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Texas Energy Policy Landscape and Analysis Report

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Introduction

Texas has long been a leader in energy production. Blessed with windy, wide-open plains, ample sunshine and large oil and gas deposits, Texas has attracted leading entrepreneurs

and companies that continue to drive investment and politics in the state. This paper will explore how Texas policy interacts with the energy industry; while a focus will be on policies that pertain to renewable energy deployment and growth, in Texas, there can be no ignoring the influence and importance of oil, gas, and more recently, hydrogen. After providing a broad overview of the state, the paper will then touch on tax policy, land use policy, and how Texas supports energy infrastructure in the state before turning to a discussion on Texas' policy relationship with climate change, how it has evolved, and what it means moving forward for energy in the state. Finally, the paper will analyze how this mix of policies and attitudes impacted energy development in the state, and what the most likely path forward is.

Background

Geographic Impacts on Policy Making

Texas is the second largest state in the country[1], and is home to more than 30 million people[2], with migration driving population growth, both from other states and international immigration[3]. The state has a diverse economy, ranging from advanced manufacturing and the aerospace industry to maritime trade and of course, energy production. Texas has long been synonymous with energy production; it leads the nation in production[4], the sector is valued at more than $170 billion in Texas[5], and employs more than 200,000 Texans[6], including more than 55,000 Texans employed in the clean energy industry[7]. These industries are all clustered (Figure 1) around Texas' major cities[8] and coastal ports, except for the energy hub of Midland. Outside of these hubs, the rest of the state is dominated by agriculture. Texas' agricultural sector produces more than $20 billion worth of cattle, cotton and more each year[9].

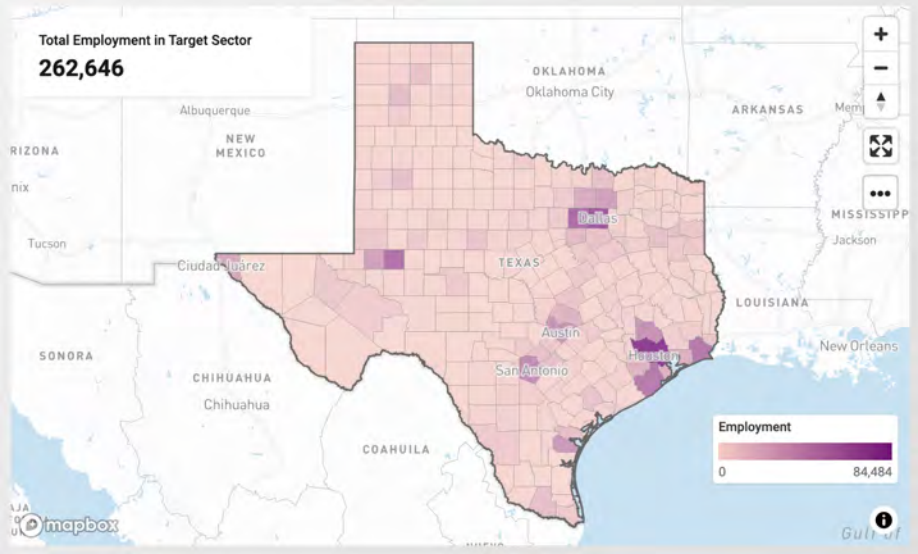

Figure 1: Heat Map of Employment in the Energy Sector in Texas. Note the intense cluster around Houston but also the purple counties in West Texas.[10]

Despite being such a large Western state, Texas has vanishingly little public lands (Figure 2). Texas retained control of its public land when it became a state and viewed this as a valuable endowment. Over time, Texas sold or leased much of its public lands to fund the state government's activities[11]. Today, less than 5% of Texas is public land, and even some of this is surrounded by private land and inaccessible to the public[12].

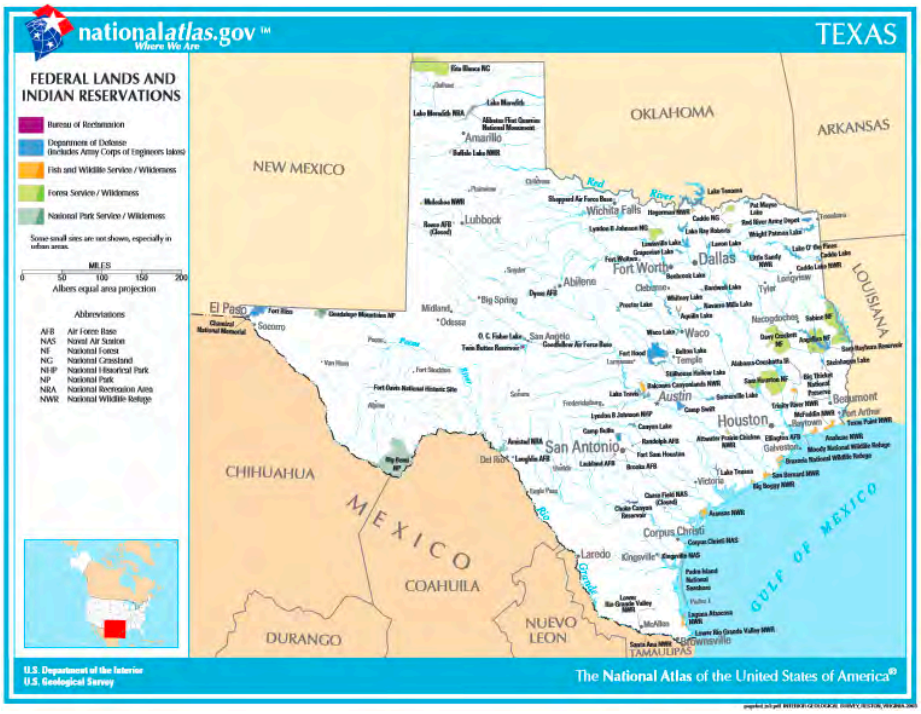

Figure 2: Map of Federal Lands in Texas. Other than a few holdings from the National Parks, the majority of federal land is for the Dept. of Defense[13]

Texas is also one of the fastest growing states in the nation. 50% of Texas' growth is from in-migration from other states, while 25% is from international immigration, and 25% is the result of natural population growth[14]. This growth is not evenly spread across Texas' 254 counties; 158 counties gained residents, but 98 lost residents in the most recent census. Texas is following a national trend of urbanization - not only are the majority of interstate migrants moving to Texas' cities, but many Texans are leaving rural areas for the cities as well. Perhaps no statement better encapsulates this growing divide than the fact that 83% of Texas is farms, ranches, and forests, but 86% Texans live in urban areas[15].

Reflecting these population patterns, Texas is viewed as a potential political swing state, though Republicans continue to hold a trifecta at the state level and both senators and a majority of House representatives are Republicans. Though migration trends are bringing younger, more

liberal voters to Texas' cities, many immigrant communities along the southern border trended away from the Democrats in 2020[16], stunting the state's swing towards being more competitive. Indeed, while Democrats initially had high hopes in the Presidential Election of 2020 and the Gubernatorial Election in 2022, Republicans managed to retain a comfortable margin, as President Trump carried the state by 6 points[17], and Governor Abbott carried the state by 10 points[18] (Figure 3).

