worked because Texas was rich in both coal and natural gas.

28 As both population and suburban sprawl increased, Texas's energy consumption skyrocketed during the late-twentieth century. Despite their historic opposition to federal oversight, Texas legislators were concerned about rising energy demands.⁵² In the late 1970s Texas began a truncated attempt at nuclear power development.⁵³ By the 1990s some independent Texas energy producers began a vocal push for deregulation, arguing that competition would reduce consumer electricity prices and help meet rising demand. They were led by Enron CEO Jeffrey

Skilling who hoped to expand into retail energy sales.⁵⁴ At that time, Texas electricity was still managed by vertically integrated utility companies, with the exception of three municipal utility companies and a network of rural cooperatives left over from the Depression era. As in the rest of the US, almost all Texas electricity was coal generated.

Due to concerns about a finite coal supply, Texas 29 deregulation was paired with incentives for renewable energy production. Following national trends, in 1995 the Texas Legislature amended the state's Public Utility Regulatory Act (PURA), fully deregulating the Texas wholesale market for electrical power a year before new federal laws went into effect.⁵⁵ Then-Texas Governor George W. Bush signed off on the deregulation of retail electricity in 1999, set to slowly transition between 2002 and 2007. In 2005 Governor Rick Perry signed legislation creating Competitive Renewable Energy Zones (CREZ) which revised the PURA to incentivize the development of Texas-generated wind energy.⁵⁶

Such policy trends were important. However, 30 crucially for the future of Texas wind development, deregulation was not confined to the electricity utilities. Concurrent changes to

⁵⁰ This autonomy has been challenged several times. R. Ryan Staine, "CREZ II Coming to a Windy Texas Plain Near You: Encouraging the Texas Renewable Energy Industry Through Transmission Investment," *Texas Law Review*, vol. 93, n° 2, December 2014, 521-555.

⁵¹ Supporters have argued that a lack of competing regulations has allowed Texas to bypass legislative red tape that has stymied wind development at the regional level. Id.; Laura Lynne Kiesling and Andrew N. Kleit (ed.), *Electricity Restructuring: The Texas Story* (Washington D.C.: AEI Press, 2009); US Department of Energy Office of Scientific and Technical Information, *Energy Policy Case Study – Texas: Wind, Markets, and Grid Modernization*, AC Orrell et al, PNNL-25822 (Washington: Government Printing Office, 2016), 16.

⁵² "About ERCOT," Electric Reliability Council of Texas, <http://www.ercot.com/about/>. Accessed 9/25/2019; Alvin Kaufman, *The Electric Reliability Council of Texas Intertie Situation: A Study*, report prepared for the use of the Subcommittee on Minerals of the Committee on Interior and Insular Affairs, *Hearings, Reports and Prints of the Senate Committee on Interior and Insular Affairs*, U.S. Congress, Senate, 94th Congress, 2d Session, 1976 (Washington: U.S. Govt. Print. Off. 1976) 1-11.

⁵³ Todd Walker, "The Lone Star and the Atom: Nuclear Energy in Texas 1945-1993" (Ph.D. diss., Lubbock, Texas Tech University, 2002).

⁵⁴ Enron also engaged in retail energy sales in newly deregulated markets in California, Ohio, and Iowa. In 2006 Skilling was convicted on felony charges stemming from the collapse of Enron Corporation and sentenced to 24 years in federal prison. For more on Enron see Jerry Markham, *From Enron to Reform: A Financial History of Modern U.S. Corporate Scandals* (New York: Routledge, 2006). See also "Regional Transmission Organizations," Docket No. RM99-2-000, Order Number 2000, United States of American Federal Energy Regulatory Commission, December 20, 1999, <https://www.ferc.gov/legal/maj-ord-reg/land-docs/RM99-2A.pdf>. Accessed 9/25/2019.

