NOMINATION

Commercial Leasing for Wind Power Development on the Outer Continental Shelf Offshore California Call for Information and Nominations [Docket No. BOEM–2018–0045]

Submitted To:
U.S. Department of the Interior
Bureau of Ocean Energy Management (BOEM)

January 2019

Submitted By:
Castle Wind LL

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1 OVERVIEW

On October 19, 2018, the Bureau of Ocean Energy Management (BOEM) published a Call for Information and Nominations (Call) (Docket No. BOEM–2018–0045) for stakeholders and companies interested in commercial wind energy leases on the Outer Continental Shelf (OCS) offshore California. Castle Wind LLC (Castle Wind) is pleased to submit this nomination in accordance with Section 7 of the Call.

The three Call Areas are identified as Humboldt Call Area on the north coast, and the Morro Bay Call Area and the Diablo Canyon Call Area on the central coast. The Call Areas were established through coordination with other OCS users, relevant Federal and State agencies, and Native American tribes. BOEM and the State of California, through the leadership of the California Energy Commission, have engaged in a collaborative, data-based offshore wind energy planning process.

Castle Wind, organized under the laws of the State of Delaware, is a joint venture between Trident Winds Inc. (Trident), a Washington state corporation, and EnBW North America Inc., a wholly-owned subsidiary of Energie Baden-Württemberg AG (EnBW), one of the largest utilities in Germany.

EnBW supplies electricity, gas, water and energy-related products and services to around 5.5 million customers with a workforce of 21,000 employees. EnBW's current power generation assets comprise 13,000 MW of conventional generation, and a portfolio of nearly 1,000 MW of offshore wind projects under operation or construction in Europe, and more than 3,000 MW under development globally.

Trident was established in 2015 to utilize prior permitting expertise in the marine environment to develop deep-water offshore wind projects using floating offshore wind technologies.

On January 14, 2016, Trident, prior to establishing the Castle Wind joint venture, submitted an Unsolicited Lease Request (Request) for a renewable energy commercial lease on the OCS under 30 CFR 585.230. The offshore site area that was stated in the Request is within the OCS official Protraction Diagram NK10-01 and is within the Morro Bay Call Area.

Prior to submitting the Request, Trident conducted extensive research on the met-ocean and wind conditions at the proposed site and initiated wide-spread dialog with the local stakeholder groups that could be affected by the proposed offshore wind farm. In the time since the Request submittal, Trident, and now Castle Wind, has continued extensive efforts with the local stakeholders to identify their needs and to develop mitigation measures.

These efforts resulted in two legally-binding agreements with the key local stakeholders:

- First, on October 6, 2018, Castle Wind entered into a first-of-its-kind mutual benefits agreement with local commercial fishing industry groups (Fishermen's Agreement) that will, among other things, (1) create a fund for infrastructure improvements to benefit the local commercial fishing industry; (2) create training and employment opportunities for local commercial fishermen; and (3) provide opportunities for the local commercial fishing industry to provide input into the project's design to minimize impacts to the industry. This agreement has resolved--in advance--a key issue that has delayed development of offshore wind on the East Coast: how to mitigate impacts on the commercial fishing industry to the satisfaction of the local commercial fishing industry that would be most impacted by the offshore wind project. *The importance of this agreement cannot be overstated*: if Castle Wind successfully obtains the lease for the Morro Bay WEA, the local commercial fishing industry will have funding for much needed improvements and will have a developer who will listen to their concerns during construction and operation of the project.

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- Second, on November 29, 2018, Castle Wind entered into a community benefits agreement with the City of Morro Bay (CBA) that will provide a wide range of benefits to the Morro Bay community. These benefits include, but not limited to, hiring of qualified local residents, establishing internships and trainee programs at local schools and universities during construction and operation of the wind farm, the establishment of a maintenance and monitoring facility for the project in the City of Morro Bay, and the promotion of local businesses during the construction phase. Castle Wind will also work with the City to generate "green solutions" with electric vehicles, charging stations, and other sustainable energy projects.

Further details on the technical and financial capabilities of Castle Wind partners are presented in Section 7 of this Nomination.

2 CONFORMANCE WITH STATE AND LOCAL ENERGY PLANNING INITIATIVES

In 2018, California adopted landmark legislation that continues to solidify the State's leadership in advancing clean energy and climate protection. Specifically, Senate Bill (SB) 100 increased the State's current Renewables Portfolio Standard (RPS) targets from 50 to 60 percent by 2030. The bill also sets an aggressive goal to meet 100 percent of the state's retail electricity supply with zero-carbon resources by December 31, 2045.

On the same day SB 100 was signed into law, California Governor Jerry Brown also signed Executive Order B-55-18 committing California to total, economy-wide carbon neutrality by 2045.

California has a long history of enacting aggressive environmental policies, including:

- In 2006, SB 107 modified Public Utilities Code Sections 399.11 – 399.19 were modified to require that investor-owned utilities (IOUs), electric service providers (ESPs) and community choice aggregators (CCAs) procure 20% of annual retail electricity sales from eligible renewable sources by 2010. The percentage of retail sales required from renewable sources is known as the RPS.
- Assembly Bill (AB) 32, signed by Governor Arnold Schwarzenegger during October 2006, required that statewide greenhouse gas (GHG) emissions be reduced to 1990 levels by 2020. SB 32 and AB 197 reauthorize California's cap and trade program. SB 32 requires that the state achieve a 40 percent reduction of the state's greenhouse gas emissions below 1990 levels by 2030. GHG reductions increase the need for electricity from renewable sources.
- Executive Order (EO) S-14-08 issued on November 17, 2008, and EO S-21-09 issued on September 15, 2009, set an RPS goal of 33% renewable energy by 2020.
- During 2011, Governor Jerry Brown signed SB 2 codifying the 33% RPS a statutory requirement.
- During 2015, Governor Brown signed SB 350. SB 350 requires that all retail sellers of electricity meet a 50% RPS by the end of 2030. In addition, SB 350 contains provisions that reduce GHG emissions, in part, by promoting electric vehicles.

Three California authorities administer the RPS and the GHG programs summarized above:

- California Public Utilities Commission (CPUC) administers the RPS compliance required under SB 100, SB 107, SB 2 and SB 350 for IOUs, ESPs and CCAs.
- California Energy Commission (CEC) administers the RPS compliance required under SB 100, SB 107, SB 2 and SB 350 for Publicly Owned Utilities (POUs).
- California Air Resources Board (CARB) is responsible for implementing the GHG reductions required under AB 32 and SB 350.

While filings and reports prepared for and by the CPUC and CEC show that IOUs, ESPs, CCAs and POUs will meet RPS requirements in the near term, substantial additional renewable energy supplies are needed to meet the SB 100 and AB 32/SB 32 requirements. California will need between 15 to 25GW of new renewable energy generation between now and 2030 and as much as twice that amount by 2050. Much of that will be new wind energy. Castle Wind is actively promoting the benefits of offshore wind for California because it is a dispatchable, abundant renewable energy resource with a high capacity factor and a production profile that complements solar.

3 NOMINATION AREA

Castle Wind submits this Nomination for the entire Morro Bay Call Area. The actual project size will be determined after geotechnical and other studies are completed. Table 1 lists the lease blocks and aliquots that Castle Wind includes in its Nomination. Figure 1 is a map showing the Morro Bay Call Area, which defines the Castle Wind Nominated area.

Table 1 OCS Lease Area Blocks (Partial and Full)

Block Number	Partial Block (Aliquot) Designation	Qty of Alqts
6102	L, P	2
6103	M	1
6152	D, L, P	3
6153	A, B, E, F, I, J, K, M, N, O.	10
6202	D, G, H, K, L, N, O, P	8
6203	All	16
6204	I, M	2
6251	D, H, K, L, O, P	6
6252	All	16
6253	All	16
6254	A, B, E, F, G, I, J, K, L, M, N, O, P	13
6301	C, D, G, H, K, L, M, O, P	9
6302	All	16
6303	All	16
6304	All	16
6305	A, E, I, M	4
6351	All	16
6352	All	16
6353	All	16
6354	All	16
6355	A, B, E, F, I, J, M, N	8
6401	All	16
6402	All	16
6403	All	6
6404	All	16
6405	A, B, E, F, G, I, J, K, L, M, N, O, P	13
6406	M	1
6451	A, B, C, D, E, F, G, H, I, J, K, L, N, O, P	15
6452	All	16
6453	All	16
6454	All	16
6455	All	16
6456	A, B, E, F, G, H, I, J, K, L, M, N, O, P	14

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6457	E, F, I, J, M, N, O	7
6501	B, C, D, G, H	5
6502	A, B, C, D, E, F, G, H, I, J, K, L	12
6503	A, B, C, D, E, F, G, H, I, K, L	11
6504	All	16
6505	All	16
6506	All	16
6507	All	16
6508	I, M, N	3
6554	D	1
6555	A, B, C, D, G, H	6
6556	A, B, C, D, E, F, G, H	8
6557	A, B, C, D, E, F, G, H	8
6558	A, B, C, D, E, F, G, H	8
6340	O, P	2
6390	B, C, D, F, G, H, J, K, L, M, N, O, P	13
6440	A, B, C, D, F, G, H, J, K, L, N, O, P	13
6490	C, D, H	3
Total quantity of Aliquots		**551**

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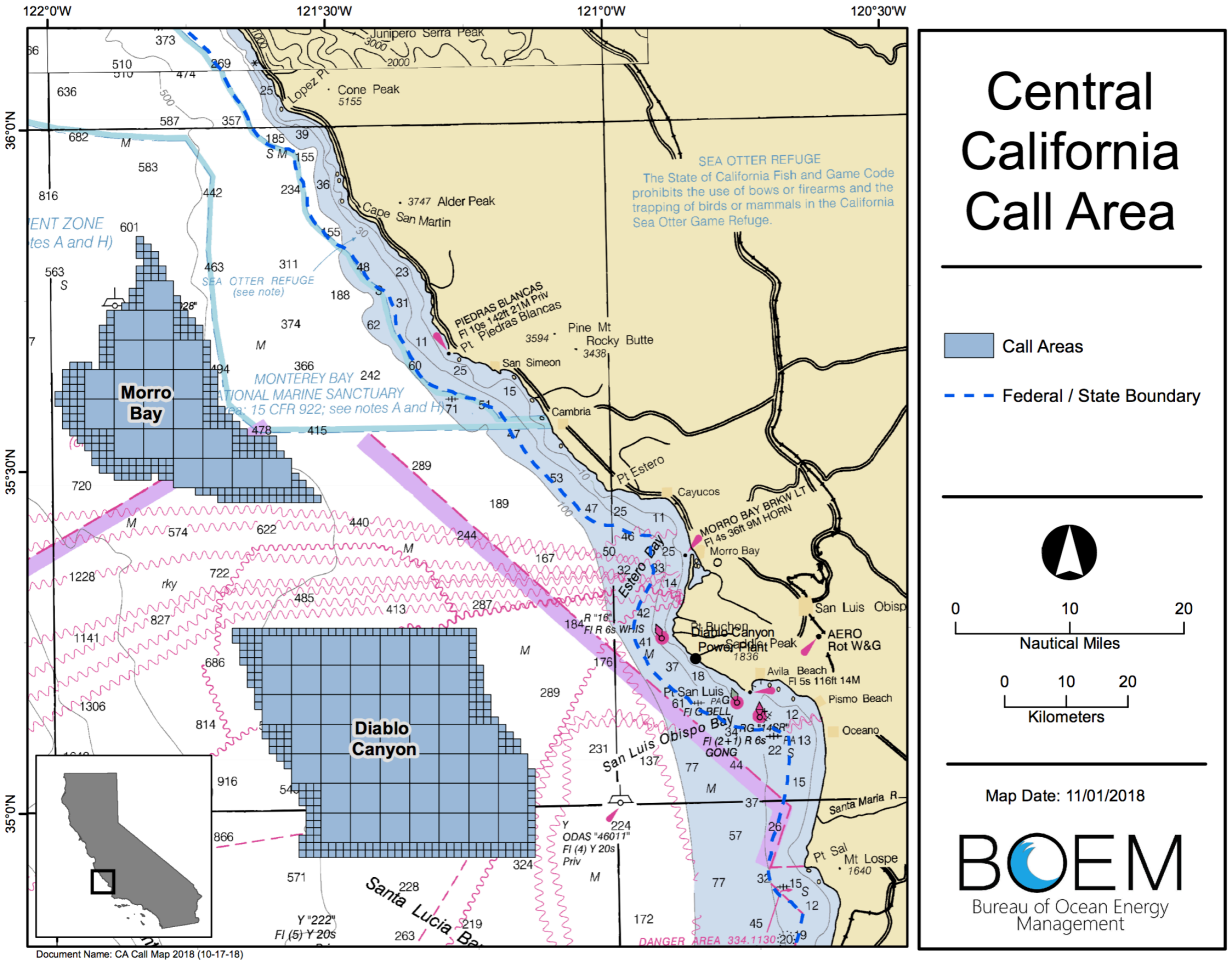

Figure 1 Nominated Area – Castle Wind is nominating only the Morro Bay Call Area

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4 OBJECTIVES AND FACILITIES DESCRIPTION

4.1 OBJECTIVES

Castle Wind's objective is to install and operate a commercial scale offshore wind farm with a commercial operation date (COD) targeted for the 2026 timeframe to generate clean and affordable electricity by accessing the vast offshore wind resources for the benefit of the California ratepayers and to facilitate achievement of California's aggressive carbon reduction and renewable energy goals. Castle Wind's project time line coincides with both the expected maturity of the floating foundations technology after 2020 and the California market demand for new renewable energy resources to meet the state's requirements under SB 100.

4.2 FACILITIES DESCRIPTION

To meet those stated objectives, Castle Wind plans to develop, install and operate a 1,000 to 2,500 MW offshore wind project – Castle Wind Offshore (Project) – within the Morro Bay Call Area, taking advantage of a consistent wind resource with an average speed of 8.5 m/sec. Castle Wind assessed over 27 years of wind data obtained from the ODAS station 46028 that is owned and maintained by National Data Buoy Center. Based on this assessment the wind resource within the Morro Bay Call Area has an average speed of 8.5 m/sec with the extreme directionality and consistency that is expected to result in energy generation with over 50% capacity factor.

4.2.1 Floating Offshore Wind Systems

The Project will deploy competitively selected, commercially available, floating support structures, each outfitted with the offshore wind turbines (OWTs) of at least 9 MW capacity, in a quantity corresponding to the overall nameplate capacity of the Project. Together, each OWT and a floating support structure is a Floating Offshore Wind System (FOWS). Each FOWS will be moored to the ocean floor using conventional properly sized anchors. Mooring lines will consists of chains, polyester lines, steel wires, shackles, fairleads and chain stoppers. Individual FOWSs will be electrically interconnected with inter-array cables to form an offshore wind farm. Since the competitive selection of the foundations and turbines will be done at a later date, the farm layout configuration will be developed at a later time as well. Each FOWS (unit) is planned to be spaced approximately 1,000 meters (0.54 nm) apart on average. Energy produced from all units will be brought to one, or more, offshore, floating substation(s) and transmitted to shore via one or more (for redundancy purposes) export cable(s) along the same cable route.

Today, a number of suppliers have commercially available OWTs with the nameplate capacity of over 9 MW.

Two companies, Equinor and Principle Power, have installed multi-unit pre-commercial projects. These companies' floating support structures (Equinor's Hywind and Principle Power's WindFloat) will be available for commercial use after 2020.

- The Hywind (Figure 2), outfitted with Siemens 2.3 MW OWT has been in operation since October 2009 off the coast of Norway. In 2017, Equinor installed a 30 MW project in Scotland that deployed five Hywind systems using Siemens 6 MW OWTs.

- The WindFloat (Figure 3), outfitted with Vestas V-80, 2 MW OWT, operated off the coast of Portugal from 2011 through 2016. In 2017 the WindFloat prototype was taken off station, refurbished and was reinstalled in the UK as the initial FOWS unit in the Kinkardine 50 MW project, planned to be completed in 2020 with additional six V164-8.0 MHI Vestas OWTs also mounted on the WindFloat. Furthermore, as of the date of this Nomination, Principle Power is constructing a 25 MW project in Viana do Castelo, Portugal that will see deployment of three WindFloat FOWSs with MHI-Vestas 9.5 MW OWTs in 2019.

Figure 2 - Hywind Prototype

Figure 3 - WindFloat Prototype

Either the Hywind, or the WindFloat floating support structure, would be suitable for the deployment in the Project.

4.2.2 Power Transmission and Grid Interconnection

The subsea export cable(s) will be used to export produced electricity to the PG&E high voltage substation located adjacent to the Morro Bay Power Plant (MBPP). The MBPP was built in 1953 as an oil-fired plant cooled with seawater. The plant was subsequently converted to utilize natural gas as a boiler fuel. The seawater was brought to the plant through a discharge structure located on the north side of Morro Rock and discharged through a tunnel to the North side on MBPP. The MBPP was decommissioned in February 2014 and is no longer operating. The subsea export cable is planned to be brought on shore using the existing water discharge structure and the tunnel as a cable route to the PG&E substation to connect to the CAISO transmission grid.

4.2.3 Electrical connection interface and load study

Delivery of electricity to the PG&E's Morro Bay substation is via the export cable(s). Studies will be required to determine how much of the existing onshore infrastructure that can be reused for the interconnection of the project, such as the outflow tunnel connection as a route for the export cable to connect to PG&E's Morro Bay substation.

In 2018, Castle Wind submitted an interconnection request to CAISO and is presently the only applicant in the Queue Cluster 11 with a point of interconnection at PG&E's Morro Bay substation.

A lease with the City of Morro Bay and possibly an agreement with the incumbent power plant owner will be required for infrastructure reuse.

The design of the offshore cable infrastructure, cable protection systems, and subsea connections will be developed during the project's design phase, as such systems require inputs from the site characterization studies and the project's operational characteristics. Inter-array cables configuration and loading calculations require consideration of the dynamic motions of the FOWSs. Cable connection systems, cable entry systems, and protection requirements will also be determined during the design phase.

4.2.3.1 Offshore grid requirement identification and design specification

Design of the offshore electrical grid will focus on the inter-array cables connections and the overall Project configuration. Details of the offshore grid design will be developed during the design phase.

4.2.3.2 Offshore electrical network preliminary design concept including metocean, seabed, and geotechnical considerations

The offshore electrical network design will be developed based on metocean, seabed, and geotechnical data collected during Site Assessment Plan (SAP) implementation and will be included in Construction and Operation Plan (COP).

4.2.3.3 Integration of cable entry and sub-structure engineering

The outlined design of the inter-array cables and the floating foundation will be defined during the design phase. Since both the Hywind and the WindFloat are undergoing clusters of multi-unit design and installations prior to the Project design phase, either of the foundations would have a field-tested approach for the inter-array cable and sub-structure interconnection.

4.2.3.4 Dynamic cable configuration design, installation/connection and fatigue study

The dynamic cable configuration design will undergo an installation/connection and fatigue study during the COP development and the design phase.

4.2.3.5 Offshore interconnection and load study

Castle Wind will perform the offshore interconnection and load study based on cable specifications and the site requirements. The study will concentrate on: 1) interconnection between export cable and the floating substation/hub, 2) interconnection between the inter-array cable(s) and the termination/hub, and 3) interconnection at each unit. This work will be performed during the COP development phase and will result in the cables specifications that will be used during the design phase.

4.2.3.6 Planned offshore route for the power cable

The planned route for the offshore power cable is to travel from the southeast corner of the Project area in a generally straight line, while avoiding any sensitive resource or cultural areas, to the existing outflow tunnel entrance (Figure 4) located on the north side of the Morro Rock.

