PROPELLING NEBRASKA'S WIND POWER

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Obstacles at all levels of government are currently hindering the construction of large-scale wind projects in Nebraska. As the state continues to rely on coal for a majority of its power, these impediments are increasing ratepayers' bills and are allowing for the continued release of CO_2 into the atmosphere. To encourage greater wind power adoption, this paper reviews the process and requirements of connecting wind turbines to Nebraska's power grid at the local, state, regional, and federal levels before recommending changes at each.

To promote wind power across Nebraska, this paper specifically advances three recommendations. To facilitate wind power development at the local and state levels, Nebraska's Legislature can pass a significant wind energy bill addressing two main concerns. This bill should create a Clean Energy Standard setting a quota for increased wind power across the state and explicitly prohibit cities and counties from setting zoning, permitting, and decommissioning regulations for wind turbines while establishing statewide requirements. At the regional level, the Southwest Power Pool should continue to adopt reforms and invest resources into its interconnection study process to expedite the approval of Nebraska's wind power projects into the regional grid. Finally, at the federal level, Congress can directly fund new wind projects in Nebraska through grants and approve funding for upgrading and constructing new transmission lines to help cover most of the interconnection costs wind developers currently pay.

As energy use and energy bills increase, it is crucial that Nebraska rapidly shift to wind generation as a more economical, environmentally friendly power source. This development will increase rental income for landowners, bring jobs and economic development to rural communities, and offer cheaper, cleaner energy to consumers. Only through a combination of local, state, regional, and federal actions can Nebraska reach such an outcome.

INTRODUCTION

Nebraska is ranked the fourth-best state for potential wind power generation yet ranks 15th in wind production.[1] While this puts the state in a position to pursue an aggressive transition to wind energy, instead, development is slow-moving.[2] A majority of Nebraska's power generation still comes from coal. In 2021 coal plants generated 51% of the state's energy, while renewable sources only produced 25%.[3]

Looking at the significant issues stalling the adoption of more wind power in Nebraska, the central focus of this paper is to advance three recommendations.[4] First, the Nebraska Legislature can pass stronger laws supporting wind power development. These laws should require wind power to make up a more significant percentage of the state's energy generation and set statewide standards to address the nonuniformity of county and municipal regulations. Second, at the regional level, it is recommended that the Southwest Power Pool continue to revise and invest resources into its power generation approval process to remove the backlog of applications stalling proposed wind energy projects in Nebraska. Finally, at the federal level, Congress should allocate grant funding to Nebraska to build wind turbines and new and upgraded transmission lines. Together, these measures can promote wind energy across the state.

I. STATE & LOCAL CONCERNS

The absence of statewide objectives for wind power and inconsistent local regulations are affecting the viability of transitioning Nebraska's power generation. To address these problems,

the Nebraska Legislature can pass laws requiring more wind power generation and prohibiting counties and municipalities from setting zoning, permitting, and decommissioning requirements.

A. Nebraska's Power Structure

Nebraska is the only state where electricity is managed entirely by consumer-owned public power entities.[5] In total, there are 161 entities holding exclusive rights to supply electric service to customers across the state.[6] There are benefits and drawbacks to this public structure. Without state laws setting renewable energy quotas, each public power entity maintains discretion over how it supplies power to its customers, which may contribute to less wind energy adoption.[7] In contrast, public management allows for the adoption of new power projects without the interference of private business interests and profitability concerns.[8]

Nebraska's statutes governing public power entities are negatively impacting the adoption of wind power. Neb. Rev. Stat. § 70–1101 states: "The policy of the state is to provide for dependable electric service at the lowest practical cost."[9] This law requires public power entities to consider not only if a new project is economical but also if it is dependable.[10] Based on these criteria, Nebraska's access to cheap coal has made adopting wind energy unnecessary. While wind power is now more cost-effective than coal,[11] this strict statutory language still means public utilities cannot transition to wind energy without thoroughly studying each new project.

Low-cost planning is only one concern, as public power officials must also consider energy predictability and long-duration storage.[12] Wind energy is not dispatchable. Nebraska's utility providers cannot make more wind when more power is needed. Instead, providers may choose to store the energy generated from wind turbines or rely on other power sources during

periods of low wind.[13] Faced with these choices, Nebraska's public power officials have continued using coal.[14] However, this reliability mandate could make wind power appealing because coal has its own potential for shortages. For example, Nebraska could face a coal shortage if there were transportation disruptions from a rail worker strike.[15] Consequently, the current law adds additional considerations for officials approving new wind turbines in the state.

Suppose a public power entity does decide to build a wind turbine. It can fund, develop, and manage the project independently or negotiate with private investors through a competitive bidding process to establish private turbines within its jurisdiction. Across Nebraska, private party development has become more prevalent because of federal tax credit incentives, which public power entities cannot take advantage of.[16] While private wind turbines are becoming more common, these private arrangements have drawbacks. For instance, if a private wind company decides to contract with a public power entity, it must construct wind turbines in compliance with the entity's rules and regulations.[17] The private-public partnership can also increase utility costs for ratepayers as private parties sell their generated power at higher prices to profit from their investment.

The Nebraska Power Review Board is one additional hurdle for renewable investment. The Board is a state agency that regulates all of Nebraska's 161 public power entities and gives final approval for constructing electric generation facilities, including wind turbines.[18] While the Board can only deny new power generators for improperly filed paperwork, the agency does add another layer of administrative procedure for new wind projects.[19]

B. Political Influence

Politics can impact the adoption of wind energy in Nebraska because elected officials oversee each of Nebraska's power entities. Officials running for election may feel compelled to object to wind projects to avoid community backlash.[20] Wind turbine developers typically build near existing transmission lines to avoid high costs, but this often places wind farms near populated areas, leading to community opposition.[21] This opposition can result in fewer votes for candidates who support wind energy. Furthermore, as more wind projects are developed, organizations become more familiar with how to organize against them.[22] Although wind projects can provide benefits such as job creation and land rental income, concerns about sound, blinking aviation obstruction lights at the top of towers, or a perceived lack of importance in transitioning away from coal can also harm their prospects.[23]

Just as local elections can hinder wind farms, the opposite may also be true. With near-total autonomy over the direction of their public power entities, officials aware of strong local support for wind energy may approve new wind projects disregarding the political influence of the State Legislature or national political parties.[24] Although elections and community support do not clearly influence wind energy development in one particular way, the politics of energy in Nebraska is another issue to consider.

C. Local Zoning

Zoning is another concern for wind developers in Nebraska. Once a relevant public power entity and the Nebraska Power Review Board approve a wind project, it still must meet local zoning requirements in the county and municipality where it will be built. These local zoning requirements can obstruct the adoption of wind power.[25]

Every county and municipality in Nebraska has the authority to create a planning commission and adopt a Zoning Resolution with the force and effect of law.[26] Although state law encourages counties and municipalities to include considerations for wind energy use and protect access to wind energy in their zoning regulations, these resolutions are often restrictive.[27] Regulations can set unique height, location, noise, setback, and even color requirements for wind turbines. This "crazy-quilt" of local regulations lacks coherence and consistency, which creates difficulties for wind developers who must be aware of the particular rules in each county and municipality where they plan to build.[28]

Another issue is that many smaller counties and municipalities have not adopted zoning regulations.[29] Because counties and municipalities can only adopt zoning regulations after adopting a comprehensive development plan, which a separately established planning commission must create, many counties and municipalities have not completed this process.[30] Richardson County, for example, with a population of nearly 8,000, has not adopted any regulations.[31] Overall, because more than two-thirds of Nebraska counties have less than 10,000 residents, many local jurisdictions either lack zoning regulations or have only adopted general regulations not covering wind turbines.[32]

One final concern for wind development under current Nebraska law is the ability of counties and municipalities to change zoning regulations at a moment's notice. Nebraska's law does not set a minimum amount of time under which a nonconforming use may continue to operate and, therefore, can make installing wind turbines risky. For example, a smaller county or municipality that did not initially have regulations in place may grow hostile to new wind projects. Upset residents from these smaller communities may be able to convince their elected officials to prohibit all wind turbines in a county's zoning regulations, which would terminate all

existing wind projects immediately.[33] Such a possibility can make parties nervous about developing in the state.