⁵⁵ Public Utility Regulatory Act, Art 1446c-0, V.A.C.S. ch. 166, § 1 (1997). Other states attempted similar processes around the same time. California's effort ended in well-publicized disaster. Ohio and Virginia also attempted deregulation, only to abort the process. Kiesling and Kleit, *Electricity Restructuring* (cf. note 51).

⁵⁶ Warren Lasher, "The Competitive Renewable Energy Zones Process," Quadrennial Energy Task Force, Department of Energy, August 11, 2014, https://www.energy.gov/sites/prod/files/2014/08/f18/c_lasher_qer_santafe_presentation.pdf. Accessed 12/17/20/.

international trade had unintended economic consequences that created new advocates for Texas wind power. Throughout the 1980s the dismantling of trade barriers, the deregulation of banks and financial markets, and the rollback of industry subsidy programs impacted rural economies across the US and made farmers very interested in other ways of using their land.

31 In Roscoe, collapse was a long time coming. In the late-nineteenth century dry-land farming methods made cotton production lucrative in semi-arid, central Texas. Roscoe was founded in 1881, originally named Vista. Texas cotton yields increased into the early-twentieth century, boosted by the increasingly global market for American farm produce and subsidized by Federal Farm Aid.⁵⁷ However, after a peak in 1920, Texas cotton production entered a prolonged decline.⁵⁸ By the 1980s international competition combined with rising farm debt and weakening subsidy programs further hurt American cotton farmers. In 1994 President Clinton negotiated the North American Free Trade Agreement (NAFTA). Similar to other free trade agreements during this period, NAFTA reduced tariff protections for US farm goods and reduced border restrictions. This led to changes in the agricultural labor force and the consolidation of farm ownership. Agricultural communities like Roscoe went into sharp decline across the nation. Roscoe experienced significant population decline and an epidemic of farm foreclosures.⁵⁹

⁵⁷ William R. Hunt, "Roscoe, TX," *Encyclopedia of Texas*, Texas State Historical Association, June 15, 2010, <https://tshaonline.org/handbook/online/articles/hjr13>. Accessed 9/25/2019.; See also Allan Jones, *Texas Roots: Agriculture and Rural Life before the Civil War* (College Station: Texas A&M University Press, 2005) and Neil Foley, *The White Scourge: Mexicans, Blacks and Poor Whites in Texas Cotton Culture* (Berkeley: University of California Press, 1999).

⁵⁸ Hunt, "Roscoe, TX.," Sheet 2, *Roscoe, Nolan County Texas April, 1921* [map], Sanborn Fire Map Co, 1921, New York Dolph Briscoe Center for American History, University of Texas at Austin, Austin, TX.; Sheet 2, *Roscoe, Nolan County Texas April, 1927* [map], Sanborn Fire Map Co, 1927, New York, Dolph Briscoe Center for American History, University of Texas at Austin, Austin, Texas.

⁵⁹ US Census, 2010, Selected Economic Characteristics, American Community Survey, Nolan County, Texas, Washington: Government Printing Office, 2017.

As globalized trade hurt rural Texas communities, 32 many opted for energy development as an alternate source of income. Some turned toward wind. Especially in Roscoe, strong economic incentives fueled residents' support for wind production. According to social scientist Dan Van Der Horst, "residents of stigmatized places are more likely to welcome facilities that are relatively green."⁶⁰ Put another way, economic need makes them more open to a disruption of the status-quo. Geographers Brannstrom *et al.* come to similar conclusions, arguing that people in West Texas have accepted wind development because they are generally less concerned with "landscape aesthetics."⁶¹ It is true that in 2009 Roscoe residents did not mount one of the most common complaints against wind turbine construction – that wind farms would irreparably damage the region's sightlines. However, residents also did not simply ignore the visual changes brought by wind turbines. Rather, as we will see in the next section, they described wind development as a way to end the long-term economic decline. Such decline had been exacerbated in the 1980s and 1990s by the loss of American agricultural subsidies and a series of painful international trade deals. And, rather than simply accepting wind as a necessary response to globalization, they incorporated wind imagery into civic traditions as representative of local community prosperity and survival.