Figure 4 Morro Rock and the Existing Entrance to the Outflow Tunnel

The power cable route will be horizontally directionally drilled offshore to avoid sensitive near-shore areas. The exact export cable route and the approach of securing cable to the ocean floor will be developed during COP preparation based on the subsea conditions determined during SAP implementation. In cases where sensitive or hard-bottom habitat is identified, Castle Wind has the flexibility to route the power cable around any sensitive areas.

4.2.4 Onshore Facilities and Staging Areas

4.2.4.1 Ports

Preliminary analysis developed by the National Renewable Energy Laboratory (specifically for Trident Winds under a Cooperative Agreement put in place in August 2015) of the potential construction and O&M needs indicated that ports of Hueneme, CA (Oxnard) and Long Beach, CA could have the necessary capabilities for the assembly and deployment of the FOWS. Detailed analysis of the actual location for the fabrication, assembly and deployment of the FOWS units will be conducted during the COP development.

Location selection for the final assembly, hull load-out, turbine installation, and future maintenance base will be performed during the COP development as such is dependent on the chosen FOWS components.

The Port of Morro Bay is a working waterfront servicing a vibrant commercial fishing industry that makes up the backbone of the economy of Morro Bay. The local commercial fishing industry is represented by the Morro Bay Commercial Fishermen Organization (MBCFO). The Port is home to a commercial fleet of primarily small-scale family owned operations, two aquaculture businesses, charter vessels that conduct recreational and commercial trips, the only marine construction operator between Santa Cruz and Los Angeles, marine chandlery /marine supplies stores and seafood processing facilities (Morro Bay, 2017).

Though the Port of Morro Bay does not have an adequate staging area for the FOWS assembly and deployment, Castle Wind has committed to set-up its maintenance facility at the Morro Bay harbor as part of its CBA with the City of Morro Bay. The O&M facility will be a source of long-term jobs for the 25-35 year life of the Project.

On October 6, 2018, Castle Wind executed the Fishermen's Agreement, a legally binding mutual benefits agreement to offset any anticipated impacts of the Project and to integrate the Project with local marine related businesses.

A summary of the Fishermen's Agreement can be found in Annex A as it is an integral part of the CBA with the City of Morro Bay.

4.2.4.2 Discharge structure and transmission corridor

Castle Wind plans to reuse the existing, and presently unused infrastructure of the MBPP by using the underground outflow tunnel (Figure 4) to connect the export cable route to connect to the PG&E substation. The distance for the connection to the PG&E Morro Bay substation from the tunnel exit, either underground or overhead, will be approximately 0.06 km (200 feet).

Castle Wind will seek a long-term power purchase agreement with one or more load serving entities, including utilities, community choice aggregators, and other end-users. The initial commercial operation for the project is expected to be in the 2026 timeframe.

5 SCHEDULE OF PROPOSED ACTIVITIES

Since the initial submission of the Request, Castle Wind has been able to significantly de-risk the project by putting in place legally-binding agreements with key local stakeholders and affected parties. These agreements recognize local community concerns and address potential impacts of the project. They also represent broad local support for the project, which will increase the likelihood of success and allow Castle Wind to build the project sooner, making it possible to deliver power to the grid when California needs it under the SB 100 requirements.

Assuming that BOEM holds an auction, and Castle Wind obtains a lease for the Nominated Morro Bay Call Area in Q4 2019 or in Q1 2020, Castle Wind foresees the COD for the Project approximately five to seven years after the date of the auction. There are several factors that could impact the project schedule. Such factors include, but are not limited to:

- Political support at Federal or State levels;
- Affected stakeholders' support for the project (e.g., the Department of Defense (DoD));
- Availability of project financing market at financial close;
- Readiness and availability a sufficient local supply chain, workforce, port infrastructure, etc.

In order for offshore wind to provide a tangible benefit to California is meeting its SB100 targets, Castle Wind could implement measures to accelerate project development and construction activities to a large extent. Such actions would include:

a) Continued active engagement with federal, state, and municipal agencies and key stakeholders, including the DoD, the City of Morro Bay, the local commercial fishing industry, and environmental organizations;
b) Comprehensive consultation with BOEM along the whole project lifecycle, starting at the very beginning (i.e. acceleration of lease process, definition of SAP and COP requirements);
c) Simultaneous preparation of the SAP and the COP;
d) Initiation of relevant market surveys and stakeholder consultations early in the project development phase to improve off-take, interconnection and financing related process cycle;
e) Introduction of EnBW´s comprehensive lessons learned from its offshore wind farms in the German North Sea to improve SAP and COP related processes;
f) Benefitting from EnBW´s vast in-house experience (see Chapter 7) when preparing the best suitable design basis and early stage involvement of major international and upcoming local suppliers;
g) Continued monitoring and improvement of the levelized cost of energy (LCOE) through early involvement of EnBW's inhouse O&M team;
h) Development and support of the local supply chain in a rational and economical way

By implementing the above-mentioned optimized work flow, Castle Wind's preliminary schedule will be as follows:

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Table 2 Preliminary Schedule for Proposed Project (with the optimized work flow)

Project milestone	Date
Lease effective date	Q1 2020
Submission of SAP to BOEM	Q4 2020
Approval of SAP by BOEM	Q4 2020
Submission of COP to BOEM	Q4 2022
Approval of COP by BOEM	Q2 2023
Completion of PPA and Interconnection agreement	Q2 2020-Q3 2023
Achievement of financial close	Q4 2023
Start of construction and commissioning	Q4 2024
Commercial Operation Date (2 years construction cycle)	**Q4 2026**

A more detailed scope of work and the associated schedule will be developed after the lease auction and will include any necessary specifics to address the needs of stakeholders (e.g. federal, DoD, state, local agencies, CAISO) as appropriate with the goal of achieving the COD in 2026 time frame.

6 RENEWABLE ENERGY RESOURCES AND ENVIRONMENTAL CONDITIONS

6.1 SCREENING PROCESS USED TO SELECT NOMINATION AREA

Castle Wind has followed a systematic effort to select the Nomination Call Area. Castle Wind based the selection process on applying a number of filters that eventually led to the Nominated Call Area. Specifically, the selection process started with a wind resource assessment, followed by the availability of an existing substation and interconnection to the CAISO transmission grid, and the local infrastructure capabilities/constrains. In particular, the Call Area selection was based on the following approach:

- Assessment of wind resources, metocean conditions, and sea floor profile;
- Assessment of the available on-shore infrastructure and proximity to existing interconnection facilities and minimal need for development and construction of new, land-based transmission lines and facilities;
- Assessment of environmental conditions and conflicting uses of space;
- Consultation with the Department of Defense; and
- Consultation with local stakeholders, including the commercial fishing industry and the City of Morro Bay.

The Project's COP will include the results of site characterization surveys and describe all the activities associated with installation and operation of the wind farm, maintenance, and decommissioning. The activities associated with siting, installing, operating, and removing the system will be integrated in time and space with potential environmental effects, ensuring that the federal and state permitting processes accurately reflect the activities and potential risks in a realistic manner.

6.2 OFFSHORE RESOURCES – WIND, METOCEAN, SEA FLOOR

Castle Wind's wind assessment was based on California's wind data that was compiled by NREL specifically for Trident Winds under a Cooperative Agreement put in place in August 2015. Though the assessment indicated that the strongest wind resources are present in Northern California, that area lacks transmission lines suitable for delivering Gigawatts of energy to the CAISO backbone.

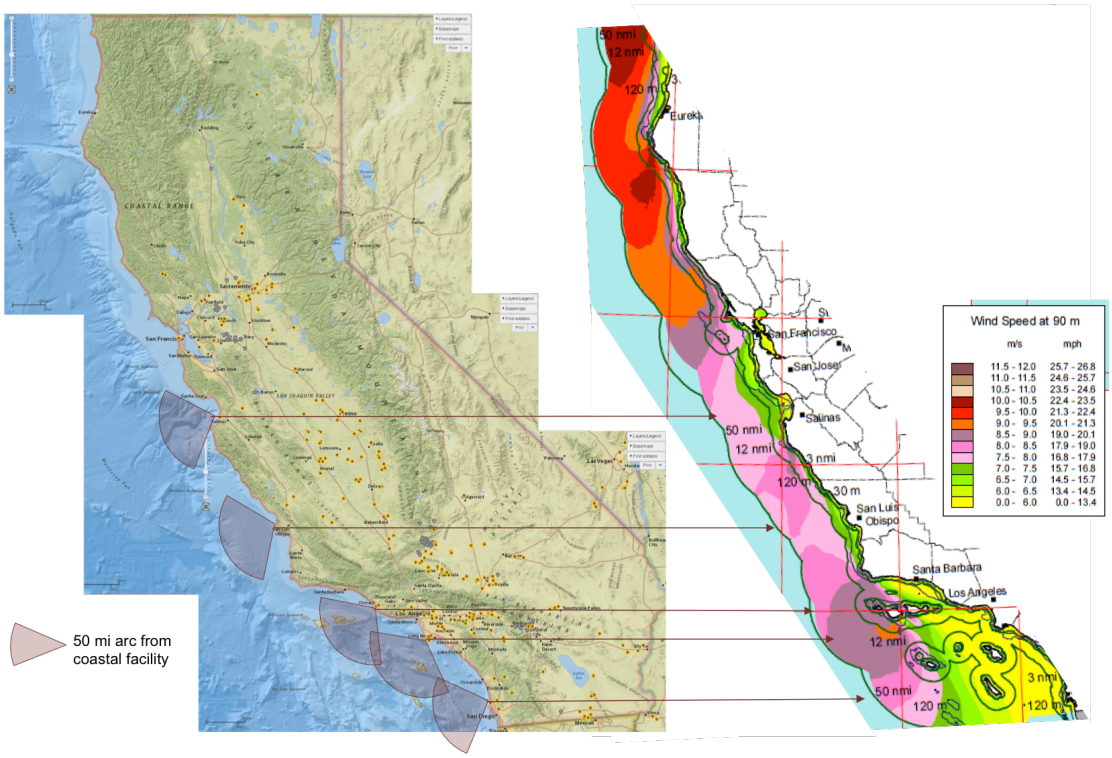
Elimination of the northern California locations was then followed by a closer look at Central California coast, with a specific focus on areas that meet a criterion of greater than 8.5 m/sec wind regime. The Nominated Morro Bay Call Area meets that criteria.

NREL first estimated the offshore wind resources of the United States in 2003 (Musial and Butterfield, NREL, 2004). Since then, updated offshore wind mapping projects (Elliott and Schwartz, 2006) are gradually being completed. Wind speed maps for California were available at heights of 50 m and 70 m off the coast in California. To calculate wind speeds at 90 m height, it was assumed that the speed shear exponent calculated between heights of 50 m and 70 m was also valid for wind speeds between at the heights of 70 m and 90 m (Elliott et al. 1987; NREL 2010). Table 3 shows the estimated wind speeds at different distances from shore based on these calculations.

NREL Wind Prospector (NREL, 2015) was used along with the ODAS buoy 46028 data to further refine the expected wind resource at the Nominated area.

Castle Wind examined nautical charts featuring the Morro Bay Call Area and relied on the expertise of the City of Morro Bay staff and consultations with local experts, including representatives of the MBCFO and NOAA, to determine the viability of the Project area. In addition, Castle Wind reviewed the California Marine Maps (OCMP 2013) and Multi-Purpose Marine Cadastre (BOEM 2013) and consulted the staff of the California Coastal Commission. After these consultations, and because the floating foundations can be secured in various water depths and sea bottom conditions, Castle Wind is confident in nominating the Morro Bay Call Area.

Figure 5 Central California potential sites



6.3 On-Shore Infrastructure

The Nominated Morro Bay Call Area offers a proximity to coastal thermal plant that were shut down as a result of Once-Through Cooling regulations (Figure 5). Out of the seventeen coastal sites with retired generation facilities, Castle Wind selected the Morro Bay location. Trident submitted the Request that is now being pursued by Castle Wind. Castle Wind nominates the entire Morro Bay Call Area.

6.4 Environmental Resources

Pacific Northwest National Laboratory (PNNL) examined studies of biological resources in the coastal and marine environments of northern California, California, and Washington for the *Updated Summary of Knowledge: Selected Areas of the Pacific Coast* (Kaplan et al. 2010). This report also contains information on oceanography, geology, cultural, and socioeconomic resources that cover the area of interest for the seabed lease.

Drawing from the 2014 report (Feinberg, L. 2014), Castle Wind examined and identified the issues that will likely drive the environmental permitting process and has initiated discussions with the key federal and state regulatory and resource agencies, as well as with important stakeholder groups. The baseline and post-installation monitoring are expected to address the present uncertainty of impacts to seabirds and marine mammals that stems from lack of data on species distribution. The Project, once in operation, will offer the ability to collect data previously unobtainable, as the installed floating OSW systems may be used as monitoring stations.

Table 3 California Offshore Wind Resource by Wind Speed Interval, Water Depth, and Distance from Shore within 50 nm of Shore (DOE EERE, 2015)

	Distance from Shore (nm)								
	0 - 3			3 - 12			12 - 50		
Depth Category	**Shallow (0 - 30 m)**	**Transitional (30 - 60 m)**	**Deep (> 60 m)**	**Shallow (0 - 30 m)**	**Transitional (30 - 60 m)**	**Deep (> 60 m)**	**Shallow (0 - 30 m)**	**Transitional (30 - 60 m)**	**Deep (> 60 m)**
90 m Wind Speed Interval (m/s)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)	Area km^2 (MW)
7.0 - 7.5	266 (1,331)	236 (1,181)	257 (1,287)	101 (504)	457 (2,284)	4,554 (22,770)	8 (38)	23 (115)	5,537 (27,684)
7.5 - 8.0	239 (1,196)	257 (1,285)	190 (948)	79 (394)	596 (2,978)	3,855 (19,273)	0 (0)	33 (165)	19,616 (98,080)
8.0 - 8.5	125 (626)	178 (891)	282 (1,409)	7 (36)	106 (529)	4,539 (22,695)	0 (0)	0 (0)	17,822 (89,111)
8.5 - 9.0	43 (216)	142 (708)	176 (882)	1 (3)	38 (190)	4,560 (22,799)	0 (0)	0 (0)	17,892 (89,460)
9.0 - 9.5	2 (10)	19 (94)	15 (74)	0 (0)	1 (4)	988 (4,940)	0 (0)	0 (0)	12,160 (60,801)
9.5 - 10.0	0 (0)	6 (30)	14 (69)	0 (0)	0 (0)	656 (3,280)	0 (0)	0 (0)	14,555 (72,774)
>10.0	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)	288 (1,441)	0 (0)	0 (0)	6,638 (33,188)
Total >7.0	676 (3,379)	838 (4,189)	187 (937)	187 (937)	1,197 (5,985)	19,440 (97,198)	8 (38)	56 (279)	94,220 (471,098)

nm = nautical miles
m = meters
m/s = meters per second
km^2 = square kilometers
MW = megawatts

6.4.1 Marine geology

Topography in this area includes the Santa Lucia Bank, Santa Lucia Escarpment, the Arguello Canyon, and the Rodriguez Seamount. The complex topography is the result of the meeting place of three major tectonic plates: the Farallon Plate, the North American Plate, and the Pacific Plate. The Santa Lucia Bank is a cetaceous uplift block that rises to within 400 meters of the surface from the north face of the Arguello Canyon to offshore Morro Bay (from about latitude 35˚27'N to 33˚51'N). The Arguello Canyon runs in a northeast to southwest direction, and is approximately 3,000 meters deep. The Rodriguez Seamount, a volcanic geological formation, is about 90 miles offshore in the southern area of the opening of the Arguello Canyon.

The unique oceanographic combination of the mile-deep canyon and current conditions leading to persistent upwelling flows create the favorable conditions for diverse density of sea life. Flora and fauna of the area are associated with two distinct oceanographic and climatic provinces: the habitat is the southern boundary of the range for many northern species, and the northern boundary for southern species. The Santa Lucia Bank area is frequently visited year-round by cetaceans, hosts numerous fish species in the area that are important for commercial harvests, and supports a diverse benthic community. Further research is needed to study the number of bird and fish species found at the Santa Lucia Bank during different seasons.

6.4.2 Marine biological resources

6.4.2.1 Threatened and endangered species

A number of species that are listed as threatened or endangered under the federal Endangered Species Act may occur in the project area. Listed species and designated Critical Habitat are under the jurisdiction of either the USFWS or NOAA National Marine Fisheries. Table 4 and Table 5 show federally listed threatened and endangered species that may occur in San Luis Obispo County.

Table 4 Threatened and Endangered Species for San Luis Obispo County under USFWS Jurisdiction

Species	Scientific Name	Status	Range
Marbled murrelet	*Brachyramphus marmoratus*	Threatened	Known to occur in California, Oregon, and Washington.
Western snowy (coastal) plover	*Charadrius alexandrinus nivosus*	Critical Habitat Threatened	Known or believed to occur in California, Oregon, and Washington. Critical Habitat designated in Morro Bay Beach.
Short-tailed albatross	*Phoebastria albatrus*	Endangered	Known to or is believed to occur in Alaska, California, Hawaii, Oregon, Washington.
Loggerhead sea turtle	*Caretta*	Endangered	See Table 4
Green sea turtle	*Chelonia mydas*	Threatened	See Table 4
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	See Table 4
Olive (Pacific) Ridley sea turtle	*Lepidochelys olivacea*	Threatened	See Table 4

Source: USFWS 2015

Table 5 Endangered and Threatened Species under NOAA Fisheries Jurisdiction

Species	Scientific Name	Status	Critical Habitat Designation	Recovery Plan	Range
Marine Mammals					
Blue whale	*Balaenoptera musculus*	Endangered	n/a	final	In the North Pacific Ocean, the blue whale's range extends from Kamchatka to southern Japan in the west and from the Gulf of Alaska and California south to Costa Rica in the east. They occur primarily south of the Aleutian Islands and the Bering Sea.
Fin whale	*Balaenoptera physalus*	Endangered	n/a	final	Fin whales are found in deep, offshore waters of all major oceans, primarily in temperate to polar latitudes, and less commonly in the tropics
Gray whale, Western North Pacific DPS	*Eschrichtius robustus*	Endangered	n/a	n/a	Gray whales are found mainly in shallow coastal waters in the North Pacific Ocean. The California coast is part of the Eastern North Pacific gray whale migratory route between Baja California and the Arctic.
Humpback whale	*Megaptera novaeangliae*	Endangered	n/a	final	Humpback whales live in all major oceans from the equator to sub-polar latitudes.
Right whale, North Pacific original listing as "northern right whale"	*Eubalaena japonica*	Endangered	Final	no	North Pacific right whales inhabit the Pacific Ocean, particularly between 20° and 60° latitude. Sightings have been reported as far south as central Baja California in the eastern North Pacific
Southern sea otter	*Enhydra lutris nereis*	Threatened	n/a	final	The southern sea otter ranges along the mainland coastline from San Mateo County to Santa Barbara County and San Nicolas Island, Ventura County.