D. State & Local Permitting, Contracting, and Decommissioning

Local permitting, contracting, and decommissioning regulations also hinder wind power development across Nebraska. Currently, counties and municipalities can require special use and conditional permits to operate wind turbines in their jurisdictions. These permits can add extra costs and steps to build wind turbines. For example, Cass County sets a $5,000 fee to obtain a conditional use permit for a Large Wind Energy Conversion System.[34] Local governments can also require permits for repairs and alterations of structures, which can add extra layers of red tape for a party trying to repair a wind turbine.[35]

At the state level, comprehensive permit requirements for wind turbines also exist. For example, the Nebraska Department of Environment and Energy requires a permit for storm water discharges from construction sites if wind farm construction disturbs more than one acre of land, the Nebraska Department of Aeronautics requires a permit for any structure exceeding 150 feet, and the Nebraska Game and Parks Commission requires a permit to avoid placing turbines, roads, and other associated infrastructure at locations impacting species protected under the Nebraska Nongame and Endangered Species Conservation Act (Nebraska's version of the Endangered Species Act). While these types of permits serve valid purposes, preventing potential harm to people and the environment, the process to obtain these permits can greatly extend the timeline for new wind turbine construction.

Counties and municipalities' contracting and decommissioning requirements can also restrict wind energy growth. In 2009, the Nebraska Legislature set statewide requirements for the terms of wind agreements.[36] Under this new law, wind power developers must contract in writing, agree to decommission their project, and provide financial security to guarantee such decommissioning.[37] These requirements ensure wind projects are adequately negotiated and disposed of at the end of their life cycles. However, this law does not prevent counties and municipalities from passing additional requirements related to a contract's terms.[38] Without any restrictions, a county or municipality can require arbitrary contracting terms or set the financial security for decommissioning to such a high amount it can make new wind projects cost prohibitive.[39]

E. State Solutions

To address the issues discussed above, Nebraska's Legislature can actively support wind development in several ways. From amending the duties of public power officials, to stopping the "crazy-quilt" of local laws, to even appropriating funds to construct wind turbines, there are many laws the Legislature can pass to support wind energy.

The Legislature can address the issues concerning public duties and local politics by passing a "Clean Energy Standard."[40] This Standard would require all of Nebraska's public power entities to generate a certain percentage of their power from sources with zero carbon emissions.[41] Under this mandated quota, officials could no longer delay wind projects to study the lowest practical energy costs. Rather, officials would be required to generate a percentage of energy from zero carbon emission sources.[42] As well, elected public power officials could push

aside the political ramifications of supporting or opposing wind energy. Even if local voters oppose wind power, a clean energy standard will have made the choice for them, and public power officials will be required to support wind energy projects. In these ways, a Clean Energy Standard would promote wind power development across the state.

When drafting a Clean Energy Standard, the Legislature should also keep Dormant Commerce Clause challenges in mind.[43] The Standard's language could not include a tax on coal-based electricity nor set requirements for energy use from sources with zero carbon emissions. Both requirements could be considered a regulation of out-of-state commerce.[44] Instead, the Clean Energy Standard should only regulate energy generation in Nebraska.

For Nebraska to ensure it meets its goals under a Clean Energy Standard, the Legislature can also appropriate funds directly to public power entities to build turbines. This decision would promote public wind power development over private arrangements and could result in lower energy costs.[45] The state's public power entities already have the resources and experienced staff to manage public wind projects.[46] As well, state funding could allow public entities to develop long-term plans and reduce the amount of "energy sprawl" characterized as a poorly planned development.[47]

High upfront costs may deter the Legislature from appropriating funds for public power. However, private wind development can save the Legislature from having to raise taxes to generate revenue. Private investment can also eliminate the perceived risks associated with wind power. The State does not lose any money if a turbine fails to generate as much power as was predicted.[48] Nevertheless, while upfront costs for wind projects are significant, public ownership could produce lower prices over time. Through public ownership, ratepayers do not pay artificially high prices, which private investors can charge to profit from the energy generated.

Additionally, with new research demonstrating wind power is cheaper than coal, the Legislature should view wind power as a safe investment. Overall, Nebraska's public power structure has historically proven cheaper than privatization, but it is up to the Legislature to decide if additional public power is worth the investment.[49]

Another way the Legislature can play an active role in developing wind power is by amending zoning laws. Specifically, the Legislature can prohibit counties and municipalities from passing zoning laws for wind turbines and instead set statewide regulations. By removing local control over zoning for wind power and creating statewide standards, the Legislature will harmonize regulations across Nebraska and reduce the number of regulations developers must be aware of. Having a standard for the entire state would also set a baseline, assuring residents of smaller counties and municipalities who currently lack zoning regulations that they will have some level of protection from wind turbines in their backyards.

This recommendation would also address concerns about local governments altering zoning regulations to designate already constructed wind turbines as non-compliant. With a single statewide regulation, developers would no longer need to concern themselves with new regulations in every local jurisdiction they have built in. Developers could instead only watch for changing state requirements. An alternative solution to this issue could be for the Legislature to pass a law requiring compensation for functioning wind turbines that new local zoning regulations later prohibit. This measure would help reassure developers that they will be compensated if a new local zoning regulation makes their turbines nonconforming.[50]

While statewide zoning regulations can address the lack of regulations in smaller counties and municipalities, in the largest counties and cities, the Legislature could continue to allow local zoning regulations. The Legislature could leave zoning regulation to the locally elected officials

in Douglas, Lancaster, and Sarpy County, because over half of Nebraska's population resides in these three counties and the municipalities within them.[51] This law would create a statewide standard and eliminate nonconformity issues for most of Nebraska, while allowing the most densely populated areas to self-regulate wind turbines through locally elected officials. This exception would not hinder wind development. The Omaha Public Power District, which governs both Douglas and Sarpy counties, and the Lincoln Electric System, which regulates Lancaster County, have already set decarbonization goals.[52] With these goals already in place, these populated areas have already prioritized developing wind energy and do not need state oversight. While this exception may seem unfair to smaller counties, with counties varying in size from Douglas at 586,327 and Blaine at 453 residents, a "one size fits all" law will not work.[53]

It may be true that giving less populated counties control over their zoning regulations can help landowners in those areas feel more comfortable with wind turbines. However, having different requirements in all of Nebraska's 93 counties can make developing wind projects in Nebraska complex and burdensome. Therefore, by prohibiting restrictive zoning requirements and instead setting statewide standards in all but the largest three counties, the Legislature can encourage wind power development across the state.

The Legislature can also pass laws prohibiting counties and municipalities from setting permitting, contracting, and decommissioning regulations for wind energy. Removing these extra barriers will help speed up the construction of wind turbines across Nebraska.

As discussed above, the permitting requirements at the state level are sufficient. To streamline the construction process and reduce the administrative steps needed to build wind turbines in Nebraska, the Legislature can prohibit counties and municipalities from setting their

own permit requirements for wind energy projects. The Legislature could also set up a single permit application for wind projects at the state level.[54] These changes would reduce delays when constructing wind turbines.

