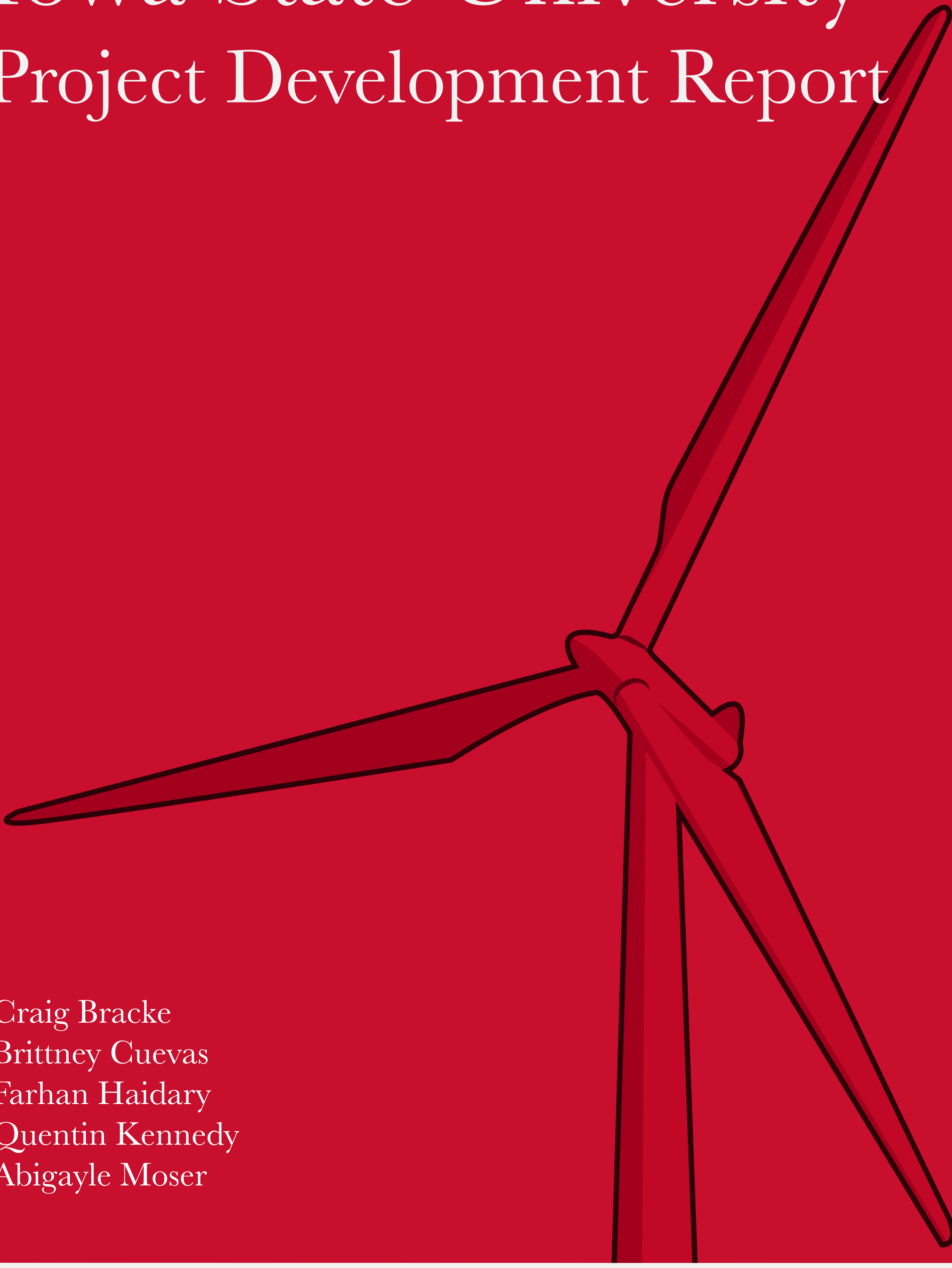
Iowa State University
Project Development Report



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Executive Summary

The Wind Energy Student Organization (WESO) at Iowa State University analyzed an auction area off the coast of Port Fourchon, Louisiana for development of a 200 MW offshore wind farm. The potential lease blocks span across the Ship Shoal, South Timbalier, and Grand Isle areas in the Gulf of Mexico. Several elements were analyzed to identify the optimal lease area for offshore wind development, including atmospheric and oceanic characteristics, environmental considerations, existing port and energy infrastructure, and ocean activities. WESO utilized ARCGIS and Furow to create a visual representation of how these considerations impacted the lease block selection. WESO plans to use twenty 10 MW wind turbines with twisted jacket foundations. The wind turbine used in this analysis is the National Renewable Energy Lab (NREL) 10 MW reference turbine whose technical details can be found in IEA Wind Task 37[i] .