Species	Scientific Name	Status	Critical Habitat Designation	Recovery Plan	Range
Sea Turtles **Note: USFWS has lead responsibility on nesting beaches, NMFS in marine waters**					
Loggerhead turtle, North Pacific Ocean DPS	*Caretta caretta*	Endangered	n/a	n/a	In the eastern Pacific, loggerheads have been reported as far north as Alaska, and as far south as Chile. In the U.S., majority of recorded sightings are of juveniles off the coast of California.
Leatherback turtle	*Dermochelys coriacea*	Endangered	final	final	Leatherbacks are commonly known as pelagic (open ocean) animals, but they also forage in coastal waters. In fact, leatherbacks are the most migratory and wide ranging of sea turtle species.
Green turtle	*Chelonia mydas*	Threatened	final	final	In the eastern North Pacific, green turtles have been sighted from Baja California to southern Alaska, but most commonly occur from San Diego south.
Olive ridley turtle	*Lepidochelys olivacea*	Threatened	n/a	final	This species does not nest in the United States, but during feeding migrations, olive ridley turtles nesting in the East Pacific may disperse into waters off the US Pacific coast as far north as Oregon.
Marine and Anadromous Fish					
Chinook salmon, California Coastal ESU	*Oncorhynchus tshawytscha*	Threatened	final	draft	Chinook salmon are found from the Bering Strait in Alaska to Southern California. California Coastal Chinook salmon includes all-natural spawned populations of Chinook salmon from rivers and streams between the Klamath River in Humboldt County to the Russian River in Sonoma County, California.
Chinook salmon, Central Valley spring-run ESU	*Oncorhynchus tshawytscha*	Threatened	final	final	Chinook salmon are found from the Bering Strait in Alaska to Southern California. Central Valley Chinook salmon current spawn in several tributaries to the Sacramento River, and are confined below the dams.

Species	Scientific Name	Status	Critical Habitat Designation	Recovery Plan	Range
Chinook salmon, Sacramento River winter-run ESU	*Oncorhynchus tshawytscha*	Endangered	final	final	Chinook salmon are found from the Bering Strait in Alaska to Southern California. The Sacramento River winter-run Chinook salmon current spawn in the Sacramento River downstream of the Shasta Dam.
Coho salmon, Central California coast ESU	*Oncorhynchus kisutch*	Endangered	final	final	Coho salmon are historically distributed throughout the North Pacific Ocean from central California to Point Hope, Alaska, through the Aleutian Islands, south to Hokkaido, Japan. The Central California Coast coho salmon range from Punta Gorda in Humboldt County south to Aptos Creek in Santa Cruz County.
Coho salmon, Southern Oregon/ Northern California Coasts ESU	*Oncorhynchus kisutch*	Threatened	final	final	The species was historically distributed throughout the North Pacific Ocean from central California to Point Hope, Alaska, through the Aleutian Islands, south to Hokkaido, Japan. Coho probably inhabited most coastal streams in Washington, Oregon, and central and northern California.
Steelhead, Central California Coast DPS	*Oncorhynchus mykiss*	Threatened	final	draft	In the U.S., steelhead are found along the entire Pacific Coast, and may use the waters along the entire coast during their oceanic residence. The Central California Coast steelhead spawn in rivers and streams around San Francisco Bay, from the Upper Russian River to the Guadalupe River.
Steelhead, Southern California DPS	*Oncorhynchus mykiss*	Endangered	final	final	In the U.S., steelhead are found along the entire Pacific Coast, and may use the waters along the entire coast during their oceanic residence. The Southern California steelhead spawn in the Santa Maria, Santa Ynez, Ventura, and Santa Clara Rivers and their associated tributaries in southern California.
Steelhead, Northern California DPS	*Oncorhynchus mykiss*	Threatened	final	draft	In the U.S., steelhead are found along the entire Pacific Coast, and may use the waters along the entire coast during their oceanic residence. The Northern California steelhead spawn in rivers and streams along the California coast from Redwood Creek to Gualala River.

Species	Scientific Name	Status	Critical Habitat Designation	Recovery Plan	Range
Steelhead, South/Central California Coast DPS	*Oncorhynchus mykiss*	Threatened	final	final	In the U.S., steelhead are found along the entire Pacific Coast, and may use the waters along the entire coast during their oceanic residence. The South-Central California Coast steelhead spawn in the Pajaro, Salinas, Carmel, Little Sur, and Big Sur Rivers and their tributaries.
Steelhead, California Central Valley DPS	*Oncorhynchus mykiss*	Threatened	final	final	In the U.S., steelhead are found along the entire Pacific Coast, and may use the waters along the entire coast during their oceanic residence. The Central Valley steelhead current spawn in tributaries to the Sacramento and San Joaquin rivers, confined below river dams.
Green sturgeon, Southern DPS	*Acipenser medirostris*	Threatened	final	in process	The critical habitat for the green sturgeon includes nearshore oceanic waters, bays, and estuaries from San Francisco north to Washington. The green sturgeon ranges from Mexico to at least Alaska in marine waters, and is observed in bays and estuaries up and down the west coast of North America
Marine Invertebrates					
Black abalone	*Haliotis cracherodii*	Endangered	final	final	Approximately 360 square kilometers of rocky intertidal and subtidal habitat within five segments of the California coast between the Del Mar Landing Ecological Reserve to the Palos Verdes Peninsula, as well as on the Farallon Islands, Año Nuevo Island, San Miguel Island, Santa Rosa Island, Santa Cruz Island, Anacapa Island, Santa Barbara Island, and Santa Catalina Island. Black abalone range from about Point Arena, CA, to Bahia Tortugas and Isla Guadalupe, Mexico. Black abalone are rare north of San Francisco and south of Punta Eugenia.

Source: NOAA Fisheries 2015.

6.4.2.2 Avian resources

The central California coast supports many habitats for a variety of avian species. The Morro Bay Wildlife Area provides a coastal estuary habitat where eelgrass and mud flats provide feeding areas for migrant and wintering shorebirds and waterfowl. Thousands of shorebirds utilize this estuary, including godwits, sandpipers, and grebes. Morro Bay also provides rocky shoreline habitat for nesting and wintering shorebirds, such as herons, cormorants, pigeon guillemots, black oystercatchers, black turnstones, and surfbirds. Other birds are commonly seen flying along the coast, including pelicans and gulls. Morro Rock is also a known location of a peregrine falcon roost. There are relatively few data on bird populations 26 nm off the coast of Morro Bay, in the vicinity of the nomination area.

Several species of bats occur in San Luis Obispo County. To date no studies have been done on bats' use of the ocean areas off the California coast. A study in Sweden showed that many species of bats hunt for insects in offshore areas. They have also been found to use offshore turbines for roosting (Ahlen et al. 2007). Bat studies on the West Coast indicate that bats may use the offshore areas when an offshore location (such as an island) guides them (Tenaza 1966; Cryan & Brown 2007).

6.4.2.3 Benthic habitat

The California seafloor is structurally complex and geographically variable. It can be divided into a variety of habitats, each with unique physical and biological characteristics. Mud can be a more pronounced bottom type in areas receiving less energy from water movement (i.e., isolated and sheltered embayments) and in deeper waters. Subtidal, soft-bottom habitats are diverse, as a result of distinct organism assemblages that are influenced by differences in substrate type (sand versus mud), organic content, and bottom depth. Although the California Seafloor Mapping Program is creating a comprehensive coastal/marine geologic and habitat base map series for all of California's State waters, the maps offshore of Morro Bay have not yet been published (Golden 2013) and is therefore not well described. According to the USGS SEABED Interactive Map, the substrate in the nearshore habitat near Morro bay is composed of sand and a mixture of clay and silt (USGS 2015). Further offshore, the substrate becomes finer, and is composed of clay and a silty clay (USGS 2015).

Species associated with soft–bottom, subtidal habitats provide a spectrum of ecosystem services. Most widespread but least apparent would be nutrient cycling by deposit feeders and microbes living within the sediments. Soft-bottom communities are commonly named or described based on the species or species groups that are most apparent. Most of these communities are dominated by burrowing invertebrates such as polychaete worms; but other organisms, such as crustaceans, echinoderms, and mollusks, may be locally abundant. Common organisms on the sediment surface can include species of shrimp, crabs, snails, bivalves, sea cucumbers, and sand dollars. Dungeness crabs are important components of sandy-bottom communities and are found both on the surface and buried in the sand. Sea pens are common on more muddy bottoms.

6.4.2.4 Rocky Reefs

Rocky reef habitat is designated as a Habitat Area of Particular Concern by the National Marine Fisheries Service (NMFS) for its importance as Essential Fish Habitat and its rarity, sensitivity, and/ or vulnerability (Oceana 2011). A large, deep rocky reef, approximately 87 miles long and 10 miles wide, is located approximately 35 miles west of Morro Bay and a smaller rocky reef, approximately 12 miles long and 2 miles wide, is located 28 miles southwest of Morro Bay (NMFS 2015).

Ecotypes of rocky subtidal habitats include:

- Shallow rocky reefs [less than 80 feet (25-meter depth)] with kelp beds,
- Shallow rocky reefs [less than 80 feet (25-meter depth)] without kelp beds,
- Deep rocky reefs [greater than 80 feet (25-meter depth)], and

- Subtidal artificial substrate (Oceana 2011).

Subtidal rocky reefs are known for their abundant and diverse biological communities. Habitat-forming organisms, such as kelp or large invertebrates, grow attached to the reef substrate, providing additional structures and types of microhabitats used by reef species. Biological communities using reefs include algae and other marine plants, attached and mobile invertebrates, fish, marine mammals, and sea birds. Many reefs have extensive growths of attached invertebrates, often covering nearly every square inch of rock surface. Common types of organisms include sponges, anemones, barnacles, bryozoans, tunicates, and coldwater corals. The rocks, algae, and attached invertebrates provide homes for a variety of mobile invertebrates such as crabs, snails, sea stars, urchins, brittle stars, nudibranchs, chitons, and worms. Free-swimming invertebrates, such as shrimps, and drifting (planktonic) invertebrates also are common on reefs. Reef fish include the more familiar types such as rockfish, perch, lingcod, and greenlings, and a large variety of smaller sculpins, gunnels, poachers, and blennies, among others. Many fish species are entirely dependent on reefs for parts of their life cycle, while others are visitors. Common visitors include herring, smelt, sharks, ratfish, and salmon. Marine mammals, especially seals and sea lions, and seabirds often feed on the abundant fish and invertebrates on rocky reefs.

The benthic habitat and rocky reef provide food and refuge to a great diversity of fishes, invertebrates, and other marine life off the coast of California (Whiteman et al. 2013).

6.4.2.5 Fish species and Essential Fish Habitat

Essential Fish Habitat (EFH) is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (NMFS 2004). NOAA further clarified the terms associated with EFH (50 CFR 600.05 through 600.930) by the following definitions:

- Waters – Aquatic areas and their associated physical, chemical, and biological properties that are used by fish and, where appropriate, may include aquatic areas historically used by fish;
- Substrate – Sediments, hard bottoms, structures underlying the waters, and associated biological communities;
- Necessary – The habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and
- Spawning, breeding, feeding, or growth to maturity – Stages representing a species' full life cycle.

The Pacific Fishery Management Council (PFMC) manages four groups of species (i.e., Fishery Management Units) that occur along the California coast and have designated EFH: Pacific coast groundfish, Pacific coastal pelagic species, Pacific salmon, and Pacific highly migratory species.

There are over 90 species of Pacific Coast groundfish that are segregated into four general categories; 1) sharks, skates, chimaeras; 2) roundfish; 3) rockfish; and 4) flatfish. Many of the Pacific Coast groundfish species use a portion of the project area for all or a portion of their life cycle. EFH for groundfish is designated along the entire continental shelf in the project vicinity and includes all waters from the high tide line (and parts of estuaries) to 1,914 fathoms (3,500 meters) in depth. The rocky reefs to the west and southwest of Morro Bay are designated as Habitat Arears of Particular Concern, which are discrete subsets of EFH that provide extremely important ecological functions or are especially vulnerable to degradation (BOEM 2013).

The coastal pelagic species (CPS) fishery includes four finfish (Pacific sardine, Pacific [chub] mackerel, northern anchovy, and jack mackerel), and market squid. CPS finfish generally live nearer to the surface than the sea floor. The definition of EFH for CPS is based on the temperature range where they are found and on the geographic area where they occur at any life stage. This range varies widely according to ocean temperatures. The EFH for CPS also takes into account where these species have been found in the past and where they may be found in the future (PFMC 2012). The east-west boundary of CPS EFH includes all marine and estuary waters from the coasts of California, Oregon, and Washington to the limits of the exclusive economic zone (the 200-mile limit) and above the thermocline where sea surface temperatures range between 10° and 26° C (PFMC 2012).

Pacific salmonids are anadromous, meaning the salmon spend the majority of their life in saltwater, but spawn in freshwater. Salmonid populations are separated into evolutionarily significant units (ESUs) and the populations are evaluated based on historical returns to determine if the population is in decline or is healthy. Pacific salmon ESUs include Chinook salmon, chum salmon, coho salmon, pink salmon, sockeye salmon, and steelhead. Salmon range from more than 1,000 miles (1,600 km) inland to thousands of miles out at sea. In estuaries and marine areas, salmon habitat extends from the shoreline to the 200-mile limit of the exclusive economic zone and beyond (PFMC 2012).

Highly migratory and schooling species are typical of the waters and biological communities living in the water column over the continental shelf. Defining EFH for highly mobile species such as tuna, swordfish, and sharks is a challenging task as these species range widely in the ocean, both in terms of area and depth. Highly migratory species are usually not associated with the features that are typically considered fish habitat (such as seagrass beds, rocky bottoms, or estuaries). Their habitat may be defined by temperature ranges, salinity, oxygen levels, currents, shelf edges, and seamounts (PFMC 2012).

6.4.2.6 Skates

Several species of skates live along the California coast, including the big skate, longnose skate, and thornback skate (CDFW 2015). The warmer waters of California also include rays, such as the bat ray and the Pacific electric ray (CDFW 2015).

6.4.2.7 Marine mammals

At least 30 different species of marine mammals occur along the California coastal waters, including many cetaceans (whales, dolphins, and porpoises) and pinnipeds (Daugherty 1972). Six species of pinnipeds frequent the California mainland and Channel Islands for breeding and/or resting. These include Guadalupe fur seals, Northern (Alaska) fur seals, Steller sea lions, California sea lions, northern elephant seals, and Pacific harbor seals (Daugherty 1972). The California coast also hosts the southern sea otter (Daugherty 1972).

6.4.3 Physical oceanography and meteorology

The California Current System, which comprises the California Current, the Davidson Current, and the California Undercurrent, drives the general ocean current system along the California coast. The California Current is a surface current that flows toward the equator along the entire West Coast of the United States between the shelf break and 540 nautical miles (1,000 km) offshore. The Davidson Current is a seasonal surface current that manifests itself as a poleward-flowing countercurrent to the California Current during the fall and winter months over the continental slope and shelf. The California Undercurrent is a poleward subsurface flow that follows the continental slope. Since currents are strongly influenced by wind-stress, demonstrating a seasonal variability. During the spring/summer, strong upwelling-favorable winds drive the currents toward the equator along the California and Oregon coasts while flow is driven by a sea surface pressure gradient toward the equator off the Washington coast (Kaplan et al. 2010). The result is high production of phytoplankton from April through September fueled by a nearly continuous supply of nutrients and concomitant high biomass of zooplankton during summer (NWFSC 2013). During the winter months off the California and Oregon coasts, the upwelling-favorable winds "relax" and allow a sea surface pressure gradient to drive the flow toward the poles (Kaplan et al. 2010). Episodic phenomenon such as the Pacific Decadal Oscillation and ENSO can interrupt and/or intensify currents and upwelling (Kaplan et al. 2010).

The coastal zone is characterized by wet winters, relatively dry summers, and mild temperatures throughout the year. Occasional strong winds strike the California Coast, usually in advance of winter storms. Wind speeds can exceed hurricane force. Such events are typically short-lived, lasting less than one day. Annual precipitation totals in excess of 50 inches per year are characteristic of the west slope of the Sierra Nevada north of Stockton, the west slope of the Coast Range from Monterey County northward, and parts of the Cascades (Western Regional Climate Center 2015). Exceptions to this include the Monterey Bay area parts of the San Francisco Bay area, where totals decrease to about 20 inches (Western Regional Climate Center 2015). Southern California receives much less precipitation, averaging less than 15 inches per year in most counties (Western Regional Climate Center).

6.4.4 Geology – terrestrial

No onshore areas would be included in the area requested for lease. The following description of terrestrial geology is included only for background information.

Morro Bay is located along the central California coast and the southern portion of the northwest trending Coast Range. Morro Bay and Estero Bay are located along the Franciscan Formation, a geologic formation that is described as a mix of oceanic and terrestrial rocks, with characteristic marine sandstone, volcanic rocks, and serpentine rocks making up the Coast Range. The coastal areas of Morro Bay are overlaid with marine sediments, sandstone, and sediment from higher elevations delivered to the ocean by creeks throughout the watershed. The alluvial deposits form mud flats at the mouth of Morro Creek in Morro Bay. Morro Rock is a 581-foot-high sea stack and is the dominant geologic feature of the city. It is one of several volcanic plugs in the area which extend about twenty miles southeast from Morro Rock (Shaw 2007).

6.4.5 Air quality

The central California coast enjoys good air quality due to the proximity to the ocean, lack of large pollution producers, and prevailing winds. The San Luis Obispo Air Pollution Control District reports annually on the air quality throughout the county and notes any exceedances of air quality standards. An air quality monitoring station is maintained in Morro Bay where nitrogen dioxide (NO2) and ozone (O3) are monitored, in addition to recording wind speed and direction. Little is known about the air quality in the open ocean at the proposed lease site; no known sources of contamination are likely to degrade air quality in the area.

Air quality indices (AQIs) are numbers used by government agencies to characterize the quality of the air at a given location. As the AQI increases, an increasingly large percentage of the population is likely to experience increasingly severe adverse health effects. Air quality index values are divided into ranges, and each range is assigned a descriptor and a color code. Standardized public health advisories are associated with each AQI range. The AQI for Morro Bay in 2015 showed that no air pollutants were rated as unhealthy or hazardous. Levels of ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, PM2.5 (particles of 2.5 micrometers or less), and PM10 (particles of 10 micrometers or less) were rated "good" (Homefacts 2015).

6.4.6 Water quality

6.4.6.1 Pollutants

Marine pollutants along the western coast of the US in the Pacific Ocean include oil, sewage, garbage, chemicals, radioactive waste, thermal pollution, and eutrophication. No data on these pollutants were found for the offshore project vicinity.

The San Luis Obispo County Environmental Health Services Department collects ocean water samples at eighteen locations along the coast on a weekly basis, including one location at Morro Bay City Beach. California has established standards for bacteria present at beaches, and the samples taken within the county are compared against these standards. A Health Advisory is issued if standards are exceeded. Beaches can be closed when health risks due to bacteria levels, hazardous waste spills, or untreated sewage impacts recreational waters (San Luis Obispo County 2015).

The Morro Bay watershed consists of two tributaries, Chorro Creek and Los Osos Creek, which combined cover approximately 76 square miles of San Luis Obispo County. Land uses include ranchland, brushland, urban areas, agriculture, and woodland. Environmental concerns within the watershed include sedimentation in Morro Bay, elevated amounts of pathogens and nutrients, and reduced amounts of dissolved oxygen. The California Central Coast Regional Water Quality Board and the US Environmental Protection Agency approved four Total Maximum Daily Load (TMDL) designations for the watershed to address environmental concerns. The TMDLS include (EPA 2015):

- Morro Bay Sediment TMDL, covering Chorro Creek, Los Osos Creek and the Morro bay Estuary (approved January 2004)
- Morro Bay Pathogen TMDL, covering Chorro Creek and Los Osos Creek, and the Morro Bay Estuary (January 2004)
- Chorro Creek Nutrients and Dissolved Oxygen TMDL (July 2007)
- Los Osos Creek, Warden Creek and Warden Lake Wetland Nutrient TMDL (March 2005)

6.4.6.2 Water column characteristics

An assessment of the status of the ecological condition of soft sediment habitats and overlying waters along the western United States continental shelf, between the target depths of 30 and 120 m (90 and 360 feet), was conducted during June 2003 (Nelson et al. 2008). The assessment included vertical water-column profiles of conductivity, temperature, chlorophyll a concentration, transmissivity, dissolved oxygen, and depth. Results showed that surface salinity was generally less than 33 practical salinity units (psu) to the north of Cape Blanco, Oregon, and greater than 33 psu to the south of Cape Blanco. Mean surface water temperature of California marine waters was approximately 59 F (15°C). The range of dissolved oxygen concentrations in the surface waters of the West Coast shelf (data available for 140 stations) was 4.1 milligrams per liter (mg/L) to 13.3 mg/L with lower values observed in California compared to Oregon and Washington. US EPA proposed that a dissolved oxygen value below 2.3 mg/L is harmful to the survival and growth of marine animals. Water-column stratification was reduced in the central California region, likely due to high winds inducing upwelling. Total suspended solids in surface waters of the West Coast Shelf ranged from 0 to 10 mg/L (137 stations with data available). The characteristics of the open ocean area of the proposed project are expected to be similar to those seen at the deeper site examined.