The Legislature can also explicitly prohibit local contracting and decommissioning requirements to remove another tool local governments can use to restrict wind development. The 2009 law passed by Nebraska's Legislature sufficiently protects parties involved in wind agreements. Not explicitly prohibiting counties and municipalities from imposing additional requirements could result in redundancy, increase the likelihood of lawsuits, and discourage wind power development.

These changes by the Legislature could promote wind projects in the state. While removing local control and expediting wind energy construction can erode local support for clean energy and create community backlash, permitting and contracting requirements at the state level are adequately protecting Nebraskans from the potential harm of wind farms. With 93 counties in Nebraska and countless municipalities, wind energy developers face a wide array of siting requirements, and the regulatory burden can worsen if a wind farm crosses multiple jurisdictions. Therefore, to foster faster wind energy development, the Legislature should remove these extra obstacles.

Finally, if upfront investment for publicly owned and managed wind power is deemed too expensive, Nebraska's Legislature can help attract private wind development in several ways.[55] For one, Nebraska's Legislature can invest in transmission line upgrades. This investment would lower the cost of entry for private developers who often pay for grid upgrades because Nebraska's transmission lines are at capacity.

Another option to increase private investment is providing state tax credits. Nebraska faces challenges attracting wind power investment because of its public structure but can bring in more private development through financial incentives. Legislative Bill 104, passed in 2013, permitted wind developers to take advantage of the Nebraska Advantage Act.[56] This Act offered private investors the opportunity to receive full reimbursement on their sales tax if they invested money in new projects and generated employment opportunities within the state.[57] However, these benefits expired at the end of 2020, and renewable energy generation facilities today must pay sales tax and a nameplate capacity tax on top of all other costs.[58] By passing a new tax credit bill, Nebraska's Legislature can stimulate growth in its wind energy sector.

The State Legislature can also make private investment in wind energy more appealing by passing laws limiting suits against wind farms under nuisance law. Currently, nuisance lawsuits arise because of issues with wind turbines' shadow flicker and noise.[59] While wind developers should consider these factors during the siting process, giving explicit immunity to developers complying with zoning and permitting laws can help reduce the potential for lawsuits and bring in more investment.[60]

Lastly, current restrictions on foreign investment may have an unintended negative effect on wind energy investment. While preferably, Nebraska's public power entities would directly own and manage wind farms, another option the Legislature could take to increase private wind production would be making an exception to the law prohibiting foreign corporations from owning land in the state.[61] Such an exception would allow private out-of-state wind companies to own the land their turbines are on. While wind companies typically lease property, if a private wind company wanted to own the land their wind turbines are placed on, this exception would

allow them to do so without having to incorporate in the state. Such an exception would need to be carefully drafted, however, to make sure it would not defeat the purpose of the original law.

II. REGIONAL CONCERNS

A. Regional Interconnection

Another significant issue slowing down Nebraska's wind projects is that they cannot quickly connect to the regional power grid. Over 95% of Nebraska's grid is part of the Southwest Power Pool (SPP), a Regional Transmission Organization connecting nearly 6 million homes across 17 states.[62] The SPP does not build transmission lines or power generators. Instead, it acts as an "air traffic controller" managing the flow of electricity across the region.[63] As such, the SPP studies new projects and sets prices to connect to its grid. This process, while necessary, can delay wind power development.

Most of Nebraska's public power entities have joined the SPP for its benefits. Nebraska's partnered entities can export and import power to and from other areas in the SPP based on where the cheapest energy is being generated at any given time.[64] This arrangement reduces Nebraska ratepayers' costs and helps explain why Nebraska has not seen more wind turbine construction. Because Nebraskans can rely on wind energy generated in neighboring states, regional interconnection has made local projects less economically attractive.[65]

While shared power can lower Nebraskan's electricity bills, membership in the SPP also has its costs. Wind developers in Nebraska cannot connect to the regional grid with only state-level approval. Instead, they must seek approval from the SPP, which runs complex calculations

to determine how a new power generator will affect the entire regional grid.[66] One can think of this connection process from a power generator to a transmission line as building an onramp to an existing interstate. SPP's primary concern is to make sure that new power sources do not add too much traffic to the interstate, overloading the grid and leading to blackouts.

Even though the SPP has no incentive to delay these studies, slow turnaround times are causing major hiccups for new projects. Historically, the SPP dealt primarily with large coal plants and could quickly study these centralized power sources' effects. However, as the number of small power generators seeking approval grows, the SPP has struggled to keep up. Because of delays, only 20% of wind projects submitted between 2000 and 2017 reached commercial operation by the end of 2022.[67] Although part of this low rate can be accounted for because developers submit multiple applications to find the best location for a new project and end up abandoning all but one application, the SPP's slow approval process is also discouraging new development.

In 2022 the SPP adopted new protocols to address this multiyear backlog.[68] When seeking approval, the SPP now requires developers to make deposits and demonstrate reasonable control over the proposed property.[69] While these changes will likely reduce the number of applications, if deposit amounts or real estate prices are too high, these changes may be cost-prohibitive, hindering wind development. The SPP also changed how developers apply during "open windows" so that it can simultaneously review all the proposed projects as a single cluster. While this process reduces the number of studies the SPP needs to conduct, if a single project pulls out of the group, the SPP must redo their analysis and readjust costs.[70] From all this, it is clear time is necessary to determine if these changes are having a meaningful impact on the backlog.

Once the cost to "build an onramp" and connect to the regional grid is determined, one final barrier developers must overcome is paying for the connection.[71] Paying to build a few miles of transmission line from a power generator to an existing transmission line would not be an issue. The problem is that because portions of the grid are often at capacity, new projects can be required to pay for upgrades to large sections of existing lines to connect. This scenario can be thought of as paying for an onramp and a major upgrade to an interstate. And these connection costs can be exorbitant, often including new breakers, transformers, and voltage control equipment hundreds of miles away. For example, the median interconnection cost for projects that withdrew their applications grew tenfold between 2002-2009 and 2020-2022.[72] Ultimately, this cost allocation significantly deters new wind projects.

B. Regional Solutions

The SPP can update its grid through its state partners and the federal government. As discussed above, a significant barrier to more renewable power within the SPP is that the regional grid is at capacity.[73] Local grids within the SPP's region were constructed to distribute electricity from centralized coal power plants, not to handle large amounts of electricity flowing in from the margins.[74] Adding more wind power today requires upgraded transmission lines to avoid power loss as energy travels hundreds of miles,[75] and an increase in supportive technical services, such as inverters and remote staff, to ensure wind turbines sync instantaneously with other energy resources in the grid.[76] As such, new wind projects can face enormous costs.[77]

In Nebraska, the areas with the highest energy demands are also not located near the windiest parts of the state. Over half of Nebraska's population lives in Douglas, Lancaster, and

Sarpy Counties.[78] Given this geographical challenge, it is vital to find ways to subsidize the high costs of transporting wind energy from the middle of the state to the populated eastern counties.

