



## 2021 Cal Maritime Siting and Project Development Report

**Faculty Advisors:** Professor Ryan Storz, Dr. Thomas Nordenholz

**Project Development Team Lead:** Andrew Cavinta

**Financial Team Lead:** Sean Wright

**Policy/Environmental Team Lead:** William Tucker

### **Team Contact Points:**

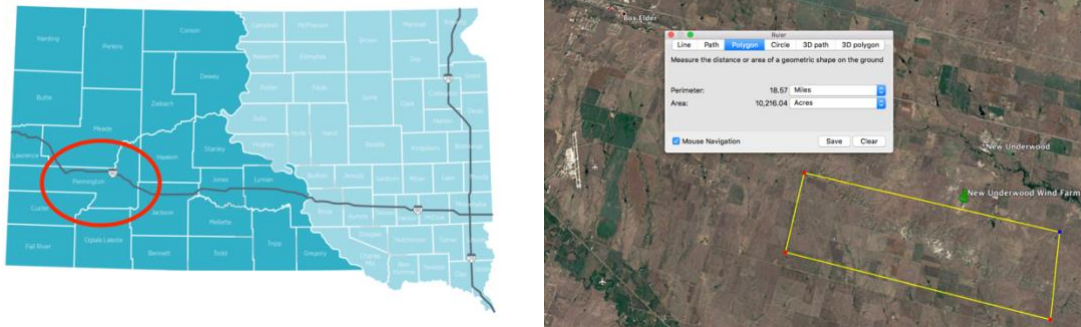
**Phone:** (707)654-1114

**Email:** rstorz@csum.edu, tnordenholz@csum.edu, adcavinta6201@csum.edu, swright5713@csum.edu, wtucker7706@csum.edu

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## Chapter 1: Site Overview

The great plains United States has ample wind resource opportunities for successful wind farm development. This report, completed by California State University, Maritime Academy Wind Turbine Team, describes the plan for a 100 MW wind farm design located in southwestern South Dakota and a financial analysis describing its 25-year life cycle. The location of the wind farm is Pennington County in South Dakota. The land within Pennington County consists of mostly prairie, which will minimize any negative ecological impact of our wind farm on forest dwelling birds, animals, and trolls.



*Figure 1 & 2: The general location of the New Underwood Wind Farm within the defined CWC boundaries, & Proposed Project Area South of New Underwood*

From this location within Pennington County, SD, The New Underwood Cooperative Wind Farm will produce 100MW of energy. The site is sitting on 10,216 acres just south of New Underwood, it stretches east and west of 161<sup>st</sup> Avenue and between 230<sup>th</sup> and 232<sup>nd</sup> street. The turbines deployed will be the Gamesa 4.5 G-128 turbine. At this turbine production rate, New Underwood Wind Farm will deploy 22 turbines to meet the desired output of 100MW. New Underwood Wind Farm would be the first of its kind within Southwestern South Dakota.

Various challenges and obstacles must be considered when siting a wind farm of this size. Various software and programs were used to conduct the research for the New Underwood Wind Farm, including but not limited to, US National Renewable Energy Laboratory (NREL) Wind Prospector, EIA, and Google Earth.

The projects long term surface disturbance will be less than 500a-eres of a 10,000-acre ranch. Which shall be land-leased with local owners. The project will ensure a reliable, competitively priced supply of renewable electricity that's unmatched in the west. This output will help America reduce gas emissions, diversify energy, and meet growing demand for renewable energy. At the same time the wind project will generate hundreds of good jobs, millions of dollars in tax revenue, and other economic benefits for Pennington County.