Based on the analysis, WESO chose lease blocks 34 and 35 in the Grand Isle area to bid on for the construction of the wind farm. The project site consists of 10,000 acres and will cost between $1,500 and $2,500 per square acre. The cost per acre is broken down in a later section detailing the methodology for arriving at this value. While BOEM initiated an initial sale price of $50 per acre, competitive bids for lease areas were far above that. An economic modeling tool was used to calculate the Levelized Cost of Energy (LCOE) and create a cost and cash flow model. The expected Annual Energy Production (AEP) is 496,517 MWh with a capacity factor of 28.3. The LCOE is $136.50/MWh.

Site Analysis

The wind data across the auction area showed little fluctuation, averaging 6.96 meters per second at a height of 120 meters and a mean power density of 385 Watts per square meter[ii]. The turbine selected has a hub height of 119 meters, so data at a height of 120 meters provides a close approximation for analysis. Using Furow, reanalysis data from the past ten years was used to calculate the wind speed frequency distributions for the leasing area. The average wind speed is on the lower end for viable offshore development, but this can prove profitable if operational costs are kept to a minimum. In the chosen lease block, the minimum and maximum depths are 19 meters and 26 meters, respectively[iii]. Development in the shallower depth range would reduce the cost and complexity of construction and operations. The seabed within the lease block is comprised of muddy sand[iv] with no reports of gravel or rock. Lease Blocks 34 and 35 are 5,000 acres each, providing sufficient area for development.

Port Description

Port Fourchon is a large, multi-use port off the coast of Louisiana that mainly serves the energy industry, but is home to fishing, transportation, ecotourism activities and more. The port is unique in that it contains many individually leased docks and facilities, which can be leased for development as needed[v]. Located at the end of Highway 1 in Louisiana, Port Fourchon provides access to a major highway for delivering equipment. The South Lafourche Airport (GAO) is located nearby and provides the ability to helicopter crews to site for daily visits if needed[vi]. With an average depth of 27 feet throughout the port, the selection of supply vessels may be limited to ensure their draft provides enough clearance to navigate the port's channels.

Severe Conditions

The Gulf of Mexico area is prone to hurricanes and tropical storms thereby putting all offshore infrastructure at risk. This risk is heightened during hurricane season from mid-August to mid-October. Figure 1 shows the mean occurrences of wind speeds at 34+ knots (17.5 m/s), 50+ knots (25.7 m/s), and 64+ knots (32.9) as well as the hurricane wind speeds over a ten-year time span. Using the reanalysis data through Furow, hurricane classes 1-5 were analyzed for a 500 km radius of the leasing area. It should be noted that when looking within 100 km of the leasing area, the number of occurrences drops by a full magnitude, and eye wind speeds do not exceed 53 m/s.

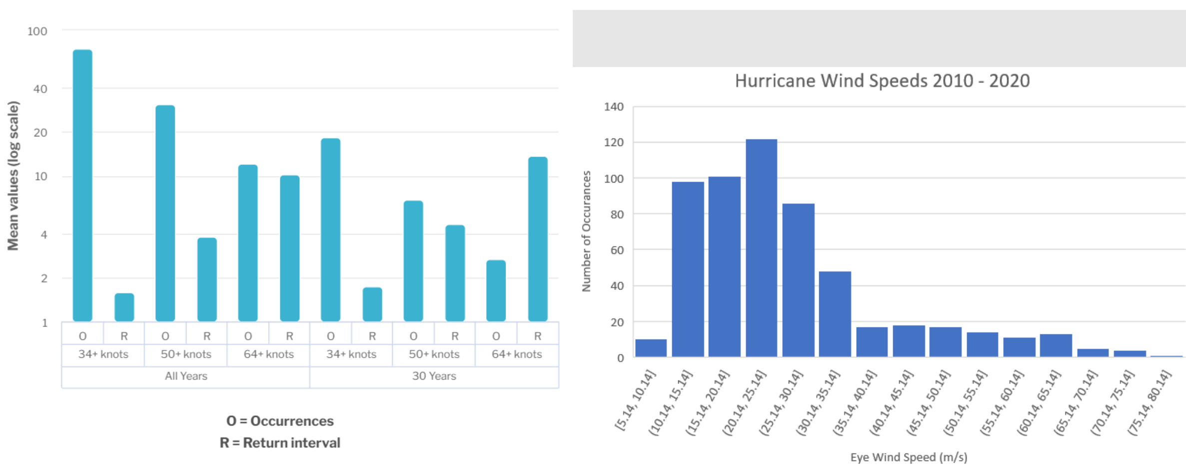

Figure 1: Wind Speeds During Hurricanes

Ocean Activities

The chosen lease block is adjacent to active oil and gas leases to the west and north. A critical goal when choosing a project site was not to interfere with existing oil and gas infrastructure. Most of the oil and gas platforms in the area are approximately 5 miles west of the lease area. The platforms between the port and blocks 34 and 35 are scattered and shouldn't cause issues when navigating vessels during construction.

