The Pennsylvania State University

Turtle Glade I Offshore Wind Farm

Project Development Final Report

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1 Executive Summary

The Happy Valley Energy Corporation, HVEC, was tasked with siting, risk assessment and financial analysis of a wind farm in the Gulf of Mexico, GoM, near Galveston County, Texas. The Preliminary Site Assessment considered the wind resource, environmental impact (migration patterns, protected species, extreme wind scenarios, bathymetry, permitting considerations), competing uses (fishing, oil, and gas shipping fairways, and military airspace restrictions), and construction and transportation constraints.

The HVEC project development team additionally assessed three potential wind turbines: the Vestas 8.0-164, Vestas 9.5-164, and Vestas 15-236, including potential configurations within two lease blocks (OCS-263 and OCS-264). The resulting project proposed is a 741 MW wind farm consisting of 78 Vestas 9.5-164 turbines achieving an LCOE of $ 0.14/kWh for a 2024 commercial operation date.

In the end, however, the HVEC team elects to postpone this project until at least 2029. This choice was made considering an assessment of current infrastructure, predicted LCOE values compared to the electricity market, and a desire to implement a more robust environmental impact assessment. As a result, our bid price in 2029 would be $5MM.

2 Site Description and Energy Estimation

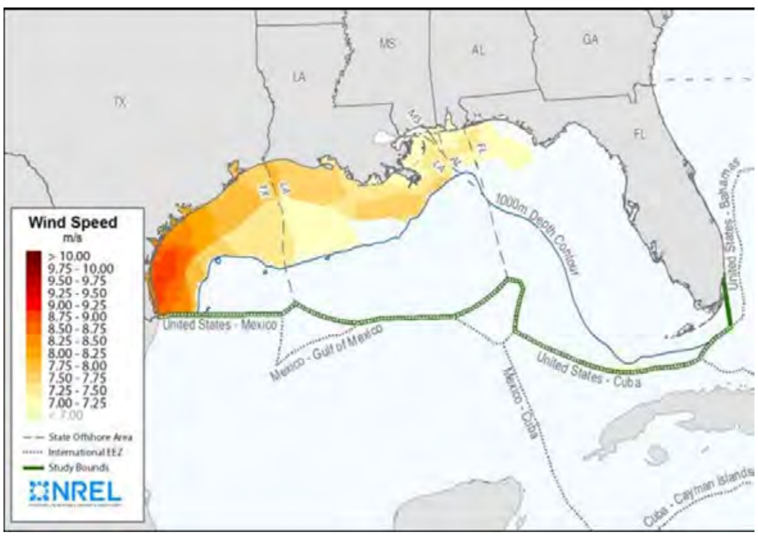

Figure 1: Wind Resource in US Gulf of Mexico (BOEM)

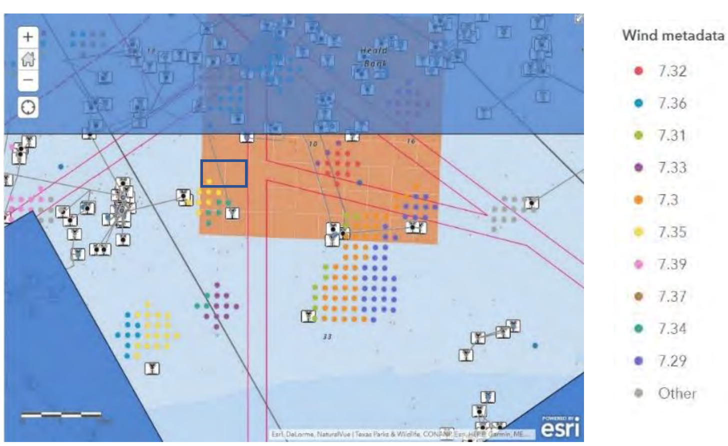

Figure 2: Competing Uses in Region (ArcGIS and Wind Toolkit)

2.1 Wind Resource

HVEC assessed the wind resource in the Gulf of Mexico, GoM, near Galveston. TX (**Error! Reference source not found.**) using the National Renewable Energy Laboratory, NREL's WindToolkit data available in Wind Prospector.[1] The observed trend shown in **Error! Reference source not found.** is that the wind resource improves as you move from East to Southwest within the GoM; therefore, HVEC has decided to focus our efforts on the lower left corner of the proposed lease blocks as shown in **Error! Reference source not found.**.[2,3]

Note: The dark blue space in Figure is restricted military airspace, which prevents the placement of turbines.

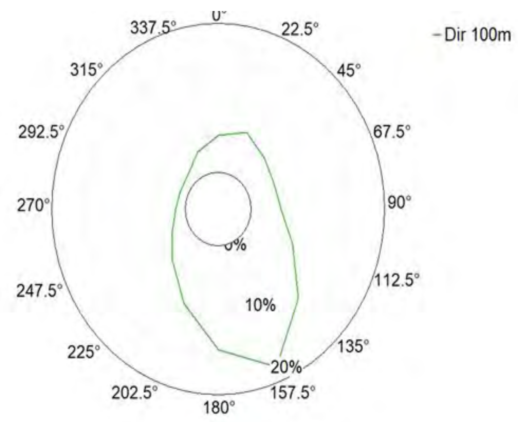

Figure 3: Frequency Wind Rose (Windographer)