## Chapter 2: Site Design

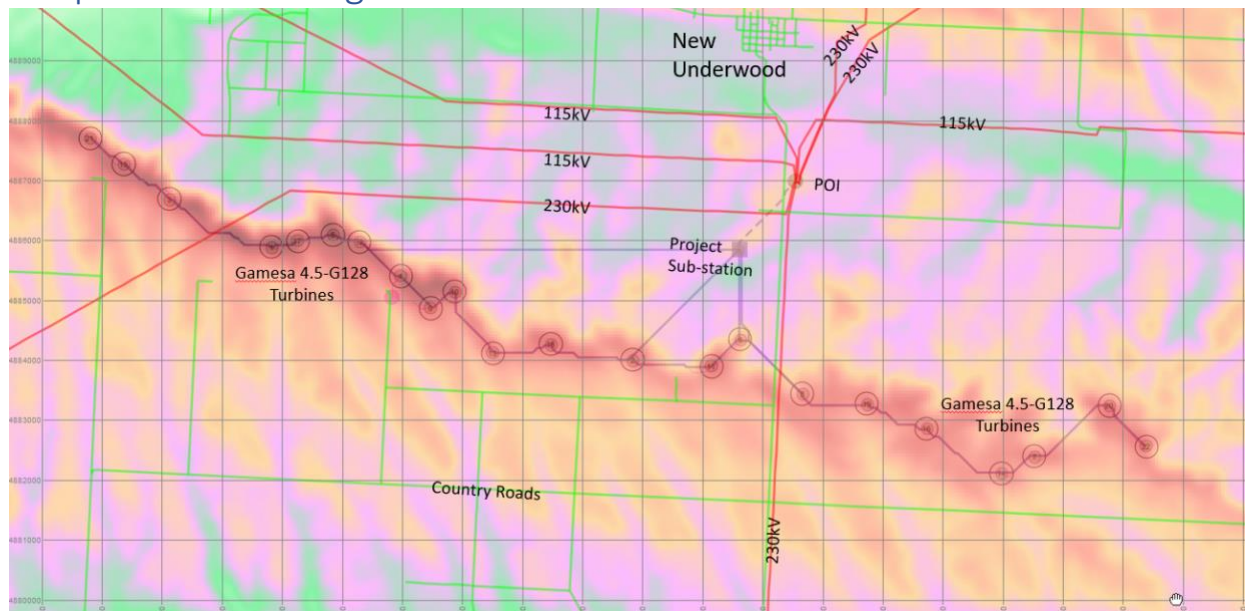


Figure 3: Site Design Layout compared to the existing transmission, distribution infrastructure, and wind resource.

## Chapter 3: Site Selection

The New Underwood Cooperative wind farm is in a unique location with many attributes and obstacles to take into consideration. Our proposed site is approximately 15 miles away from both Elsworth Air Force base as well as Rapid City Airport. In addition, the surrounding area hosts roughly 16 structures, which must be taken into consideration when minimizing both noise and shadow flicker. After considering both local structures and localities, there are many features of this site that make it advantageous in terms of logistics, and wind speed. Much of the proposed site location has a wind power class of 6, and north of the proposed site location, on the corner of 161<sup>st</sup> Avenue and 230<sup>th</sup> street, is a power switch yard. Additionally, this site is also home to both service roads and railroads, while will help immensely with construction and maintenance logistics. Finally, the large size of the proposed site location allows for flexibility in terms of turbine location and spacing.

### 3.1 Wind Resources

For the 2021 competition, the geographical region for siting the wind farm was defined as the Western Half of South Dakota. Being tasked with conducting the siting process within an expansive midwestern state brought a unique set of challenges, which required extensive amounts of research and utilization of government and industry resources. After examining the pros and cons of various counties situated within the Western Half of South Dakota, Pennington County was identified as the most promising location for a wind development site. Within Pennington County, New Underwood has both Class 5 and Class 6 wind power ratings. Utilization of NREL Wind Prospector showcased such promising wind speeds in Pennington County, as seen in Figure 3.