6.4.7 Noise

Natural noise sources in the offshore and onshore areas include wind, waves, birds, and other wildlife. Human-caused noise sources offshore include ship motors and horns and aircraft. Onshore noise sources include motor vehicles, aircraft, construction equipment, and industrial activity.

6.4.8 Visual Resources

Visual resources for the coastal area inshore of the proposed Project site include scenic views from popular viewpoints near Morro Bay including Morro Rock, Point Estero, Hearst Castle and the Piedras Blancas Light Station. Public parks on, or near Morro Bay, along the coastal bluffs, and mountain foothills are popular sites for observing scenery, whales, seals, other marine life, and birds. Natural elements of the viewscape include the shoreline, Morro Rock, and the open ocean.

Viewsheds from seaside residences are of particular concern in analyzing potential visual impacts of offshore energy structures (Norman et al. 2006). The Nominated Call Area is due West from Hearst Castle, a National Historic Landmark and California Historical Landmark mansion located in San Simeon.

Castle Wind contracted DNV GL to perform visual simulations to predict the viewshed with wind turbines in the Nomination area from Hearst Castle (35.6852° N, 121.1682° W).

DNV GL prepared visual simulations by using WindFarm 4.2.5 software to create a technical drawing (also called wireframe) of the topography and horizon, with wind turbine locations as seen from the given viewpoint. Terrain was modelled using digital elevation data (10 m resolution, National Elevation Dataset), and wind turbine outlines representing the chosen wind turbine dimensions were inserted in their corresponding locations.

The selected turbine dimensions were 150 m hub height and 220 m rotor diameter, which represents the GE 12 MW offshore turbine prototype, currently touted as the world's largest wind turbine.

The ocean views imagery provided to Castle Wind under a contract with the California State Parks that manages Hearst Castle, were then superimposed on top of the wireframe by entering all the applicable modelling parameters, such as viewpoint coordinates, orientation relative to true north, horizontal included view angle, vertical pitch angle, and clockwise or counter-clockwise rotation angle of the photograph if necessary.

Accuracy of the physical and optical parameters was ensured by reviewing the meta data and specifications of each photograph or camera model and comparing the visible features within the photo with recent aerial imagery. These methods have been field validated and have been used by DNV GL for performing visual simulations for many wind projects in North America.

The wireframe turbine outlines were then rendered by the software to create a more realistic wind turbine appearance. Three turbine rendering scenarios were implemented:

- Clear sky
- Foggy sky near the turbines (simulated)
- Night time with red aviation lights activated on all turbines

This option required a digitally darkened version of the original photograph to simulate night sky. No night time photo was taken.

Simulation of aviation lights on wind turbines carries with it some inherent additional uncertainty due to the difficulty of digitally simulating light intensity accurately on photographs. This option can be considered an indicative representation of the night time visual impact of the project and can be considered a conservative estimation.

A final visual simulation illustrating all potential turbines visible in the given photograph was rendered and exported as an image for the three rendering scenarios listed above. The images were then edited in GIMP photo editing software to create a final, polished simulation.

Visibility statistics were provided to DNV GL, as recorded by the Morro Bay Harbourmaster's Office, between early 2017 and mid-2018, tabulated on a monthly basis.

The results of the simulations indicate that a minimum visibility distance of 10 miles or more occurs only a fraction of the time in the Nominated Call Area (between 7% and 52% depending on the month, resulting in an annual average of under 25%). Since the Project will be located more than 26 miles from shore, the visibeality in clear sky conditions will occur even less frequently.

Therefore, the proposed Project site will rarely be visible from onshore locations such as Hearst Castle and the Piedras Blancas Light Station, given the site's distance from shore and the area's typical weather conditions.

6.5 MARINE TRANSPORTATION AND COMMERCE

Morro Bay Harbor supports recreational and commercial vessel traffic. Commercial traffic includes commercial fishing vessels, for which the city maintains 50 slips in the harbor. Other main ports along the central California coast are Monterey, Santa Barbara, Oxnard, and Los Angeles, California. The majority of commercial vessel traffic along the central California coast is further offshore from Morro Bay and the Morro Bay Call Area (BOEM 2015).

6.6 Military and Coast Guard Operations

The Nomination Area includes portions of DoD operating areas, including Warning Areas W-532 and W-285. W-532 is part of the Point Mugu Sea Range, which is used extensively for testing of weapons systems and training, including live fire activities. W-285 is used primarily for training. The BOEM call describes potential impacts on the military mission in the Morro Bay Call Area as follows:

> *Interested parties should also be aware that the Morro Bay and Diablo Canyon Call Areas on the central coast contain OCS blocks that have been assessed as incompatible with wind energy development by DoD. DoD is currently reviewing additional detailed project information supplied by the offshore wind energy industry to determine if any of the areas previously identified by DoD as incompatible in the Morro Bay Call Area may be identified as compatible after further analyses.*

Castle Wind has met with DoD representatives on several occasions and believes it is possible to build a wind farm in the Morro Bay Call Area that is compatible with the military mission with certain site stipulations.

There are no areas mapped as Navy Operation Areas off the coast of Morro Bay. There is an offshore area mapped as a danger zone and restricted area, approximately 60 km south of Morro Bay, associated with Vandenberg Air Force Base (BOEM 2015).

The United States Coast Guard (USCG) operates Coast Guard Station Morro Bay, located adjacent to the Harbor Office. The USCG maintains a 27-person National Security Base and Search and Rescue Station at Morro Bay Harbor to provide the Coast Guard services for the entire Central California Coast, including port safety coverage for the Diablo Canyon Nuclear Power Plant and Vandenberg Air Force Base and search and rescue (Morro Bay 2015). The USCG Base Los Angeles-Long Beach provides Military Funeral Honors to recently passed retired or honorably discharged Coast Guard veterans and serves Morro Bay in San Luis Obispo county (USCG 2015).

6.7 Airspace Utilization – Civilian and Military

Morro Bay and surrounding communities are served by San Luis Obispo County Regional Airport in San Luis Obispo, California. The airport is open for public use with flights to Los Angeles, Phoenix, and San Francisco. The airport is also home to full service general aviation and corporate facilities. Commercial flights are provided by United Airlines and American Airlines. Local airspace surrounding the airport is designated as Class E Airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. Also, in this class are federal airways, airspace beginning at either 700 or 1,200 feet above ground level used to transition to and from the terminal or enroute environment, and enroute domestic and offshore airspace areas designated below 18,000 feet mean sea level (MSL). Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 NM of the coast of the 48 contiguous states and Alaska, up to but not including 18,000 feet MSL, and the airspace above FL 600 (FAA 2014). San Luis Obispo County outlines airport rules, regulations, and the airport overlay zone in the municipal code (17.57).

As noted previously, Warning Areas W-532 and W-285 are used for military testing and training. An active military aviation restricted zone exists off the California coast approximately 60 kilometers south of the proposed project area, which is associated with Vandenburg Airforce Base (FAA 2015).

6.8 COMMERCIAL AND RECREATIONAL FISHING

On October 6, 2018, Castle Wind entered into a first-of-its-kind mutual benefits agreement with local commercial fishing industry groups (Fishermen's Agreement) that will, among other things, (1) create a fund for infrastructure improvements to benefit the local commercial fishing industry; (2) create training and employment opportunities for local commercial fishermen; and (3) provide opportunities for the local commercial fishing industry to provide input into the project's design to minimize impacts to the industry. This agreement has resolved--in advance--a key issue that has delayed development of offshore wind on the East Coast: how to mitigate impacts on the commercial fishing industry to the satisfaction of the local commercial fishing industry that would be most impacted by the offshore wind project. *The importance of this agreement cannot be overstated*: if Castle Wind successfully obtains the lease for the Morro Bay WEA, the local commercial fishing industry will have funding for much needed improvements and will have a developer who will listen to their concerns during construction and operation of the project.

Commercial fishing is an important element of California's economy, and Morro Bay in particular. The harvest value of California onshore landings has increased from $136.3 million for 553.5 million pounds of fish harvested in 2000 to $235.2 million for 357.6 million pounds of fish harvested in 2014 (CDFW 2015). The revenue from California commercial fisheries is not generated principally from the harvest of one target species, but instead is a balance of several fisheries that include the groundfish fishery, highly migratory species fishery, the coastal pelagic species fishery, and the Dungeness crab fishery. Although total landings in weight has decreased since 2000, the total revenue generated from the harvest has increased by 58 percent. The major regional fishing centers in California are Eureka, Fort Bragg, Bodega Bay, San Francisco, Monterey, Morro Bay, Santa Barbara, Los Angeles, and San Diego. Revenue from the port of Morro Bay accounted for approximately 4.4 percent of the overall revenue from commercial ocean catch (CDFW 2015).

Table 6 shows typical distances from shore and/or depths for each fishery, preferred habitat type, and revenue from the 2014 harvest.

Table 6 Depths and Distances from Shore and Revenue for California (and Morro Bay) Commercial Fisheries

Fishery	Distance/Depth of Harvest[1]	CA Revenue from 2014 Harvest[2]	Morro Bay Revenue from 2014 Harvest[2]
Tuna	Generally near surface, 30 nm or more from shore at 50 to 100 fathoms up to 500 to 2,000 fathoms	$4,793,386	$47,471
Salmon	Breakers to 200 fathoms; sometimes up to 650 fathoms	$12,120,121	$138,679
Crab	Breakers to 130 fathoms and up to 700 fathoms in some years; around tops of canyons, high spots	$70,517,956	$3,817,799
Shrimp	30 to 150 fathoms; 90 percent in 60 to 140 fathoms; muddy, soft, flat bottom	$4,824,385	$0
Groundfish	Breakers to 400 to 700 fathoms; 1,200 fathoms for midwater, but nets are not this deep	$10,116,998	$1,220,735
Sablefish	100 to 500/650 fathoms	$8,962,574	$2,066,392
Halibut	22 nm at 100 to 125 fathoms	$2,126,431	$47,292

[1] Source: Industrial Economics, Inc. 2012.
[2] Source: CDFW 2015.

Morro Bay is one of the state's smaller commercial fishing ports. The primary commercial fishing activity off Morro Bay is groundfish trawl, Dungeness crab (pot; mostly in state territorial sea), and sablefish (Table 5; CDFW 2015). The top fishery group coming into the port of Morro Bay based on economic value is the crab fishery (CDFW 2015).

Charter fishing businesses offer overnight trips as well as day trips. Charter operations are dependent on access to particular habitats for some target species (e.g., rocky structures and reefs for bottom fishing, sandy or muddy bottom for crabbing) and on particular water column and current conditions for others (e.g., salmon and tuna) (Industrial Economics, Inc. 2012.). There were eleven charter vessels operating out of Avila Beach and Morro Bay in 2014 that hosted 23,651 fishers, and caught 204,832 fish (CDFW 2015). The total landings by charter vessels in 2014 represent 16.5 percent of the total charter landings in California.

Recreational boaters (many of whom are also recreational fishermen) travel anywhere from 3 to 40 nm (75 km) from shore. In 2004, the California Recreational Fisheries Survey was created to estimate total marine recreational finfish catch and effort in California. The primary recreational fishing off central California (San Luis Obispo to Santa Cruz) targets mackerel and rockfish (PSMFC 2015).

6.9 Historical and Cultural Resources

The Obispeño Chumash originally inhabited Northern Channel Island area, including Morro Bay. The area has provided natural resources to local inhabitants for centuries. People lived as far inland as the San Joaquin Valley, along rivers, and along the Pacific coast where they were hunters, gatherers, and fishermen. They gathered food throughout the year in the mild Mediterranean climate and stored food through the winter. They built domed houses of willow branches, whale bones, and woven mats. The Chumash were excellent boat makers and advanced trades such as basket weaving, stone cookware, and beads (Chumash 2015). The earliest European contact at Morro Bay came in 1595, when Sebastian Rodriguez Cermeno put in at Estero Bay. This contact was followed by the explorations of Sebastian Vizcaino in 1602 and Gaspar de Portola in 1769. Mission San Luis Obispo was established in 1772, thus ending traditional Native American village life at Morro Bay. Mission records indicate the first Native American baptism from the Morro Bay village of Chotcagua occurred in 1773. The last person to leave Chotcagua and move to the mission was baptized in 1803 (Gibson 1993).

The California State Historic Preservation Office (SHPO) maintains a database of known cultural or archaeological sites (OHP 2015). Historic sites (eligible listed and unlisted) along the coast north and south of Morro Bay within the project vicinity with publicly available records include:

- Morro Rock – Morro Bay, San Luis Obispo County
- Hearst San Simeon Estate – San Simeon, San Luis Obispo County
- Hearst San Simeon State Historic Monument – San Simeon, San Luis Obispo County
- Piedras Blancas Light Station – San Simeon, San Luis Obispo County
- Old Santa Rosa Catholic Church and Cemetery – Cambria, San Luis Obispo County

Specific cultural resource information is confidential. A records search and literature review would need to be conducted at the appropriate California Historical Resources Information System Information Center located at the Central Coastal Information Center at the University of California, Santa Barbara to determine the types, sizes, and quantity of known cultural resources (prehistoric archaeological resources, historic-period archaeological resources, and built-environment resources) in the immediate vicinity of the project area.

The National Oceanic and Atmospheric Administration's (NOAA) Office of Coast Survey charts known shipwrecks and other navigational obstructions through the Automated Wreck and Obstruction System (AWOIS). Shipwrecks near Morro Bay include an unnamed vessel within Morro Bay that is always visible above the water surface (BOEM 2015; NOAA 2015)

6.10 Tourism and Recreation

The central California coast and Morro Bay offer a variety of outdoor activities including fishing; kayaking; sailing and bay cruises; wildlife, bird, sea lion, and whale watching charter tours, cycling, and many more activities. State parks in the project vicinity include Morro Bay State Park, Morro Strand State Beach, and Montaña de Oro State Park. Local parks managed by the city include Anchor Memorial Park, Bayshore Bluffs Park, Centennial Parkway, City Park, Cloisters Park, Coleman Park, Del Mar Park, Lila Keiser Park, Mariner Memorial Park, Monte Young Park, Morro Rock Beach, North Point, and Tidelands Park. The city parks have a variety of amenities ranging from trails, vistas, picnic tables, child play areas, beach access, open space, barbeques, and restrooms. Morro Bay State Park has amenities for tent camping and RV hookups. Morro Bay Natural Preserve is located along the spit that separates Estero Bay from Morro Bay.

6.11 Socioeconomics and Environmental Justice

According to data from the State of California Employment Development Department (EDD 2015a), the unemployment rate in San Luis Obispo County, as of November 2015, was 4.4 percent, while that of California, as a whole, was 5.7 percent. Total nonfarm employment in the County was 116,900 in November 2015, up 3.7 percent from November 2014. The 2010 US Census reports median household income for California in 2009 at $61,094, and the poverty rate at 15.9 percent (US Census Bureau 2015a).

The largest industry sectors in San Luis Obispo County, based on 2014 data, are: healthcare; education; government; trade, transportation, and utilities; professional and business services; and leisure and hospitality (EED 2015b).

The 2010 US Census (US Census Bureau 2015b) reports the population of San Luis Obispo County as 369,637. The median age was 39.3 years; 18.1 percent of the population was under the age of 18, and 17.5 percent of the population was over 65. Race and ethnic groups are reported as shown in Table 7.

Table 7 San Luis Obispo County Race/Ethnic Groups, 2014

Race/Ethnic Group	Percent of Population
Non-Hispanic	
White	69.5 %
Black	2.2%
American Indian	1.4%
Asian	3.8%
Pacific Islander	0.2%
Two or More Races	3.4%
Hispanic	19.5%

Source: US Census Bureau 2015b

6.12 Public Services, Infrastructure, and Utilities

Morro Bay is accessible via air, sea, and road. The San Luis Obispo County Regional Airport is used for air transportation. The major roads connecting Morro Bay to nearby communities are California State Routes 1 and 41, which connect to US Route 101. Three bus companies operate in Morro Bay: City of Morro Bay Transit, San Luis Obispo Regional Transit Authority, and Greyhound. There is no commercial freight rail service to Morro Bay and the closest passenger service is provided by Amtrak located in San Luis Obispo, California (Caltrans 2015).

The City of Morro Bay, Harbor Department manages the Morro Bay Harbor. The harbor operates the North and South T-piers, a floating dock, and anchorage area for temporary vessels. Approximately 50 slips and 70 moorings are provided by the city for local recreational and fishing vessels (World Port Source 2015).

San Luis Coastal Unified School District consists of ten elementary schools, two middle schools, and three high schools in the region. Within Morro Bay there is Del Mar Elementary, Los Osos Middle School, and Morro Bay High School. Cuesta College has multiple campuses throughout the County. California Polytechnic State University is the nearest university and is in San Luis Obispo, California.

The City of Morro Bay provides water and sewer services to local residents. AT&T Communications provides telephone communications, and electric power is administered by Pacific Gas and Electric (PG&E).

Public safety is provided by the Morro Bay Police Department. The Morro Bay Fire Department responds to fire and safety calls from on fully staffed fire station and one unstaffed fire station. The Fire Department has a mutual aid agreement with neighboring communities, the Morro Bay Harbor Patrol, and the US Coast Guard. Local hospitals include an urgent care facility in Morro Bay, the Sierra Vista Regional Medical Center in San Luis Obispo, and the Atascadero State Hospital in Atascadero, California.

Offshore utility infrastructure includes approximately ten east-west submarine cables south of Morro Bay within Estero Bay (BOEM 2015).

6.13 Natural and Man-Made Hazards

The primary natural hazards that could affect Morro Bay and San Luis Obispo County include coastal erosion, drought, earthquake, flood, landslide, tsunami, wildfire, and wind storms. Coastal erosion occurs throughout the year, but is accelerated during the winter months when storms increase the rate of erosion. Winter wind storms can also cause heavy damage on shore to buildings, utilities, and transportation systems. Tsunamis can result from either local earthquake events or distant earthquake events. Historic tsunamis occurred in the Morro Bay area in 1878, 1953, 1960 and 1964, which resulted in localized damage to piers, wharves and buoys in Morro Bay Harbor (Morro Bay 2008).

The potential for earthquake hazard comes from the four known seismically active faults that run through San Luis Obispo County and adjacent offshore areas. These include the San Andreas Fault approximately 50 miles inland from Morro Bay, the Los Osos Fault approximately 8 miles southeast of Morro Bay, the Hosgri Fault approximately 8 miles offshore to the west of Morro Bay, and the San Simeon Fault approximately 30 miles north of Morro Bay. Seismic activity within the offshore basin area is mainly from the Hosgri Fault which is primarily a reverse and thrust fault with some right-lateral slip. It is approximately 140 kilometers long, trending north-south with the shoreline of San Luis Obispo County, and is a complex zone of interlaced and parallel fault segments. The last earthquake along this fault was in 1927 and was recorded at a magnitude of 6.5-7.5. Small earthquakes from the other faults in inland San Luis Obispo County occur frequently (CalTech 2013).