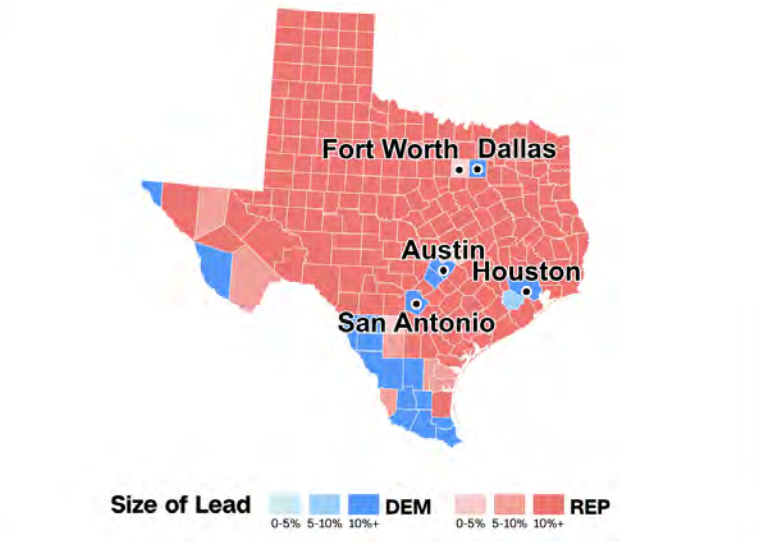

Figure 3: County Level Results from the 2022 Gubernatorial Race[19]

In 2022's gubernatorial race, renewable energy did not factor into the conversation as much as grid reliability. Though the Democratic candidate Beto O'Rourke did favor renewable energy, his campaign website did not contain an issues page for it; rather, his campaign focused on increasing efficiency and carbon capture and sequestration (CCS)[20]. Similarly, Republican Governor Abbott's website made no mention of climate related initiatives[21]. Indeed, the gubernatorial debate focused more on the fallout from the grid failure in 2021 than it did on any concrete plan to expand renewable energy in the state[22].

Winter Storm Uri

In February 2021, Texas was hit by Winter Storm Uri, bringing record snow and cold temperatures to the state[23]. Texas' electrical grid, however, was unprepared for the cold snap, and millions of Texans lost power for days (Figure 4). The cold temperatures prevented power plants and renewable energy farms that were designed for warmer temperatures from operating at full capacity, and as demand began to overtake supply, power began to be cut across the state[24]. All told, the storm killed more than 200 people and cost the state more than $80 billion[25]. In the aftermath, the grid's failure became a hot political item, with everyone looking for someone to blame.

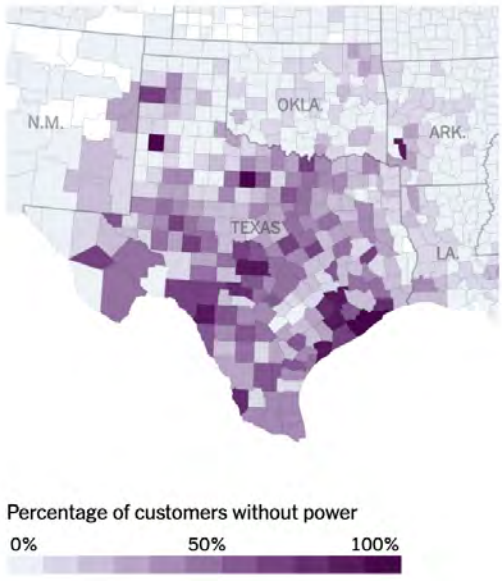

Figure 4: Map of Impacts of 2021 Texas Grid Failure[26]

Though studies have shown that all forms of energy generation struggled to perform during the storm[27], Republicans in power have sought to deflect blame for the regulatory failure by blaming renewable energy sources for the failure. Due to their control of state policy, this has set the policy tone for the state. Indeed, their focus has been on 'dispatchable' energy, as State

Senator Charles Schwetner succinctly summarized, stating, "We have to have generation that performs when its critically necessary, and that's dispatchable generation that can be counted on when the wind is not blowing and the sun is not shining"[28] while he introduced a bill aimed at reforming the state's electric grid. This approach will be reflected in several different sections of the paper, and understanding the importance of the storm is essential to understanding the current political climate for energy in Texas.

Existing Electricity Mix

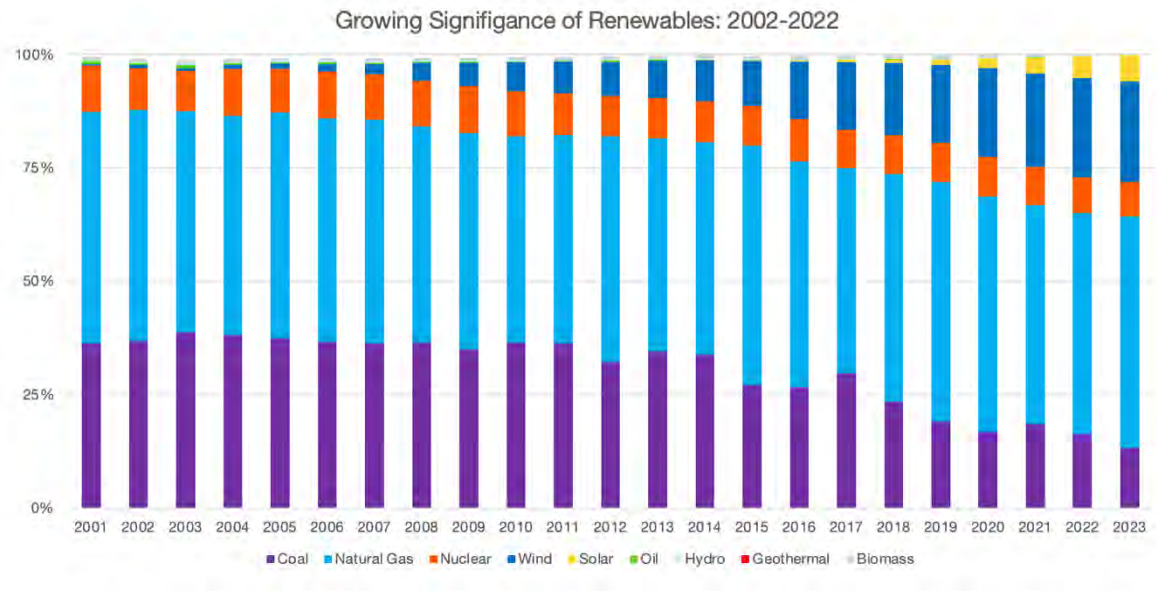

Figure 5: Percentage of total net generation by fuel source from 2001 to 2023[29]

Texas' net generation mix has changed significantly over the past 20 years, as shown in Figure 5. Though natural gas has continued to represent about 50% of the state's energy generation, coal has experienced a significant decline. Indeed, coal has largely been replaced by wind, and to a lesser extent, solar, which have combined to grow from less that 1% of the energy mix in 2001 to more than 25% in 2023[30]. In addition, the state's total generation grew

significantly, starting at 385.8 TWh in 2002, reaching 424.3 TWh in 2022 (see Figure 6)[31]. In that same year, Texas produced more than twice as much electricity as any other state[32].