To get more wind energy online in Nebraska, all local, state, regional, and federal parties should invest in and build hundreds of new miles of transmission lines.[79] Because the SPP is funded directly by ratepayers and does not have the resources to pay for new lines, it will be primarily left to the states and federal government to address these concerns. Nebraska's public power utilities may be able to self-fund transmission projects but will likely need support from the Legislature to pay for the high upfront costs.[80] Alternatively, the federal government may be best positioned to appropriate funds.[81]

As demand for electricity increases, the region will need to develop enough new power to keep pace and keep energy costs low. By 2050, it is estimated total energy consumption across the United States will increase by 15%.[82] Nebraska has already begun to see more power use with increased electric vehicle sales,[83] more homes using electrical heaters in winter,[84] companies constructing data centers in Sarpy County,[85] and crypto mining taking advantage of the state's cheaper energy prices.[86] As Nebraska's grid begins to support these increasing demands, it will be necessary for the Southwest Power Pool to expand capacity and approve new wind projects more quickly.[87]

To address these concerns, the SPP should continue to look for ways to speed up its review process. If a magic solution to the backlog were easy to find, the long wait times would not exist. There is no doubt that managing a portion of the United States' power grid is a challenging task. Yet, current delays caused by the SPP are resulting in rising materials costs, expiring options to buy land, lost interest from potential customers, and frustrated communities, all of which can end a new wind project. Currently, the SPP's approval process is a significant

bottleneck for new wind energy in Nebraska, and if the SPP does not develop more solutions, Nebraska will be unable to increase its wind power output. In this way, successfully developing renewable power in Nebraska depends on the SPP.

III. FEDERAL CONCERNS

The federal government is affecting wind energy development in Nebraska through regulation and spending. While the federal regulations in place serve essential purposes, and it is not recommended Congress amend them, Congress should modify federal spending in particular ways to facilitate wind energy development in Nebraska.

A. Federal Permitting

When seeking approval for a wind energy project in Nebraska, complying with federal laws can affect a project's viability.[88] Specific considerations, including military operations and environmental concerns, add extra steps before construction can begin. For one, new wind project developers must notify the Federal Aviation Administration if their construction will interfere with airports or aircraft.[89] This process is reasonable. There are no fees associated with filings, and while agency approval can increase the construction time for a project, this permitting process exists to protect the safety of air travel. A second permit is required if a wind project could disturb a wetland. If so, a developer must obtain a permit from the United States Army Corps of Engineers. Furthermore, proposed wind projects near military installments need to apply through the military aviation and installation assurance siting clearinghouse for

approval.[90] While all these federal requirements can add time and costs to a new wind project, they each serve a valuable purpose.

Wind project developers also need to be concerned with birds and bats flying into the turbine blades and must be aware of several federal laws, including the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.

Section 9 of the Endangered Species Act makes it a civil and criminal offense for a person to "take" a listed species.[91] The definition of "take" includes harassing, harming, or killing and has been interpreted by the Supreme Court to include "significant habitat modification or degradation."[92] Nevertheless, a developer installing a wind turbine may receive an incidental take permit after submitting a satisfactory habitat conservation plan to the U.S. Fish and Wildlife Service to avoid civil and criminal liability if the turbine does "take" an endangered species.[93]

The Migratory Bird Treaty Act similarly prohibits the "taking" of migratory birds. However, there is a circuit split regarding the interpretation of "take."[94] While some circuits broadly construe "taking" to mean any killing, the Eighth Circuit has taken a much narrower approach.[95] The Eighth Circuit interprets "taking" to only apply when a migratory bird is killed through hunting and poaching, not from indirect causes resulting in death.[96] This interpretation is significant for wind developers because violating the Act is a misdemeanor punishable with fines up to $15,000 or incarceration for up to six months.[97] Therefore, while having a mitigation plan and developing strategies to reduce the deaths of migratory birds is important, if a migratory bird does die from a wind turbine accident, it is unlikely a federal court in Nebraska will find the owner criminally liable for violating the Act.

Finally, the Bald and Golden Eagle Protection Act prohibits the "taking" of Bald and Golden Eagles.[98] This law exists because neither of these birds is on the endangered species list.[99] If there is a risk of taking these eagles, developers may apply for a take permit from the U.S. Fish and Wildlife Service to protect themselves from liability.[100]

B. Federal Solutions

The federal laws in place regulating wind projects are appropriate. Instead of amending these laws, the federal government can promote wind power development in Nebraska by appropriating funding in ways favorable to the state's unique public power structure. In fact, a complete transition of Nebraska's power to net zero emission sources can be accomplished without increasing the current annual energy budget.[101] However, funding must be directed deliberately.

To support the public development of wind generation in Nebraska, it is up to Congress, particularly Nebraska's federally elected officials, to properly allocate federal funding. Historically, Nebraska's consumer-owned power entities have been unable to capitalize on many federal wind power incentives.[102] These incentives are usually tax credits, which do not benefit public power entities already exempted from federal taxes. For example, the Inflation Reduction Act, signed into law on August 16, 2022, continues to offer clean energy production credits for wind power while offering little in terms of direct grants.[103] Federal funding like this has led to less public wind development in Nebraska, as the law fails to subsidize public wind power.[104] These tax credit schemes can even lead to higher energy prices in the state as they promote private wind development. As stated above, this can be detrimental because private wind power

can lead to higher energy bills for Nebraskans because customers pay artificially high prices so that private parties can see a return on their investment.

Targeted grant funding from the federal government will allow Nebraska to take advantage of its wind power potential. Through direct federal grants to the state and its public power entities, wind energy will develop quickly as the state and ratepayers will not need to cover the high upfront costs. This type of appropriation would also ensure that public power entities have the funding to transition to more economical and environmentally friendly power sources without the need for private investment. Additionally, a large grant spread out over several years would allow Nebraska's public power entities to strategically plan wind development, which could reduce costs even further.

An alternative way Congress can develop wind generation in Nebraska is by federally funding transmission lines across the state. Like the rest of the county, Nebraska has many transmission lines needing upgrades and many areas of the state requiring new lines to develop more wind power.[105] These problems are preventing the timely development of new wind generation projects across Nebraska. To address this, the Inflation Reduction Act does provide $760 million in grant funding for transmission project studies.[106] It also provides $2 billion in direct loans for constructing and modifying electric transmission facilities.[107] However, the federal government can do more for Nebraska specifically. The grant funding does not provide any direct funding for new transmission line development. Additionally, the Act does not set interest rates for the loans, and it is unclear if Nebraska's public power entities would benefit from these federal loans. Ultimately, wind power development in Nebraska will be best supported through federal grants to build new transmission lines, not through loans that will still result in public power entities paying enormous costs to upgrade their transmission line capacity.

CONCLUSION

In 2014 a study for the Nebraska Power Review Board noted: "In the near term, renewable generation developers in Nebraska face competitive disadvantages that include: (a) lower financial incentives from the state; (b) lower wholesale power prices due to transmission congestion; (c) [and] the perception of a more burdensome permitting and regulatory process."[108] Today, these issues persist. State financial incentives are still lacking, transmission congestion has only worsened, and zoning and permitting laws remain burdensome. Through the recommendations of this paper, however, it may be possible to begin addressing these issues.

Nebraska can see more wind development through the Legislature setting zero-emission energy quotas and passing statewide zoning and permitting laws, the SPP continuing to address the multiyear backlog of interconnection studies, and the federal government providing grant funding to the State to build wind turbines and transmission lines.

At the state level, the Legislature should aggressively pursue cleaner, cheaper energy to not only decrease CO_2 emissions but also ratepayers' bills. The Legislature, with its large budget, is uniquely positioned to fund this transition because new wind projects typically have high upfront costs that public power entities and private developers may be unwilling or unable to cover. Suppose the Legislature can pass legislation prioritizing wind power through a Clean Energy Standard, direct funding, or by creating statewide zoning laws for wind turbines. In that case, Nebraska will likely see rapid construction of new wind projects. In this way, unless Nebraska can offer incentives and remove barriers to entry, developers who have experience building wind energy in other states will continue to build where they are familiar.

At the regional level, the Southwest Power Pool's power generator approval process was not working. While it will take time to determine if the 2022 changes solve the backlog, the SPP should continue developing ways to speed up the interconnection queue. Otherwise, developers will continue to wait years to find out the actual cost of their projects and wind energy production will not increase in Nebraska.