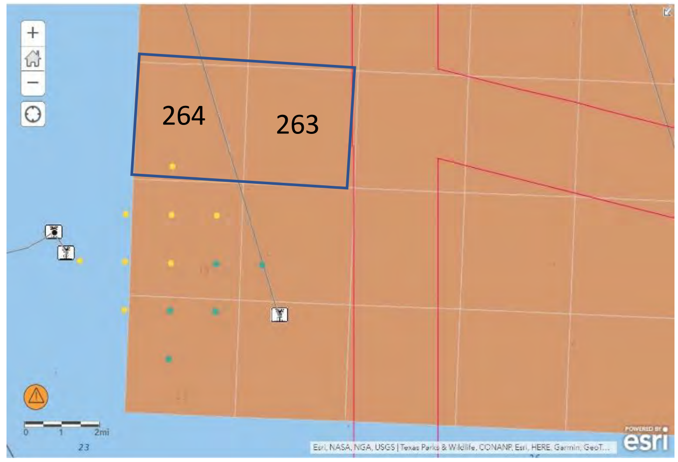

Figure 2: Competing Uses in the Region (ArcGIS and WindToolkit)

The region of interest resides within Texas' jurisdiction within the GoM (Figure); however, the region is also further than 9 nautical miles off of the Texas coast near Galveston, so it resides in federal waters.[3]

HVEC decided to use the lease blocks depicted in Figure 4 because the only obstacles would be the shipping fairway and the abandoned oil and gas pipeline and platform.

As shown in Figure 4, HVEC assessed the wind resource using WindToolkit data obtained from NREL's Wind Prospector tool in Windographer and produced **Error! Reference source not found.**, which demonstrates the predominant wind direction and , which shows a 12x24 heat map of the wind resource.[4,5] As a result, it was determined that the wind resource predominantly approaches the site from a South-Southeast direction of 157.5° and from the North-Northeast approximately 20% of the time.

Figure 3 shows the percent power wind rose which shows the percentage of time the wind arrives from each direction.[6]

Additionally, indicates that the wind speed is lower in the summer months and windier in the winter months, except for Hurricane Season, which will be discussed in Section 2.2. Additionally, the highest wind speeds are experienced over the nighttime hours between 7 PM and 7 AM.

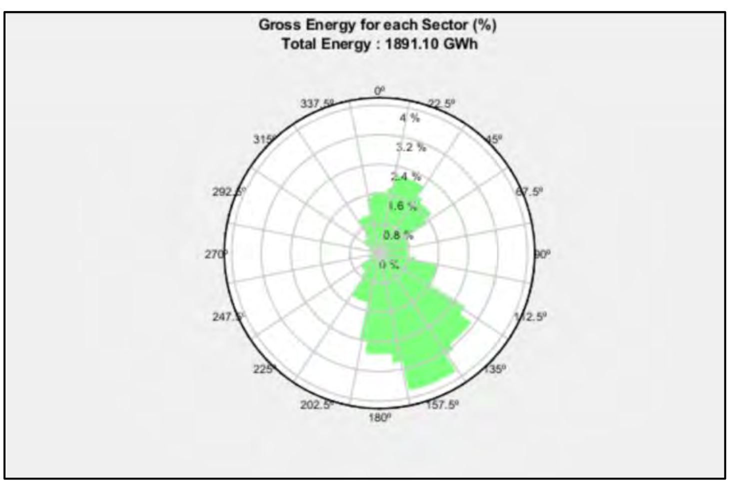

Figure 3: Percentage of Energy by Direction (Furow)

Table 1: 12 x 24 Diurnal Profile at 100 m Hub Height (Windographer)

	Mean Speed at 100 m (m/s)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
00:00 - 01:00	8.888	9.207	8.377	9.435	7.699	6.946	6.83	6.036	6.55	7.642	8.626	9.408
01:00 - 02:00	8.964	9.14	8.306	9.423	7.625	6.958	6.788	6.029	6.49	7.72	8.543	9.328
02:00 - 03:00	8.889	9.178	8.16	9.364	7.568	6.805	6.652	5.973	6.408	7.694	8.574	9.27
03:00 - 04:00	8.822	9.211	7.984	9.232	7.362	6.625	6.482	5.881	6.4	7.701	8.599	9.291
04:00 - 05:00	8.791	9.237	7.954	9.025	7.239	6.387	6.299	5.649	6.373	7.631	8.571	9.383
05:00 - 06:00	8.655	9.117	7.922	8.87	7.189	6.117	5.979	5.638	6.37	7.634	8.564	9.445
06:00 - 07:00	8.761	9.188	7.885	8.721	7.151	5.906	5.674	5.327	6.312	7.535	8.506	9.452
07:00 - 08:00	8.834	9.147	7.84	8.524	7.015	5.91	5.371	5.148	6.379	7.558	8.488	9.531
08:00 - 09:00	8.776	9.234	7.806	8.388	6.908	5.643	5.248	4.855	6.285	7.504	8.418	9.444
09:00 - 10:00	8.547	9.085	7.525	8.208	6.724	5.441	5.039	4.596	6.218	7.357	8.281	9.334
10:00 - 11:00	8.247	8.755	7.46	7.974	6.515	5.294	4.664	4.401	6.051	7.189	8.112	9.134
11:00 - 12:00	8.024	8.514	7.237	7.699	6.151	5.114	4.502	4.202	6.049	6.961	7.863	8.874
12:00 - 13:00	7.966	8.418	7.105	7.449	5.969	5.068	4.519	4.008	5.671	6.779	7.677	8.692
13:00 - 14:00	7.991	8.364	6.99	7.524	5.986	5.305	4.786	4.048	5.325	6.67	7.494	8.524
14:00 - 15:00	7.94	8.274	6.978	7.689	6.176	5.414	5.09	4.501	5.318	6.669	7.446	8.434
15:00 - 16:00	7.98	8.309	7.163	7.947	6.424	5.756	5.462	4.827	5.52	6.628	7.381	8.429
16:00 - 17:00	8.104	8.373	7.376	8.162	6.696	5.897	5.646	5.149	5.475	6.685	7.615	8.521
17:00 - 18:00	8.281	8.514	7.55	8.428	7.096	6.013	5.913	5.457	5.802	6.918	7.802	8.745
18:00 - 19:00	8.48	8.724	7.77	8.852	7.287	6.324	6.068	5.689	5.85	7.127	8.117	8.977
19:00 - 20:00	8.637	9.096	8.007	9.075	7.462	6.529	6.182	5.896	6.146	7.382	8.306	9.1
20:00 - 21:00	8.738	9.255	8.113	9.179	7.579	6.88	6.446	6.018	6.531	7.435	8.408	9.216
21:00 - 22:00	8.801	9.278	8.273	9.276	7.636	7.044	6.542	6.059	6.642	7.519	8.501	9.317
22:00 - 23:00	8.827	9.262	8.335	9.534	7.619	7.222	6.679	6.083	6.686	7.576	8.507	9.367
23:00 - 24:00	8.898	9.315	8.382	9.642	7.552	7.215	6.748	6.112	6.613	7.529	8.659	9.439