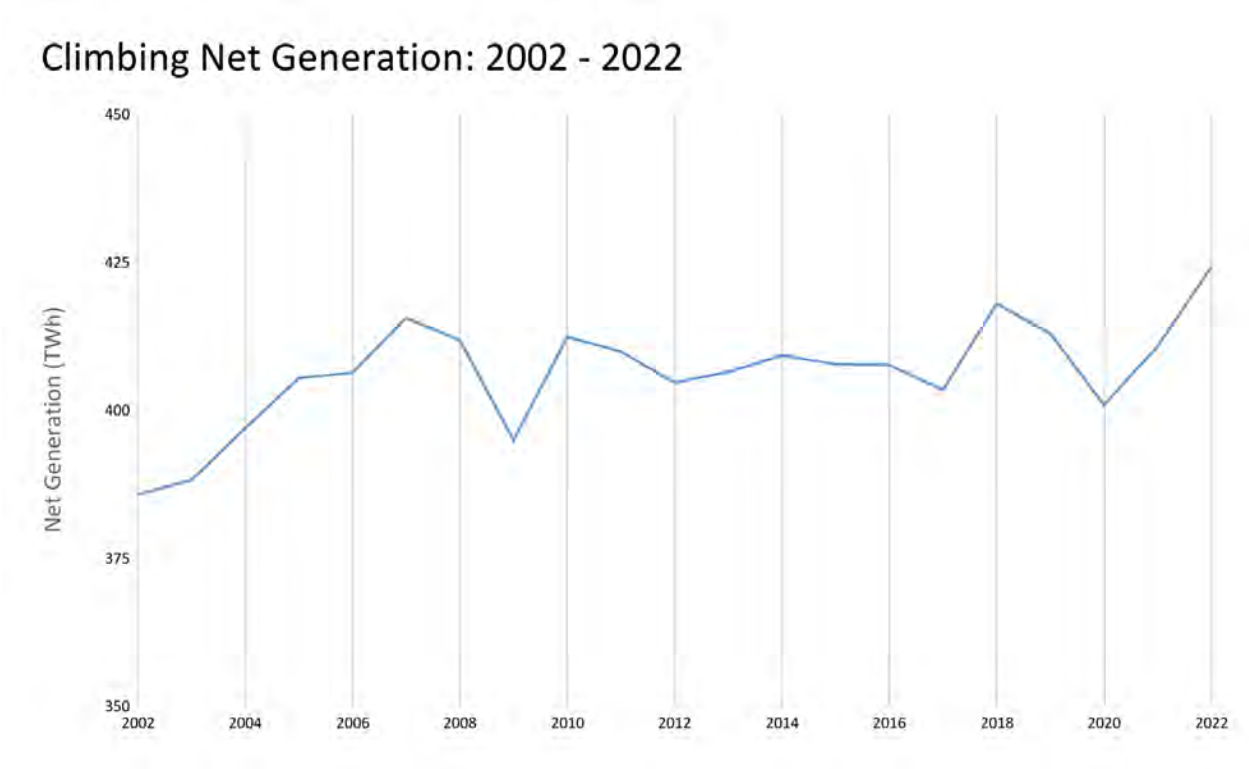

Figure 6: Annual net generation totals from 2002 to 2022[33]

This trend of increasing reliance on renewables is set to continue, with the EIA projecting that 62% of all generation capacity that comes on-line in the state between 2023 and 2027 will be wind and solar[34]. As renewables become more and more prevalent, coal and natural gas plants are the prime targets for retirement. Nearly 31,000 MW of nameplate capacity have been retired since 2012 in Texas, with around 46% being coal plants and 49% natural gas[35]. A survey of news stories about power plant retirements in the state shows coal retirements dominating the news[36], which holds with EIA projections that 23% of the country's coal-fired capacity will be retired by 2029[37]. This capacity is owned by a diverse utility landscape with 11 investor-owned utilities[38], 72 municipally run electric utilities[39], and 73 co-ops[40].

Renewable Energy Potential

Texas has an incredible amount of renewable energy potential and is currently exploiting more of that potential than any other state. In 2022, Texas generated 139.3 TWh from wind, solar and hydro combined, more than any other state, with California in second at only 87.6 TWh[41]. Texas still has significant amounts of potential to exploit however, and NREL's SLOPE model predicts that the state's renewables generation will grow quickly over the next 30 years.

The SLOPE mid-case scenario is treated as a baseline, and assumes median values for things like technology cost, fuel prices, moderate demand growth, and no significant electricity sector policy changes[42]. Hydro generation is not predicted to change from its current level of generation of .885 TWh per year across any of the scenarios, so it is excluded from Table 1, which shows generation in 2020 and predicted generation in 2030, 2040, and 2050. Wind generation is predicted to nearly double by 2050, and both distributed PV and utility scale PV are predicted to generate 15x as much electricity by 2050.

Annual Energy Generation (TWh) - Mid-Case Scenario				
	2020	**2030**	**2040**	**2050**
Wind	106.7	113.3	179.5	210.2
Distributed PV	1.3	11.4	20.6	24.9
Utility scale PV	15.1	83.7	109.6	226.9
Total	123.1	208.4	309.7	462.0

Table 1: Annual generation in 2020, 2030, 2040, 2050 as predicted by NREL's SLOPE model under the mid-case scenario[43]

Texas is predicted to continue to lead the nation in renewables generation in 2050, with nearly as much generation from either wind or utility scale PV alone than California's entire renewable production, as shown in Table 2.

TX vs CA 2050 Annual Energy Generation (TWh) - Mid-Case Scenario		
	Texas	**California**
Wind	210.2	9.3
Distributed PV	24.9	39.0
Utility scale PV	226.9	153.3
Hydro	.885	33.4
Total	462.9	235.0

Table 2: A comparison of annual generation in Texas vs California in 2050 as predicted by NREL's SLOPE model under the mid-case scenario[44] [45]

The mid-case scenario is just one potential future, and NREL looked at many others. Choosing several other representative scenarios, we see similar growth across wind and solar in Texas in Table 3.

2050 Annual Energy Generation (TWh) - Comparison Across Scenarios			
	Low Renewables Cost	**Low Demand Growth**	**High Demand Growth**
Wind	274.8	229.4	270.2
Distributed PV	36.7	24.9	24.9
Utility scale PV	171.5	158.4	217.2
Total	311.5	412.7	512.3

Table 3: A comparison of annual generation in Texas in 2050 across several different SLOPE scenarios, Low Renewables Cost[46], Low Demand Growth[47], and High Demand Growth[48]

The theme across these scenarios is that significant investment will be made in Texas to expand renewables generation over the coming decades. The state is unlikely to be able to rely fully on renewables by 2050, however. In 2022, there were 475 TWh of total electricity retail sales[49], which is significantly more than most of the SLOPE scenarios predict will be generated. SLOPE's business-as-usual natural gas consumption prediction backs this up, with an estimated 3,253,160,000 MMBtu of natural gas being used for residential, commercial and industrial needs in 2050, in addition to 1,413,649,000 MMBtu of electricity[50].