Finally, it is recommended the federal government more precisely fund a transition to wind power in Nebraska. While the Inflation Reduction Act shows a serious commitment to wind power nationally, to successfully assist Nebraska's public power structure, federal funding for wind power and transmission lines should be through grants, not tax credits.

Today renewable sources generate more electricity than coal or nuclear power in the United States, yet Nebraska lags drastically behind.[109] Nebraska can catch up, but it will require a combination of solutions at the local, state, regional, and federal levels. If it does catch up, Nebraska will not only help its own residents, but demonstrate more generally that publicly managed and developed wind power is a great way to offer cheap, dependable power to all.

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[1] UNIV. OF NEBRASKA-LINCOLN, *Wind Speeds, Wind Energy & Wildlife*, https://wind-energy-wildlife.unl.edu/wind-speeds (last visited May 24, 2024); NEB. DEPT. OF ENV'T AND ENERGY, *Wind Facilities' Installed Capacity by State*, https://neo.ne.gov/programs/stats/inf/205.htm (last visited May 24, 2024). As of January 2023, Nebraska has a wind energy capacity of 3,476.3 Megawatts per hour, and 1475 running large scale turbines; *see* NEB. DEPT. OF ENV'T AND ENERGY, *Wind Energy Generation in Nebraska*, https://neo.ne.gov/programs/stats/inf/89.htm (last visited May 24, 2024).

[2] While nationally wind generation has increased by more than 1,000 percent from 2007 to 2021, and coal generation has decreased by more than half over that same timeframe, Nebraska has not followed these trends. *See* Michelle Solomon et al., *Coal Cost Crossover 3.0: Local Renewables Plus Storage Create New Opportunities for Customer Savings and Community Reinvestment*, 7–8 (Energy Innovation Pol'y & Tech. LLC, 2023); *see also* Lisa N. Garrett, *Wind in the Wild West to Wind in the Midwest: How Iowa and Nebraska Could Implement Texas Strategies to Increase Installed Wind Capacity*, 48 TEX. ENV'T. L. J. 101, 107 (2018) (discussing how states like Texas and Iowa, which are also some of the windiest states, have installed a proportionately larger number of wind turbines than Nebraska).

[3] Nuclear Power (18%), Natural gas (3%), Hydroelectric (3%), and Petroleum (0.1%) make up the remaining amounts. *See* NEB. DEPT. OF ENV'T. AND ENERGY, *Annual Electricity Generation in Nebraska by Fuel Type,* https://neo.ne.gov/programs/stats/inf/52.html (last visited May 24, 2024); *see also* BLOOMBERGNEF, *Sustainable Energy in America 2023 Factbook*, 11 (The Bus. Council for Sustainable Energy 2023). (illustrating that Nebraska's reliance on coal is much higher than the national average of 19.4% in 2022) http://www.bcse.org/factbook.

[4] This paper focuses exclusively on the viability of large-scale wind projects seeking connection to Nebraska's power grids and does not discuss small scale wind turbines. Expanding on the issues and solutions offered by other authors, this paper provides a current analysis of Nebraska's wind power and makes updated recommendations. For other discussions on the topic of Nebraska's wind power adoption; *see generally* Allan Williams, *The Winds of Change: How Nebraska Law has Stalled the Development of Wind Energy and What Can Be Done to Spur Growth*, 47 CREIGHTON L. REV. 477 (2014); *and* Judy W. Chang et al., Nebraska Renewable Energy Exports: Challenges and Opportunities, iv (THE BRATTLE GRP. DEC. 12, 2014), https://neo.ne.gov/info/pubs/reports/pdf/Nebraska_Renewable_Energy_Exports-Challenges_and_Opportunities.pdf; *and* Garrett, *supra* note 2. (While both Garrett's article and this paper discuss issues of local zoning ordinances, insufficient transmission capacities, and the absence of a Renewable Portfolio Standard hindering the adoption of wind power in Nebraska, Garrett also asserts that private investors are worried about the condemnation power of Nebraska's Public Power Districts*; see id*. at 107; *but see* NEB. REV. STAT. § 70-670 (2021) (illustrating that eminent domain is no longer an issue as of 2016 Nebraska's Legislature passed LB824 prohibiting public electric suppliers from condemning property operating as a privately developed renewable energy generation facility).

[5] NEB. PUB. POWER DIST., *Powering Nebraska*, https://www.nppd.com/powering-nebraska/public-power?locale=en (last visited May 24, 2024).

[6] Interview with Tim Texel, Executive Director and General Counsel, NEB. POWER REV. BOARD, in Lincoln, Neb. (Apr. 18, 2023). *See also* NEB. POWER REV. BOARD, *Service Area Boundary View*, https://nprb.gworks.com/ (last visited May 24, 2024).

[7] Because wind projects have historically been more speculative and variable in cost, public utilities have been less supportive of them. Interview with Tim Texel, *supra* note 6.

[8] State law prohibits private companies from selling any power directly to customers. *See* NEB. REV. STAT. §§ 70-1012 to 70-1014.02 (2021). *See also* Nebraska Attorney General, Op. Att'y Gen. No. 96073 (Nov. 4, 1996), available at https://ago.nebraska.gov/sites/ago.nebraska.gov/files/docs/opinions/AG%20Opinion%201996-073.pdf.

[9] NEB. REV. STAT. § 70-1101 (2021).

[10] The Nebraska Power Review Board is exempted from this requirement for renewable energy facilitates. *See* L.B. 65, 98th Leg., 1st Sess. (Neb. 2003) (amending NEB. REV. STAT. § 70-1014).

[11] Recent studies have found that across the country coal-fired power plants are more expensive on a forward-looking basis than the total cost of a new renewable energy project. Solomon, *supra* note 2 at 2; *see also* INT'L RENEWABLE ENERGY AGENCY RENEWABLE, Power Generation Costs in 2021, 4 (2022).

[12] *See generally*, Molly Fellus, *Time-of-Need and Amount-of-Need: Overcoming Two Key Issues with Deploying Clean, Renewable Electricity Generation*, 32 GEO. ENV'T. L. REV. 369 (2020) (discussing possible solutions for deploying renewable electricity generation).

[13] Energy storage may take the form of batteries or even large industrial weights which add extra costs. *See generally* Vilayanur Viswanathan et al., *2022 Grid Energy Storage Technology Cost and Performance Assessment* (Tech. Rep. No. PNNL-33283, U.S. DEPT. OF ENERGY, 2022). *See* Julian Lamy, *The Role of Energy Storage in Accessing Remote Wind Resources in the Midwest*, 68 ENERGY POL'Y. 123, 131 (2014) (discussing the impracticality of integrating storage into wind resources).

[14] Inara Scott, *Teaching an Old Dog New Tricks: Adapting Public Utility Commissions to Meet Twenty-Frist Century* Challenges, 38 HARV. ENV'T. L. REV. 371, 375 (2014) (noting that unless legislation specifically requires public utility commissions to consider environmental, technological, or policy matters, commissions will most likely focus exclusively on rate impacts for current customers).

[15] In 2021 all of Nebraska's coal supply was shipped from Wyoming. *See* U.S. ENERGY INFO. ADMIN., *Annual Coal Distribution Report 2021*, at 65 (Oct. 2022), https://www.eia.gov/coal/distribution/annual/pdf/acdr_fullreport 2021.pdf.

[16] John Krajewski, a consultant for the Nebraska Power Review Board, estimates these tax credits can make up to half of a private party's revenue stream during the first 10 years of operation. Tax credits therefore can make private power cheaper, while providing no benefits to the public utility entities. Interview with John Krajewski, Consultant, NEB. POWER REV. BOARD (Apr. 12, 2023).