Rainfall and inclement weather occur seasonally from November through March. Several creek drainage systems, including Chorro Creek, the Morro/Little Morro Creek convergence, No-Name Creek, Alva Paul Creek, Toro Creek, and San Bernardo Creek flow into and/or near the City. Flooding may occur when storms bring rainfall that exceeds the conveyance capacity of the creeks and stormwater infrastructure throughout the city. Potential flood hazard areas within Morro Bay include: the South Bay Boulevard area between Highway 1 and State Park Road; the area between Highway 41/Atascadero Road and Radcliff Avenue; low-lying sections of Island Street and Beachcomber; Highway 1, at the northern City limits; and, Highway 1 south of the City limits.

Wildfire is a potential hazard in Morro Bay residential, industrial, commercial, harbor front, and wildland areas. Fires are fanned by ocean or Santa Ana winds, making them spread quickly and difficult to control. Homes and businesses within Morro Bay are built close together and offer little defensible space for fighting fire. Furthermore, homes on the hillsides of Morro Bay are on the border of the urban-wildland interface and face the threat of large-scale wildland fire. The T-pier fire of 1988 and the Highway 41 Fire in 1944 were examples of the threat of fire from development within the city and wildfire from adjacent wildlands (Morro Bay 2008).

Potential manmade hazards include the Diablo Canyon Nuclear Power Plant operated by the Pacific Gas and Electric Company (PG&E) and located approximately 10 miles southwest of Morro Bay, unexploded ordnance, obstructions, and shipwrecks.

There is no known unexploded ordnance in the project vicinity. However, the unexploded ordnance data is not complete. The presence and locations of the unexploded ordnance have been derived from graphical representations recorded on NOAA Raster Navigation Charts.

There is one artificial reef consisting of 3,500 tons of quarry rock along the shore, north of Morro Rock, in the project vicinity. There is one visible shipwreck within Morro Bay. Eight submerged obstructions and three partially submerged rocks obstructions are associated with an old pipeline, sunken mooring buoys, a sewer outfall, and submerged pilings north of Morro Rock along the shore, and two partially submerged rock obstructions south of Morro Rock along the Morro Bay spit (BOEM 2015).

Onshore hazards include hazardous material sites registered in and around Morro Bay under the US EPA reporting requirements. The identified sites include multiple toxic release sites, hazardous waste sites, water discharges, and brownfields around Morro Bay (US EPA 2015).

6.14 Outreach, Coordination and Engagement Efforts

Castle Wind has conducted an extensive outreach to the public, state, federal, and local agencies, NGOs and other stakeholders regarding the development of the Project near Morro Bay. Since 2015 Castle Wind's joint venture partner, Trident Wind, conducted the initial outreach as broadly as possible through numerous in-person meetings and phone calls to provide an overall overview of potential projects in the Morro Bay Call Area and to receive feedback on potential permitting issues that may arise. Discussions have focused on listening to and learning from stakeholders on the issues anticipated to be of concern, prior to formal federal and California State permitting activities, including compliance with the National Environmental Policy Act (NEPA).

Since the inception of the Project, Castle Wind has been engaged in discussions with the MBCFO, representing interests of the local fishermen and has agreed to make changes to any development in the Nominated Morro Bay Call Area to minimize the impact on fisheries.

Error! Reference source not found. provides a summary of the initial outreach to the community entities, the City of Morro Bay, and the local chapters of the non-governmental environmental organizations (NGOs). Castle Wind has contacted California State agencies such as CEC, CCC, CSLC, CPUC and CAISO regarding cable routing plans and consistency and compliance with the Coastal Zone Management Act and the California Environmental Quality Act.

These initial engagements have primarily focused on informing stakeholder groups of the proposed Project, including potential locations for the Project, answering Project-specific questions, and seeking input on areas or issues that may be of concern. A complete list of all the agencies, NGOs and community groups that have been contacted can be found in Table 7. Research results and the outcome of discussions with regulatory agencies, as well as important stakeholder groups, will be documented for the NEPA process.

On October 11, 2018, Castle Wind held its third public information session to provide an open forum for the public, stakeholders and the NGO's. The video recoding of the public information session is available on YouTube: https://www.youtube.com/watch?v=6ZhfdTu7jxY.

In July and August 2015, Trident Winds met with various elected officials from the City of Morro Bay to present the proposed Project. These meetings and discussions culminated in approval by the City Council of a Cooperation Agreement dated October 5, 2015 between Trident Winds and the City of Morro Bay that calls for Trident Winds to conduct project development in an open, cooperative and transparent manner (Morro Bay, October 5, 2015). After three years of additional outreach, the Morro Bay City Council approved an exclusive Community Benefits Agreement (CBA) with Castle Wind on November 29, 2018, Annex A.

At the same time, Castle Wind initiated discussions with the MBCFO that since 1972 has been the voice for the commercial fishing industry in San Luis Obispo County. Castle Wind continued an active dialog with MBCFO, as well as the Port San Luis Commercial Fishermen Association (PSLCFA) to incorporate their inputs to the site location and to ensure that the site area would be least intrusive on the productive fishing grounds. On October 6, 2018, the Morro Bay Commercial Fisherman's Organization, the PSLCFA, and Castle Wind entered into a mutual benefits agreement intended to minimize the impacts of the Project and provide support for on the local commercial fishing industry, Annex A.

Table 7 Stakeholder Outreach

Government	Economic and Development	Fishing Community & Native Americans	Environmental Groups
BOEM	City of Morro Bay	MBCFO	The Sierra Club
NOAA	PG&E	PSLCFA	The Audubon Society
NOAA Fisheries	Community Choice Aggregators	Northern Chumash Tribal Council	The Nature Conservancy
U.S. Coast Guard	End Users		The Environmental Defense Fund
U.S. Army Corps of Engineers	California Polytechnic Institute (CalPoly)		Natural Resources Defense Council
Ocean Protection Council U.S DOE	San Luis Obispo (SLO) County		Center for Biological Diversity
U.S. Department of Energy			Community Environmental Council of Santa Barbara County
CEC			Ocean Conservancy
CPUC			
CCC			
CLC			
CAISO			

7 LEGAL QUALIFICATIONS

Castle Wind is a limited-liability company headquartered in San Francisco, California, organized and authorized to conduct business under the laws of the State of Delaware. Castle Wind is a joint venture between Trident Winds Inc., a Washington state corporation, and EnBW North America Inc., a wholly-owned subsidiary of Energie Baden-Württemberg AG (EnBW), a German utility and an offshore wind developer, a Delaware corporation.

Castle Wind is authorized under its operating agreement to hold and operate leases, right-of-way grants, and right-of-use and easement grants for activities that produce, or support production, transportation, or transmission of, energy from sources other than oil and gas, on the OCS, and right-of-use and easement grants for the alternate use of OCS facilities for energy or marine-related purposes.

The legal qualifications package was submitted to BOEM on December 20, 2018. Confidential Annex B includes copies of Castle Wind's registration documentation.

8 TECHNICAL QUALIFICATIONS

Castle Wind's team's experience spans industries including but not limited to offshore construction, high-tech manufacturing, development and operation of electric generation facilities, and financial services. This effort will leverage the collective know-how of these industry professionals through all phases of the project development.

8.1 PROJECT PARTICIPANTS

Castle Wind is committed to the success of development in the nominated Morro Bay Call Area. Individual organizational staffing levels and resources will be allocated to meet the development process needs in accordance with the project schedule and needs.

Castle Wind's joint venture partners, Trident Winds and EnBW North America, bring extensive experience in permitting, technology, utilities and energy markets to the development of offshore wind.

Trident Winds, established in 2015, brings extensive expertise in permitting in the marine environment, development of deep-water offshore wind technology and projects and project financing.

EnBW North America, a wholly owned subsidiary of EnBW AG, one of the largest energy supply companies in Germany and in Europe with current power generation assets comprise 13,000 MW of conventional generation, and a portfolio of nearly 1,000 MW of offshore wind projects under operation or construction in Europe, and more than 3,000 MW under development globally.

8.2 EXPERIENCE WITH SIMILAR PROJECTS

Castle Wind joint venture partners have extensive experience with offshore wind permitting, project development and financing.

8.2.1 Trident Winds Inc.

Trident Winds is a Washington state corporation, with its founder and CEO, Ms. Alla Weinstein and Green Giraffe B.V.

Ms. Alla Weinstein brings extensive experience in successful multijurisdictional permitting of a wave energy project in Makah Bay, WA, developing a commercially viable floating offshore wind technology while serving as a CEO of Principle Power Inc., and being the first to submit the Request.

She has founded and financed two marine renewables companies - AquaEnergy Group, LTD that was the first in the US to receive a FERC permit for the installation of a hydrokinetic project in Makah Bay, WA within the Olympic Coast National Marine Sanctuary, and Principle Power Inc. the developer of the WindFloat floating support structures technology (http://principlepowerinc.com).

While CEO and President of Principle Power, the company raised over $35 million for the engineering design, fabrication and installation of its prototype WindFloat off the coast of Portugal. She was the project manager for the prototype installation and negotiated and awarded four contracts for the WindFloat prototype implementation:

- A turbine supply contract including engineering, procurement, installation with Vestas;
- A turbine operation and maintenance contract with Vestas;
- A Turnkey contract for the WindFloat system, including hull, mooring and electrical cable design, procurement, fabrication, installation;
- A WindFloat operation and maintenance contract.

Green Giraffe, a specialist advisory boutique focused on renewable energy with a specific focus on offshore wind financing, including floating offshore wind. Green Giraffe has a strong presence in the European market with a 100% market share on European offshore greenfield financings in 2017 and a proven track record on more than 60 projects worldwide. Green Giraffe brings its extensive EUR 20 B renewable fund-raising track-record for offshore wind project financing and covering 25 GW of capacity across renewables. Green Giraffe has successfully raised development equity for two floating offshore wind projects, making Green Giraffe the most reputable financial advisor in the floating offshore wind sector. In the US market, Green Giraffe assisted Deepwater Wind in procuring non-recourse financing for the 30 MW Block Island offshore wind project off the coast of Rhode Island.

8.2.2 EnBW North America

EnBW North America is a wholly owned subsidiary of Energie Baden-Württemberg AG (EnBW) one of the largest utilities in Germany and supplies electricity, gas, water and energy-related products and services to around 5.5 million customers with a workforce of 20,000 employees. EnBW is active along the entire electricity and gas value chain. EnBW is the only German utility which owns one of the four transmission grid operators in Germany, TransnetBW, EnBW responded early to the fundamental changes brought by the German "Energiewende" (energy transition) with a redesigned strategy in 2013 and a radical reorganization of the company in 2014. The EnBW 2020 strategy envisages the expansion of renewable energies to make them one of the main pillars of the EnBW business. Offshore wind power plays a central role in EnBW's recently published extended strategic view beyond 2020. In addition, EnBW is one of the pioneers in the

offshore wind sector in Germany, building the first commercial scale offshore wind project in Germany in 2011. The company has a significant track record in planning, building and operating offshore wind farms (336 MW in operation, 610 MW under construction and 900 MW secured pipeline, all in the German Baltic Sea/North Sea). Pursuing a long-term, industrial approach, EnBW has built up high-caliber in-house competencies along all relevant development disciplines since EnBW has entered the offshore wind sector in 2008. EnBW typically invests in offshore wind projects on a long-term basis.

In its long-term strategy going beyond 2020, EnBW is focused on building sustainable and innovative infrastructure, namely sustainable power infrastructure (e.g. offshore wind farms), system-critical infrastructure (e.g. transmission grids) and intelligent infrastructure for the customer (e.g. e-mobility). EnBW has announced €10bn for investments from 2021 to 2025, of which 80% should be allocated to growth investments.

Furthermore, EnBW is used to working in joint venture structures. In fact, all of our offshore wind projects are partially owned by third party investors that have joined in different phases of the project life-time. While the first joint venture (Baltic 1) with local German municipalities has been set up after COD, the most recent partnership with Enbridge was implemented at Financial Investment Decision (FID).

Offshore wind is and remains one of EnBW's main growth areas as demonstrated by recent final investment decisions for the projects Hohe See and Albatros as well as by the award of He Dreiht with a subsidy free bid for 900 MWs in the first round of the German auction in 2017. Moreover, EnBW has just confirmed its strategic commitment to the offshore wind sector in its recent board-approved strategy review. As part of the strategy review EnBW has publicly specified its commitment to investments in renewables, focusing on Taiwan and the USA in January 2018.

Additionally, EnBW has recently acquired a 37.5% stake in three offshore fixed foundations wind projects in Taiwan with potential total capacity of up to 2 GW. Joining EnBW as developers and investors in the Taiwan market is an Australian investment bank and a Taiwanese project developer in projects off the Changhua region of the Asian island. The grid allocation and auctioning process is still ongoing so that the exact timeline for project realization cannot be determined today. However, the joint venture has shown its determination for the projects by setting-up project offices and by proceeding with detailed planning and site investigation. Within the scope of the projects, EnBW is taking the majority of the technical project development and already has staff on site in Taiwan, with further support coming from the company's office in Hamburg. The investors also plan to establish a skilled local workforce with employees trained and qualified by EnBW. As part of this engagement, EnBW is currently hiring technical people in Taiwan and has sent 5 experienced employees on a permanent basis to Taiwan.

8.2.2.1 EnBW – Proven Technical Strength in the Offshore Wind Business

We anticipate that the pre-qualification assessment by BOEM will, among others item, aim to determine the technical competencies and abilities of offshore wind companies to construct, operate, maintain and decommission one or more large-scale Offshore Wind Farm(s) (OWF) offshore California.

EnBW has the technical capability and resources to undertake and implement the Project through to completion.

- EnBW covers all disciplines across the project life-cycle with in-house re-sources from early stage development (permitting, technical design, procurement) over project execution to O&M services (incl. turbine service) and has a proven relationship with the leading industrial suppliers and service providers, e.g. Siemens (Siemens/Gamesa).
- Our team has a strong track-record in developing early-stage offshore wind projects on their way to FID, COD and beyond.
- As the operating phase of the windfarm determines the actual investment return of the owners it is important to optimize the operating period in order to increase profit, either by reducing cost or by increasing yield. The crux is that most of the big optimization levers (e.g. an O&M optimized contractual setup, a farsighted constructed and equipped O&M base and control center, or O&M concepts which can deal with the foreseeable and unforeseeable issues of daily offshore business) can only be achieved in the pre-operation phase, a phase during which the focus is typically on design and construction and the O&M concerns are shifted to later times as the O&M period is still so far away.
- EnBW is able to provide in-house operation management and service activities, in particular for Balance of Plant. At all times, EnBW is in close contact and discussion with all major OEM wind turbine suppliers. Specifically, with some OEM like Siemens Gamesa, GE and Savion, EnBW is very familiar and has supported future developments with its profound technical knowledge and understanding of service and maintenance needs. The close collaboration results in detailed trainings by the OEM for our gaffers and the majority of our service technicians up to the level of experienced trouble shooters. In addition, EnBW cooperates closely with experienced service providers with a profound knowledge regarding Siemens turbines. We believe that significant value can be created through further optimization of the operation and service concept as well as the contractual structures and terms.

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Table 8 EnBW´s in-house expertise

Areas of EnBW´s in-house expertise
Project management
Wind turbine technology
Foundations and substation steel construction
Substation technology
Inter-array cabling
Offshore installation management and maritime logistics
Marine biology and environmental management
Geology and subsoil analysis
Health and safety
Quality assurance
Contract and claim management
Certification
Consenting and external grid
Commercial
Finance
Plus: interface & risk management, time scheduling, insurance, document management and others

EnBW's vast in-house offshore wind competences and its proven track record in offshore wind projects is a strong element to comfort the successful implementation of the Project.

8.2.2.2 EnBW's track record offshore wind

Table 9 EnBW's fully or partly owned Offshore Wind Projects and major offshore service

Name	Capacity	COD	Challenges & Achievements
Baltic 1	48.3 MW	2011	• First commercial offshore wind farm in Germany • Awarded best offshore wind farm in operation in 2015 and 2016 • Multi-contracting approach realized • Management of a complex fabrication process
Baltic 2	288 MW	2015	• Challenging soil conditions resulting in a complex design process, monopiles and jackets installed; deepest offshore wind farm so far in Germany (up to 44 meters) • First Siemens turbine installed on jacket foundations • Very good HSE statistic • Disposal of 49.9% after COD to financial investor Macquarie
Wikinger	350 MW	2016-18	• Owners Engineer • Offshore construction • Support in engineering, vessel coordination HSE and QA
Bard Offshore 1	400 MW	Since 2017	• Operation and maintenance of offshore substation
Hohe See	497 MW	2019	• Joint project execution since Financial Close in a partnership together with financial investor Enbridge • Challenging conditions – 100 km offshore • Tight schedule due to regulatory framework
Albatross	112 MW	2019	• Biggest consented offshore wind farm in Germany • One of the world's first OWF without state subsidy • Proximity to the Hohe See and Albatros projects allows for synergies in operation (offshore cluster with 1500 MW) • Late grid connection date allows deployment of next offshore wind technology with 10+ MW turbines
Formosa 3	1900 MW	2025-	• Development of 3 Sites of the coast of Taiwan • Site Assessment • Technical Design and invitation to tender
Total	**4495.3 MW**		

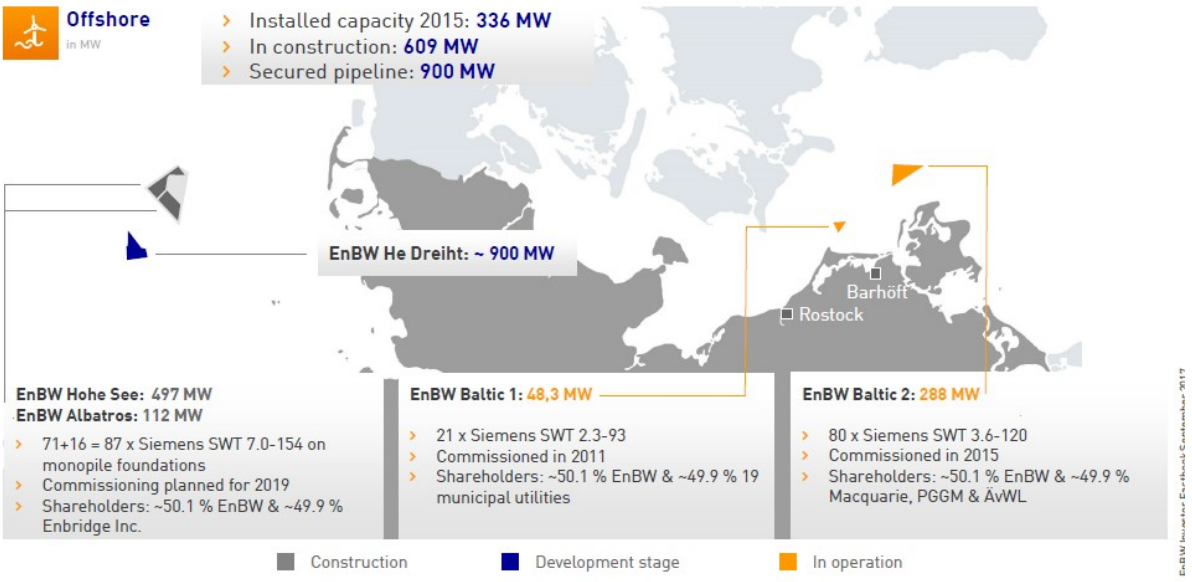

Figure 7 EnBW´s Offshore Wind Assets

In 2011, EnBW's Baltic 1 (48.3 MW) Wind Farm was the first commercial OWF in Germany to commence operation. It was a challenge that EnBW faced up to with great commitment and experience. Because offshore means much more than just onshore at sea. It places the highest demands on people and machines. EnBW has been responsible for operating EnBW Baltic 1 since COD and has taken full management of the Wind Turbine Package since 2016. For two years EnBW Baltic 1 was awarded best offshore wind farm in operation by the German Offshore Forum.