A GRASSROOTS OPERATION IN GLOBAL CONTEXT

Initial support for the Roscoe Wind Farm was 33 grassroots and was quickly picked up by the press. Cliff Etheredge, a sixty-five-year-old cotton farmer, became the local and national face of the campaign. Etheredge first took note of an uptick in Texas wind development in the

⁶⁰ Dan Van Der Horst, "NIMBY or Not? Exploring the Relevance of Location and the Politics of Voiced Opinions in Renewable Energy Siting Controversies," *Energy Policy*, vol. 35, n° 5, 2007, 2705-2714.

⁶¹ Christian Brannstrom, Wendy Jepson and Nicole Persons, "Social Perspectives on Wind-Power Development in West Texas," *Annals of the Association of American Geographers*, vol. 101, n° 4, 2011, 839-851.

early 2000s. He was interested in the potential for wind power to augment his waning farm revenue. Etheredge explained, “The more I studied it the more I learned that we had a world class wind resource here and there was no reason why we shouldn’t be able to develop this flat farm land.”⁶² Etheridge had little experience in energy production. Born and raised in Roscoe, he had lost an arm to a cotton harvester in his youth. According to Etheredge it was relatively easy to convince 400 of his neighbors to sign on. However, attracting investors was a bigger challenge.⁶³ After traveling to New York City in 2004, Etheredge was able to convince Airtricity, a Dublin-based wind energy startup to back the construction of a wind farm. General Electric, who at that time had already invested in three other Texas wind farms, also invested in initial construction. In 2007 E.ON bought Airtricity’s North American operations for \$1.4 billion and would see the project to completion.⁶⁴

34 Etheredge was interviewed many times by green energy promoters. In these interviews, Etheredge explained he was not put off by the potential changes to Roscoe’s skyline. Rather, he saw the turbines as geographically monumental, “I never did get up close to them but I could see them and I could see how big they were and how magnificent they were to me.” Etheredge explained in a 2013 interview, “Look at the rows, the lines. Those things are just spectacular.”⁶⁵ Other locals expressed a similar perspective. In 2007 Daylon Althof, a farmer who had one turbine go up on his land described a change of heart, “My wife and I talked about this the other day. We were coming in from church, and she said, ‘You know, at first I really thought they were kind of trashy looking. But the more I see these going up, they’re kind of beautiful because we know

what they’re going to provide for the economy around here.”⁶⁶

Etheredge also connected a sense of beauty 35 to the prospect of money made. Etheredge explained in 2007, “We used to cuss the wind,” he says. “Killed our crops, carried our moisture away, dried out our land. But because of the advent of the wind farms, we’ve had a complete 180-degree attitude change. Now, we love the wind.”⁶⁷ While his enthusiasm might not be universal, there was undeniably lots of money to be made in wind power. Even better, the turbines were reported to have little impact on farm operations, preventing only the use of crop-dusters for the aerial spread of pesticides. As turbines went up, Roscoe officials quickly imbedded wind energy into local iconography. The town logo and website were redesigned to depict gently turning wind turbines.⁶⁸ In 2007 a group of local industry boosters formed the Roscoe Wind Council. That year they held a West Texas Wind Harvest Festival. Such programs reframed a multinational industry within established civic touchstones.⁶⁹

Such development is indicative of the maturity 36 of wind power as a technology. It also signifies a global system of trade and energy transmission beyond early pioneers’ wildest dreams. Texas wind production has skyrocketed since 2010. In 2012 Texas produced the most wind power of any state – approximately 22,637 megawatts. That year Texas had another forty wind farm projects under development. In 2013 Roscoe was at the center of this new wind boom. The surrounding Nolan county housed three of the largest windfarms in the world, producing five to six gigawatts – 5,000 to 6,000 megawatts -- within a single hundred-mile radius. By itself Nolan county was the second largest wind producer in the US, after the state of Texas as a whole.

⁶² Mae-Nelson, “Cliff Etheredge” (cf. note 16).