Developing the project in an area that does not disrupt vessel traffic was a primary concern when selecting a lease block. Figure 2 shows vessel counts in 2019 in the area[vii]. Blocks 34 and 35, outlined in white, have vessel traffic of only 25-50 vessels in that year. The year 2019 was chosen to analyze because it shows the peak traffic before the COVID-19 pandemic. The low vessel count reinforced the decision to choose blocks 34 and 35 for development.

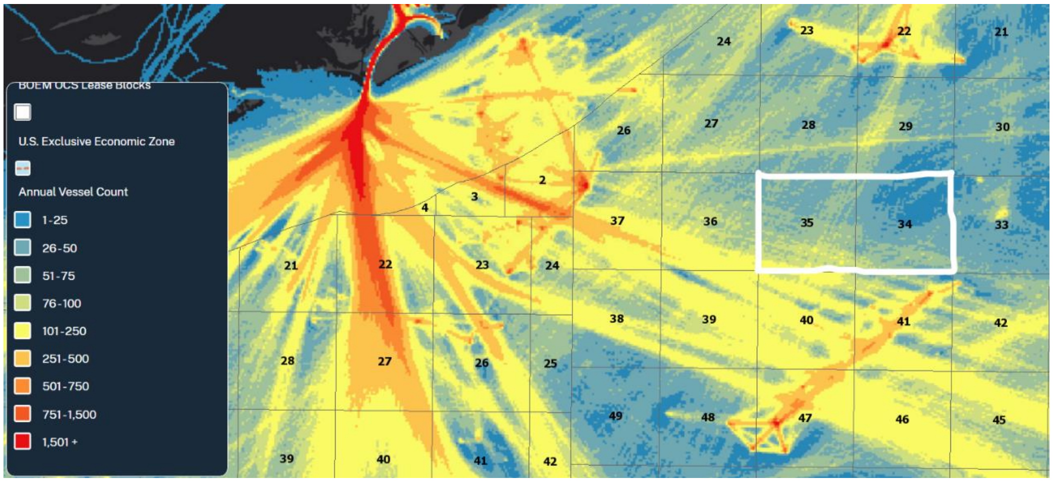

Figure 2: Vessel Traffic in-and-out of Port Fourchon in 2019

Commercial fishing in the Gulf of Mexico is a multi-million-dollar industry, yet BOEM has no method to compensate fishermen for displacement due to energy projects[viii]. However, mitigation efforts will be outlined in the Construction and Operations Plan (COP), which may include fisherman compensation funds.

Risk Analysis

As mentioned in the previous section, hurricanes are a recurring issue in the Gulf of Mexico, and as a result, they bring with it a large source of risk. Both during the construction of the wind farm and throughout the farm's life cycle, steps will have to be taken to mitigate and plan for this risk. The acquisition of insurance throughout the construction process will have to be considered throughout the financial analysis. Additionally, throughout the design process, storm data should be considered to locate areas where turbines might be at a higher risk for tropical storm damage.

Offshore construction is far more unpredictable than onshore construction, and due to this fact, the risk level is higher. Insurance for the construction process will be obtained to better control any unforeseen costs that may arise throughout the project's life cycle. Due to the struggling post-pandemic supply chain, some critical components of the turbines will have longer lead times than what would normally be expected. Once again, this will increase the risk, but with construction insurance and early procurement planning, this risk can be mitigated. And of course, with any construction project, the crew is at the mercy of the weather, which will play a larger role since the project is offshore. The construction insurance will help to cover any weather delays throughout the construction process.

Unpredictable weather can also increase the investment risk by having conditions that do not produce the expected amount of energy. Such conditions can lead to an unprofitable wind farm. One of the ways that this can be mitigated is by investing in more advanced or accurate wind data. The wind data, if more accurate, could detect the best places for such farms, and the best times to have them active. Once again, insurance can also play a role in risk management by covering periods of time where the wind farm is unprofitable due to low wind activity or low energy prices.

Site Design

The wind farm was designed in Furow using reanalysis data over a ten-year time span in addition to their provided optimization and data analysis tools. The 10 MW NREL reference turbine was imported into Furow using data from both the technical report[ix] and from the digital repository containing coefficient of thrust and power data[x]. In an iterative process discussed in a later section, twenty 10 MW wind turbines were positioned within lease block 34 and 35. The layout is shown in Figure 3 in tandem with the energy yield generated from Furow's built-in calculator. The total energy listed below is lower than the AEP noted in previous sections due to factoring in variable downtime for maintenance. A total energy output of 473.77 GWh is the gross yield considering a total downtime 8% of the year for unscheduled maintenance.