In 2015, the significantly bigger EnBW Baltic 2 (288 MW) was commissioned. EnBW Baltic 2 has significantly larger dimensions than EnBW Baltic 1. The planning and logistical challenges faced in constructing the wind farm were considerably greater. EnBW Baltic 2 has wind turbines that are almost a third larger than those at Baltic 1. On an area covering 27 square kilometers, it is four times larger than EnBW Baltic 1 and can generate six times as much electricity. The depth of the sea at the wind farm varies between 23 and 44 meters. Depending on the sea depth, the wind power plants were either mounted on monopiles (up to around 35 meters) or jackets (from around 35 meters). An annual yield of around 1.2 billion kilowatt hours means that the EnBW Baltic 2 wind farm can supply an aggregate of around 340,000 households per year and thus save around 900,000 tons of CO_2 emissions. As for EnBW's first offshore wind farm Baltic 1, an investment partner was also brought on board for Baltic 2: Following the commissioning of the wind farm, almost half of the shares were sold to the Australian financial investor Macquarie. Operation and maintenance of the wind farm remains in EnBW's hands. The participation model provides EnBW with additional financial scope for other growth projects.

After acquiring EnBW Albatros in 2014, it is currently being constructed together with EnBW Hohe See as a joint project with altogether 609 MW. The Hohe See and Albatros wind farms are being erected far out in the North Sea – about 100 kilometers from the coast. On areas covering 42 and 11 square kilometers respectively, both wind farms will generate 2.5 billion kilowatt hours of electricity to supply an aggregate of around 710,000 households from 2019. The investment costs for the construction of the Hohe See wind farm come to 1.8 billion euro, while constructing the Albatros wind farm will cost an additional 0.4 billion euro. This joint project thus represents the largest investment decision for EnBW in the history of the company to date and will bring the company nearer to its goal of expanding renewable energies into a main pillar of its energy generation. In order to finance the offshore wind farms from their construction through to commissioning, EnBW has secured the Canadian energy infrastructure company Enbridge Inc. as an investment partner: Enbridge Inc. has acquired 49.9 percent of the shares in EnBW Hohe See, while EnBW will retain the remaining 50.1 percent. This investment provides a scope for the further development of new projects. The final investment decision for Albatros has been made in May 2017. Signing of all transaction documents with Enbridge and financial close have been done in Q3 2017. The grid connection capacity and date have been secured and are binding for the TSO since May 2017. A change permit by the authority BSH has been granted in December 2016. The fabrication of foundations, cables and the OSS started end of 2017. The fabrication of the wind turbines started in July 2018. The Installation works for foundations started in April 2018. The installation of cables, wind turbines and the OSS will follow in 2019. Planned commissioning 2019.

EnBW submitted a highly competitive bid for EnBW He Dreiht (900 MW) in the scope of the first German auction for offshore wind projects and was allocated 900 MW out of the 1,490 MW total against a field of renowned bidders. He Dreiht will be one of the world's first offshore wind farms without government subsidies. From a cost and efficiency perspective, He Dreiht offers a combination of benefits unique in Germany: The wind farm is scheduled to be commissioned in 2025 and will benefit from rapidly advancing technological developments and the further professionalization of the wind energy sector. As by far the largest single project in the competitive auction, He Dreiht is also based on excellent foundations for the highly efficient realization of the project. Important synergy and thus cost-saving effects also arise due to its proximity to the two EnBW wind farms in the North Sea: around 1,500 megawatts of capacity can be realized and operated in close proximity with Hohe See, Albatros and He Dreiht. In combination, these factors ensure that EnBW He Dreiht will offer particularly low electricity generation costs and can be realized and operated without government subsidies.

In addition to these projects, EnBW is investing in new and future offshore wind technologies including floating wind. EnBW is engaged in a floating wind joint industry project and is preparing a participation in a pilot project with floating turbines.

8.2.2.3 EnBW – Offshore Wind Competencies and Market Knowledge

EnBW´s project team consists of a well-experienced offshore wind workforce.

At this project stage we typically do not contact well known contractors (see Table below) for the main offshore wind park components. Nevertheless, due to our offshore wind portfolio already in the operation, construction and development stages we have a highly comprehensive knowledge of the offshore wind market in general and capable supplies in particular.

WTG	FOU	IAG	OSS	Installation
• Siemens Gamesa	• GeoSea • Hochtief • Siemens Gamasa (with GeoSea)	• TKF • JDR • DRAKA • Nkt • VBMS (with TKF)	• Fabricom • Siemens • Alstom • ABB • Weserwind • Consortium Fabricom, CG and Lemants • Siemens Gamesa (with Siemens Energy Management, Heerema, VEAG, GeoSea)	• VBMS • A2Sea • Ballast Nedam • Hochtief • GeoSea • Siem Offshore Contractors

Project participants bring expensive experience in resource analysis, project development, energy infrastructure asset management, and transmission and electrical services.

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ANNEX A: COOPERATION AGREEMENT(S)

Castle Wind LLC and the City of Morro Bay executed a Community Benefits Agreement (CBA) on November 19, 2018. A copy of this agreement is provided in this Annex.

The CBA was preceded by a Mutual Benefits Agreement executed between Castle Wind and commercial fishermen organizations of Morro Bay and Port San Luis. A summary of that agreement is included in the CBA.

COMMUNITY BENEFITS AGREEMENT
CASTLE WIND MORRO BAY OFFSHORE WIND FARM PROJECT

This COMMUNITY BENEFITS AGREEMENT (this "Agreement") is entered into as of November 29, 2018 (the "Effective Date"), by and between the CITY OF MORRO BAY, a California municipal corporation, ("City") and CASTLE WIND LLC, a Delaware limited liability company, ("Castle Wind"). Each of City and Castle Wind are sometimes referred to below individually as a "Party" or, collectively, as the "Parties."

RECITALS

A. Castle Wind is in the process of developing an offshore wind project off the coast of San Luis Obispo County proximate to City (the "Project"), which process includes obtaining various federal, state and local permits, entitlements, and other approvals ("Governmental Agency Approvals") and entering into related commercial contracts, including the lease described below;

B. Castle Wind and the Morro Bay Commercial Fishermen Organization and the Port San Luis Commercial Fishermen Association (the latter collectively the "Fishermen's Organizations") have engaged in extensive review of the potential economic and other impacts of the Project on commercial fishing activities in the vicinity of the Project, and have entered into the Fishermen's Agreement; and

C. City acknowledges, in addition to the community benefits, described Section , the Parties anticipate the Project will provide significant economic benefits to City and County of San Luis Obispo, as shown in the "Economic Benefits Study" prepared by California Polytechnic Institute, a copy of which is attached as Exhibit B; and

D. This Agreement provides for a cooperative effort between Castle Wind and City for the economic and other benefits of the Project to the Morro Bay community.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby confirmed by each Party, the Parties have agreed to enter into this Agreement and to be bound by this Agreement's terms and conditions set forth below.

DEFINITIONS

"Agreement" is defined in the introductory paragraph of this Agreement. "BOEM" means the Bureau of Ocean Energy Management.

"BOEM Lease" is defined in Subsection 1(c).

"Castle Wind" means Castle Wind LLC, a Delaware limited liability company.

"CEQA" means the California Environmental Quality Act.

"City" means City of Morro Bay, a California municipal corporation.

"Community Benefits" means the benefits to the Morro Bay community described in Section 1.

"Community Communications Plan" is defined in Subsection 1(a).

"Covered Area" is defined as (1) the Wind Energy Area (WEA) off the coast of central California identified in Exhibit A, attached hereto, (the "Morro Bay WEA"); and (2) the Outfall Conduit.

"Cure Period" is defined in Section 6.

"Default" means any material or substantial failure by a Party to perform its obligations or responsibilities under this Agreement. Minor or technical breaches or deviations from the terms of this Agreement that do not materially affect the rights or obligations of the non-defaulting Party shall not constitute a Default. A Default shall not exist until expiration of the applicable notice and cure period under Section 6.

"Default Notice" is defined in Section 6.

"Defaulting Party" is defined in Section 6.

"Effective Date" is defined in the introductory paragraph of this Agreement.

"Environmental Review Process" means the Government Agencies' compliance with environmental statutes, including NEPA and CEQA, which may include evaluation of potential impacts to the marine ecosystem, as well as impacts to visual resources, recreational opportunities, navigable channels, cultural resources and the fishing industry;

"Fishermen's Agreement" is defined in Section 1(b).

"Fishermen's Organizations." is defined in Recital B.

"Force Majeure" is defined in Subsection 10(p).

"Government Agencies" refers to the federal, state, and local agencies that are involved in the permitting and approval of the Project, including the Environmental Review Process.

"Governmental Agency Approvals" is defined in Recital A

"Lease Execution Date" is defined in Subsection 4(c).

"Local Economic Development Activities" is defined in Subsection 1(c).

"NEPA" means the National Environmental Policy Act.

"Non-Defaulting Party" is defined in Section 6.

"Option" is defined in Subsection 4(b).

"Option Exercise Date" is defined in Subsection 4(c).

"Outfall Conduit" is defined in Section 4.

"Outfall Conduit Lease" is defined in Section 4.

"Party" or "Parties" is defined in the introductory paragraph of this Agreement.

"Project" is defined in Recital A.

"SAP" means the Site Assessment Plan submitted to BOEM for the Project pursuant to 30 CFR § 585.605 *et seq.*

"Third-Party Transferee" is defined in Subsection 10(b).

Section 1. Community Benefits

(a) Community Communications: Upon the Effective Date, in order to promote (i) open communications and (ii) accountability with the Morro Bay community, Castle Wind shall develop and implement the Community Communications Plan reasonably acceptable to the City Manager, which shall include scheduling, as reasonably requested by City, a series of public meetings with residents and certain interest groups, including various local business concerns, to discuss all aspects of the Project, including potential environmental impacts. City may post timely updates on the Project on its website and social media channels, and provide such reasonable support as may be required in organizing, promoting, and recording such public meetings.

(b) Commercial Fishermen's Agreement. The Parties acknowledge the Morro Bay community will benefit from the Fisherman's Agreement, entered into between Fishermen's Organizations and Castle Wind, dated October 6, 2018 ("Fishermen's Agreement"). Under the Fishermen's Agreement, Castle Wind has committed to minimize and mitigate the anticipated impacts to the commercial fishermen from the Morro Bay and Port San Luis communities who

operate within the Covered Area and area proximate to the Project. A summary of the Fishermen's Agreement is attached as Exhibit C.

(c) Local Economic Development Activities: Subject to receipt of a legally binding lease from BOEM for the Wind Energy Area (WEA) portion of the Covered Area ("BOEM Lease"), Castle Wind shall use its best efforts to achieve local economic development goals related to the development and long-term operations and maintenance of the Project ("Local Economic Development Activities"), including, but not limited to:

(i) promoting local hiring of qualified residents from the Morro Bay community, including handicapped persons,

(ii) establishing internships/trainee programs with locally located schools and universities;

(iii) establishing a maintenance and monitoring facility for the Project in the Morro Bay community;

(iv) promoting local accommodation and the hotel/housing sector during construction phase;

(v) promoting the local supply chain for construction services (*e.g.* 24/7 construction office), maintenance services (*e.g.* facility management, transportation, catering, waste management, weather forecasts), parts, tools and supplies (e.g. personal protection equipment, fuel, auxiliaries);

(vi) promoting opportunities to generate "green solutions" with electric cars, charging stations and other green sustainable energy solutions;

(vii) to the extent opportunities arise Castle Wind and City shall work together to develop methods economically advantagous to both for reuse of the former Morro Bay Power Plant, while recoginzing that property is under a third-party's ownership and

(viii) assisting City with the potential formation or implementation of Community Choice Aggregation for the Morro Bay community.

(d) Binding Conditions: As part of the Outfall Conduit Lease, the Parties shall enter into a binding agreement, after negotiating in good faith, establishing priorities and legally enforceable conditions and timelines through and by which Castle Wind and the ultimate developer/owner/operator of the Project shall implement activities needed to accomplish the matters described in Subsection 2(c).

Section 2. Reservation of Discretion by City

The Parties understand, acknowledge and agree, notwithstanding the terms and conditions of this Agreement, certain discretionary actions incidental to matters described in this Agreement (including, without limitation, the grant by City, individually or in conjunction with

another Governmental Agency, of governmental approvals, permits or entitlements with respect to the Project) may require the exercise of discretion by one or more decision-making bodies at City and such discretionary actions cannot lawfully be committed to by contract pursuant to the constitution and laws of the State of California. Nothing in this Agreement is intended or shall be interpreted to limit City's exercise of discretion with respect to any actions needed from City as a Governmental Agency or as a lessor of the Outfall Conduit nor shall anything in this Agreement be construed to (a) grant or commit City to grant, Castle Wind, or any other person, any discretionary governmental approvals, permits or entitlements or leasehold rights with respect to the Project, (b) limit or restrict City's discretion to approve, if at all, or disapprove any term or terms of the Outfall Conduit Lease, or (c) limit or restrict City's discretion with respect to (i) the approval, conditional approval or denial of any development approvals or entitlements that may be required from City for the Project as a Governmental Agency or lessor of the Outfall Conduit Lease, (ii) exercise of any other discretionary authority with respect to the Project possessed by City under the police power, or (iii) any environmental approvals that may be required under CEQA, NEPA or any other federal or state environmental laws or regulations in conjunction with any development approval required for the Project (all such decisions or actions, collectively, "Discretionary Actions"). In the event City takes or fails to take one or more of the Discretionary Actions, any such action or inaction shall not constitute a breach of City's obligations under this Agreement or of any express or implied covenant herein.

Section 3. Mutual Cooperation and Assistance

The successful implementation of this Agreement will require a coordinated effort by Castle Wind and City. The Parties understand, acknowledge and agree, while some of the Community Benefits (such as those set forth in the Fishermen's Agreement) are specific and well-defined, other Community Benefits, including Local Economic Development Activities, will require further delineation and refinement and the terms of the Community Communications Plan and the Outfall Conduit Lease remain to be developed and negotiated in the future. Without limiting the effect of the timing requirements of Subdivision 1 (d), each Party agrees to work together collaboratively with the other Party and to take such further actions and execute such additional documents as may be reasonably necessary to carry out the provisions of this Agreement while preserving, to the maximum extent possible, all material consideration to both Parties and (ii) Castle Wind agrees to use its best efforts, in good faith, to agree upon and implement the Local Economic Development Activities and the Community Communications Plan consistent with their purpose and intent as described in this Agreement, and in a manner that allows the Morro Bay community to realize the Community Benefits and to maximize the economic and other benefits of the Project. City agrees, subject to reservation of discretion with respect to any Discretionary Actions described in Section 2, to reasonably cooperate with, assist and support Castle Wind in the Environmental Review Process and the Governmental Agency Approvals process and to negotiate, in good faith, the terms and conditions of the Outfall Conduit Lease.

Section 4. Outfall Conduit Lease Option

(a) Outfall Conduit. City owns and controls the submerged outfall structure formerly utilized by the Morro Bay Power Plant for discharge of cooling water into Estero Bay north of Morro Rock ("Outfall Conduit"). The Parties acknowledge the Outfall Conduit could be effectively re-utilized to route the export cable that will electrically connect the Project to the Morro Bay substation owned and operated by PG&E, located adjacent to the former Morro Bay Power Plant property, and, thereby, interconnect with the high-voltage transmission system operated by the California Independent System Operator.

(b) Option, Consideration. Within 14 calendar days after the Effective Date, Castle Wind shall pay to City $250,000 ("Option Consideration"), in consideration of which, and subject to, and without waiver or compromise of the reserved discretion of City described in Section 2, Castle Wind shall have the exclusive option ("Option") to enter into a non-transferable, long-term, mutually agreeable lease of the Outfall Conduit ("Outfall Conduit Lease").

(c) Exercise of Option, Expiration. If Castle Wind desires to exercise the Option, then it shall (i) within 12 months after having received the legally binding BOEM Lease, have submitted to BOEM a complete SAP and (ii) have delivered written notice to City of the desire to exercise the Option no later than 180 days after BOEM approves the SAP ("Option Exercise Date"). Following the Option Exercise Date, the Parties shall promptly, and in good faith, negotiate the terms and conditions of the Outfall Conduit Lease, subject to, and without waiver or compromise of the reserved discretion of City described in Section 2. If Castle Wind fails to provide timely notice of its desire to exercise the Option or the Parties fail to execute the Outfall Conduit Lease within 120 days after Castle Wind provides notice of its desire to exercise the Option ("Lease Execution Date"), then the Option shall expire and be of no further force or effect and neither Party shall have any rights or obligations pursuant to this Agreement arising from the Option.

Section 5. Term and Termination

The Agreement shall become effective on the Effective Date and shall remain in full force and effect unless or until:

(a) Notice from Castle Wind to City, Castle Wind has terminated the Project;

(b) Castle Wind has surrendered the BOEM Lease, or the BOEM Lease has expired;

(c) The Parties fail to enter into an Outfall Conduit Lease by the Lease Execution Date;

(d) Castle Wind does not timely make the Option Consideration; or

(e) The execution of the Outfall Conduit Lease.

Section 6.

(a) Breach, Default and Cure. Before either Party may declare a Default and take any action based thereon (including, without limitation, commencing any administrative or judicial proceeding), the procedures in this Section 6 must be followed. The Party asserting a Default ("Non-Defaulting Party") may elect to do so by providing written notice to the Party alleged to be in Default ("Defaulting Party") specifying the nature of the Default and the actions, if any, to be taken by the Defaulting Party to cure or remedy the Default ("Default Notice"). The Defaulting Party shall have 30 days from receipt of the Default Notice within which to cure the Default (the "Cure Period") and, if it fails to do so within that period, it shall be deemed in Default, and the Non-Defaulting Party may exercise any rights or remedies available under this Agreement, in equity (including the right to specifically enforce this Agreement pursuant to Section 6(b)) or by law; provided, however, that if the nature of the Default is such that it cannot reasonably be cured within 30 days, the Defaulting Party shall be afforded reasonable additional time so long as it commences such cure within the Cure Period and diligently pursues such cure to completion. The provisions of this Subsection 6(a) shall be inapplicable to Section 5.

(b) Equitable Relief. The Parties acknowledge and agree that, in the event of any material breach of this Agreement, damages would be extremely difficult or impossible to determine and that a remedy at law alone would be inadequate and the breach would therefore result in irreparable injury to the non-breaching Party. Accordingly, the Parties agree that, in addition to any other available remedies for material breach, the non-breaching party shall be entitled to obtain both temporary and permanent injunctive relief to enforce the material provisions of this Agreement and to seek specific performance of the obligation as to which the Default exists.

Section 7. Exclusive Nature of Agreement

As consideration for the binding commitment by Castle Wind to provide the Community Benefits and its assumption of the other obligations described herein, City agrees it shall not enter into any similar agreement with any third party to support an offshore wind project in the Covered Area other than the Project.

Section 8. Castle Wind's Representations and Warranties

Castle Wind represents and warrants to City:

(a) Castle Wind is a duly organized and existing limited liability company under the laws of the State of Delaware, and it has full right, power and authority to carry on its activities and to execute, deliver, perform, comply with and consummate this Agreement.