⁶³ Id.

⁶⁴ “E.ON AG Buys Airtricity North America for \$1.4 Billion,” *Renewable Energy World*, October 9, 2007, <https://www.renewableenergyworld.com/articles/2007/10/e-on-ag-buys-airtricity-north-america-for-1-4-billion-50196.html>. Accessed 9/25/2019.

⁶⁵ Mae-Nelson, “Cliff Etheredge” (cf. note 16).

⁶⁶ John Burnett, “Winds of Change Blow Into Roscoe Texas,” *All Things Considered*, NPR, November 27, 2007, <https://www.npr.org/templates/story/story.php?storyId=16658695>. Accessed 9/25/2019.

⁶⁷ Id.

⁶⁸ “City of Roscoe, TX,” <http://roscoetx.com>. Accessed 9/25/2019.

⁶⁹ Lifset, *Energy Policy* (cf. note 2).

Texas proudly boasted it was the “for profit” wind energy leader in the United States. In 2017 wind powered 15.7 percent of Texas’s electrical needs and the number was only expected to increase.⁷⁰

37 Despite Texas’s American preeminence, by 2020 the world’s largest wind energy companies were based in Denmark, China, and Germany. These multinational corporations built windfarms across the globe, generating power that they then sold to locals or to local distributors.⁷¹ For example, West Texas was just one part of a larger E.ON energy empire. E.ON was based in Essen, North-Rhine-Westphalia, the largest urban area in Germany. In 2000 it was formed through the merger of the second and third largest German utility companies, VEBA (United Electricity and Mining Corporation) and VIAG.⁷² This immediately made E.ON the third largest energy provider in Europe.⁷³ E.ON Climate & Renewables operated six wind farms in the US, five of which were in Texas. E.ON also managed several other wind farms in the UK, Sweden, German, and Poland. In 2019 E.ON was also one of the largest investor-owned electric utility services provider in the world.⁷⁴ It supplied electricity to 33 million customers in thirty countries.

⁷⁰ Mae-Nelson, “Cliff Etheredge” (cf. note 16); Public Utility Commission of Texas, “New Electric Generating Plants in Texas since 1995,” Austin, TX, <https://www.puc.texas.gov/industry/electric/reports/genplant/gentable.xls>. Accessed 12/17/20.

⁷¹ L. M. Sixel, “So, exactly how much electricity can Texas produce? No one knows and regulators are trying to find out,” *Houston Chronicle*, December 20, 2018, <https://www.houstonchronicle.com/business/energy/article/So-exactly-how-much-electricity-does-Texas-13479452.php>. Accessed 9/25/2019.

⁷² *Vereinigte Elektrizitäts und Bergwerks Aktiengesellschaft* (VEBA). As a result, Germany deregulated its electricity market in 2000. Peter Navarro, “Electric Utilities: The Argument for Radical Deregulation,” *Harvard Business Review*, January-February, 1996; Jim Rossi, “The Electrical Deregulation Fiasco: Looking to Regulatory Federalism to Promote a Balance Between Markets and the Provision of Public Goods,” *Michigan Law Review*, vol. 100, n° 6, 2002.

⁷³ “German Utilities VEBA and VIAG to Merge,” *CBS Market Watch*, September 27, 1999, <https://www.marketwatch.com/story/german-utilities-veba-and-viag-to-merge>. Accessed 9/25/2019.

⁷⁴ T. Wang, “E.ON - Statistics & Facts,” June 11, 2018, <https://www.statista.com/topics/1459/eon/>. Accessed 9/25/2019.