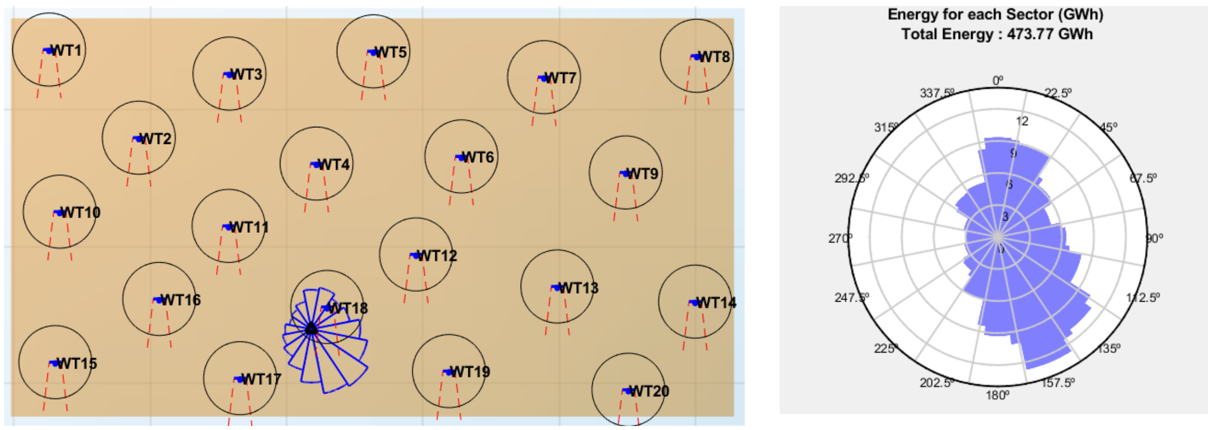

Figure 3: Site Layout and Total Energy Yield

Interconnection

The wind turbines shown in Figure 3 will be connected with 66kV interarray cables. The growing energy industry within the U.S. necessitates strengthening the grid as well and supporting wind farm development. Companies such as Prysmian and Nexans announced opening manufacturing plants for high voltage transmission cables for offshore wind allowing for steps from using 33kV cables to 66kV cables to be feasible goals. Additionally, from the offshore substation to the onshore substation, the transmission cables will be high-voltage AC cables rated at 115kV to accommodate the onshore substation.

Port Fourchon lies in the MISO south region with points of interconnection near the port. However, the closest points of interconnection do not have the capacity to add 200 MW of wind. The closest viable POI is "Happy Jack" on the west side of the Mississippi, as shown in Figure 4. According to MISO's POI analysis tool, the load capacity factor will reach a maximum of 83.4% across all transmission lines leaving the substation. This also includes other lines with significant distribution factors from the addition of the project[xi]. Since there is no capacity exceedance, this POI could be proposed to MISO. This analysis is based on the 2020 cycle and will need to be re-evaluated for the 2022 cycle. Interconnection studies will be performed by MISO to assess congestion and complete the comprehensive GI process upon submittal.

Environmental Considerations

The Gulf of Mexico is home to hundreds of marine species and is integral to several large-scale migratory bird pathways, which makes its protection pivotal. Since offshore wind in the United States is still relatively new, there are few environmental regulations regarding offshore wind farms. Strategies for mitigating environmental impacts will be mimicked from the U.K., one of the world leaders in offshore wind energy.

Areas of high concern include Essential Fish Habitats (EFHs) and the critical habitats of endangered species. Several EFHs are recognized by the National Oceanic and Atmospheric Administration (NOAA) in the gulf for species such as Red Drum and Spiny Lobster, to name a few. For most species that have critical habitats established, their boundaries do not interfere with the lease block location. To avoid adverse effects of any threatened species, construction in the lease block will only occur once adequate consultation has been achieved per the Ecological Society of America (ESA) guidelines.

Offshore wind can also affect bats and bird species. Due to the difficulty of carcass recovery at an offshore location, collision rates are typically inferred based on monitored avian activity. Since collision rates onshore are cause for concern, offshore is no different. Additionally, acoustic detectors have monitored bats up to 81 miles offshore[xii]. Along with collisions, prey displacement causes concerns for avian species during construction. After erecting the wind turbines, the foundations will act as an artificial reef and attract increased marine life[xiii]. To mitigate these concerns, marine life surrounding the wind farm will continually be monitored post-commission. Wind turbines can be equipped with ultrasonic acoustic deterrents which emit high-frequency sounds to avoid collisions. Turbine blades can also be feathered, and the turbine cut-in speed can be increased to reduce collisions during high-risk periods[xiv].

Construction is a key area for caution, especially when considering foundation type. The twisted jacket foundation consists of multiple pin piles rather than a larger monopile, which reduces the impact radius due to the piling process's excessive noise[xv]. The twisted jacket also allows for a smaller sea-floor area than the gravity-based foundation. Despite the benefits of the twisted jacket foundation, it is still important to recognize and mitigate the ever-present wildlife concerns. One of the most researched mitigation methods is the Big Bubble Curtain (BBC), which is used frequently in the Baltic Sea. The BBC is made up of bubbles expelled from a large hose placed on the ocean bed, which can reduce noise by 15 decibels[xvi].