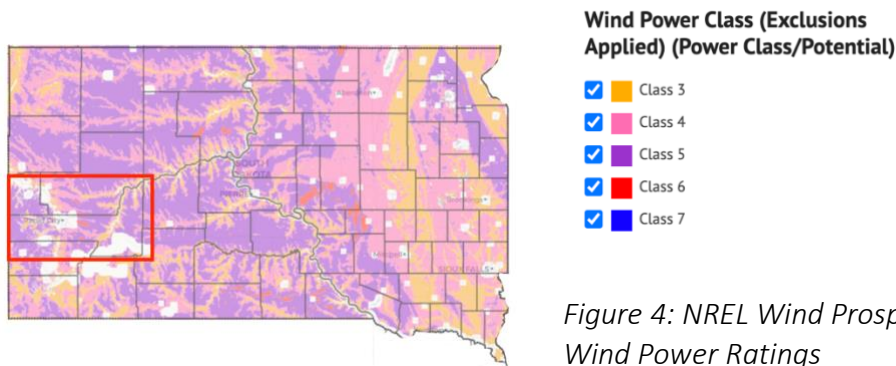


Figure 4: NREL Wind Prospector of South Dakota Wind Power Ratings

### 3.2 Geotechnical Report

After careful examination of Wind Resources as well as weather hazards, an examination of land was conducted to determine the feasibility of construction of a 100MW wind farm. Pennington County has a very diverse geographic makeup. The arid Western end of Pennington County is home to high peaks at the continental divide, as well as rolling hills, and gullies, while the eastern side –where the site was determined to be- is home to much flatter and less extreme geographic features. Large open spaces that occupy Eastern Pennington County enable limited conflicts with human settlements and infrastructure. Geotechnical and soil research must be conducted at our site, but because the location is home to both a railroad and high-voltage substation, the foundational integrity of such soil is very promising.

### 3.3 Economical Demand

One of the biggest rationales for choosing Pennington County as the home for New Underwood Cooperative Wind Farm was the promising economical demand. Development of New Underwood Cooperative Wind Farm would not only boost employment prospects for Pennington County Residents, but the county's current commercial, industrial, and residential energy costs illustrated how beneficial the construction of our site would be to residents.

Articulating to the community of Pennington County that the New Underwood Cooperative Wind Farm will decrease their monthly electricity bill is of our highest priorities. The average costs of energy in Pennington County are higher than neighboring counties. Pennington County's higher energy rates than its neighbors can incentivize the construction of a wind farm to lower its energy prices. Pennington County has a per person median income of \$29,805, with the poverty line for South Dakota at an income of \$22,314. The deployment of New Underwood Cooperative Wind Farm would not only increase employment prospects for residents of New Underwood and Pennington County, but it would also bring down the monthly electricity bill, which is very significant for such residents living right above the poverty line.

In addition, the construction of New Underwood Cooperative Wind Farm would increase employment prospects in Pennington County. According to the Bureau of Labor and Statistics, Rapid City has unemployment rate of 4.2% as of September 2020 (BLS. 2020). Construction of our farm would enable the employment of contractors during the construction phase, as well as full time maintenance employees during operations, which would assist in employment prospects for Pennington County residents.

Counties	Commercial Costs (\$/MWh)	Industrial Costs (\$/MWh)	Residential Costs (\$/MWh)
Pennington (Rapid City)	\$137.99	\$80.13	\$137.99
Custer	\$138.44	\$75.91	\$138.44
Shannon	\$95.10	\$75.81	\$114.46
Hughes County (Pierre)	\$100.20	\$83.70	\$100.20
Pipestone	\$125.14	\$76.45	\$130.90

Table 1: Comparison of commercial, industrial, and residential costs in Pennington County and others in South Dakota. Statistics retrieved from NREL Wind Prospector.

### 3.4 Project Life Cycle

The PEIS describes the different activities that are most likely to occur during the phases of a wind energy project’s life cycle. Site testing, monitoring, construction, operation, maintenance, and decommissioning are the different phases of the project that would occur. The project life cycle would be 25 years.

## Chapter 4: Balance of Plant Considerations

### 4.1 Turbine Selection

The turbine selected is the Gamesa G128-4.5MW, known well for its design and efficiency on land farms. Producing 4.5 Mw of rated power from three rotors with a diameter of 128.0 m. The tower itself has a hub height of 90m. After examining the wind resources of our region, it is evident that Gamesa G128-4.5MW turbines produce twice the output of previously reviewed turbines. In addition, the New Underwood Cooperative Wind Farm will need to only construct 22 turbines, which will yield a 99MW wind farm.