See Appendix A for maps of solar and wind generation potential, showing that solar potential is the highest in the west and wind in central and southern Texas. The state's population is concentrated in the east, with the exception of El Paso in the west. According to the EIA, a significant hurdle in the way of making use of all the generation potential discussed above is transmission capacity and without significant upgrades to both transmission and storage capacity, the state will be met with rising congestion and curtailment challenges[51].

Policy Landscape

Texas' Climate Policy

Historically, Texas has been proactive when it comes to adopting renewable energy. Texas' current energy mix is the direct result of policy decisions made in the past three decades. Texas' landmark renewable energy policy is the Renewable Portfolio Standard that was passed in 1999. Created to incentivize the utilization of Texas' abundant wind resources, Texas was the 7th state in the country to adopt an RPS, after Wisconsin, Connecticut, New Jersey, Nevada,

Massachusetts and Iowa, who was first in 1983.[52] Texas set what seemed to be ambitious goals- 5,000 new MW of renewable capacity by 2015, and 10,000 MW of capacity by 2025[53]. It quickly became clear that these benchmarks would be easily met. Indeed, this trend continued; by 2019 the state had installed more than 26,000 MW of renewable capacity, including 24,000 MW of wind, far exceeding the original goal set for 2025[54].

Despite this success, Texas has turned away from renewable energy and climate action, particularly in the aftermath of the 2021 blackouts, and the state has no official climate policy. A marker of this change was the 2015 repeal of the RPS. This was largely symbolic, however, as the RPS had accomplished much of what it had been enacted to do, and the RPS's original sponsor in 1999, State Senator Troy Fraser, introduced a new bill in April of 2015 repealing the standard. This represents a sea change in the Texas State House, to be sure, but is also indicative of Texas politics more broadly. As Jeremy Mazur, Senior Policy Director for Natural Resources and Energy at Texas 2036, pointed out, Texas is always quick to repeal unneeded regulations[55].

Further illustrating the state's lack of climate focus, an independent review of state plans by the Georgetown Law Climate Change Center found no statewide climate change adaptation plan[56]. Further, an investigation by WFAA, a local Dallas news station, found no state plan for climate mitigation and no acknowledgement of the risks posed by climate change to the state's water supply by the Texas Water Development Board, who's commissioners are appointed by the Governor[57]. A review of Governor Abbott's campaign and Governor websites found no mention of climate change, and while the Republican Speaker of the House, Dade Phelan mentions 'Disaster Mitigation' as a top issue, it makes no mention of the connection to climate change[58]. Further, Governor Abbott studiously avoids mentioning climate change, even when declaring disasters[59].

In the statehouse this summer, several climate proposals were introduced, and went nowhere in the legislature. Though guidelines supporting geothermal energy and EV charging were passed, energy efficiency measures were rejected, and local climate policies regarding vehicle fuels were restrained[60]. At the same time, incentives for the development of natural gas passed easily[61]. Indeed, the head of Environment Texas, Luke Metzger remarked that "The climate is worse off for the Legislature having met".[62]

Given these headwinds, the most politically palatable path forward is likely an 'all-of-the-above' energy strategy, one that still leaves room for renewables, but still focuses heavily on fossil fuels[63]. This mirrors much of what Gov. Abbott has pushed forward and could be representative of a high-water mark for anti-renewable actions[64], as attention turns to lowering the price of energy in the state and expanding energy production from all sources.

This is not to say that Texas' political leaders are blind to the threats their state faces. A Times investigation found that Governor Abbott, and Senators Cruz and Coryn have each lobbied the federal government for support in climate adaptation projects, notably the expansion of the Galveston Seawall, and an improved flood mitigation system in Houston[65]. Further, though you will find little public support for action on climate at the Texas State House, privately, many politicians acknowledge the risks their state faces due to climate change.

If it seems that there is a disconnect between the scientific and political realities of climate change in Texas, that is reflected on the ground. Politicians in Texas are engaged in a debate in the state over the credibility of climate change[66]. There is such disagreement in fact, that while a bill that either increases Texas' ability to prepare for climate change or mitigate its causes may have wide support, any mention of climate in the bill causes many politicians to tune out. Thus, the pragmatic approach in Texas is to leave any mention of climate action out and try

to take action less overtly. To this end, expect Texas to focus more on preparing for extremes and new changes in the years ahead, rather than addressing or focusing on the root causes of those changes[67].

Investment in Infrastructure

The main influence on Texas' modern renewable energy infrastructure is Competitive Renewable Energy Zones (CREZ), which was designed by the Republican controlled Legislature[68] in 2005 and implemented by the PUCT in 2008[69]. Implemented to support more grid capacity for the wind power that was rapidly being deployed in the wake of the state's adoption of its ambitious Renewable Portfolio Standard, the original CREZ legislation called for the construction of more than 2,300 miles of transmission lines across the state[70](Figure 7) and was financed by placing a fee on electric ratepayers' bills[71]. When the $6.9B project was completed in 2013, it had far exceeded this goal; more than 3,500 miles of new transmission lines traversed the state, capable of hosting more than 18.5 MW of new electrical generation[72] (Figure 8).

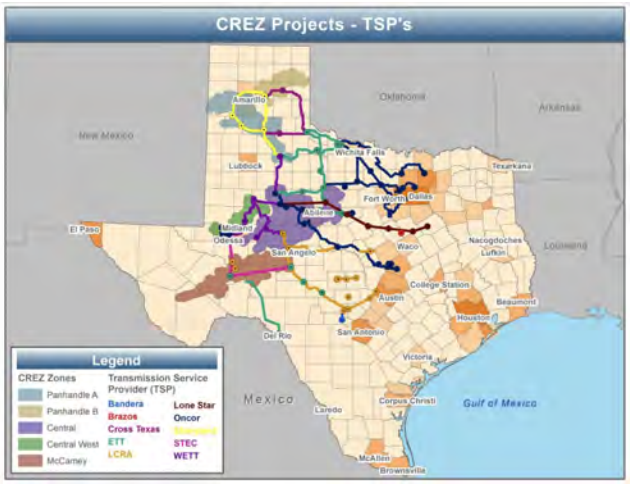

Figure 7: Planned Competitive Renewable Energy Zones and proposed transmission lines[73]