(b) Except as expressly set forth herein, Castle Wind is relying solely upon its own inspection, investigation and analysis of the foregoing matters and is not relying in any way upon any representations, statements, agreements or other information by or from City not expressly contained in this Agreement.

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(c) The execution of this Agreement by Castle Wind, its delivery to City and the performance by Castle Wind of its obligations under this Agreement have been duly authorized by its management.

(d) The execution, delivery, performance of and compliance with this Agreement has not resulted and will not result in any violation of, or be in conflict with, any federal, state or local law, policy or regulation applicable to Castle Wind.

If Castle Wind becomes aware of any act or circumstance which would change or render incorrect, in whole or in part, any representation or warranty made by Castle Wind hereunder, whether as of the Effective Date or any time thereafter through the termination of the Agreement, then Castle Wind shall give immediate written notice of such changed fact or circumstance to City, but such notice shall not release Castle Wind of any liabilities or obligations with respect thereto.

Section 9. City's Representations and Warranties

City represents and warrants to Castle Wind as follows:

(a) City is a duly organized and existing public entity by virtue of the laws of the State of California, and it has full right, power and authority to carry on its activities and to execute, deliver, perform, comply with and consummate this Agreement.

(b) Except as expressly set forth herein, City is relying solely upon its own inspection, investigation and analysis of the foregoing matters and is not relying in any way upon any representations, statements, agreements or other information by or from Castle Wind not expressly contained in this Agreement.

(c) The execution of this Agreement by City, its delivery to Castle Wind and the performance by City of its obligations under this Agreement have been duly authorized by its City Council.

(d) The execution, delivery, performance of and compliance with this Agreement has not resulted and will not result in any violation of, or be in conflict with, any federal, state or local law, policy or regulation applicable to City.

If City becomes aware of any act or circumstance which would change or render incorrect, in whole or in part, any representation or warranty made by City hereunder, whether as of the Effective Date or any time thereafter through the termination of the Agreement, then City shall give immediate written notice of such changed fact or circumstance to Castle Wind, but such notice shall not release City of any liabilities or obligations with respect thereto.

Section 10. Miscellaneous

(a) Advice of Legal Counsel. Each Party acknowledges it has reviewed this Agreement with its own legal counsel, and based upon the advice of that counsel, has freely entered into this Agreement.

(b) Assignment; Successors. This Agreement shall inure to the benefit of, be binding upon, and be enforceable by and against the Parties and their respective successors and permitted assigns. Castle Wind shall be permitted to assign this Agreement, or any portion thereof, to an affiliate or subsidiary of Castle Wind; provided, that Castle Wind remains in control of the affiliate or subsidiary. Castle Wind may also transfer its rights with respect to the Option to a third party in the event Castle Wind fails to secure the BOEM Lease ("Third-Party Transferee"); provided, that any transfer by Castle Wind of any right or obligation under this Agreement shall require the prior written consent of City. Castle Wind shall provide City with written notice of any transfer of any rights or obligations under this Agreement within 10 calendar days after such transfer. City and Castle Wind shall each be entitled to 50 percent of the value received by Castle Wind from a Third-Party Transferee as consideration for the transfer.

(c) Controlling Law. This Agreement shall be enforced in accordance with the laws of the State of California and the United States.

(d) Notices. All notices to either Party under this Agreement shall be in writing and shall be addressed to the affected Party at the addresses set forth below. A Party may change its address by giving notice in compliance with this Subsection 10(d). The addresses of the Parties are:

If to Castle Wind:

Castle Wind LLC
548 Market St #62641
San Francisco, California 94104-540
Tel: 206.300.7721
Facsimile: 425.988.1977
Email: allaw@castlewind.com
Attn: Alla Weinstein, CEO

Copy to:

Perkins Coie, LLP
11988 El Camino Real, Suite 350
San Diego, CA 92130-2594
Tel.: 858.720.5748
Facsimile: 858.720.5799
Email: lzagar@perkinscoie.com
Attn.: Laura Zagar

PUBLIC VERSION

If to City:

City of Morro Bay
595 Harbor Street
Morro Bay, CA 93442
Tel.: 805.772.6205
Facsimile: 805.772.7329
Email: scollins@morrobayca.gov
Attn: City Manager

Copy to:

Joseph W. Pannone
Aleshire & Wynder, LLP
2361 Rosecrans Avenue, Suite 475
El Segundo, CA 90245-4916
Tel.: 310.527.6663
Facsimile: 310.532.7395
Email: jpannone@awattorneys.com

(e) Counterparts. This Agreement may be executed in counterparts, each of which may be deemed an original, but all of which shall constitute one and the same document, and signatures transmitted by facsimile or email/pdf shall in all respects be treated as originals.

(f) Entire Agreement. The Agreement contains the entire agreement between the Parties and supersedes any prior agreements, discussions, or commitments, written or oral, between the Parties.

(g) Further Assurances. The Parties hereto agree to take such actions and execute such additional documents as are reasonably necessary to carry out the provisions of this Agreement.

(h) Modification. This Agreement may not be altered, amended or modified except by an instrument in writing signed by the Parties to this Agreement.

(i) Severability. If any term, provision, covenant or condition of this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, but the remainder of the provisions can be enforced without failure of material consideration to either Party, then the remainder of the Agreement shall continue in full force and effect.

(j) Venue. Venue for all legal proceedings shall be in the Superior Court of California, County of San Luis Obispo or the United States District Court for Central District of California, if the matter involves federal law.

(k) Waiver. A waiver by any Party of any breach of any term, covenant or condition herein contained or a waiver of any right or remedy of such Party available hereunder at law or in equity shall not be deemed to be a waiver of any subsequent breach of the same or any other term, covenant or condition herein contained or of any continued or subsequent right to the same right or remedy. No Party shall be deemed to have made any such waiver unless it is in writing and signed by the Party so waiving.

(l) Rules of Construction. In this Agreement, the singular includes the plural; "shall" is mandatory, and "may" is permissive. The Parties acknowledge and agree each of the Parties. In cases of uncertainty as to the meaning, intent or interpretation of any provision of this Agreement, the Agreement shall be construed without regard to which of the Parties caused, or may have caused, the uncertainty to exist. No presumption shall arise from the fact that particular provisions were or may have been drafted by a specific Party, and prior versions or drafts of this Agreement shall not be used to interpret the meaning or intent of this Agreement or any provision hereof.

(m) Time of the Essence. Time is of the essence of each and every obligation of the Parties under this Agreement.

(o) Independent Contractors. Each Party is an independent contractor and shall be solely responsible for the employment, acts, omissions, control and directing of its employees. Except as expressly set forth herein, nothing contained in this Agreement shall authorize or empower a Party to assume or create any obligation or responsibility whatsoever, express or implied, on behalf of or in the name of the other Party or to bind the other Party or make any representation, warranty or commitment on behalf of any other Party. Nothing in this Agreement shall be deemed to create any form of business organization between the Parties, including, without limitation, a joint venture or partnership.

(p) Force Majeure. The obligations of any Party under this Agreement, and all deadlines by which any Party's obligations hereunder must be performed ("Delayed Obligation"), shall be excused or extended for a necessary period of time equal to any prevention, delay or stoppage in performance which results from any strike, lock-out or other labor or industrial disturbance, regulatory delay, civil disturbance, act of a public enemy, war, riot, sabotage, blockade, embargo, lightning, earthquake, fire, storm, hurricane, tornado, flood, explosion or other delays not within the control of the Party required to perform the Delayed Obligation ("Force Majeure"). Any Party relying on a Force Majeure shall give the other Party written notice of the Delayed Obligation within 30 days after becoming aware or it could have become aware of the Force Majeure; and the Parties shall use their reasonable, good faith efforts to minimize potential adverse effects from such Force Majeure.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the date first written above.

CITY OF MORRO BAY

By: _____
Jamie Irons, Mayor

ATTEST:

_____
for Dana Swanson, Clerk

APPROVED AS TO FORM:

_____
Joseph W. Pannone, City Attorney

CASTLE WIND LLC

By: _____
Alla Weinstein, CEO

By: _____
Holger Grubel, COO

PUBLIC VERSION

Exhibit A

The Covered Area referred to in Sections 5(c) and 6 refers to: (1) the entire potential Wind Energy Area (WEA) designated as "Morro Bay WEA" and as referred to by BOEM and the California Energy Commission; and (2) the Outfall Conduit. The actual Project site location and Outfall Conduit will be defined by the BOEM issued lease and will be subject to potential adjustments during the Environmental Review Process.

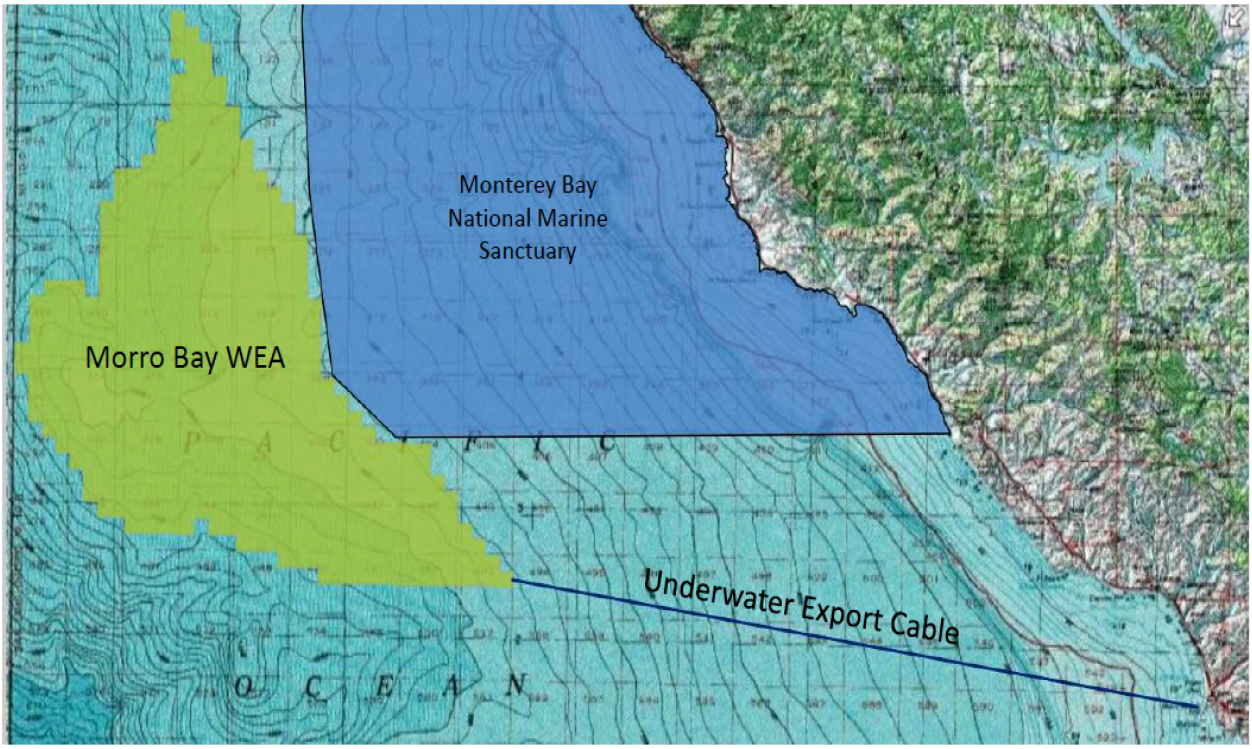

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Exhibit B

Economic Benefits Study

PUBLIC VERSION

CAL POLY
California Polytechnic State University
San Luis Obispo, Ca 93407

ORFALEA COLLEGE OF BUSINESS

Economic and Fiscal Impacts of the Morro Bay Offshore (MBO) Wind Farm Project

May 2, 2018

Stephen F. Hamilton
Professor of Economics
California Polytechnic State University

Prepared for

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EXECUTIVE SUMMARY

This report calculates the economic and fiscal impacts of the proposed Morro Bay Offshore Wind Farm (MBOWF), a 765 megawatt[1] (MW) floating offshore wind farm proposed by Trident Winds.

Table E1 shows the annual local economic output that results from the direct spending in each year of the operation period. The entries in the table include only the benefits resulting from local spending on labor, materials and services and do not include any additional benefits resulting from the value of the energy created.

The *direct impact* reflects the initial change in economic activity from local payroll and construction expenditures over the construction and operation period. The *indirect impact* results from local "business-to-business" transactions necessary to support the direct activity, for instance local purchase of building materials, engineering and consulting services, and other goods purchased from supporting industries. The *induced impact* results when the increased earnings generated by the direct and indirect economic activity is spent on local goods and services, for example when workers at the facility purchase food, clothing, automobiles, real estate, and education, health and social services.

Table E1: SLO County Economic Impact of MBOWF

Impact	Economic Activity	Job Years (FTEs)[1]	Employee Compensation[2]	Economic Output[3]
Operating Phase (Annual)				
Direct	Project Development	28	$1,734,259.63	$11,053,280.00
Indirect	Local Supply Chain	23.7	$1,188,398.63	$3,928,857.77
Induced	Employee Spending	13	$542,170.37	$1,682,374.33
Total Operating Phase		**64.7**	**$3,464,828.63**	**$16,664,512.10**
Total Economic Impact		**64.7**	**$3,464,828.63**	**$16,664,512.10**

[1] Job estimates include part-time and full-time employment
[2] Employee compensation includes wages and fringe benefits paid for by employers
[3] Economic output includes all local spending on labor, materials, and services, and does not include the value of the energy created.

Source: Copyright 2011 Minnesota IMPLAN Group, Inc.

Based on the projected need for direct employment of employees making up 28 job-years for annual operations, it is estimated that MBOWF would create 64.7 full-time equivalent jobs during the operating period in the County.[2] The total local economic impact of MBOWF is $16.6 million per year. The share of local benefits attributed to San Luis Obispo County will depend on the success of programs Trident Winds has put in place to emphasize employment in the county.

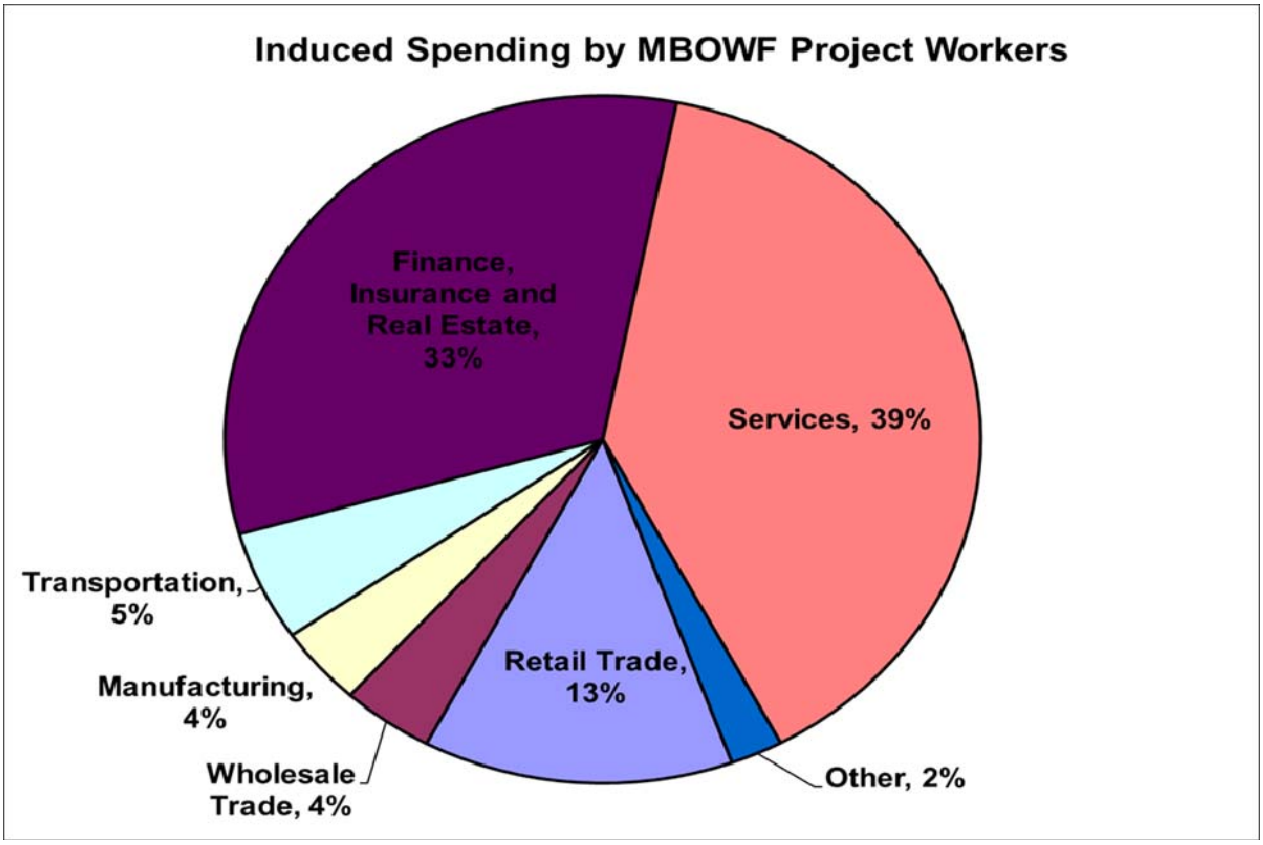
[1] Nameplate Capacity provided by Trident Winds.

[2] A full-time equivalent (FTE) job represents the equivalent of a single person employed for the entire fiscal year. An FTE is considered to be 2,080 hours of employment.

In addition to providing a local economic impact of over $16 million annually, MBOWF is expected to produce a net fiscal benefit for the County of $311,287 per year.

Figure E1 provides a breakdown of induced spending by MBOWF workers. The majority of induced spending is projected to occur in Finance, Insurance and Real Estate, Services and Retail Trade.

Figure E1. Induced Spending by MBOWF



PUBLIC VERSION

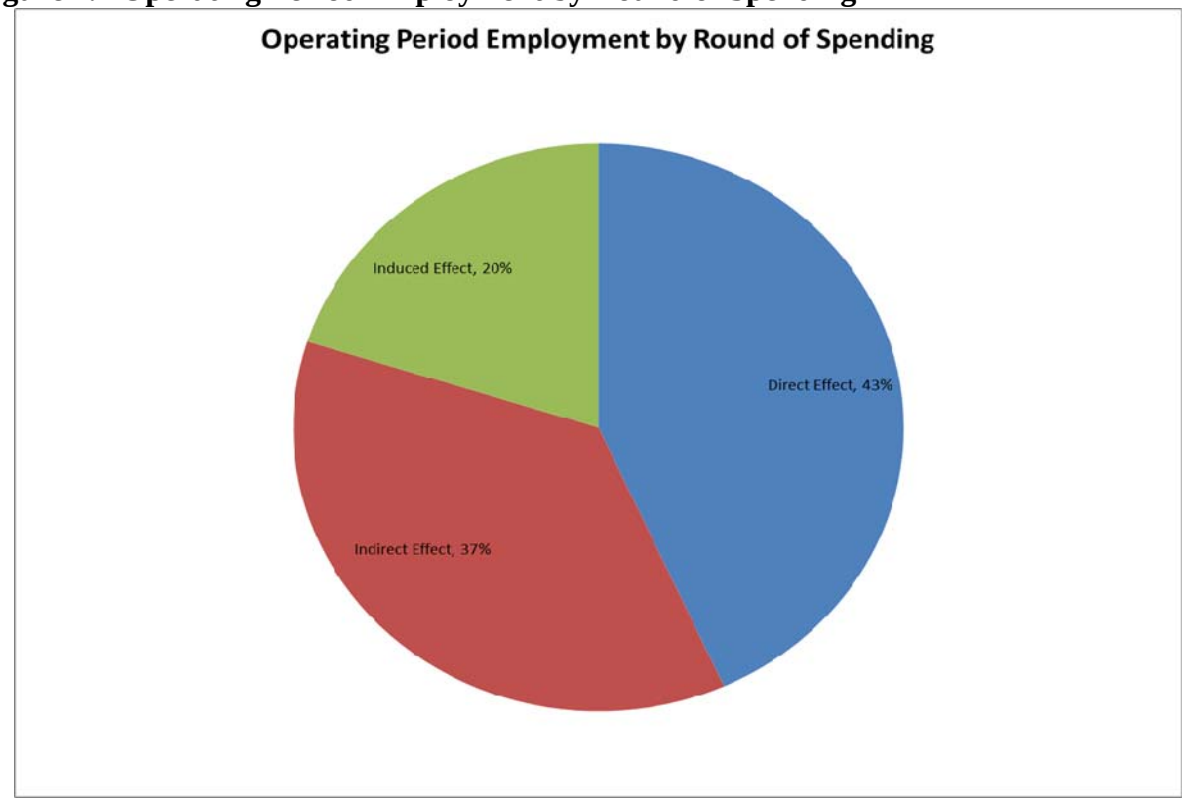
I. INTRODUCTION

This report details the economic and fiscal impacts of the Morro Bay Offshore Wind Farm (MBOWF), a 765 megawatt (MW) offshore wind farm proposed for San Luis Obispo County by Trident Winds.