Market Analysis

The offshore wind energy market in the United States is still relatively small compared to other countries; however, a significant increase in offshore wind development is anticipated over the next 20 years. According to the 2022 Offshore Wind Market Report from the Department of Energy, the U.S. offshore wind capacity as of May 2022 was 40,083 MW, which is a 13.5% growth from 2021[xvii] . A large portion of this number consists of projects in the permitting and site development phase, making up 86% of total capacity. Both state and federal policies have recently pushed to expand renewable energy generation through tax credits and subsidies for utility scale projects. In the last year, BOEM held lease auctions for a total of eight new lease areas on the East Coast, totaling $4.69 billion in revenue from lease auctions. The selling prices of the lease areas ranged from $707,894/km^2 in the Carolina Long Bay region to $2,380,952/km^2 in the New York Bight region[xvii]. After seeing unprecedented lease payments, the industry became concerned that high lease prices would lead to higher electricity costs. Because of this, BOEM modified their auction methods by implementing multifactor bidding criteria which allows bidding credits to be allocated for local supply chain commitments[xvii]. The modified bidding process significantly reduced the lease prices in the Carolina Long Bay region.

Site Development Plan

The single-phased development of the wind farm will follow the Project Design Envelope (PDE) approach that is used in the U.K. offshore wind industry. The PDE gives WESO flexibility to analyze a range of design options to optimize the project around performance and environmental impact. A PDE typically includes details on offshore infrastructure within the array, offshore transmission infrastructure, vessel information, landfall details, and onshore transmission infrastructure[xviii]. Multiple phasing options are identified within the PDE so the developer can analyze potential impacts from the maximum design scenario on resources such as aquatic life, fisheries, and other activities in the area while waiting for permits. The maximum design scenario reflects the most environmentally adverse effects of a given process[xix]. Once the project is permitted and ready for construction, a revised permit will not be needed if WESO chooses to change the design to a different option outlined in the approved PDE.

The PDE will be outlined in detail in the COP. Resources, conditions, and activities that could be affected by the project will be included[xx]. All relevant information regarding the design of the project will be included for BOEM to perform environmental and technical reviews. Once permitting activities are complete, construction will commence.

When selecting the foundation, the risk of hurricanes in the area was the main concern along with cost, complexity, and environmental impact. An Inward Battered Guide Structure (IBGS), also known as a twisted jacket foundation, was selected for the project. Designed by Louisiana-based Keystone Engineering, the twisted jacket was used for an oil and gas project and withstood wind speeds of 67 m/s during the category 5 Hurricane Katrina in 2005[xxi]. It uses less steel than traditional jacket foundations and significantly reduces foundation CAPEX costs. Additionally, it maximizes vessel deck space by fitting five IBGS's for every three traditional jackets on the same vessel, reducing transportation costs[xxii]. It also can be decommissioned using the same lift equipment used during installation.

An offshore survey vessel will be used to conduct a geophysical ground survey and identify exact locations of the foundations and cables. Daily crews can be transported to site via crew transfer vessels (CTVs)[xxiii]. For construction, Jones-Act-compliant Wind Turbine Installation Vessels (WTIV) are scarce in the U.S. The *Charybdis* will be the first Jones-Act-compliant WTIV in the country upon completion in 2023 and is scheduled for projects through 2027[xxiv]. Another option is to utilize a foreign-flagged WTIV and a U.S.-built feeder barge. The feeder barge can load components from the port and the foreign WTIV can lift components from the barge onto the foundation without moving[xxv]. This option will accrue additional costs for feeder barges and make the process more complex. Depending on when permitting is completed, reserving the *Charybdis* for installation in 2027 may be the most cost-effective option.

Since our project is located approximately 35 miles from the POI, an offshore substation will be included to step up the voltage from 66 kV to 115 kV. An IBGS foundation will also be used for the substation. Inter-array cables will connect the turbines to the offshore substation and export cables will connect the offshore substation to the POI. A cable laying vessel will be used to lay the cables at a target depth of 4 to 6 feet[xxvi]. A self-propelled trencher will be used to simultaneously trench and lay cable.

Project Cost and Financing

WESO utilized Furow and NREL's CREST model to conduct a financial analysis for the wind farm. This created a comprehensive overview of the project and whether or not the project is financially feasible. The costs considered for this section are compiled based on public data for pricing, technical reports, and industry feedback.

Capital Costs

The total capital investment for the project came to $629 million, or $3,145/kW. Several inputs were considered to come up with this number, including the cost of turbines, offshore substation, interconnection cabling, and more. These numbers were found through extensive research of offshore wind projects on the East coast, overseas, and through discussions with industry professionals. A breakdown of the most impactful cost divisions can be seen in Table 1. Note that not all capital costs are included in the table.