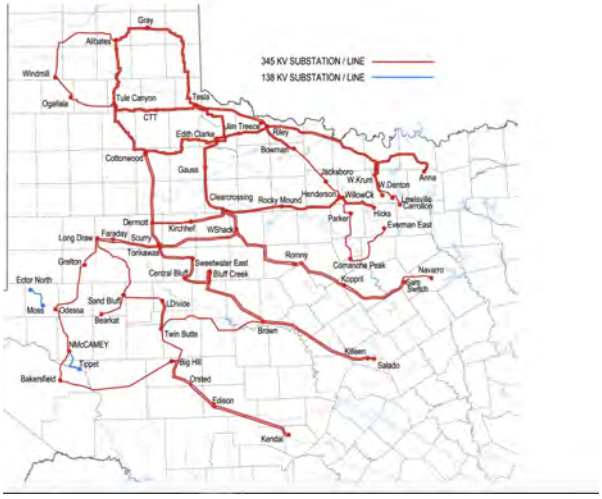

Figure 8: Completed CREZ Transmission lines, 2014[74]

Given the project's success, there have been calls for a new round of CREZ deployment. Indeed, much of the 18.5 MW of capacity has been absorbed, and renewable energy deployment is running into the limits of the grid once again[75]. The 2021 ERCOT Long Term System Assessment has identified 18 high voltage transmission projects that may be necessary to deploy by 2035 to keep up with rising demand for electricity[76]. However, the state PUC has been reluctant to raise rates to allow for more renewable energy capacity, particularly in the wake of the February 2021 blackouts, which Mazur described as delivering a 'body blow' to support for renewables in Texas[77].

Siting Authority

Texas law deals with siting authority in a unique manner; once a city reaches a population of 5,000, they are able to vote to adopt home rule, and if they elect to make this change, it will remain, even if the city's population drops back down below 5,000[78]. Counties, on

the other hand, are prohibited from adopting home rule[79]. This has led to a patchwork of home rule vs general law jurisdictions across the state[80].

Due to this, siting authority in Texas is largely left up to local authorities, both for wind and solar[81], with state-level rules passed in 2019 for decommissioning wind projects[82], and in 2021 for decommissioning solar projects[83]. Support for decommissioning requirements is mixed. Supporters include utilities who claim they will encourage investment and protect landowners, and landowners themselves who also are given more confidence by these protections, but opponents are worried that utilities will use these requirements as justification to raise rates[84]. Unified state-wide requirements are welcomed by developers, as it is easier for them to comply with a single decommissioning standard as opposed to many standards implemented at local levels. Among local governments, however, there is a fear that these standards won't take into account the specifics of their locality[85].

As part of the state's turn away from supporting renewable energy, there were several bills introduced into the State Legislature which sought to add regulations to renewable generation siting. Of these, Senate Bill 624/House Bill 3707 could have a significant impact on how projects are sited in Texas. If passed, Senate Bill 624/House Bill 3707 would bring numerous changes to siting processes for wind and solar facilities, such as requiring that new and expanding facilities apply for permits from the PUCT, with substantial requirements for public notice, environmental assessment, and public meetings[86]. This would also mean that both the PUCT and local officials have the authority to deny the construction of new facilities, adding a new layer of complexity to getting projects approved.

As siting is currently under local control, the PUCT would need to develop entirely new regulatory frameworks before reviewing any projects, which would drastically slow down or

even stop siting processes while that work is underway. Other state agencies would also be involved in the changed permitting process, including the Texas Parks and Wildlife Department, which would be required to submit an environmental impact review, another entirely new process[87].

Though developers are concerned about the stricter requirements[88], and critics claim that these kinds of restrictions would increase energy prices for consumers and harm the state's economy[89], there is some support for the new regulations in some rural communities across the state. Indeed, residents there are concerned about the environmental impact of renewable generation facilities, fire danger, and soil and water contamination[90].

PUC Policy

In recent years, PUCT policy has been largely driven by the devastation from Winter Storm Uri in February 2021. Several bills relating to PUCT governing policy and Uri have been introduced in recent legislative sessions. Two of note passed in 2023; Senate Bill 1368/House Bill 1500, which allows the PUCT to pay generators that have reserves on standby, ready to be used in case of emergency[91], and Senate Bill 2627, which establishes a $7.2 billion loan and grant program for dispatchable generators, which specifically excludes renewables and energy storage facilities[92].

Senate Bill 1368/House Bill 1500 sets guardrails on funding for these generators, requires generators to file reports explaining any unplanned outages, requires generators to hit reliability metrics or be fined, and incentivizes generators to locate their facilities near interconnection lines[93]. However, the PUCT needs to finalize these regulations: reliability metrics must be set,

and both fine and incentive levels must be determined. The exact values the PUCT chooses will have significant impacts on how effective these regulations are.

The funds approved under Senate Bill 2627 can be used for upgrades to existing infrastructure or the construction of new infrastructure, and on November 7th, 2023, the fund was approved by Texas voters with nearly 65% voting yes[94]. Luke Metzger, the director of Environment Texas, and one of the opponents of the bill, cites public distrust in the power grid for the strong support of the bill[95], a sentiment that was echoed by The Dallas Morning News editorial team in their recommendation that voters support the bill[96].

Senate Bill 624/House Bill 3707, mentioned in the Siting Authority section, are also relevant to PUC policy. If passed, the PUCT would be given the ability to impose new conditions on previously issued permits to ensure that these permits comply with rules adopted under this new permitting program and to require unspecified "other information" about the facility under consideration in the permitting process[97].

In addition to work focused specifically on reliability, Texas will need to make significant investments in transmission capacity to be able to fully utilize all its renewable resources[98]. Increasing transmission within the state could have a range of benefits including improved reliability, reduced congestion, enable construction in cost-effective locations, and meet future generation requirements both within and outside of the state[99]. To spur this investment, the legislature could pass a new version of the previously discussed Competitive Renewable Energy Zone initiative. Another round of proactive investment in transmission infrastructure could allow Texas to continue to be a national leader in renewable energy generation. However, as previously discussed, the political headwinds in the legislature make a new policy unlikely.

Tax Policy

Texas offers multiple layers of state and local level tax benefits for renewable deployments. At the state level, a corporation engaged solely in the manufacturing, selling, or installing of solar energy is exempted from the state franchise tax which accounts for 3-5 % of the state's total tax revenue. Texas also allows any corporation to deduct the cost of installing solar from its taxable capital or 10% of this cost from its taxable income for franchise taxes[100].

In keeping with the current shift away from supporting renewables in Texas, however, Governor Abbott has promised to exclude renewable energy from incentives in a renewed economic development tax package[101]. Indeed, the prevailing argument in Texas has been that the raft of subsidies and supportive policies passed at the federal level (namely, the IRA and the Bipartisan Infrastructure Law) mean that Texas no longer needs to support these technologies[102]. This contrasts with recent investments in hydrogen and natural gas, as both fuel sources were included by Gov. Abbott in the economic development package[103]. Even more recently, the Governor signed into law HB 2847, a bill that encourages the development and transportation of hydrogen[104].