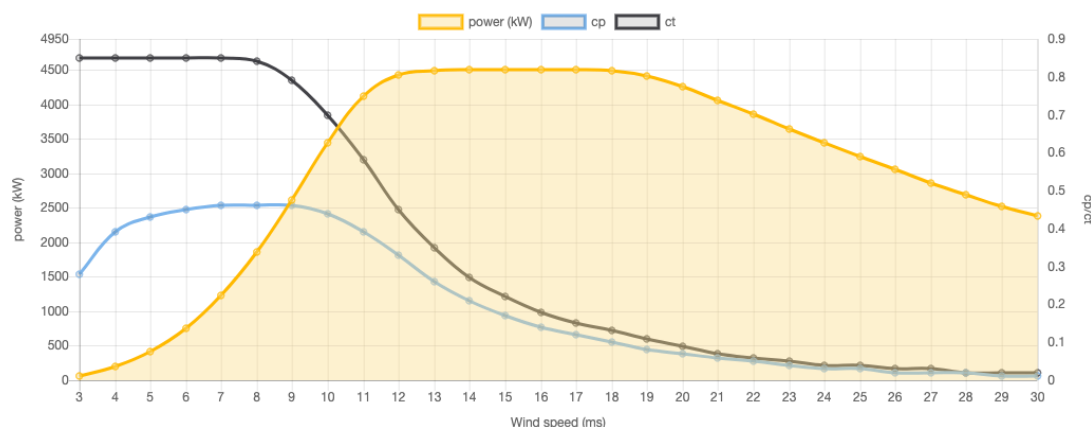


Figure 5: Gamesa G128-4.5MW Wind Turbine Power Curve

### 4.2 Roads

In order to facilitate successful operations, 1.41 miles of roads will need to be constructed at and around the New Underwood Cooperative Wind Farm. According to the American Road and

Transportation Builders Association, the national average for road costs for a two-lane road is 2-3 million per-mile (ARTBA 2020). This brought us to \$2,820,000.00 in total for access roads. A durable road is required in order to facilitate the movement of construction and maintenance equipment and vehicles, so the construction of a two-lane road is imperative to ensuring the success of the operation.

### 4.3 Foundation

Foundational costs vary significantly based on the geological site and the manufacturers recommended foundation types. According to NREL Wind Prospector, the soil for our site is rated to be able to support turbines larger than 140-meter hub height. In order to get a more definitive quality of the geological site, surveys such as soil samples will need to be taken, pressure calculations completed, and trial pits. The surveys will be conducted at the exact wind turbine location before a definitive BOP cost is given for contracts. If a non-standard condition is identified, the foundation may need to be redesigned to carry designated loads. The innate difficulties of pouring concrete according to specifications (Orrell and Poehlman, 2017)

The turbine selected for this site has a hub height of 81 meters. When calculating the cost for constructing a foundation for each turbine we forecasted the cost to be higher than what we really expect to pay. We forecast each foundation to cost about \$250,000 per turbine installed.

### 4.4 Transmission

In order to effectively outsource energy generated at New Underwood Cooperative Wind Farm, effective transmission lines will need to be utilized. There is an existing substation as well as 230kv lines near our site location. Such amenities being near our site will drastically lower the levelized cost of energy, as well as the amount of resources that will need to be purchased and installed to effectively set up the New Underwood Cooperative Wind Farm. The average cost per-mile for high Megawatt cable is \$70,000.00 (Windindustry, 2016). The New Underwood Cooperative Wind Farm will need to install just 2km of transmission cabling to connect our substation to the point of interconnection at the existing station. This leaves 34km of site cabling within the wind farm's collector system with the totalized amount of nearly \$12.3 million.

### 4.5 Wind Resource and Turbine Monitoring

Wind resourcing will be tracked through meteorological towers, while the performance of wind turbines will be tracked through Supervisory Control and Data Acquisition. Supervisory Control and Data Acquisition (SCADA) will provide our team with accurate and real time information regarding wind farm health as well as financial projections. In addition, the incorporation of meteorological evaluation towers (MET) to our SCADA systems will yield unmatched wind farm performance forecasting and gauges. For our study, we used regional MET tower data from a project partner and geographically relocated those MET towers within our siting location to allow for proper Openwind model development.