2.2 Environmental Impact

2.2.1 Bathymetry and Tides

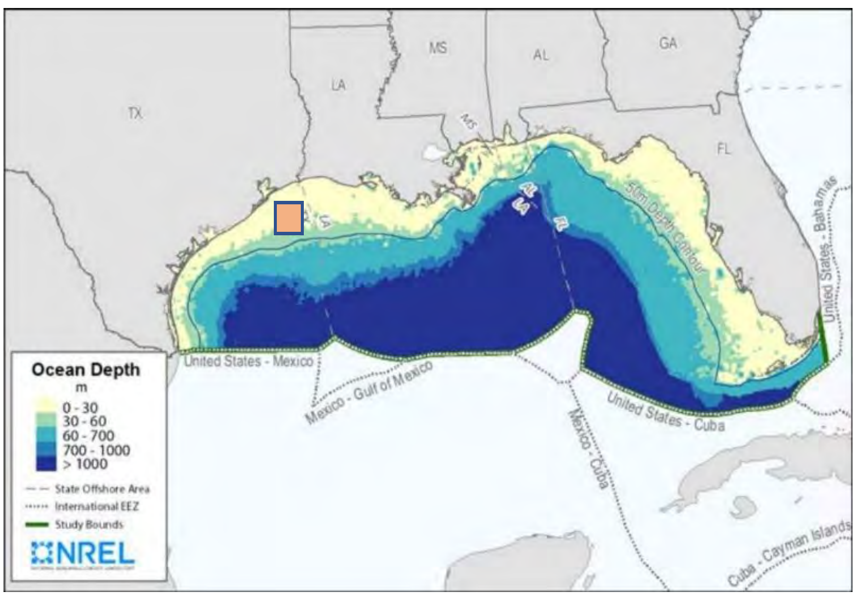

Figure 4: Bathymetry Zones US Gulf of Mexico (BOEM(

The area of interest has depths ranging from 15 to 24 m (Figure 6), making the site an excellent candidate for fixed-bottom turbine development.[3]

Sea level rise was also considered as it pertains to the climate crisis. Galveston sees one of the nation's highest rates of sea level rise at 6.55 mm per year.[7]

Significant wave height was also assessed using data from buoy 42047 and NOAA's GFS-Wave model.[8] HVEC observed that the range in wave height ranges 10-20 feet (3.05 – 6.1 m) above normal wave heights during hurricane season. During Hurricane Ike in 2008, Galveston saw a storm surge of 10 feet.[9] Wave heights are shown in Table 2 and charted in Figure 7.[9]