At the local level, beyond the patchwork of local incentives handed out by local governments, the state also has historically had two policies to reduce local taxes for all classes of investors, including renewable energy developers; Chapter 312 and Chapter 313. Chapter 312 empowers municipalities and county commissioners to designate reinvestment zones within which project investment including renewables could benefit from tax abatement. Chapter 313 offered school districts a tax abatement that lasted 10 years before the property became fully taxable. According to multiple case studies by Rhodes (2020), these investments could often multiply the taxable property value in many rural districts, as they drew projects to different

towns across the state. Even with the 10-year initial tax abatement, the project over the lifetime could bring in windfalls to many hosting districts[105].

While Chapter 312 was renewed in 2019 and is set to expire in 2029, Chapter 313 has undergone a large overhaul. Though it was largely successful, resulting in over $1.67 billion of supplemental payment and $1.77 billion of revenue protection payment to local districts. The windfall in property taxes allowed the school to finance capital projects such as building improvements but did not lead to significant increases in new teacher hires[106]. Despite this success, Chapter 313 was also criticized for being a corporate handout, and not fully spreading benefits across the state and just being a corporate handout. Indeed, ⅔ of all projects are located in just 14 counties[107]. Due in part to these criticisms the program, which had been in effect since 2001 but was allowed to expire by Texas Legislature last year[108].

Beyond supporting the termination of tax incentives for renewables, Texas Governor Greg Abbott has historically been quiet in regards to Chapter 313. However, as the debate around replacing Chapter 313 gained momentum in the Texas legislature earlier last year, Abbott started advocating for continued tax incentives for businesses. Citing Micron, a chip manufacturer, choosing Upstate New York over Texas for its new factory, Abbott said the state needs to revamp its economic development tools following the expiration of Chapter 313[109]. With the implementation of HB5, the state did precisely that. While HB5 continues many of the provisions from Chapter 313, including continuing to provide school district tax incentives for other projects, the bill explicitly excludes wind and solar projects from the tax abatements[110]. This exclusion came at a time when Texas Republican leaders have been increasingly hostile toward renewable energy sources and the federal government offers more incentives for renewables. Rep. Todd Hunter, the main author of the bill whose district has ⅔ of its chapter 313

agreement from gas and oil, said he believed excluding renewables from the renewed tax incentives would help consolidate more support for the tax incentive bill[111].

Use of Public Land

Though Texas does have relatively little public land, as mentioned in the Background section, it is worth a mention of whether it might provide an opportunity for energy development.

The two major public landowners are the State Land Board and National Park Service, as shown in Figure 9. As the National Park Service has a conservation-oriented mission, getting utility scale renewable projects approved on national parks might be more uncertain, though there might be better prospects for smaller scale projects. The National Park has taken initiatives to improve energy efficiency and cut emissions, so potential development could tap into the need of the park to supply its own energy with on-site solar like South Texas Solar Systems.

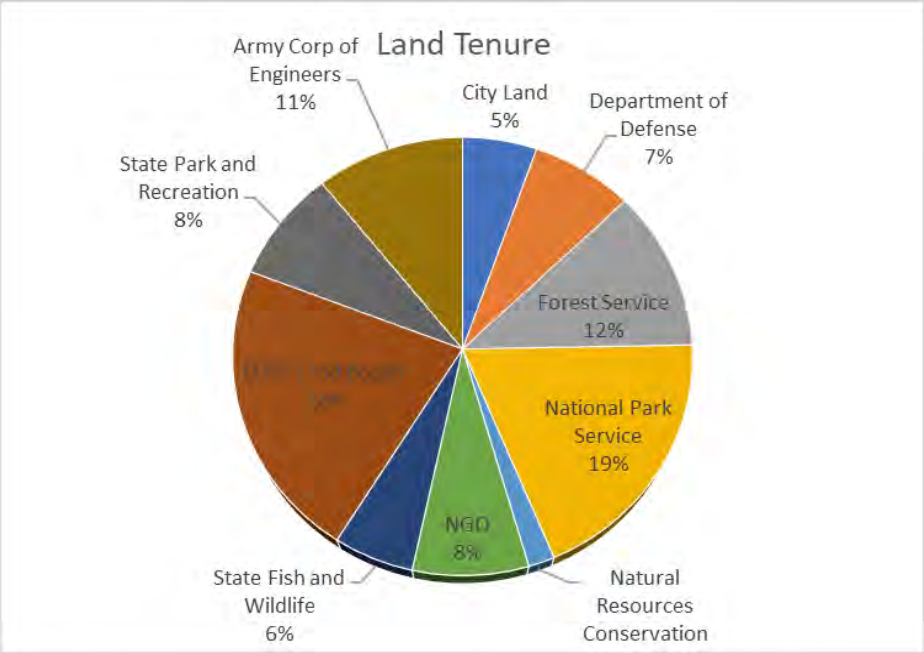

Figure 9: Public land owners in Texas[112]

Lands managed by the State Land Board have a more nuanced relationship with renewable energy sources. In contrast to lands managed by National Park Service, the State Land Board has an established procedure in reviewing wind and solar siting applications. For both onshore wind and solar, GLO (State Land Board) requires developers to directly negotiate with the board to obtain permit to develop on state lands[113]. Despite this clearly defined procedure, few renewable power plants or transmission lines have been utilizing the GLO land so far. This could be a function of geography. As shown below in Figure 10, the wind and solar plants are concentrated in the panhandle and US-Mexico border area while the GLO lands are concentrated in the westmost area of the state (small yellow shades instead of dots).

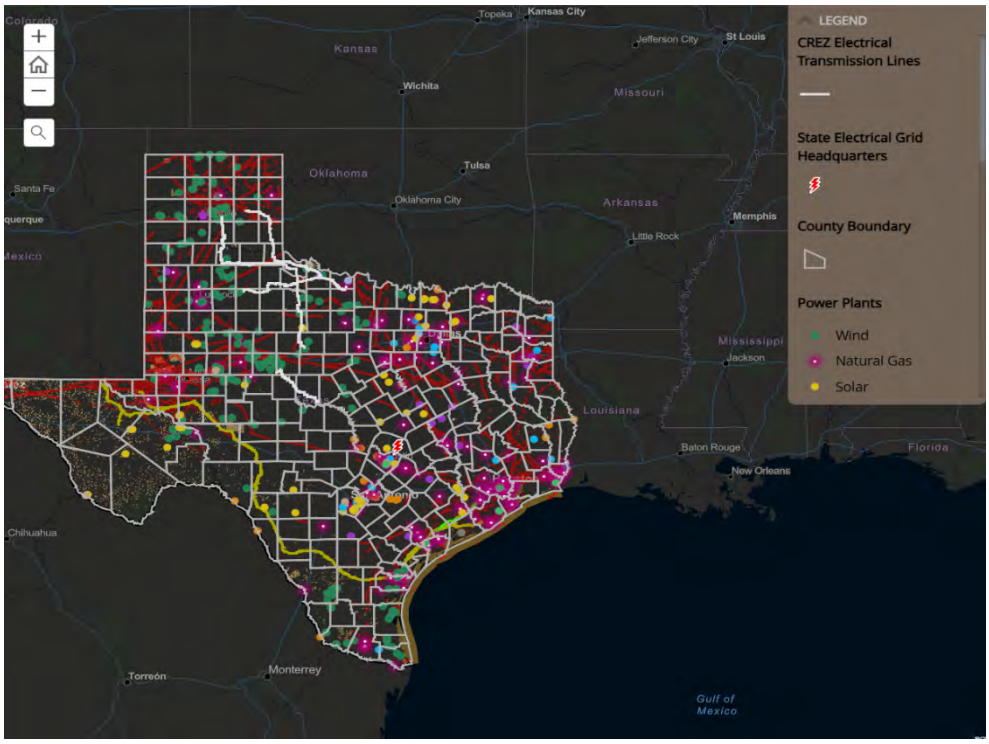

Figure 10: Transmission lines, power plants, and GLO land[114]