[17] These contract terms can include liquidated damages clauses and other provisions.

[18] The Nebraska Power Review Board approves wind projects through the Certified Renewable Export Facility ("CREF") process. *See generally* NEB. POWER REV. BOARD, *About the Nebraska Power Review Board*, https://powerreview.nebraska.gov/about (last visited May 24, 2024).

[19] So long as a private developer notifies the Nebraska Power Review Board of its intent to begin construction of a facility that satisfies certain requirements the Board must approve the project. Interview with Tim Texel, *supra* note 6. *See also* NEB. REV. STAT. 70-1012 (2021).
[20] *See* Preserve the Sandhills v. Cherry Cty., 985 N.W.2d 599, 603 (2023).
[21] As more wind projects are developed, the best locations are taken, and new projects may need to develop in closer proximity to communities. *See* Alexandra B. Klass, *Takings and Transmission*, 91 N.C. L. REV. 1079, 1117 (2013) (discussing the interconnection between transmission line and new renewable energy development). *But see* Salma Elmallah & Joseph Rand, *"After the leases are signed, it's a done deal": Exploring procedural injustices for utility-scale wind energy planning in the United States*, Energy Res. & Soc. Sci., 89 (2022) (examining how acceptance of wind energy correlates to fair and participatory planning processes, not necessarily location).
[22] *See* SAMANTHA GROSS, RENEWABLES, LAND USE, AND LOCAL OPPOSITION IN THE UNITED STATES (BROOKINGS INST. 2020), https://www.brookings.edu/wp-content/uploads/2020/01/FP_20200113_renewables_land_use_local_opposition_gross.pdf.
[23] This is despite the major risks of climate change to the stability of the United States' financial system and economy, caused in part by the release of CO_2 into the atmosphere from coal power plants. *See* MKT. RISK ADVISORY COMM. OF THE U.S. COMMODITY FUTURES TRADING COMM'N, MANAGING CLIMATE RISK IN THE U.S. FINANCIAL SYSTEM (Sept. 2020) https://www.cftc.gov/sites/default/files/2020-09/9-9-20%20Report%20of%20the%20Subcommittee%20on%20Climate-Related%20Market%20Risk%20-%20Managing%20Climate%20Risk%20in%20the%20U.S.%20Financial%20System%20for%20posting.pdf (In Nebraska, 67% of people believe global warming is happening, 51% say it is caused mostly by human activities, and 59% say they are worried about it. 76% want to fund research into renewable energy sources). *See* Jennifer Marlon et al., YALE CLIMATE OP. MAPS 2021 (Feb. 23, 2022), https://climatecommunication.yale.edu/visualizations-data/ycom-us/. One additional concern is the loss of workers in the fossil fuel industry and the growth of a disproportionately white renewable energy sector workforce. *See* Sonya Carley and David M. Konisky, *The Justice and Equity Implications of the Clean Energy Transition*, 5 NATURE ENERGY 569, 572 (2020).
[24] *See* Mackenzie Brown, *How Public Power Advocates Helped Win a Major Victory for Renewables in Rural America*, CLIMATE CABINET EDUC. (June 15, 2021), https://climatecabineteducation.org/how-public-power-advocates-helped-win-a-major-victory-for-renewables-in-rural-america/ (commenting on how public power board elections are often nonpartisan).
[25] Yael R. Lifshitz, *Private Energy*, 38 STAN. ENV'T. L. J. 119, 125–127 (2019) (discussing the effects of zoning on energy development).
[26] NEB. REV. STAT. §§ 23–114, 66–913 (2021).
[27] *See* Univ. of Nebraska–Lincoln, *County Zoning*, https://wind-energy-wildlife.unl.edu/county-zoning (last visited May 24, 2023) (providing a list of county zoning regulations in 2016).
[28] The Supreme Court originally used the term "crazy-quilt" to describe the patchwork of state laws regulating estate taxes. *See* Rogers' Estate v. Helvering, 320 U.S. 410, 414 (1943).
[29] Univ. of Nebraska–Lincoln, *supra* note 27.
[30] NEB. REV. STAT. §§ 23–114.01, 23–114, 19–903; 19–929, 19–901 (2021).
[31] Interview with Richardson Cnty. Clerk (Apr. 18, 2023).
[32] Nebraska–Demographics, *Counties by Population*, https://www.nebraska-demographics.com/counties_by_population (last visited May 24, 2024).
[33] NEB. REV. STAT. §§ 23–173.01, 19–904.01 (2021).
[34] CASS CNTY., NEB., ZONING REGULATIONS (April 2023), https://www.cassne.org/plugins/show_image.php?id=929.
[35] NEB. REV. STAT. § 23–114.04 (2021).
[36] NEB. REV. STAT. § 66–911.01 (2021).
[37] NEB. REV. STAT. § 76–3001 (2021).
[38] NEB. REV. STAT. § 70–1014.02 (2021).
[39] NEB. REV. STAT. §§ 76–3001 to 76–3004 (2021).
[40] While most states have adopted similar measures called "Renewable Portfolio Standards," there is a slight distinction between the two. A Clean Energy Standard includes energy sources with zero carbon emissions, while a Renewable Portfolio Standard excludes nuclear energy. The Legislature adopting a Clean Energy Standard appears more practical because the Cooper Nuclear Station currently provides 17.5% of Nebraska's power. The Station is

licensed to operate through 2034 and taking it offline before then would be financially burdensome and provide little environmental benefit. *See* NEB. PUB. POWER DIST., NUCLEAR ENERGY, https://www.nppd.com/powering-nebraska/energy-resources/nuclear?locale=en (last visited May 24, 2024).

[41] Target percentages and timelines vary by state. Thirty states currently have Clean Energy or Renewable Portfolio Standards, and three states have set voluntary renewable energy goals. *See* Nat'l Conf. of State Legis., *State Renewable Portfolio Standards and Goals* (Aug. 2021) https://www.ncsl.org/energy/state-renewable-portfolio-standards-and-goals.

[42] In 2019, Omaha Public Power District's Board voted to commit to net-zero emissions by 2050. *See* OMAHA PUB. POWER DIST., BOARD RESOLUTION 6347 (Nov. 14, 2019). In 2021, the Nebraska Public Power District, which includes all or parts of 84 of Nebraska's 93 counties also committed to net-zero emissions by 2050. *See* NEB. PUB. POWER DIST., BOARD POL'Y. STRATEGIC DIRECTIVE NO. BP-SD–05 (Dec. 9, 2021). While these public power entities, supplying a majority of Nebraska's power, have already set self-mandated requirements, under a Clean Energy Standard, all local public power officials across the entire state would be required to generate a percentage of their power with zero carbon emissions.

[43] *See generally* North Dakota v. *Heydinger*, 825 F.3d 912 (8th Cir. 2016) (In 2016, the 8th Circuit Court of Appeals held that Minnesota could not ban the importation of power from sources that would increase statewide carbon dioxide emissions without congressional approval).

[44] Because Nebraska is part of a regional transmission grid, and the actual flow of electrons within the grid is unpredictable, the only way to ensure that a certain percentage of power used in Nebraska comes from renewable sources would be to mandate that the entire regional grid produce the same portion of power from renewable sources. This mandate would therefore be subject to a Dormant Commerce Clause challenge.

[45] Heather Payne, *Electrifying Efficiency*, 40 STAN. ENV'T. L. J. 57, 75 (2021) (discussing how investor-owned utilities focus on profit margins over cost reduction and technology advancement).