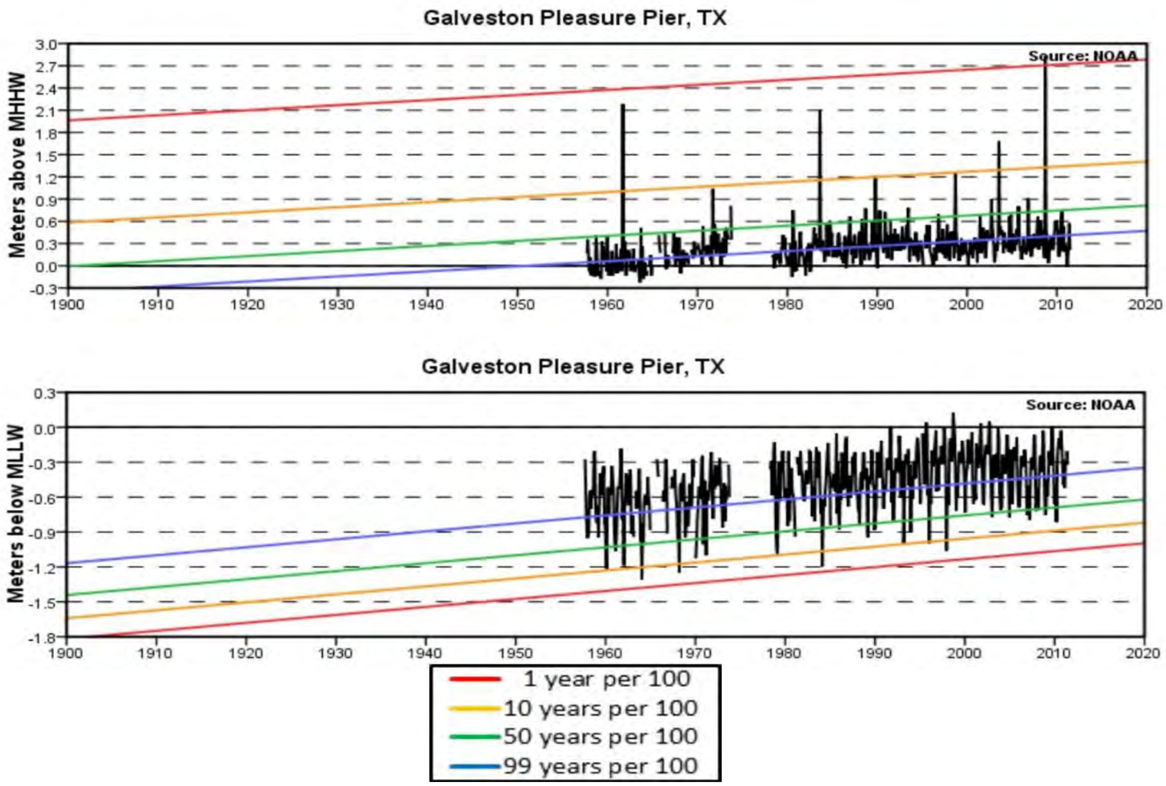

Figure 5:100-year Significant Wave Height (NOAA)

Table 2:Recorded Significant Wave Height (NOAA(

Table 2: Significant Wave Height Variants over the last 100 years (Galveston Pier)	
Highest Wave Height	**Lowest Wave Height**
2.1 m (1961)	-1.3 m (1964)
2.1 m (1983)	-1.2 (1968)
1.1 m (1989)	(1979 data recorded but not available)
1.6 m (2003)	-1.2 m (1984)
2.8 m (2008)	-1.0 m (1996)
	-1.0 m (1997)

HVEC has determined the range of range in wave heights to be between -1.0 to 2.8 m, which falls within the range found by NOAA.

2.2.2 Species

Considering the growing area of uninhabitable or unfavorable space in the US GoM, HVEC also researched the impacts on the habitat available to fish and wildlife. The US Environmental Protection Agency, EPA, in conjunction with NOAA, has determined the current dead zone to be 6,334 square miles which is the equivalent of more than 4 million miles of habitat deemed as uninhabitable.[10] As oxygen levels increase in the water, fish typically die or leave the region. Within this region, is the entire area of interest.

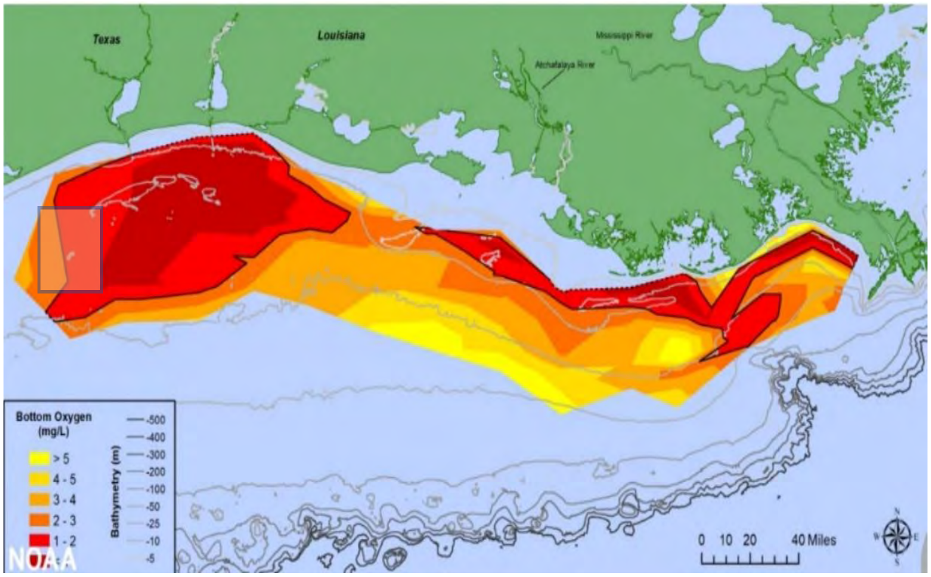

Figure 6: Hypoxic Zone US Gulf of Mexico (NOAA/EPA)

Previous species of interest within the region are shown in Table 3. These species were recorded to migrate or to have habitat in this specific region of the GoM as of 2021.[9,11]

Table 3: Protected Species Recorded

Species of Interest within the Specified Region of the Gulf of Mexico					
Corals	**Fish**	**Sharks**	**Turtles**	**Whales**	**Other**
Boulder Star	Bass	Whitetip	Green	Blue	Crabs
Elkhorn	Sailfish		Hawksbill	Fin	Jellyfish
	Catfish		Kemp Ridley's	Rice's	Seagrass
			Leatherback	Sei	
			Loggerhead	Sperm	

Avian species whose migratory patterns were assessed include brown pelicans, piping plovers, and falcons.[11]

Mitigation strategies are discussed in Section 2.3.

2.2.3 Soils and other Impacts

The geology in the proposed wind development region of the GoM are softer, composite soils (mud and sand) which will require longer piles for stability. Because of this, HVEC has decided to use the fixed-bottom jacket substructure for its turbines as monopile foundations face structural issues in more difficult soils and floating substructures are best suited for deeper water depths, deeper than 60 m.[3,12]

Table 4: Ideal Ranges for Foundation Depths

Table 4: Foundation Depths Data (Beiter NREL)		
Technology Type	**Technology**	**Depth (m)**
Fixed-Bottom	Monopile	5-100
	Jacket	5-100 (best in 40-80)
Floating	Semi-submersible	40-1,000
	Spar	40-1,000

Hurricanes and extreme wind scenarios are common in the GoM from June to November. This impacts the choice of turbine as well as construction time, which will be discussed in Section 3.