## Chapter 5: Siting Challenges

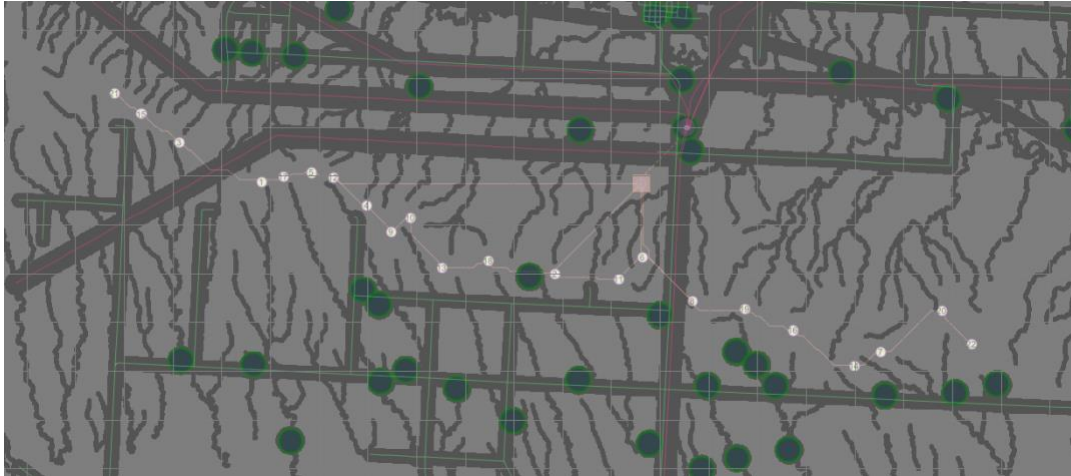


Figure 6: Validity Layer displaying various siting challenges.

### 5.1 Weather Hazard

Southwestern South Dakota has an abundance of extreme weather. Southwestern South Dakota experiences more snowfall than other areas of the state. “While most of the state averages at least 30 inches of snow annually, portions of the Black Hills National Forest can receive upwards of 70 inches annually and South Dakota has generally experienced an increase in snowfall” (NOAA,2019). This area of the state also experiences thunderstorms, tornados, hail, flooding, and most beneficial to our cause High Winds. Those High winds sustaining between 30 and 45 MPH and gusting up to 55 mph (NOAA,2019). In order to mitigate this risk, cold and extreme weather packages would need to be installed on the turbines of the New Underwood Cooperative Wind Farm. In addition, StrikeTape, developed by Weather Guard Lightning Tech, will be installed on New Underwood turbines. StrikeTape bonds to the tip of a wind-turbine blade with double-sided tape and epoxy. It’s installed near the lightning receptor and the strips guide lightning energy to those existing receptors to prevent strikes and damage from nearby lightning (Carter, 2020).

### 5.2 Shadow Flicker

The site location is in relative proximity to thirty-seven residential and commercial structures, additionally the proposed site location is along 232<sup>nd</sup> Street and 161<sup>st</sup> Avenue. These two variables can pose concerns in relation to shadow flicker. The proposed site location is approximately 4 miles south of the nearest residential and commercial structures. At this point in time, Pennington County does not have any current ordinance referencing a minimal safe distance to prevent shadow flicker, but past projects have determined that 300 meters is considered a permissible proximity to residences and roads. To further mitigate this concern, all turbines were placed at least 133.5 meters from the roads, railroads, and transmission lines. Furthermore, the turbines are placed at least 500 meters away from residential dwellings.

### 5.3 Military and Airspace

In reference to military installations near the prospective site location, Ellsworth Air Force Base is approximately 15 miles from New Underwood. Ellsworth AFB is home to multiple bomber and fighter wings, with a population of over eight-thousand military members, civilian employees, and family members. A Large Wind Energy System must be marked as required by the FAA. There may be no lights on the towers other than lighting required by the FAA and infrared heating devices used to protect monitoring equipment. In addition, as wind developers, we must submit written documentation to Pennington County officials from Ellsworth Air Force Base acknowledging the location and size of the proposed large wind energy system, to ensure that it does not interfere with safe aircraft operations (Pennington County, 2012). If in fact Ellsworth AFB determines that New Underwood Cooperative Wind Farm will interfere with its radar capabilities, New Underwood Farm would suggest that additional radar installations be installed.

### 5.4 State and Local Policy

Our selected site is not located on federal land and as such we will run the challenge of receiving funding from federal and state incentive programs. There are only three wind ordinances in place in South Dakota as of 2014 (WINDExchange, 2020). These ordinances call for the regulation of wind projects such as zoning, permitting, and the development of wind farms. None of the three ordinances are in Pennington County, meaning much of the research and development will need to be performed by our team. We will also run challenges of surveying the area from UAVs, helicopters, or small aircraft as the site chosen is under Class D airspace.

### 5.5 Environmental Considerations

We run risks of encountering harsh, unforgiving winters resulting in upwards of 50 inches of snow. Along with our infrastructure's exposure to cold weather hazards, South Dakota is subject to frequent thunderstorms, tornados, hail, and floods (NOAA, 2019). There are two environmental concerns within 100 miles of our selected site. Peregrine falcons have been reintroduced into the Rapid City greater area and bats are currently being researched in the Black Hills region (Wildlife of South Dakota, 2020). In addition, southwestern South Dakota is within the Whooping Crane migratory path, which will pose concerns in reference to collisions with turbines by Whooping Cranes, as seen in Figure 7.