Another limiting factor against Texas renewables is the restrictions against siting near military bases. In 2017, Governor Abbott signed into law banning projects in proximity to aviation facilities (within 25 miles) from receiving tax abatements. Legislators at the time argued that military bases contributed significantly to the Texas economy and wind farms could be detrimental to military missions, despite confirmations from Pentagon officials that there are no such issues[115]. CLOSUP estimates that these restrictions could affect about 5% of the developable land for renewable energy in Texas[116]. With the expiration of Chapter 313, however, the punitive impact of these fully taxed zones might diminish and it remains to be seen if new restrictions are coming to further restrict renewable energy development in these areas.

Synthesis and Conclusion

Political Environment

A common theme throughout this paper has been the political reaction to the blackouts in February of 2021, and this is a helpful lens through which to view much of the current state of affairs in Texas. Indeed, as Republicans have blamed the failures on renewable energy, they have sought to shore up the competitiveness of other sources of energy, namely natural gas, and oil, and have taken steps to slow the proliferation of renewable energy projects throughout the state, namely by not supporting transmission expansion and excluding renewables from an economic development package, as will be discussed below.

The reaction to 2021, though helpful, is not the only context needed to understand the current moment, however. Texans' long held aversion to regulation and a preference for a free market certainly are also impacting the landscape. As Texas has watched the federal government

pass a raft of legislation to shift the market towards clean energy sources, traditional fuels in Texas have become less competitive. Much of what Texas has done in the past 10 years has some semblance of an effort to maintain a level economic playing field or eliminate needless regulation. The symbolic repeal of the RPS in 2015 is one example of this, as is excluding renewables from the economic development package. Though perhaps these historical tendencies are being used as political cover from which to attack renewable energy, a generous interpretation would say that Texas is not hostile to renewable energy, they are just no longer interested in encouraging it as much as they had in the past.

Assessing where Texas politics may move in the future is by no means easy, but a good bet is that Texas will likely not take more actions that harm renewables. The economic opportunity presented by renewables gives them decent political clout (though certainly not as much as fossil fuels) and makes getting the full majorities in the state house required to take more action unlikely. With that said, however, renewable energy in Texas will have to expand on the strength of its economic benefits and ability to provide consistent power to the grid, not based on favorable policies or their potential to mitigate climate change. To this end, an emphasis on innovation in the hydrogen space and an expansion of storage options in the state are likely avenues of progress, though continued development of renewable energy is also likely, but at a more measured pace.

Taxation and Community Economic Development

Amid the intensifying political pushback against renewable energy, it is important to examine the economic aspect of renewable energies to understand their outlook more comprehensively in Texas. Renewable energy projects benefit local communities by contributing

to the tax bases, offering direct payments to school districts, and providing passive income for landowners willing to sell or lease the land. They also create employment opportunities for local contractors. Compared to oil and gas, the relative stability of electricity prices makes renewable energy infrastructures a reliable income source for local governments. It is estimated the current fleet of wind, solar plants and energy storage could generate over $7.2-8.8 billion in tax dollars over the lifetime and provide $7.1-11.3 billion in landowner payments. If all currently planned projects within the interconnection queue are built out, those numbers could rise to $12.5-15.9 billion and $11.8-21.7 billion respectively [117].

As economic impacts are mostly realized through taxation and landowner payments, the shift in attitudes toward renewable energy within potential host communities and the alteration in taxation landscape could jointly influence the economic benefit derived from renewables. On one hand, landowners from geographically diverse communities currently hosting renewable energy infrastructures have attested to the economic benefits of both renewable energy infrastructure and energy storage[118]. On the other hand, as the projects expand their footprint, many communities, particularly in Eastern Texas, are fiercely resisting these projects, citing worries about potential change of lifestyle, safety hazards with energy storage, and damage to pastoral landscapes. Socioeconomic factors could also impact the acceptance of renewable energy infrastructures by landowners, as wealthier landowners may perceive less marginal benefit from land payments in mitigating the locals' concerns[119] [120].

At the state level, the increasing political pushback, and criticisms against the reliability of renewable energy has led the state government to terminate the local tax abatements initiative, namely Chapter 313. This alteration is anticipated to adversely impact the competitiveness of Texas for renewable energy developers, given its relatively higher ad valorem property tax compared to neighboring states[121], and subsequently eliminating a potential economic

development opportunity for many communities. Despite this setback, some scholars remain optimistic about the long-term competitiveness of renewables in Texas. Dr. Joshua Rhodes, a Research Scientist at the Webber Energy Group at the University of Texas at Austin, contends that the tax credits offered through the Inflation Reduction Act hold greater financial significance. He asserts that Texas' abundant wind and solar resources, coupled with a more streamlined approval process for renewable infrastructure projects, will continue to attract more wind, solar, and energy storage projects, albeit at a somewhat slower pace than in the past [122].

Transmission

A key subject cross-cutting many of the policies discussed above is transmission. The initial investment the state made in the CREZ allowed them to become a national leader in wind generation, but the state is now running into transmission problems of curtailment and congestion. In order to use the incredible amount of untapped wind and solar potential, the state needs to invest again in transmission but there are a number of hurdles in the way.

Without further investment in transmission infrastructure, the growth of renewables in Texas will almost certainly not mirror the incredible growth of the past 20 years. Expansion is expected in any scenario but may be severely limited[123] unless consensus can be created among stakeholders across the state that more transmission investment would be in their best interest.

Conclusion

Though a source of tax revenue and economic development opportunities, the renewable energy industry cannot match the historical significance that the fossil industry has in the state. This, coupled with Texas’ longstanding principle of opposing government overreach and a

statewide debate regarding the validity of climate science, has brought the state to an inflection point with its relationship with renewable energy projects. The state that pioneering CREZ and was an early adopter of a Renewable Portfolio Standard is now regularly portrayed as attacking renewable energy and propping up fossil fuels.

Though the validity of this charge is difficult to truly measure, what is clear is that moving forward, renewable energy developers will need to work harder to broaden the appeal of their projects, both to legislators and to Texans in communities that may host a new project. This could take the shape of presenting projects as enhancing energy resilience and will definitely require a focus on increasing the economic benefits packages available to landowners and communities. In a state where so much is said about renewable energy, money talks loudest, and if there are true benefits to Texans, then in time, renewables will continue to grow their share of the energy mix.