2.3 Risk Assessment and Mitigation Strategies

HVEC recognizes the many stakeholders impacted by the development of offshore wind in the region (marine and avian life, coastal communities, oil and gas development, and shipping). In Figure 4 some of the competing uses are shown.

HVEC has selected a site with minimal impact to marine life, due to the hypoxic zone described in Section 2.2.2. This does not excuse our impact on the life that does exist in the region, however. As a result, HVEC will implement strategies including recording and monitoring any sediment contamination and maintaining specified noise levels.[13]

As for the avian life in the region, HVEC recognizes the impacts on changing the oceanic landscape for birds and bats which may migrate or feed in the region. To mitigate these impacts, HVEC proposes to implement a longer study of the effects on avian life. Globally, it is understood that birds can adapt to avoid a wind farm however, more research must be implemented. HVEC proposes to install infra-red observance towers on the northern and southern sides of the wind farm to allow for observation and collection of data for the avian life in the region.[13]

HVEC proposes an 8-month break in construction from June to January (which accounts for Hurricane season and spring and fall migration) to account for hurricane season and migration patterns for species in the region, which will allow for minimal environmental risk.[11]

HVEC intends to post its intent to develop for public register in accordance with BOEM's policies. Additionally, HVEC understands the competing use with oil, gas, and shipping industries. To mitigate any issues, HVEC has selected a site with minimal interaction with oil and gas pipelines, while also adding a buffer between the shipping fairway in Figure 2, and allowing for additional spacing between the turbines in the proposed wind farm.

2.4 Turbine Selection

The turbines that were proposed for study where all Vestas models, including the V164-8MW, V164-9.5MW, and the V236-15MW, the last of which is slated to be in production in 2024, correlating to our proposed project commercial operation year. These were chosen as HVEC was confident in their offshore power capability and the turbine specifications were accessible via Vestas technical professional Jose Luis Hoyos. With these selections being approved for offshore use, the next step was exploring site compatibility. Each turbine model considered holds an IEC classification of type S, which means that they are specially designed for the offshore environment.[14] The main concern in selecting a turbine was whether it was designed to withstand the extreme wind conditions experienced by the site. V_{ref} is defined as the "50-year extreme wind speed averaged over 10 minutes," and for each named turbine their IEC specifications sheet denotes a V_{ref} of 50 m/s.[14–17] Furow was utilized for establishing the extreme wind conditions for the proposed project site using Wind Toolkit metadata. Furow generates a V_{ref} for periodic maxima and independent storms. For the site, Furow's results are shown in Table 5. Although including the uncertainty the extreme winds can go upwards to 52.7 m/s, the HVEC team deemed this 2.7 m/s margin not enough dissuade analyzing these turbines further as other factors such as average temperatures and air density, for instance, can help offset the loading impacts of extreme winds.[6]

Table 55: Extreme Wind Analysis

Table 5: Extreme Wind Site Analysis		
	V_{ref} 50-years (m/s)	Uncertainty (m/s)
Periodic Max	36.72	15.98
Independent Storms	21.11	0.36

The next consideration was looking at historical hurricane data that have intercepted the site. Using Furow's Hurricane Track Viewer, the hurricane paths of classes 1-5 are shown in Figure 7.[6] The green path line running through the center of the proposed site is one for a class 2 hurricane from 2008 of eye speed 48 m/s, the gray path above the site is a class 1 hurricane from 2012 27.3 km away, and the pink path below the site is a class 3 hurricane from 2009 73.21 km away.[6] With the largest historical concern being a class 2 hurricane still within the V_{ref} limit, the proposed turbines were deemed appropriate for further analysis.

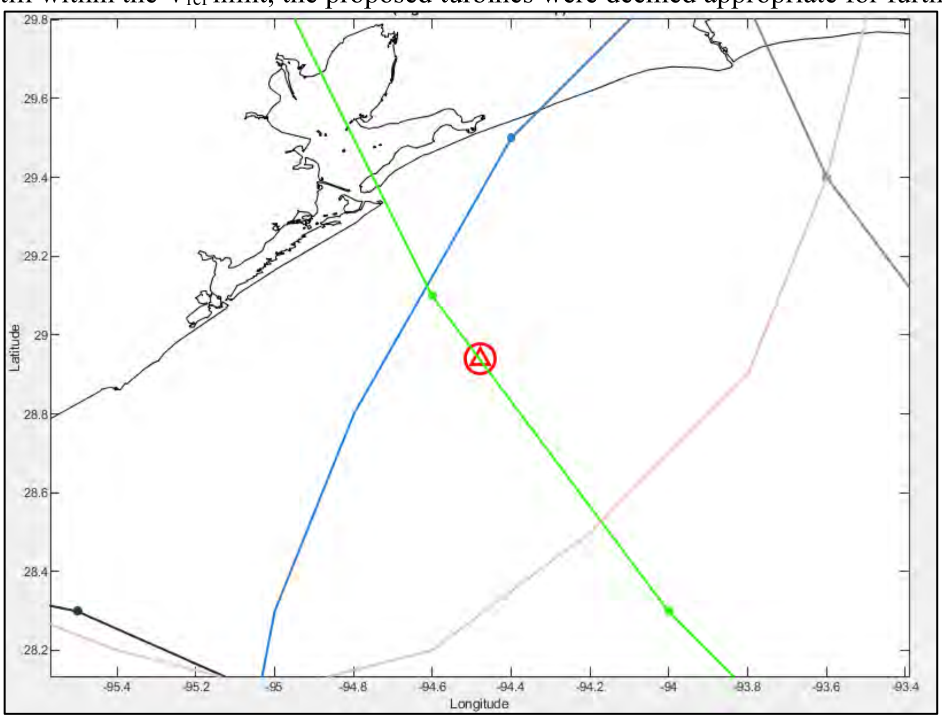

Figure 7: Historical Hurricane Paths (Furow)