Division	Description	Cost	$/kw
Wind Turbines	Ex-work costs, SCADA, Step-up Transformers, Lightning Protection, Aviation Lights, Spare Parts, Protection Cells	$201,700,000	$1008.50
Civil Works & Infrastructure	Foundations, Earthworks, CTVs, WTIVs, Dock Leasing, Platforms, Control Building	$165,800,000	$829.00
Electric Works & Infrastructure	Interconnection cabling, Grounding system, Installation & Commissioning, Transmission line, Optic Fiber	$122,700,000	$613.50
Development & Engineering	Project development, Licenses, Permits, Taxes, Basic & detailed engineering, Project management, Power curve measurements	$30,600,000	$153.00
General Expenses	Legal, Contingency, Decommissioning	$81,300,000	$406.50

Table 1: Breakdown of Capital Expenditures

Operation and Maintenance Costs

A thorough estimate for operations and maintenance was established to identify costs associated with maintaining optimal performance and longevity of the wind farm. These costs were further broken down into fixed and variable operational expenditures, which were used in conjunction with our total capital cost to calculate our LCOE. Fixed costs include all routine maintenance and scheduled payments for the lease, insurance, administrative fees, and other services. Variable costs consist of payments that may fluctuate throughout the lifetime of the wind farm. These include any additional expenses associated with unscheduled maintenance, environmental vigilance, and electricity usage. The fixed and variable costs are displayed in Table 2 below.

O&M Cost	Description	Cost	$/kw-yr
Fixed	Routine O&M, Warranty, Insurance, Management fees, Forecasting service, Land Payments, etc.	$15,175,602	$75.88
Variable	Unscheduled maintenance, Environmental vigilance, Electricity usage	$2,060,000	$10.30

Table 2: Breakdown of Operational Expenditures

Tax Considerations

Wind energy projects have the option to utilize either the Production Tax Credit (PTC) or the Investment Tax Credit (ITC). The PTC offers a credit based on the amount of energy produced per hour, while the ITC provides a one-time credit calculated as a percentage of investment costs. The ITC has been extended by the IRA for projects that commence construction before December 31, 2024. The ITC covers a maximum of 30% of the cost of installed equipment, considering apprenticeship and prevailing wage criteria[xxvii]. Additionally, specific projects may receive bonus credits. The Renewable Energy PTC has been extended by the Inflation Reduction Act (IRA) until 2024, having previously expired for wind at the end of 2021. For wind energy projects that meet the new wage and apprenticeship requirements and begin generating electricity after December 31, 2021, they will receive an adjusted credit of 2.6 cents per kilowatt-hour for the first decade of electricity production[xxviii]. The credit will be adjusted for inflation. Moreover, the Domestic Content Bonus, according to the IRA, raises the credit amount by 10% for projects where 100% of any steel or iron that is a component of the facility and 40% of the manufactured goods that are components of the facility were produced in the US[xxix]. Components can be purchased and stored before year-end 2024 as safe harbor to qualify for these credits.

Levelized Cost of Energy

The upfront costs do not determine the economic attractiveness of an energy project. By calculating the LCOE, energy projects can be directly compared based on their lifetime costs divided by the energy they produce. The renewable energy market, especially wind energy, can fluctuate in economic attractiveness based on geographic features and political incentives, among other factors. Average wind speed metrics are among the strongest influences on the LCOE for a given wind project. When looking at the Gulf of Mexico region, specifically in the central planning area, wind speeds are relatively low for an attractive wind project. Figure 4 shows the anticipated LCOE values for the Gulf of Mexico with a 2030 COD[xxx].