Both Roscoe landowners and municipal infra- 38 structures benefited from wind farm success. In Roscoe, wind farm tax revenue paid for renovations disproportionate to the town’s size and population. In 2013 the county approved renovations to Roscoe’s 318-student, primary and secondary school. It had last been improved by the Works Progress Administration in the 1930s. Although student enrollment had stagnated in the intervening fifty years, beginning in 2013 enrollment increased by forty students. County tax revenue from the wind industry funded the construction of a new sewer line through town.⁷⁵ Roscoe also saw a boom in the wind turbine service industry as Mitsubishi opened two turbine service stations in Roscoe.⁷⁶ The Roscoe windfarm itself employed seventy full-time service and administrative staff.⁷⁷ These jobs paid well. According to the Bureau of Labor Statistics, in 2018 West Texas employed 280 wind turbine technicians, mostly in Nolan county. That same year, the median pay for a wind farm service technician was twice the Nolan county median at \$54,370 and required no college degree.⁷⁸ The Texas wind industry remains on track for further expansion in the 2020s.

TEXAS NATIONALISM AND GLOBALIZED WIND

This story of Texas wind energy expansion is fully 39 imbedded within a national and global process of intellectual and commercial exchange that has remapped the relationships between individuals and the state in the twenty-first century. The regulation and management of shared resources sat at the heart of mid-twentieth century liberal

⁷⁵ Edwin Duncan, “City Sewer Line Upgrade Begins,” *The Roscoe Hard Times*, Roscoe, Texas, June 7, 2017, <http://roscoehardtimes.blogspot.com/2017/06/city-sewer-line-upgrade-begins.html>. Accessed 9/25/2019.

⁷⁶ “Browsing Roscoe, TX Businesses,” US Business Directory, <https://us-business.info/directory/roscoe-tx/>. Accessed 9/25/2019.

⁷⁷ “The Roscoe Wind Farm Project, Texas, USA,” Power Technology, <https://www.power-technology.com/projects/roscoe-wind-farm/>. Accessed 9/25/2019; “Wind Turbine Technicians,” Occupational Outlook Handbook, Bureau of Labor Statistics, April 12, 2019, <https://www.bls.gov/ooh/installation-maintenance-and-repair/wind-turbine-technicians.htm>. Accessed 9/25/2019.

⁷⁸ Id.

statehood.⁷⁹ Deregulation in the 1970s loosened state controls over a variety of industries including shipping and airlines, replacing the iconography of a well-managed state with that of free-market consumer choice. Deregulation also coincided with an increasingly antagonistic relationship between industry and government in which US federal agencies became the enforcers of new environmental and public health regulations. Rather than perceived as a partner in development projects, the state increasingly took on the role of adversary and hindrance.⁸⁰

40 Public antagonism towards this new role can be seen in the energy landscapes of the twenty-first century. The network of electricity poles, generating stations, and tension lines that make up the electricity grid was no longer publicly lauded by policy makers as a marker of a successful state, but rather indicative of one among many consumer choices. In previous decades, monumental infrastructure such as the Hoover Dam or the LCRA were used by state actors as symbols of inclusion and stability. However, as demonstrated in the previous section, interviews suggest that for Roscoe community members, the massive, at-times-intrusive turbines of the Roscoe Wind Farm did not provide the same

⁷⁹ For example, tighter controls on oil and gas production began in 1930 and expanded over the next several decades. Municipalized infrastructure systems such as water and sewage shaped the geographies of industry and patterns of daily life and natural monopolies such as the telephone network and the energy grid were well publicized private-public partnerships. Crucially however, such partnerships were designed to ultimately turn a profit, and after World War II such systems were increasingly impacted by Cold War fears about state-controlled resources. Adam Plaiss, “From Natural Monopoly to Public Utility: Technological Determinism and the Political Economy of Infrastructure in Progressive-Era America,” *Technology and Culture*, vol. 57, n° 4, 2016, 806-830; For broader analysis of these trends see “Space, Knowledge, and Power,” in Paul Rainbow (ed.), *The Foucault Reader* (New York: Pantheon Books, 1984), 239-56; James C. Scott, *Seeing Like a State* (New Haven: Yale University Press, 1998).