With four Wind Toolkit metadata points in our proposed site and the turbine placements from Google Earth Pro, Furow was used for Energy Yield Calculations. With the addition of an in-engine bathymetry map, Furow was able to calculate Gross Energy Yield capacity factors for the site. The rationale for these calculations in Furow is found in Section 2.4. The capacity factors were implemented into HVEC's SAM model to match the resulting AEPs in calculating each farm scenario's real LCOE and PPA price. The financial parameters for these results are found in Section 3. The main results from these calculations are seen in Table 6, with the V164-9.5MW winning out in the categories of AEP, real LCOE and PPA price; despite the lowest capacity factors, HVEC thought the winning categories were more attractive for project feasibility. The specific design highlights are shown in Table 7.[6,17,18]

Table 66: Turbine Comparison Breakdown

Table 6: Turbine Comparison			
Turbine	**V164-8MW**	**V164-9.5MW**	**V236-15MW**
Turbine count	78	78	36
AEP (MWh)	1,328,994.43	1,546,888.06	1,265,747.07
Capacity factor (%)	24.3	23.8	26.8
LCOE ($/MWh)	146.5	140	147
PPA ($/MWh)	141.4	139.8	141.7

Table 77: Turbine Design Information

Table 7: Turbine Design Highlights					
Turbine Model	**Rated Output (kW)**	**Rotor Diameter (m)**	**Hub Height (m)**	**Cut-in Wind Speed (m/s)**	**Cut-out Wind Speed (m/s)**
V164-8MW IEC Class S	9500	164	140	3	25

2.5 Site Layout and Rationale

Windographer, ArcGIS Pro, Google Earth Pro, and Furow were used to determine the optimal layout for the proposed project site. Initial site determination was performed via ArcGIS through analysis of shipping fairways, NREL's Wind Toolkit metadata, oil and gas pipelines and platforms, and military restricted air zones in the region of interest as shown in Figure .[5] Through this analysis, HVEC deduced the lease blocks 264, 264, 292, and A62 to be of initial interest, later deducted further to only blocks 264 and 263. NREL's Wind Toolkit was used to obtain resource data at four locations near the site and were loaded into Windographer and Furow for analysis. With the lease blocks and wind resource established, Google Earth Pro was used to plan multiple farm arrays that were turbine dependent.

The HVEC team went through multiple wind farm array iterations that followed a similar philosophy. The turbines that were proposed for study where the V164-8MW, V164-9.5MW, and the V236-15MW, the details for their selections being in Section 2.4. The siting for the three different turbine choices followed the same separations of 4 rotor diameters between turbines and 5 rotor diameters between each row perpendicular to the predominant wind direction, a spacing chosen to minimize wake interactions between turbines while maximizing possible turbines in the two proposed lease blocks. Limiting to two blocks was chosen to reduce the expenses detailed in Section 3. A maximum of 800 MW for the nameplate was chosen as it is the limit allowable for the 345 kV transmission lines considered for interconnect and was also factored into the limiting of the number of lease blocks.[19]

The final layout composed of 78 x V164-9.5 turbines was chosen in lease blocks 264 and 263. Final edits to the layout were made to avoid placement of our jacket foundations on the out of commission oil and gas pipeline and platform, and to give a buffer region of 0.5 mile from the shipping fairway (the red lines in Figure 8). The total area of the proposed wind farm is 11,180.6 acres (45.25 km^2).[20]

Figure 8: Final Site Layout (ArcGIS and Furow)

2.5.1 Net Annual Energy Production

Based on the final layout, the wind resource conditions, and the Vestas V164-9.5 MW turbine selected for the project, the net annual energy production for the site can be evaluated. From Furow's Energy Yield Calculation, the net yield for the project was 1,546,888.06 MWh.[6] The capacity factor given was 23.8%, implemented into SAM as the total wake loss to garner HVEC the same AEP for financial analysis.[6,18]

3 Financial Analysis

3.1 Overview

Once the site assessment concluded, HVEC performed a financial analysis for the 741 MW wind farm proposed. The financial analysis assesses the capital and operating expenditures, assumed structure and rates for our financial model developed in System Advisor Model (SAM); and assesses the funding structure and market constraints. Additionally, HVEC considered a potential decommissioning plan.

3.2 Initial Capital Expenditures

3.2.1 Balance of System costs

The System Advisor Model's Offshore Balance of System (BOS) Cost Model was utilized for the BOS financials. The Jacket parameter was selected for our substructure type due to the reasons mentioned in Section 2.2.3.[3,18] The default 2 m electrical cable burial depth was kept as it abide by regulation standards. For installation, the feeder barge strategy was chosen as in accordance with the Jones Act there are no Primary Vessels planned for production in the GOM area yet.[21] The parameters of Bunny Ears and One Piece were chosen for turbine installation method and tower installation method respectively for cost effectiveness. The bunny ears method is when the nacelle, hub, and two of the blades are assembled at the port, while the one piece method means that the tower is assembled and is carried out in one piece; this combined method is "bunny ear with tower in one piece (BE1T)," and the turbine is assembled from the total three pieces on site.[22] For the cables from the site substation to interconnect, the voltage class of 345 kV double circuit was chosen as it could support a maximum load of 800 MW for up to 300 miles.[19] Our Distance to landfall and the Distance over land to grid interconnect are 48 km and 45.1 miles respectively.[5,20] The final BOS implementation was the value of decommissioned components, valued at $98,200/turbine in accordance with the Cassadaga Wind Farm Decommissioning Cost Estimate.[23] The calculated Total Offshore BOS per kW was $2,149.79/kW.[18]