Figure 7: North American Migratory Path of Whooping Crane

## 5.6 Environmental Mitigation

Site mitigation includes avian strike data collection and a raptor mitigation plan which involves weekly canvassing of the site for bird carcasses to keep track of fatalities. Yearly impact reports will be conducted for a minimum of three years post construction and will be sent to the state and federal departments of fish and wildlife to determine if the turbines generate disproportionately high levels of avian strikes. If our turbines generate levels of such strikes, we will implement acoustic emission techniques to drive away birds and bats. Offsite mitigation consists of purchasing a replacement mitigation habitat that accounts for a 1:1 ratio of the total rotor swept area of each turbine. The area must consist of any combination of open oak woodland, mixed grain, or cropland, grazing land, or non-native grasslands. The land must have sufficient nesting areas for species such as the Whooping Crane, and if not, tree planting must be incorporated. In the years post construction, if the site proves to be the cause of disproportionately high numbers of fatalities, other deterrence options include sonar, radar, and UV light. Additionally, we will be coordinating with the Friends of the Whopping Craine and the South Dakota Wildlife Action Plan to ensure compliance with local ordinances and to obtain more information on the migration patterns and habits of local species. Most of the information we gathered for our environmental impact assessment comes from data from Ellsworth Air Force Base and the neighboring Wessington Springs Wind Project, both of which track and monitor bird fatalities and practice deterrence.

## 5.7 Risk Management

In addition to analysis of risks listed above, it is of utmost important that New Underwood Cooperative Wind Farm acknowledges and plans for unique risks pertaining to our project. In this section, our team analyzes other risks that will impact the development and successful operation of the New Underwood Cooperative Wind Farm. Our proposed is within proximity to a nearby road and local community, which poses certain risks pertaining to site security. A nearby road can create easy access to our site for vandals and trespassers, which threatens the security of our energy operation. In addition, being close to a nearby community can lead to certain members of such community attempting to explore our site. To mitigate this threat, New Underwood Cooperative Wind Farm will utilize proper lighting, alarm systems, fencing, and deployment of security patrol services during construction and operating phases of our project. Although it seems that we are at the tail end of the COVID-19 Pandemic, supply-chain issues can still be seen. In order to ensure that such issues do not negatively impact the construction and operation of the New Underwood Cooperative Wind Farm, we will be carefully monitoring our supply and logistics chains to ensure that possible setbacks due to COVID-19 will be avoided.

## Chapter 6: JEDI

The JEDI Land Based Wind model is an excel tool developed by NREL that aids developers in the estimation of the economic impacts of the construction and operation of land-based wind power projects (Jobs, 2019).

Project Location	South Dakota	
Year of Construction	2021	
Total Project Size –Nameplate Capacity (MW)	100	
Number of Projects (included in total)	1	
Turbine Size (kW)	4500	
Number of Turbines	22	
Installed Project Cost (\$/kW)	\$1,728	\$1,671 (Without taxes)
Annual Direct O&M Cost (\$/kW)	\$45.32	\$44.00 (Without Taxes)
Money Value (Dollar Year)	2020	
Installed Project Cost	\$172,757,048	
Local Spending	\$46,476,243	
Total Annual Operational Expenses	\$31,306,402	
Direct Operating and Maintenance Costs	\$4,532,130	
Local Spending	\$806,475	
Other Annual Costs	\$26,774,272	
Local Spending	\$1,745,833	
Debt and Equity Payments	\$0	
Property Taxes	\$883,200	

*Table 2: Project Data Summary from JEDI Model (Jobs, 2019). Project data summary based on user modifications to default.*

## Chapter 7: Project Funding

### 7.1 Regional Incentives

Currently, Pennington County has no regional incentives in place to promote the creation of wind farms. New Underwood Cooperative Wind Farm would be the first wind farm within Pennington County, and would work with the local governing body and municipal utilities to create new programs and incentives for renewables (Gouchoe, 2000).