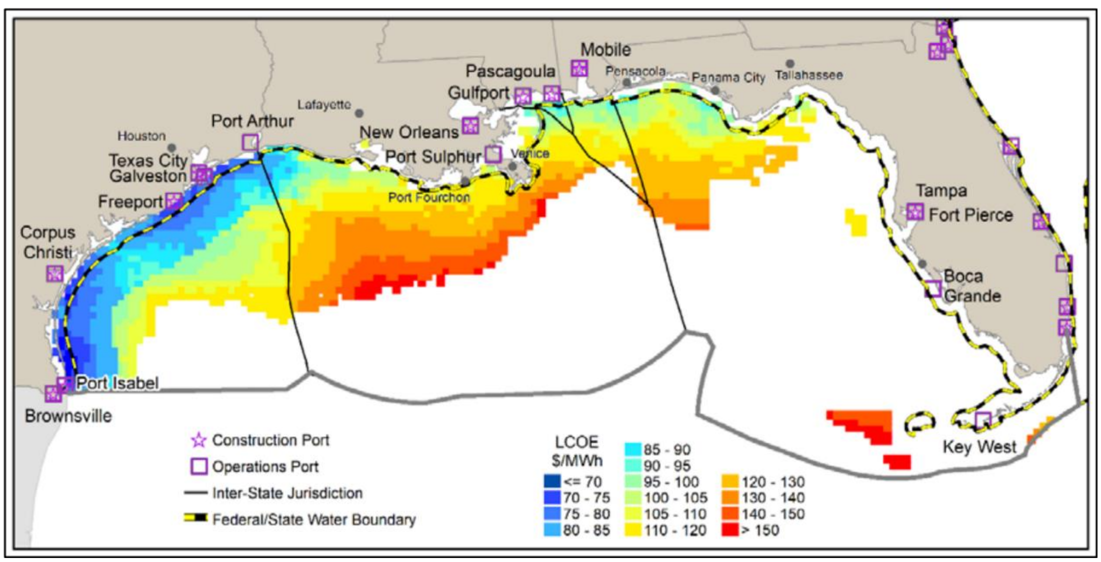

Figure 4: Levelized Cost of Energy Values in the Gulf of Mexico

As shown in Figure 4, a large range of LCOE values from \$70 to \$170 per MWh can be expected across the gulf. The sites with the lowest LCOE values contain higher wind speeds, closer proximity to shore, and shallow water depths. Within the Grand Isle area near Port Fourchon, an LCOE in the range of \$110 to $130 per MWh is anticipated when commissioned in 2030. While this isn't the lowest levelized cost in the region, it can still be justified as an economically viable project when considering tax incentives and favorable interest rates.

The LCOE of this project was calculated to be $136.50/MWh using NREL's Cost of Renewable Energy Spreadsheet Tool (CREST)[xxxi]. This tool creates an economic model and cash flow analysis based on a comprehensive range of inputs.

Financing

Determining an accurate LCOE using the CREST model demanded in-depth financial decision making. First, WESO used a wind farm capacity factor of 29.7% which was determined using Furow's wind farm analysis tool. A 60/40 debt-equity ratio was used with a 14% target after-tax equity IRR and a debt term of 20 years. The interest rate on the debt term is 4.4%, which is lower than current interest rates. By 2030, a drop in interest rates can be anticipated due to the gradual bounce-back from the pandemic, which would make this assumption reasonable. Federal Performance-Based Incentive (PBI) credits of 2.6 cents per kilowatt hour were fully utilized for the first 10 years of production with a 2% PBI escalation rate. No additional federal or state grants were used to fund this project; however, qualifying grants could prove to make the project more financially attractive. The depreciation of the wind farm was calculated using the Modified Allocated Cost Recovery System (MACRS). This depreciation method allows for faster depreciation early in the asset's life and slower depreciation later.

Cash Flow

A cash flow model was developed to assess the economic viability of the project based on performance, cost, and anticipated returns. To summarize the model shown below, information is displayed on 5-year intervals from the commission date to the end of the project's expected life.

Project/Contract Year	*Years*	0	1	5	10	15	20
Production Degradation Factor			1.00	0.980	0.956	0.932	0.909
Production	*kWh*		496,516,800	486,660,694	474,615,235	462,867,916	451,411,358
Project Revenue, All Sources	**$**		**$68,139,186**	**$66,795,328**	**$65,152,998**	**$63,551,363**	**$61,915,049**
Project Expenses							
Total Operating Expenses	**$**		**($15,759,890)**	**($17,383,132)**	**($19,534,813)**	**($21,761,106)**	**($24,241,629)**
Total Operating Expenses	*¢/kWh*		*(3.17)*	*(3.57)*	*(4.12)*	*(4.70)*	*(5.37)*
EBITDA (Operating Income)	$		**$52,379,296**	**$49,412,196**	**$45,618,184**	**$41,790,258**	**$37,673,420**
	Avg. DSCR	*Min DSCR*					
Annual Debt Service Coverage Ratio	*1.59*	*1.34*	*1.82*	*1.72*	*1.59*	*1.45*	*1.65*
Loan Interest Expense			($16,605,600)	($14,320,640)	($10,851,333)	($6,548,592)	($1,212,200)
Operating Income After Interest Expense			**$35,773,696**	**$35,091,556**	**$34,766,852**	**$35,241,666**	**$36,461,220**
Repayment of Loan Principal			($12,156,600)	($14,441,561)	($17,910,867)	($22,213,608)	($27,550,000)
Pre-Tax Cash Flow to Equity			**$23,592,096**	**$20,624,996**	**$16,830,984**	**$13,003,058**	**$18,802,152**
Project Cash Flows							
Equity Investment		($251,600,000)	$0	$0	$0	$0	$0
Pre-Tax Cash Flow to Equity			$23,592,096	$20,624,996	$16,830,984	$13,003,058	$18,802,152
Net Pre-Tax Cash Flow to Equity		($251,600,000)	$23,592,096	$20,624,996	$16,830,984	$13,003,058	$18,802,152
Running IRR (Cash Only)			*-90.6%*	*-22.7%*	*-4.0%*	*1.3%*	*3.4%*
Depreciation Expense			($119,116,875)	($69,440,845)	($1,151,762)	($1,152,768)	($595,097)
Taxable Income (operating loss used as generated)			($83,343,179)	($34,349,289)	$33,615,090	$34,088,898	$35,866,123
Federal Income Taxes Saved / (Paid), before ITC/PTC			$21,669,226	$8,930,815	($8,739,923)	($8,863,113)	($9,325,192)
Cash Benefit of Federal ITC, Cash Grant, or PTC			$12,909,437	$13,696,207	$14,747,438	$0	$0
After-Tax Cash Flow to Equity		**($251,600,000)**	**$58,170,760**	**$43,252,018**	**$22,838,498**	**$4,139,944**	**$9,476,960**
Running IRR (After Tax)			*-76.9%*	*3.7%*	*12.9%*	*13.6%*	*13.8%*