Appendix A: Renewable Energy Potential Maps

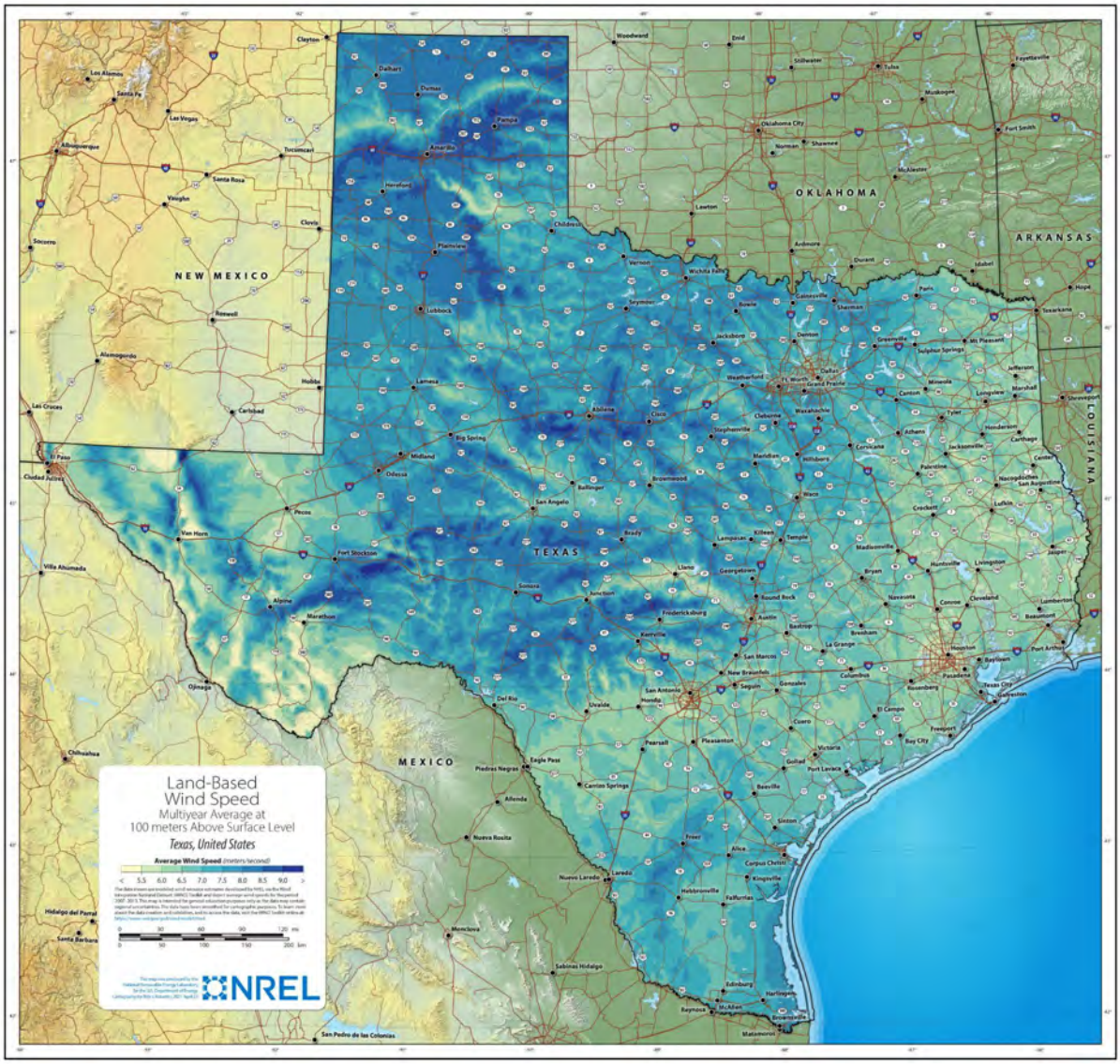

Figure 11: Wind speed at 100m[124]

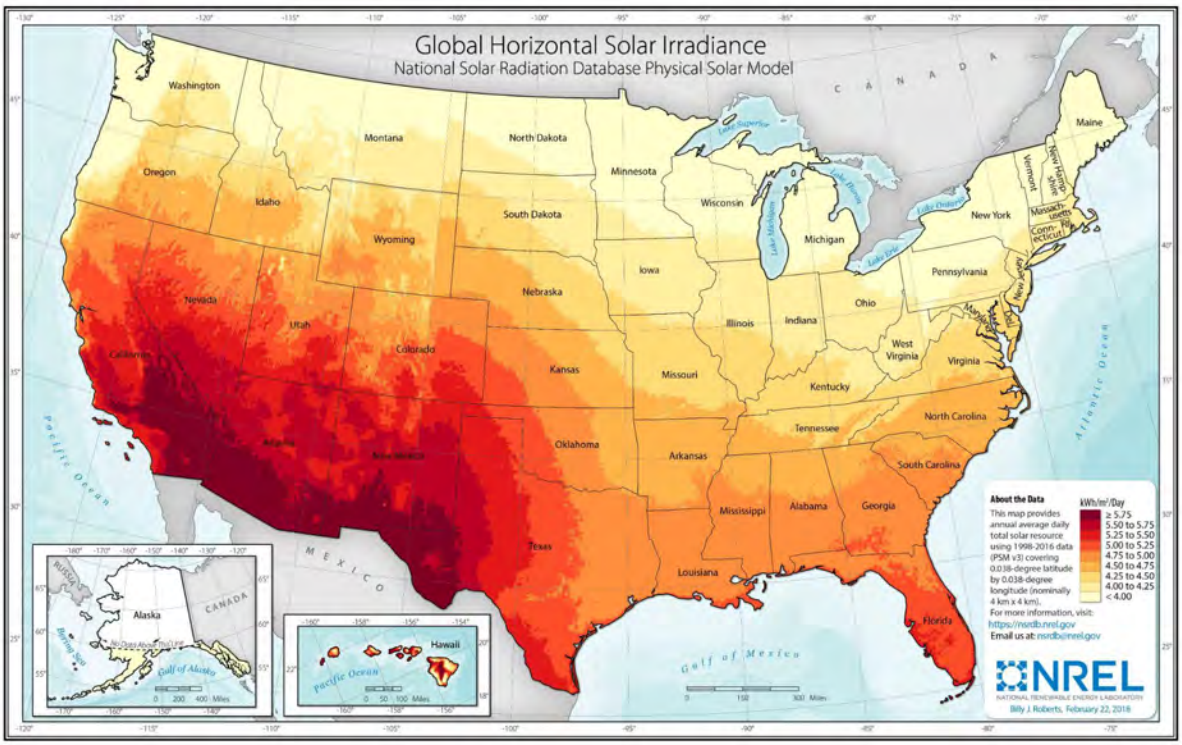

Figure 12: Average daily global horizontal solar irradiance[125]

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