[46] For example, the Nebraska Public Power District involves the public in the transmission planning process and by meeting with residents in person can obtain land rights without eminent domain at a rate close to 98%-100%. *See* Brandon Gerstle, *Giving Landowners the Power: A Democratic Approach for Assembling Transmission Corridors*, 29 J. ENVTL. LAW AND LITIGATION 535, 553 (2014). Compare this success with the issues and alleged conflict of interest created when a private company sought to build wind turbines in Nebraska. *See also* Bill Kelly, *Did Cherry Co Board Have Conflict of Interest in Wind Farm Vote?*, NEB. PUB. MEDIA (Nov. 3, 2022), https://nebraskapublicmedia.org/en/ news/news-articles/did-cherry-co-board-have-conflict-of-interest-in-wind-farm-vote/.

[47] *See* Robert I. McDonald et al., *Energy Sprawl or Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America* (2009), https://doi.org/10.1371/journal.pone.0006802 (examining the harms of "energy sprawl").

[48] Interview with Tim Texel, *supra* note 6.

[49] *See* NEB. DEPT. OF ENV'T. AND ENERGY, ANNUAL AVERAGE ELECTRICITY PRICE COMPARISON BY STATE, https://neo.ne.gov/programs/stats/inf/204.htm (last visited May 24, 2024) (Listing Nebraska's average electricity price as the 8th cheapest in the country in 2021).

[50] Currently only four states, Massachusetts, Maryland, Virginia, and West Virginia place the entire siting authority at the state level. *See* Jaclyn Kahn & Laura Shields, *State Approaches to Wind Facility Siting* (NAT. CONF. OF STATE LEGIS., 2020), https://www.ncsl.org/research/energy/state-wind-energy-siting.aspx. A standardized, clear siting process may be best suited to promote wind energy. *See* Warigia M. Bowman, *Dust in the Wind: Regulation as an Essential Component of a Sustainable and Robust Wind Program*, 69 UNIV. KAN. L. REV. 45, 49 (2020).

[51] One concern with this plan could be that such a law is viewed as special legislation, which Nebraska's constitution prohibits. NEB. CONST. ART. III, §18. By carving out self-governance only for three counties and the cities within them, such a law may be challenged as unconstitutional. Nevertheless, the Legislature generally has some discretion and can pass laws that only affect the large population centers of Nebraska. This is especially the case because of the large number of Senators that represent districts within these counties. *See generally* Brandon Haubensak, *Special Legislation in Nebraska: Are the Rules Being Followed?*, 98 NEB. L. REV. BULL. 94 (2019).

[52] OMAHA PUB. POWER DIST., *supra* note 42; Lincoln Electric System adopted a 100% net decarbonization goal by 2040 on Nov. 20, 2020. *See* LINCOLN ELEC. SYS., LES DECARBONIZATION GOAL, https://www.les.com/les-decarbonization-goal (last visited May 24, 2024).

[53] U.S. CENSUS BUREAU, *Nebraska Quick Facts*, https://www.census.gov/quickfacts/NE (last visited May 24, 2024).
[54] *See* Uma Outka, *Renewable Energy Siting for the Critical Decade*, 69 UNIV. KAN. L. REV. 857, 864 (2021) (stating that to accelerate renewable energy development, new state level siting approaches may be necessary).
[55] Community-Based Energy Development Projects are another option not discussed in this paper. For additional information on C-BEDs: *see* NEB. DEPT. OF REVENUE, COMMUNITY-BASED ENERGY DEVELOPMENT (C-BED) PROJECTS INFORMATION GUIDE (Jan. 14, 2022), https://revenue.nebraska.gov/sites/revenue.nebraska.gov/files/doc/info/6-539-2022.pdf.
[56] L.B. 104, 103d Leg., 1st Sess. (Neb. 2013).
[57] L.B. 1118, 102d Leg., 2d Sess. (Neb. 2012).
[58] The nameplate tax is $3,518 per megawatt of production capacity of a facility. *See* NEB. REV. STAT. § 77–6203 (2021).
[59] A recent study by the Electricity Markets and Policy Department at Berkeley Lab found no clear relationship between the amount of shadow flicker exposure and self-reported annoyance. *See* Ryan Haac et al., *In the Shadow of Wind Energy: Predicting Community Exposure and Annoyance to Wind Turbine Shadow Flicker in the United States*, 87 (2022). For an example of a lawsuit regarding noise and zoning regulations; *see generally* Burgess v. Omahawks Radio Control Org., 219 Neb. 100, 362 N.W.2d 27 (1985). *Cf.* Preserve the Sandhills v. Cherry Cty., 313 Neb. 590, 985 N.W.2d 599 (2023).
[60] A reduction of noise pollution can be through the installation of modern turbine designs which have serrated trailing edges. *See* Ben Hoen et al., *Effects of Land-based Wind Turbine Upsizing on Community Sound Levels and Power and Energy Density*, 338, (APPLIED ENERGY 2023). For a discussion on the necessity of more regulation to stop "green on green" lawsuits involving environmental activists and industry; s*ee* Bowman, *supra* note 50, at 46.
[61] *See* NEB. REV. STAT. § 76–402 (2021) (stating corporations not incorporated in Nebraska are prohibited from acquiring title to or taking or holding any land, or real estate, or any leasehold interest extending for a period for more than five years).
[62] SW. POWER POOL, *About Us*, https://www.spp.org/about-us/ (last visited May 24, 2024).
[63] *Id.*
[64] SW. POWER POOL, *Markets Operations*, https://www.spp.org/markets-operations/ (last visited May 24, 2024).
[65] NEB. LEGIS., PERFORMANCE AUDIT COMM., PERFORMANCE AUDIT REPORT: NEBRASKA ENERGY GENERATION AND TRANSMISSION (Jan. 2018), https://nebraskalegislature.gov/pdf/reports/research/public_power_2018.pdf.
[66] The Southwest Power Pool must act in accordance with the Federal Energy Regulatory Commission's Order No. 2003, which sets out interconnection requirements. *See* FED. ENERGY REG. COMM'N, ORDER NO. 2003: STANDARDIZATION OF GENERATOR INTERCONNECTION AGREEMENTS AND PROCEDURES, https://www.ferc.gov/sites/default/files/2020-04/E-1_71.pdf (last visited May 24, 2024).
[67] Joseph Rand et al., *Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection as of the End of 2022*, LAWRENCE BERKELEY NAT'L. LAB'Y. (Apr. 2023).
[68] SW. POWER POOL, ATTACHMENT V GENERATOR INTERCONNECTION PROCEDURES (2022), http://www.apus.edu/z/search/student/_documents/Bluebook_Whitepages_Models.and.Examples_3-2016.pdf
[69] SW. POWER POOL, SITE CONTROL CRITERIA (Jan. 15, 2022), https://opsportal.spp.org/documents/studies/SPP%20Site%20Control%20Criteria.pdf (Requiring demonstrated control of 30 acres per Megawatt).
[70] Interview with John Krajewski, *supra* note 16.
[71] *See* Williams, *supra* note 4 at 495.
[72] LAWRENCE BERKELEY NAT'L. LAB'Y., *SPP Data Show Rising Network Upgrade Costs* (Apr. 27, 2023), https://emp.lbl.gov/news/spp-data-show-rising-network-upgrade-costs.
[73] DEPT. OF ENERGY, QUEUED UP…BUT IN NEED OF TRANSMISSION (Apr. 2022), https://www.energy.gov/policy/queued-need-transmission
[74] Nicholas A. D'Andrea, *The Renewable Grid: Integrating Renewable Energy into the U.S. Electrical Grid*, 39 HARV. ENVT'L. L. REV. 293, 311–12 (2015).
[75] Markus Pötsch et al., *Transmission and Distribution Losses in the Power Grid*, 56 ENERGY ECON. 451, 451–462 (2016) (examining the challenges of power loss).
[76] Jim Rossi & Hannah Wiseman, Electricity Regulation, Markets, and Governance, in GLOB. CLIMATE CHANGE AND U.S. L. 413–414 (Michael B. Gerrard, Jody Freeman & Michael Burger eds., 3d ed. 2021).