⁸⁰ For example, the US nuclear power industry is marked by a dramatic shift in the 1970s in which the Atomic Energy Commission became the Nuclear Regulatory Commission and was tasked with safety oversight in an era of increasing nuclear opposition. Samuel Walker, *Containing the Atom: Nuclear Regulation in a Changing Environment, 1963-1971* (Berkeley: University of California Press, 1992).

political touchstones. Locals were proud of their savvy business decisions and described the turbines as symbolic of their economic future – a perspective further indicated by the incorporation of turbines on town promotional markers. However, the state’s role in facilitating the industry was invisible. In interviews locals did not credit Texas green energy incentives or federal deregulatory trends for their construction.⁸¹ Further, even though E.ON was a German company, the wind farm was described in the local press as a fundamentally local resource and avoided mentioning the Wind Farm’s European connections. This suggests a community desire to celebrate distinctly local forms of economic development. Avoidance of E.On, Mitsubishi, and other multinational corporations in municipal booster efforts suggest that the interdependence inherent in globalized energy production was a source of anxiety.

Beyond Roscoe, waning expectations for state involvement in infrastructure projects has created new challenges for state and local governments. Just as utilities companies in the 1920s did not fund rural electrification because it was not profitable, in the 2010s electricity companies have avoided funding upgrades to the energy grid. Even though such improvements were known to be vital to wind development, high up-front costs meant that construction and maintenance either was not completed or fell to state and municipal authorities who met with stiff pushback on development proposals.⁸² Case in point, in 2005 CREZ divided Texas into renewable energy producing zones and identified their viability for wind development. In 2015, the state began work on a massive project to extend high voltage transmission lines to rural areas with

⁸¹ Mae-Nelson, “Cliff Etheredge” (cf. note 16); Burnett, “Winds of Change” (cf. note 66).

⁸² Infrastructure maintenance has become increasingly controversial. In 2018 catastrophic California wildfires were caused by utility company PG&E’s failure to clear brush and service electrical towers. For competing interpretations see Katherine Blunt and Russell Gold, ‘Safety Is Not a Glamorous Thing’: How PG&E Regulators Failed to Stop Wildfire Crisis,” *Wall Street Journal*, December 8, 2019; “California Wildfires: How PG&E Ignored Risks in Favor of Profits,” *New York Times*, March 20, 2019.

high wind generation potential.⁸³ Overall, since 1995 the state has spent \$25 billion to upgrade the Texas electricity grid.⁸⁴ Opponents of such expenditures did not distinguish between electricity and other forms of commerce. Instead, they expressed frustration that so much state money was spent to benefit a single industry. Indicative of an effort to side-step controversy, the state of Texas has been comparatively slow to advertise these efforts.

42 Decades of industry consolidation and deregulation and the growing reach of energy multinationals in an era of state invisibility have made ERCOT and the rigid geographic boundaries of the TRC into anachronisms. Historically, champions of the TRC described it as protecting state electricity producers from unnecessary and burdensome federal regulations. Supporters referenced Texas's history as an independent nation and a desire to retain autonomy over state natural resources. In the 1990s ERCOT regulators championed electricity deregulation as a way to boost Texas energy industries. However, as electricity providers became global entities, wind development presented a new challenge for ERCOT's strictly enforced borders. In the 1980s, ERCOT's geographic boundaries were challenged, and upheld in court, for the first time.⁸⁵ Other cases followed. So far, E.ON and other multinational wind developers have abided by Texas's long-standing laws forbidding electricity sales across state lines. However, if trends in Europe and at the US-Canadian border are any indication, the days are numbered for Texas's electric isolation.⁸⁶ In this way, the globalization of

energy production and the rise of wind power challenged a very Texan – and very American -- myth of an autonomous, geographically distinct empire in which Americans alone maintain and benefit from domestic resources. While the way forward remains uncertain, it is clear that Texas's precarious balancing act between a geographically distinct energy infrastructure, support for deregulation, and disavowal of state actors and state authority has created a gridlock that must be resolved.