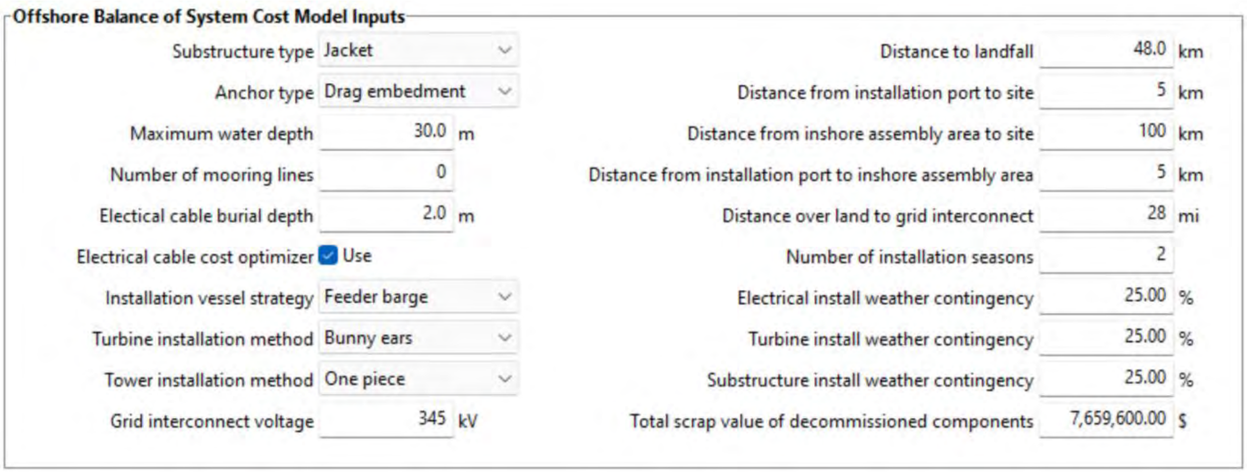

Figure 9: Balance of System Parameters Implemented (System Advisor Model)

To note in reference to Figure 9, the parameters shown but not mentioned are due to those not being factored into SAM's calculations due to HVEC's use of the jacket substructure type.

3.2.2 CAPEX & OPEX

For the project's capital costs, the turbine cost value used was $1,301/kW as given by NREL's 2020 Cost of Wind Energy Review: a reference price given to fixed offshore projects with 8.0-MW turbines.[24] Noting that the V164-9.5MW is officially an upgraded V164-8MW system, the HVEC team deemed this reference price appropriate for the project.[17] For Operation and Maintenance Costs, the fixed cost by capacity of $85/kW was chosen in accordance with 2024 projections from the 2021 Offshore Wind Market Report [21,25]

3.2.3 Lease Costs

The final annual system cost to consider was a fixed annual cost of $2.7 MM/year accounting for total operating fees for the leased area. The lease cost structure is defined by Federal Register notice 87-FR-2446.[26] The lease structure includes a flat $3/acre fee for the project pre-Commercial Operation Date (COD). For the proposed project, this would be prior to 2024. Rounding the two-lease block area to 12,000 acres, this would equal $36,000/yr initially. Then once the project is in operation, the operation fee is calculated as follows: project size (741MW) x hours (8760 hours) x estimated capacity factor (.3, approximate) x the fee rate (2%) x regional electricity market price (est. $70/MWh).[27] This equals $2,726,287 per year. This is in addition to the bid price for the lease block, discussed further in section 3.5.

3.3 Key Assumptions

For wake loss modeling, Furow's Energy Yield Calculation was utilized. After running the model with the in-engine Eddy Viscosity wake loss model, the capacity factor for the farm was calculated to be 23.6%. The resulting wake loss by directional sector is shown in Figure .[6]

For incentives, the Investment Tax Credit of 30% was applied. Also 5 yr accelerated depreciation (5 yr MACRS) was selected, along with a bonus depreciation of 60% allowable in 2024.[25]

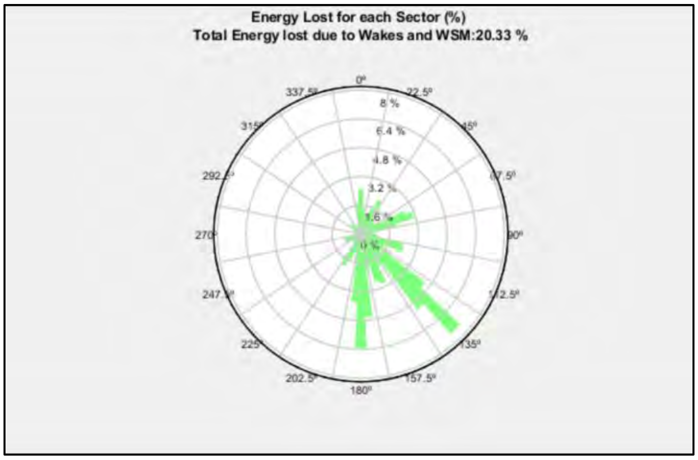

Figure 12: Total Wake Loss Percentages by Sector (Furow)

Since the project is relatively large and HVEC has defined a relatively short construction window of 4 months/yr, it is assumed that the project would be installed in at least two phases, with roughly half of the project installed in 2024 and the other half installed in 2025.