[77] This is especially true considering Nebraska was ranked in the bottom three states for overall grid modernization efforts in 2018. *See* GRIDWISE ALL., *Grid Modernization Index 2018* (2018) https://gridwise.org/grid-modernization-index-2018/.
[78] U.S. CENSUS BUREAU, *supra* note 53.
[79] In addition to building new lines, old lines will also need to be updated. The most recent network-infrastructure review conducted by the U.S. Department of Energy in 2015, discovered that over 70% of transmission lines in the United States are more than 25 years old. *See* U.S. DEPT. OF ENERGY, ANNUAL U.S. TRANSMISSION DATA REVIEW (Aug. 2015), https://www.energy.gov/sites/prod/files/2018/03/f49/2018%20Transmission%20Data%20Review%20FINAL.pdf
[80] Chang, *supra* note 4 at V.
[81] Weather events and physical attacks on power stations have also led to increased costs to maintain grids. *See* Michael Levenson, *Attacks on Electrical Substations Raise Alarm*, N.Y. TIMES (Feb. 4, 2023), https://www.nytimes.com/2023/02/04/us/electrical-substation-attacks-nc-wa.html.
[82] U.S. ENERGY INFO. ADMIN., *Annual Energy Outlook 2023* (Mar. 16, 2023), https://www.eia.gov/outlooks/aeo/narrative/.
[83] Matt Olberding, *As Gas Prices Surge, Nebraskans are Buying More Electric Vehicles*, LINCOLN STAR J. (July 21, 2022), https://journalstar.com/business/local/as-gas-prices-surge-nebraskans-are-buying-more-electric-vehicles/article_389c4c3e-4d81-5aec-9d02-fd27fd3d50d1.html.
[84] Mike Specian, *Demand-Side Solutions to Winter Peaks and Constraints* (AM. COUNCIL FOR AN ENERGY–EFFICIENT ECON., Apr. 2021).
[85] BUREAU OF BUS. RSCH., UNIV. OF NEBRASKA–LINCOLN, ECONOMIC AND FISCAL IMPACTS OF SARPY CNTY. DATA CENTERS: FINAL REPORT (Apr. 8, 2019), https://www.omahachamber.org/wp-content/uploads/2019/10/Sarpy-DC-Impact-Final-Report.pdf
[86] Natalia Alamdari, *Crypto Needs Cheap Energy. It Found a Whole Bunch in Nebraska*, FLATWATER FREE PRESS (Jan. 25, 2023), https://flatwaterfreepress.org/crypto-needs-cheap-energy-it-found-a-whole-bunch-in-nebraska/.
[87] Payne, *supra* note 45.
[88] With only 1% of Nebraska owned by the federal government, many of the issues involving federal permits do not apply to wind projects in the state. Therefore, this paper focuses on federal laws affecting renewable power projects on state land.
[89] *See* 14 C.F.R. § 77.9 for the exact requirements.
[90] Placing wind turbines near federal military nuclear silos is affecting wind project development in Nebraska. *See* Natalia Alamdari, *Banner County was Set to Have Nebraska's Largest Wind Project Until the Military Stepped In*, FLATWATER FREE PRESS (Sept. 17, 2022), https://nebraskapublicmedia.org/en/news/news-articles/banner-county-was-set-to-have-nebraskas-largest-wind-project-until-the-military-stepped-in/.
[91] 16 U.S.C. § 1532(19) (2021).
[92] Babbitt v. Sweet Home Chapter of Communities for a Great Oregon, 515 U.S. 687, 708 (1995).
[93] *See* 16 U.S.C. § 1539(a)(1)(B) (2021).
[94] *See* 16 U.S.C. § 703 (2021); *see* Ben Davis, *To Kill a Mockingbird: A Look into the Migratory Bird Treaty Act and its Application to Unintentional Takings*, 23 ANIMAL L. 117, 118 (2016).
[95] *Id*.
[96] Newton Cty. Wildlife Ass'n v. U.S. Forest Serv., 113 F.3d 110, 111 (8th Cir. 1997).
[97] 16 U.S.C. § 703 (2021).
[98] Taking's definition under this Act includes wounding, killing, molesting, or disturbing. 16 U.S.C. 668–668d.
[99] 16 U.S.C. § 668–668d (2021).
[100] Eagle take permits likely require an analysis under the National Environmental Policy Act, which has made the process time consuming and resulted in few issued permits. *See* 50 C.F.R. § 22; To address concerns with this permit process the U.S. Fish and Wildlife Service has developed a proposed rule to standardize eagle take permits for wind energy projects but has not taken final agency action as of the publication of this paper. U.S. FISH & WILDLIFE SERV., *Eagle Rule*, https://www.fws.gov/regulations/eagle (last visited May 24, 2024).
[101] ERIC LARSON ET AL., NET ZERO AMERICA: POTENTIAL PATHWAYS, INFRASTRUCTURE, AND IMPACTS, FINAL REPORT SUMMARY 6 (Oct. 29, 2021), https://netzeroamerica.princeton.edu/img/Princeton%20NZA%20FINAL%20REPORT%20SUMMARY%20(29Oct

2021).pdf (concluding that through appropriate spending, a national transition to net-zero energy sources can be accomplished through spending comparable or lower to the current annual percentage of GDP spent on energy).
[102] While the Inflation Reduction Act is helping the country develop clean energy through an investment of at least $369 billion, without targeted help to develop wind energy in Nebraska, it is unclear if such investments will result in increased wind energy in the state. *See* Inflation Reduction Act of 2022, Pub. L. No. 117–365, § 13501, 136 Stat. 2934, 3004 (2022).
[103] *See id*; *see also* CONG. RSCH. SERV., ELECTRICITY TRANSMISSION PROVISIONS IN THE INFLATION REDUCTION ACT OF 2022 (IN11981) (Aug. 23, 2022) https://crsreports.congress.gov/product/pdf/IN/IN11981 (Congress has approved $60 billion on domestic clean energy manufacturing, including $10 billion that build electric vehicles, wind turbines, and solar panels).
[104] The Inflation Reduction Act invests at least $271 billion in tax credits to promote the transition towards renewable power. *See* BLOOMBERGNEF, *supra* note 3.
[105] Larson, *supra* note 101.
[106] Inflation Reduction Act of 2022, Pub. L. No. 117-365, § 50151, 136 Stat. 2934, 3004 (2022).
[107] Inflation Reduction Act of 2022, Pub. L. No. 117-365, § 50152, 136 Stat. 2934, 3004 (2022). Other sections of the Inflation Reduction Act fund technology development or provide loans. *See generally* U.S. DEPT. OF ENERGY, GRID AND TRANSMISSION PROGRAM CONDUCTOR GUIDE, https://www.energy.gov/gdo/grid-and-transmission-program-conductor-guide (last visited May 24, 2024).
[108] Chang, *supra* note 4 at iv.
[109] Katherine Antonio, *Renewable Generation Surpassed Coal and Nuclear in the U.S. Electric Power Sector in 2022*, U.S. ENERGY INFO. ADMIN. (Mar. 27, 2023) https://www.eia.gov/todayinenergy/detail.php?id=55960.