CONCLUSION

In the mid-twentieth century, the complexity and expense involved in maintaining the energy grid seemingly necessitated natural monopoly and state actors harnessed the electricity infrastructure as a symbol of national prestige. By the twenty-first century, electricity lost much of its ideological power as competition and then consolidation between energy companies was touted as a way to cut costs and increase efficiency. In this context, neoliberal electricity deregulation beginning in the 1970s made the rise of Texas wind power possible. At the same time, such shifts were also the result of local responses to deregulation and globalization which transformed the rural Texas economy and sparked the decline of agricultural communities. Such a process vividly illustrates how political trends can simultaneously help and hurt communities in unexpected ways. 43

Roscoe's excitement for wind development also suggests that Texas's deep cultural and economic ties to the oil industry are malleable. Over a period of years, the erosion of state protections made Texas agriculturalists unexpectedly interested in wind farming. 44

Such developments provide hope for those concerned about the ability of American energy producing communities to survive a shift away from fossil fuels. However, it is important to remember 45

⁸³ Interim Order on Reconsideration, Commission Staff's Petition for Designation of Competitive Renewable-Energy Zones, Docket 33672, Public Utility Commission of Texas (2008). ERCOT also oversees a network of backup natural gas power plants designed to kick on when wind turbines are not spinning. Jude Clemente, "The Great Texas Wind Power Boom," *Forbes*, October 11, 2016, <https://www.forbes.com/sites/judeclemente/2016/10/11/the-great-texas-wind-power-boom/#2bd41ef8c6aa>. Accessed 9/25/2019.

⁸⁴ Kiesling and Kleit, *Electricity Restructuring* (cf. note 51).

⁸⁵ Staine, "CREZ II Coming to a Windy Texas Plain Near You" (cf. note 50).

⁸⁶ For example, in 2000 the British company National Grid bought the Niagara Mohawk Power Corporation which supplied electricity for most of New York State. Barbara

Kollmeyer, "VIAG confirms in merger talks with VEBA," *CBS Market Watch*, August 20, 1999, <https://www.marketwatch.com/story/viag-confirms-in-merger-talks-with-veba>. Accessed 9/25/2019.

that the intertwined trajectory of deregulation and the rise of wind power in Texas has had at best mixed results for consumers. Despite reassurances, consolidation and deregulation did not produce dramatic drops in consumer prices.⁸⁷ While in 2019 Texas produced 28 percent of American wind powered electricity, the fluctuating natural gas market simultaneously made consumer prices more volatile than ever.⁸⁸ Further, instead of free competition, for the most part deregulation only expanded the scale of utility mergers and consolidation. As of 2019, the top three utility companies still dominate 75 percent of the Texas electricity market.⁸⁹ Making

matters worse, the viability of this new energy system was put to the ultimate test in February of 2021 as a state-wide freeze shut down natural gas lines and left most of Texas without power. As electricity became scarce, consumer prices skyrocketed to record highs. As wind power continues to grow in Texas and across the Plains states and renewables increasingly shape American energy politics, it is vital that we remember that the structure and organization of power providers matters just as much as the energy source. Equitable communities, states, and nations are built upon stable energy systems.

⁸⁷ Kollmeyer, “VIAG confirms in merger talks with VEBA” (cf. note 86).

⁸⁸ “Texas Profile Overview,” US Energy Information Administration, <https://www.eia.gov/state/?sid=TX>. Accessed June 24, 2020.

⁸⁹ Of these, fifty percent is controlled by the old, vertically integrated utility companies. Sioshansi, *Evolution of Global Electricity Markets*, Chapter, 10. (cf. note 5); Hughes, *Networks of Power* (cf. note 6); A. Al-Sunaidy and R. Green, “Electricity deregulation in OECD (Organization for Economic Cooperation and Development) Countries,” *Energy*, vol 31, n° 6–7, 2006, 769–787; Kiah Collier, “Texas is using a record amount of electricity. Could demand outpace supply?,” *Fort Worth Star Telegram*, July 22, 2018, <https://www.star-telegram.com/news/state/texas/article215328850.html>. Accessed 9/25/2019.

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