3.4 Financing Plan

Figure 13 and Figure 12 show the after-tax cash-flows and the outputs based on the assumptions made by HVEC. From Figure 12, the Tax-equity Investor sees a large investment in Year 0, but receives most of it as a return in Year 1, with modest returns until the flip year in Year 5.

Metric	Value
Annual energy (year 1)	1,541,809,920 kWh
Capacity	741,000 kW
Capacity factor (year 1)	23.8%
PPA price (year 1)	13.98 ¢/kWh
PPA price escalation	3.00 %/year
Levelized PPA price (nominal)	17.95 ¢/kWh
Levelized PPA price (real)	14.26 ¢/kWh
Levelized COE (nominal)	18.23 ¢/kWh
Levelized COE (real)	14.48 ¢/kWh
Investor IRR in flip year	9.00 %
Flip year	5
Investor IRR at end of project	9.37 %
Investor NPV over project life	$3,662,278
Developer IRR at end of project	9.35 %
Developer NPV over project life	$12,939,561
Net capital cost	$3,118,360,576
Equity	$1,700,496,256
Debt	$1,417,864,192

Figure 11: HVEC's Calculated Values from SAM

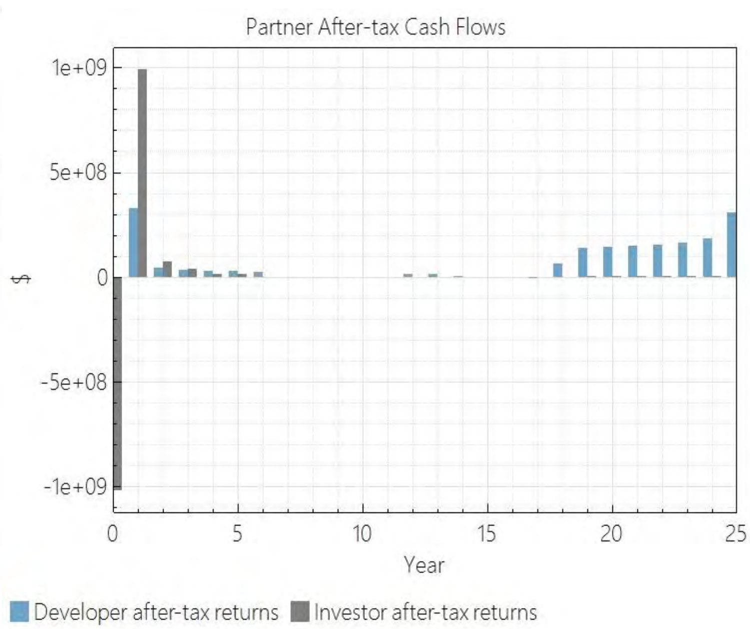

Figure 10: After-Tax Cash Flows for Developer and Investor (SAM)

The 25-year project will be financed via a PPA flip with debt structure with 45% of the project financed via a corporate bank loan at a rate of 3.5% and the remaining 55% financed via equity with IRRs on the order of 9%.[18] HVEC will contribute 40% of the project equity (Figure 13) while a tax-equity partner will take on the remaining 60% of the project equity.

3.4.1 Market Conditions

Under conditions for construction beginning in 2024, the LCOE was $100 to 125/MWh in 2027, which is significantly lower than the calculated LCOE ($144.8/MWh (Figure 13)). The Levelized Avoided Cost of Energy, LACE, which is the amount of value the project would lose if replaced by another project, is $70/MWh.[3]

HVEC acknowledges that the US GoM has a long history of oil and gas, which provides a large supply of workers who could be trained in construction and service of offshore wind. With 10% lower labor rates, the GoM is more ideal for job creation.[3] Additionally, it is understood that the infrastructure, policies, and incentives in the GoM are in need of a lot of improvements in terms of transport and construction of an offshore wind farm. Texas' Renewable Portfolio Standard has not been updated since 2005.[28] As a result, once the initiative was surpassed, newer forms of alternative energy, such as offshore wind, were not assessed. The increased volatility of the ITC and phasing out of the PTC also impacts offshore wind negatively.

Based on this realization, HVEC has determined this project to not be feasible for construction in 2024, and would elect to postpone construction until at least 2029. In this time, HVEC would conduct more thorough environmental impact studies and hopes that the financial conditions would be more favorable. However, HVEC would pursue a path to safe harbor 5% of the construction costs via the 2024 Turbine technology selected for the realization of the wind farm. As BOS costs as well as Turbine costs decrease per kW over the next several years, we estimate that a $100/MWh LCOE is feasible by 2029.

3.5 Proposed Bid Price

While offshore wind winning lease bids in the Northeast have recently been reported at record prices of ~$10,000/acre, the most recent bid prices in the GoM are on the order of $190/acre due to a considerably weaker wind resource in the region.[27] A bid price of $200/acre is assumed in the financial model presented, which totals $2.4MM approximating a lease size of 12,000 acres. As the site is considered for development on a more distant 2029 timeline, a max bid price of $5MM would be feasible.

4 Conclusion

Initially, HVEC sought to implement a 741 MW wind farm in the US Gulf of Mexico, US GoM, to begin construction in 2024. HVEC's maximum bid for lease blocks 263 and 264 in the US GoM would be $2,400,000 USD. Upon consideration of the financial analysis, it was determined that beginning an endeavor in 2024 would potentially not be far enough into the future for the project to be feasible as mentioned. As a result, HVEC elects to postpone its construction to 2029 in hopes that infrastructure in the Galveston region of the US GoM would be more favorable and the project would be able to support a more substantial max bid price of $5MM.

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