Table 3: Cash Flow Model

As seen from the model, an IRR of 13.8% was achieved by the end of the project's useful life. The average Debt Service Coverage Ratio (DSCR) is 1.59 and the minimum DSCR is 1.34, which means that the project will be able to service its debt payments throughout its useful life. Many lenders will require a minimum DSCR of 1.2.[xxxii]. If this wind farm were to be constructed and owned by a private entity and sold onto the grid, a Power Purchase Agreement (PPA) should be pursued. This would guarantee a set energy price for a portion of the project's operating life, which could be more profitable. This analysis assumes that the wind farm is a turnkey project from a General Contractor or Design-Builder to a local electric utility, such as Entergy.

Optimization

Wind Farm Layout

The process for selecting a wind turbine relied on industry feedback, data availability, and anticipated advancements in the offshore wind industry. NREL references provided opensource data for several wind turbines rated at 6 MW, 8 MW, 10 MW, and 12 MW[x]. 8 MW and 10 MW were considered because of their rating and the increasing size of turbine production by companies such as Vestas and Siemens Gamesa.

Furow contains a built-in tool for optimization. Using defined vector spaces for "optimal" and "restricted" areas, conditions to space the turbines within four to 6 diameters was used to place the turbines. Following their placement and some manual adjustment within the bounds of the lease blocks, a wake analysis was done with the model from Bastankhak and Porte-Agel. Figure 5 below shows the wind turbine wake effects. Further analysis from Furow gave an array efficiency of 96.44% and AEP of 496,517 MWh.

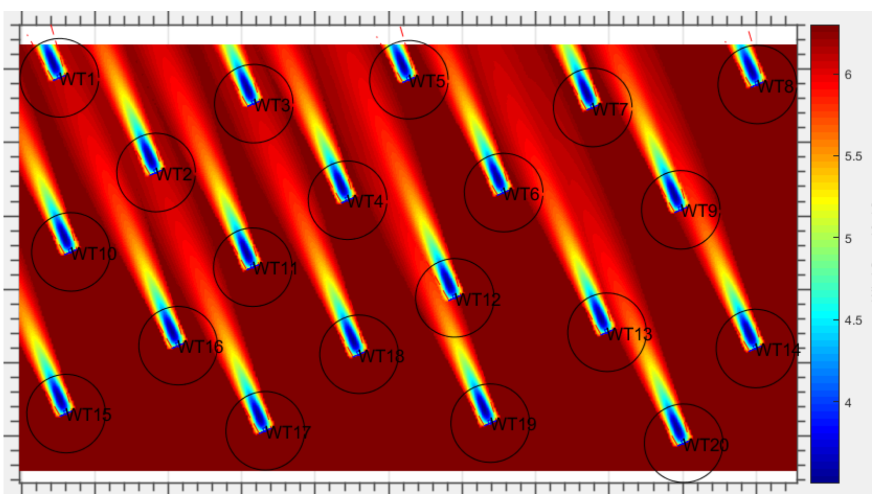

Figure 5: Wind Turbine Wake Effects

Lease Block Costs

BOEM manages the sale of lease blocks through an auction. In other lease locations in the Gulf of Mexico, BOEM proposed using a multiple-factor bidding auction which considers both monetary and non-monetary factors. The non-monetary bid consists of bid credit. Bidding credits are an intended contribution to support some aspect of the offshore wind industry. This can involve supporting workforce training programs, developing the U.S. offshore wind supply chain, or some other benefit. The lessee must provide accompanying documentation with written agreements outlining how the intended funding toward some initiative will advance the U.S. offshore wind workforce with some qualitative and/or quantitative information on the job impact.

When making the financial commitment to bid the cash amount, BOEM institutes a minimum price per acre. For other areas in the Gulf of Mexico, BOEM recommended the starting bid of $50/acre. From ArcGIS, the lease blocks 34 and 35 were each 5,000 acres putting the minimum cash bid at $500,000. Based on wind lease sales on the east coast, competitive bids ranged from $1,500 to $2,500 per acre. The accompanying bid credit was between $300 and $480 per acre toward workforce development. Considering previous lease activities, a competitive bid for lease blocks 34 and 35 is a cash bid between $15,000,000 and $25,000,000. Assuming BOEM will continue to use a multiple-factor bidding process, competitive bid credits toward workforce development are between $300,000 and $480,000.

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