### 7.2 Government Loans

Due to the expiration of the Wind Energy Farm Exemption in 2014, a federal loan or tax exemption is the only option for funding. The U.S. Department of Energy Loan Guarantee Program can “fund up to \$4.5 billion in loan guarantee authority for innovative renewable energy & efficient energy projects to high-risk technology projects for renewable” (DOE,2021). According to the

USDA Renewable Energy for Rural America or REAP, “the department will issue a grant of \$1,500 minimum and \$500,000 maximum per turbine” (USDA, 2021). Applicants are required to provide at least 75% of the cost if they are applying for a grant, or 25% of the project cost if they are applying for a loan or a loan/grant combination. Government Loans by the USDA REAP, “have a \$5,000 minimum and \$25 million maximum loan amount and up to 85% loan guarantee with a 30-year maximum term for real estate or combined real estate/equipment loans. There is 15 years maximum term for equipment and machinery loans 7 years maximum term for capital loans” (USDA, 2021). Because New Underwood Cooperative Wind Farm will have a total cost of over \$100 million, a technical report must be completed before construction may begin.

### 7.3 Carbon Offsets

Carbon offsets from New Underwood Wind Farm will have a host of benefits for our cooperative as well as the local community. Within the first quarter of first year operations, our cooperative will have already offset all carbon production that occurred during the construction phase, and from that point forward, will be carbon-free. Carbon offset prices have volatility depending on location, standards, and project type. On average, carbon offsets sell for \$3-6 per ton, and in 2016, offset transactions were sold at 1.4\$/tCO<sub>2</sub> e. According to the IPCC, “the CO<sub>2</sub> equivalent produced per kWh of wind energy is 8 to 20g”. After factoring in these values, the New Underwood Cooperative Wind Farm will produce roughly about 72t/CO<sub>2</sub> e, which is based on turbines that have a 20-year life expectancy, running for 120,000 total hours.

When engaging in the local community, New Underwood Cooperative Wind Farm will be able to offset carbon emissions from the local farming community, while selling the remainder to Ellsworth Air Force Base. Ellsworth Air Force Base has a carbon footprint of nearly 191 metric-tons per year and selling to the Ellsworth community offers a great opportunity for our cooperative (Air Combat Command, 2012). Alternatively, our cooperative can work to renew the Midwestern Greenhouse Accord, which was abandoned in 2010, that would allow to trade carbon offsets on the local rather than national level (Land Trust Alliance, 2021).

### 7.4 Levelized Cost of Energy

After calculating our levelized cost of energy (LCOE), we have determined the optimal rate to be \$26.87 per MWh. *OpenWind* estimates that New Underwood Cooperative Wind Farm will produce about 488,214 MWh annually. To produce this total output, this will cost the New Underwood Cooperative Wind Farm \$12,730,456. However, the breakeven cost per kilowatt hour is \$0.0261. The wind farm cooperative would sell its energy for about \$0.05 per KWh in a Power Purchase Agreement.

Levelized Cost of Energy Calculations	
LCOE (\$/MWh)	\$26.09
PTC (\$/MWh)	\$15.65
Net Energy MWh	488,214
IRR	1.83%

Table 3: Levelized Cost of Energy (LCOE) Calculations

## Chapter 8: Breakdown of Capital Expenditures

Capital Costs	
Cost per turbine/ electrical	\$5,850,000.00
Total Turbine Cost	\$128,700,000.00
Total road cost	\$1,947,580.00
Site access, staging	\$132,000.00
Engineering management	\$600,000.00
Total Cable Cost	\$12,307,000.00
Installation, assembly	\$15,060,000.00
Cost per foundation	\$250,000.00
Total foundation	\$5,500,000.00
<b>Total cost</b>	<b>\$164,246,580.00</b>
Developer Fee	4.80%
total developer fee	\$7,883,835.84
<b>Total Capital Cost</b>	<b>\$172,130,415.84</b>
Total Amount Financed	\$32,032,603.94
Capital Recovery Factor	\$3,098,346.49

*Table 4: Breakdown of Capital Expenditures*

The above table lists all factors that contribute to total capital expenditures. The most significant cost during the construction phase of the New Underwood Cooperative Wind Farm is the Gamesa G128-4.5MW turbines, cable costs, and installation/assembly.

The total capital expenditures for New Underwood Cooperative Wind Farm are \$172,130,415.84. In order to receive a bank loan, a 60% down payment must be provided by the New Underwood Cooperative Wind Farm. In order to secure the 60% down payment, our cooperative will utilize government loans and grants.

To successfully utilize government loans and grants, our cooperative will work closely with the 22 local landowners occupying the planned site location. The New Underwood Cooperative Wind Farm will assist landowners in the application process for the USDA Rural Energy America Program (REAP). This program will grant up to \$500,000 per wind turbine, which totals at \$11,000,000. REAP can also guarantee up to 75% of total construction costs (USDA, 2021). The total value of USDA loans is \$129,097,811.90. USDA grants and loans will allow the New Underwood Cooperative Wind Farm to receive \$140,097,811.90 in funding.

After securing the 60% down payment through government loans and grants, the remaining cost will be \$68,957,766. If our cooperative receives the maximum amount of loans and grants from the USDA, a loan of \$32,032,603.94 would need to be financed from a bank. Taking

full advantage of all USDA programs will allow our cooperative to have roughly \$35,000,000 in financial flexibility for our budget.

## Chapter 9: Breakdown of Operational Expenditures

O&M Budget		
Items	USD	Units
<u>Insurance per 30 Days</u>	\$27,500	\$/30 Days
<u>Total Insurance per Year</u>	\$1,045,000	\$/Year
<u>Administrative cost per Turbine</u>	\$163,334.16	\$/22 Turbines
<u>Total Administrative Cost Per Year</u>	\$220,000.00	\$/22 Turbines
<u>Ongoing Maintenance</u>	\$440,000.00	\$/22 Turbines
<u>Total Maintenance Per Year</u>	\$120,000	\$/100 Mw
<b><u>Total O&amp;M Budget</u></b>	<b>\$1,988,334.16</b>	<b>\$/Year</b>

*Table 5: Breakdown of Operational Expenditures data for calculations received by Windustry, Chapter 8: Costs*

The annual budget for operations and maintenance is roughly \$2,000,000, and the annual budget per turbine is \$90,378.83. Calculations for budget overestimated total costs, and real project costs should be less than the stated budget. Within this budget, most funds are dedicated to insurance costs. The elimination of land lease agreements through the project stakeholder program eliminates many other operations and maintenance costs.

### 9.1 Insurance Costs

New Underwood Cooperative Wind Farm would need various types of insurance, from general, health, liability, energy, risk, workers compensation, overhead expense disability, business owner's policy group, and payment protection insurance (Nwokoro, 2017). The New Underwood Cooperative Wind Farm is comprised of 22 turbines, and therefore monthly insurance costs will amount to \$1,250 per turbine. Total monthly insurance costs for the entire cooperative will be \$27,500. The New Underwood cooperative has included a \$20,000 deductible per turbine for the first year of operations. Total annual costs for insurance amount to \$1,045,000, with \$400,000 of that cost being attributed to deductibles.

## Chapter 10: Triple Bottom Line

An important facet of renewable energy projects is to ensure that sustainability is at the forefront of design and planning. Sustainability is defined by the triple bottom line: good for people, planet and profit (University, 2020). Project developers who design sustainably seek to strike a balance between the environmental, social and economic realms. A wind power project that produces clean energy but is ultimately harmful to the local community and ecosystems cannot be considered truly sustainable.

An environmental factor of sustainability is turbine layout. Turbine layout is the most important factor when conserving agricultural land. Layouts that follow a linear design allow for the landowners to utilize the land with minimal impact on farming patterns and other intensive land uses. Our wind farm layout follows this approach. Since the turbines are placed on the edges of farms, the impact on row cropping will be minimized and the disturbance to the landowners is minimized for both turbine construction and maintenance. These considerations also minimize the cost of buying land from the farmers and the loss of crop land to farmers.

A future of sustainable and renewable energy also depends on the creation and training of skilled technicians and employees to work on and maintain wind farms. The New Underwood Cooperative Wind Farm will work closely with Central High School (Rapid City, SD) as well as Mitchell Technical College (Mitchell, SD) to train certified wind technicians. Mitchell Technical College is the home to a renowned wind turbine technician program, with a 100% hire rate upon certification. New Underwood Cooperative Wind Farm will create a scholarship fund for qualified Central High School graduates to provide them with the education and training to earn their wind turbine technician certification, and work as traveling field technicians, to work at New Underwood Cooperative Wind Farm as well as other farms in the region. Such technicians would work out of a regional deployment center, from which they would be sent to various farms across the Midwest to maintain and repair wind turbines. Employment of local individuals is essential to the success of our farm, as well as the positive economic impacts that New Underwood Cooperative Wind Farm will bring to the Pennington County community.

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