During the operating period, an estimated cost of $95 per Kilowatt is projected for local operations and maintenance (O&M) over a 30-year operating period, which is the lifetime of the wind farm considered in this report. Approximately $1.7 million annually will be spent over this period on the estimated 28 annual workers needed to operate and maintain the plant.[3] In total, MBOWF will generate an estimated 64.7 job-years annually over the 30-year operating period in San Luis Obispo County ("local economy").

Figure 1.1 presents a breakdown of the operating period employment created by round of spending in the local economy.

Figure 1.1 Operating Period Employment by Round of Spending



Earnings and output are based upon the local content assumptions recommended by BOEM.[4] The study creates cases for local share content. Scenario 0 assumes little infrastructure and supply chain to support the new facility. Scenario B assumes a robust infrastructure and supply chain to support the industry. Because of this, Scenario B can be thought of as the long run annual impact of the facility. The following analysis will focus primarily on Scenario 0 with a brief case study of Scenario B prior to the conclusion.

[3] Data provided by Trident Winds.

[4] Speers et al. 2016, pg. 19

II. BACKGROUND

Morro Bay Offshore Wind Farm is a 765 MW alternating current (AC) wind farm currently being developed by Trident Winds. Each floating offshore wind system will consist of a commercially available floating support structure and a large offshore wind turbine generator. The proposed plant, located approximately 45 km offshore, is expected to have approximately 100 floating windmills[5].

MBOWF relies on technology that requires no piling and is well suited for deep and variable seabed conditions. This unique method relies on anchoring and is completely reversible; no permanent damage will be done to the sea bed. The energy generated by the plant will help meet California's Renewable Portfolio Standard (RPS), which requires investor-owned utilities, electric service providers and community choice aggregators to increase procurement from eligible renewable energy resources by at least 1% of their retail sales annually to 33% by 2020. Conveying the energy produced at the plant will require interconnection to the transmission grid, an effort that will be undertaken by Trident Winds. Additional economic benefits created from construction of the interconnect are not considered in this report. The final project site will include windmills, as well as an electrical substation and maintenance facilities.

This report considers a minimum operating life of 30 years, which results in a conservative lower-bound on the economic benefits that will arise over the operating period of the project under the existing lease.

III. METHODOLOGY

The economic analysis relies on IMPLAN (Impact analysis for Planning), an input-output model developed and maintained by the Minnesota IMPLAN Group ("MIG") that is used for economic impact analysis by over 2,000 public and private institutions.[6] The analysis draws on data collected from numerous state and federal sources, including the Bureau of Economic Analysis, Bureau of Labor Statistics (BLS), and the U.S. Census Bureau. The wind industry inputs for the analysis come from the National Renewable Energy Laboratory (NREL) and Jobs and Economic Development Impact Model (JEDI). The local share estimates come from Bureau of Ocean Energy Management (BOEM).

a. Description of IMPLAN

The IMPLAN modeling system relies on a matrix representation of the economy that describes the relationships among industries, consumers, government and foreign suppliers in order to derive the economy-wide impacts of changes in a specific industry. This matrix representation is the so-called Leontief matrix, which contains average input (purchase) coefficients that describe the mix of goods, services and labor that are required to produce a unit of output; that is, how the output of one industry is used as an input in other related industries. The resulting input-output

[5] Information provided by Trident Winds.
[6] MIG; http://implan.com/V4/index.php?option=com_content&view=article&id=282:what-is-implan&catid=152:implan-appliance-&Itemid=2

coefficients represent what economists refer to as production functions.[7] The basic input-output model can be expressed in a straightforward equation: $X= (I-A)^{-1} *dY$ where (I-A) is the inverse of the Leontief matrix, dY is a change in final demand and X is output.

The IMPLAN model refines the US economy into 440 unique sectors and allows for regional disaggregation down to the county level. The model can be used to estimate the direct, indirect and induced impacts on employment, earnings and output as a result of final demand changes that result from a new investment in a particular industry or compilation of industries.[8] The *direct effect* captures the initial change in economic activity resulting from the new investment. The *indirect effect* reflects new economic activity that is stimulated by the direct investment in industries that supply inputs to the sector of initial change. For example, increased spending on engineering consulting services to support the construction industry would be an indirect effect that arises during the construction phase of a plant. The *induced effect* captures the economic activity that results when the increased earnings generated by the direct and indirect economic activity is spent on local goods and services, for instance when workers hired to work on the wind farm spend income on groceries, clothing, financial services, real estate, and healthcare. The economic impact of the project is the sum of these direct, indirect and induced effects.

b. **Description of JEDI**

The Jobs and Economic Development Impact (JEDI) model, produced by National Renewable Energy Laboratory, is a screening tool that estimates the economic impacts of constructing and operating power plants, fuel production facilities, and other projects at the local and state level. Based on user-entered project data, JEDI estimates the direct, indirect, and induced effects by the creation of a new energy facility. JEDI methodology relies upon the MIG state-level data to estimate the local economic activity and the resulting impact form new energy generation plants.[9]

c. **IMPLAN Inputs**

The county-level economic impacts of the proposed 765MW MBOWF are estimated using IMPLAN v3. To maintain consistency with the National Renewable Energy Laboratory's (NREL's) Jobs and Economic Development Impact (JEDI) model, the 536 IMPLAN industries are aggregated into 14 sectors that correspond to distinct areas of investment related to power generation projects. The aggregated sectors are as follows: Agriculture; Construction; Electrical Equipment; Fabricated Metals; Finance, Insurance and Real Estate; Government; Machinery; Mining; Other Manufacturing; Other Services; Professional Services; Retail Trade; Transportation, Communication and Public Utilities; and Wholesale Trade.

[7] The production functions used in IMPLAN are based on the US Bureau of Economic Analysis' (BEA's) Benchmark Input-Output Accounts.

[8] *Final Demand* is the demand of units external to the industrial sectors that constitute the producers in the economy, *e.g.*, households, government and foreign trade. (Miller and Blair, 1985). Output represents the value of industry production.

[9] JEDI Methodology

Economic value is generated from the direct labor requirement for operations and maintenance of the facility. The labor cost to Trident Winds is comprised of both employee wages and employee benefits. Trident Winds is projected to spend $61,937.84[10] per worker in total compensation during the operations phase of the project (the compensation rate for maintenance and repair occupations in San Luis Obispo County).

The JEDI model was utilized to generate the direct impacts to the local economy given the initial input conditions provided by Trident Wind. The direct employment results from Jedi were then inputted into an analysis by parts template to calculate IMPLAN inputs for a nonexistent industry. These results in the nonexistent industry template were imputed using the output per worker estimate for all other renewable industries. This estimate is $394,760 output per worker[11]. This created inputs for IMPLAN where the indirect and induced economic effects were generated. IMPLAN contains a zip code analysis allowing for results based on Morro Bay as well as SLO county.

The process was completed with two different scenarios, with different local share estimates for both SLO county and Morro Bay.

IV. RESULTS

a. Economic Impacts

The results of modeling in IMPLAN are displayed in Tables 4.1- 4.3. Tables 4.1 and 4.2, respectively, show the induced and indirect impacts of the MBO Wind Farm project on employment across the aggregated sectors underlying the study.

Table 4.1: Induced Employment Generated by Direct Spending in the Local Economy

	Operation Phase	
Industry/Sector	Jobs	% of Total
Agriculture	0	1%
Mining	0	0%
Transportation, Communication and Public Utilities	0	3%
Construction (Maintenance & Repair)	0	1%
Other Manufacturing	0	2%
Fabricated Metals	0	0%
Machinery	0	0%
Electrical Equipment	0	0%
Wholesale Trade	0	3%
Retail Trade	2	18%
Finance, Insurance and Real Estate	1	12%
Professional Services	1	6%
Services (except Public Administration)	6	55%
Government	0	0%
Total Induced Employment	**11**	**100%**

Source: Copyright 2011 Minnesota IMPLAN Group, Inc.

[10] Calculated by: Direct Labor Income ÷ Direct FTE Employment. The values can be found in Figure 4.3
[11] Source: 2011 Minnesota IMPLAN Group, Inc.

Table 4.2: Indirect Employment Generated by Direct and Indirect Spending in the Local Economy

	Operation Phase	
Industry/Sector	Jobs	% of Total
Agriculture	0	0%
Mining	1	2%
Transportation, Communication and Public Utilities	2	10%
Construction (Maintenance & Repair)	3	11%
Other Manufacturing	0	1%
Fabricated Metals	0	0%
Machinery	0	0%
Electrical Equipment	0	0%
Wholesale Trade	1	4%
Retail Trade	1	3%
Finance, Insurance and Real Estate	3	11%
Professional Services	9	36%
Services (except Public Administration)	5	21%
Government	0	0%
Total Indirect Employment	**24**	**100%**

Source: Copyright 2011 Minnesota IMPLAN Group, Inc.

Note that the employment figures generated by IMPLAN are converted into full-time equivalent jobs (job-years) to facilitate the comparison of employment effects across sectors for different compositions of part-time and full-time employees. The employment effects reported for the operating period represent the annual impacts of the project on local job creation in SLO County over the operating horizon.

Table 4.3 depicts the local economic impact of MBOWF in terms of employment, employee compensation, and total economic output.[12] The entries in the table indicate that the proposed project will create 64.7 job-years annually over the 30-year operating period in the local economy. In total, 43% of employment creation of the project arises through direct employment effects as a result of the MBOWF facility.

The resulting impact on local employee compensation and economic output are presented in the table in 2018 dollars. Development of MBOWF will generate $3.5 million in local employee earnings and $16.7 million in local economic output annually over the initial 30 year operating period.

[12] Local economic impacts reflect the assumption that the construction and O&M employment requirements are met by workers located in San Luis Obispo County.

Table 4.3: SLO County Economic Impact of MBOWF

Impact	Economic Activity	Job Years (FTEs)[1]	Employee Compensation[2]	Economic Output[3]
Operating Phase (Annual)				
Direct	Project Development	28	$1,734,259.63	$11,053,280.00
Indirect	Local Supply Chain	23.7	$1,188,398.63	$3,928,857.77
Induced	Employee Spending	13	$542,170.37	$1,682,374.33
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Total Economic Impact		**64.7**	**$3,464,828.63**	**$16,664,512.10**

[1] Job estimates include part-time and full-time employment

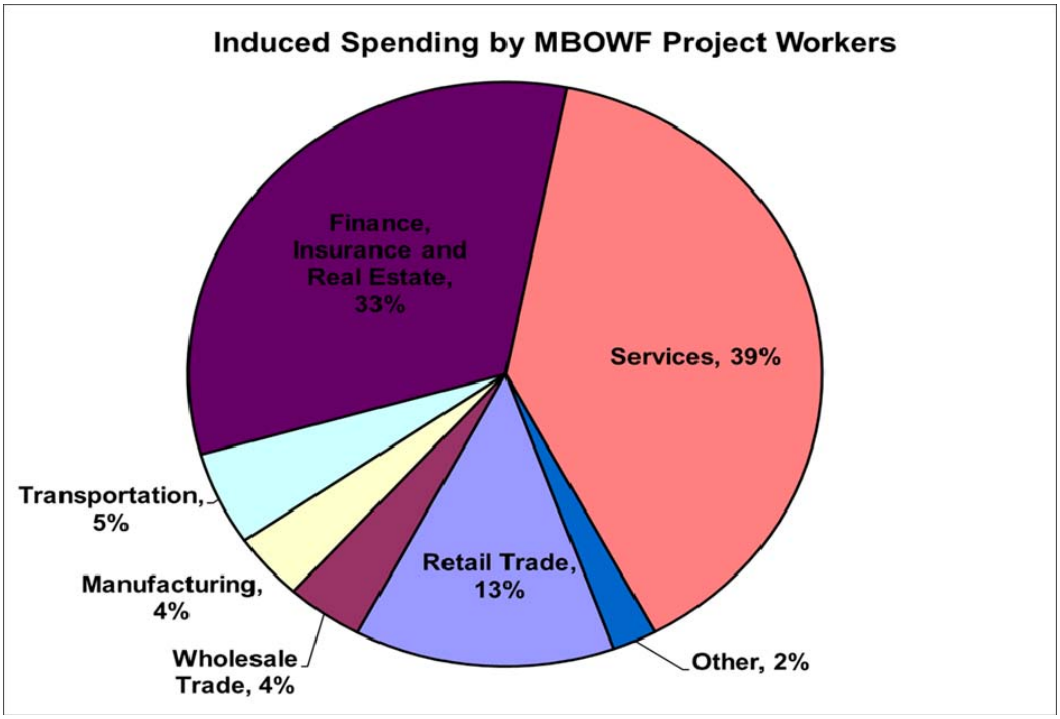
[2] Employee compensation includes wages and fringe benefits paid for by employers

[3] Economic output includes all local spending on labor, materials, and services, and does not include the value of the energy created.

Source: Copyright 2011 Minnesota IMPLAN Group, Inc.

Figure 4.1 details the distribution of induced spending by MBOWF workers across industries. The largest shares of induced spending is projected to occur in the service sector, finance, insurance and real estate industries, and retail trade, where service industries include administrative and waste services, educational services, health and social services, entertainment and recreation, professional services, and accommodation and food services. Other industries, which together account for 2% of induced spending, include agriculture, mining, construction and wholesale trade, with wholesale trade accounting for about half of spending in the category.

Figure 4.1. Induced Spending by MBOWF Project Workers



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b. **Fiscal Impacts**

Table 4.4 displays a detailed distribution of the California state sales and use tax. SLO County will collect a local sales tax of 1% on all materials and supplies spent for the MBOWF.

Table 4.4 Distribution of Sales and Use Tax

Purpose	Rate
State	6.00%
SLO County	0.25%
Local	0.50%
Special	1.00%
Total	7.75%

Source: https://www.taxrates.com/state-rates/california/cities/morro-bay/

Fiscal Impacts on SLO county are dependent on our percentage of local share attributed to materials and maintenance costs as well as indirect taxes from property and corporate taxes. The local share for Scenario 0 provides a smaller portion of local share value. Table 4.5 displays the aggregated sales and tax revenues collected by San Luis Obispo County in the operating phase of the project.

Table 4.5: SLO County Tax Benefits For Scenario Year 0

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Dividends				$557	
Social Ins. Tax	$7,158				
TOPI[1]		$231,302			
Corporate Tax				$9,927	
Personal Taxes[2]			$62,343		
Total County and Local Tax	$7,158	$231,302	$62,343	$10,484	$311,287

[1] Tax on Production and Imports includes Sales, Property, Severance, and Use taxes.
Also includes motor vehicle license and other S/L taxes.
[2]Includes Income Tax, Fines/Fees, and other licenses(Fish/Hunting)

Total state and local tax benefits total $311,287 with 74% of revenue is generated from sales, property, severance, and use taxes. This is a conservative estimate for SLO county assuming tax revenues will take place annually during the startup period of the wind farm. This estimate is based off of IMPLAN's estimates of fiscal impacts. Direct spending and sales tax revenue will depend on Trident Wind's O&M estimates for materials and supply costs relative to local share of operating spending.

Scenario B for SLO county assumes a larger local share of spending for operating expenses based on a 30 year average. B implies Trident and SLO county has become a supplier for the

wind industry along the central coast and will increase indirect effects within the county. Scenario B county and local tax benefits total $555,868 with 74.3% of revenue generated from sales, property, and use taxes.

Morro Bay Fiscal Impacts Estimate

IMPLAN has the ability to run a zip code level estimate of tax revenues from the wind farm. Scenario 0 provides a conservative estimate for total tax benefits of $119,091 and Scenario B provides an estimate for total tax benefits of $214,191. Tax benefits consist of sales, property, and severance tax, but Morro Bay does not receive a use tax benefit. Table 4.6 displays the aggregated sales and tax revenues collected by Morro Bay in the operating phase of the project for scenario 0.

Table 4.6: Morro Bay Tax Benefits For Scenario Year 0

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Dividends				$221	
Social Ins. Tax	$2,941				
TOPI[1]		$82,871			
Corporate Tax				$3,938	
Personal Taxes[2]			$29,120		
Total City and Local Tax	$2,941	$82,871	$29,120	$4,159	$119,091

[1] Tax on Production and Imports includes Sales, Property, and Severance taxes. Also includes motor vehicle license and other S/L taxes.

[2]Includes Income Tax, Fines/Fees, and other licenses(Fish/Hunting)

Note that the tax revenue generated by Morro Bay is a subset of tax revenue generated by SLO county.

c. **Scenario B**

Scenario B looks at the potential local economic impact after the industry supply chain has had time to adjust to the introduction of the MBOWF. Over the lifespan of the wind farm, the local economy will develop to meet the needs of the facility. Scenario B estimates the impacts of the changes described above. It can be thought of as the long run annual effects of MBOWF to the local economy.[13] Table 4.7 depicts the updated figures for the annual local economic impact with amounts to a 68% increase in job-years, 78% increase in employee compensation, and 78% increase in economic output.

[13] Local shares for Scenario B comes from NREL Floating Offshore Wind in California: Gross Potential for Jobs and Economic Impacts from Two Future Scenarios

Table 4.7: Total Economic Impact of MBOWF for Scenario B

Scenario B: O&M Spending in San Luis Obispo County				
Impact	**Economic Activity**	**Job Years (FTEs)**	**Employee Compensation**	**Economic Output**
Direct	Project Development	50	$3,096,892	$19,738,000
Indirect	Local Supply Chain	42	$2,122,140	$7,015,815
Induced	Employee Spending	20	$968,161	$3,004,239
Total Economic Impact		**112**	**$6,187,193**	**$29,758,055**

d. **Morro Bay Impacts**

Table 4.8 restricts the model to only the economic impact on the city of Morro Bay. The table shows an increase in 47 job-years for the local city with just under 60% of the job-years coming directly from the MBOWF over the initial 30-year operating period.

Table 4.8 Morro Bay Economic Impact of the MBOWF

Impact	Economic Activity	Job Years (FTEs)[1]	Employee Compensation[2]	Economic Output[3]
Operating Phase (Annual)				
Direct	Project Development	28	$5,145,744	$11,053,280
Indirect	Local Supply Chain	13	$917,903	$1,651,398
Induced	Employee Spending	6	$474,679	$759,083
Total Economic Impact		**47**	**$6,538,326**	**$13,463,762**

[1] Job estimates include part-time and full-time employment

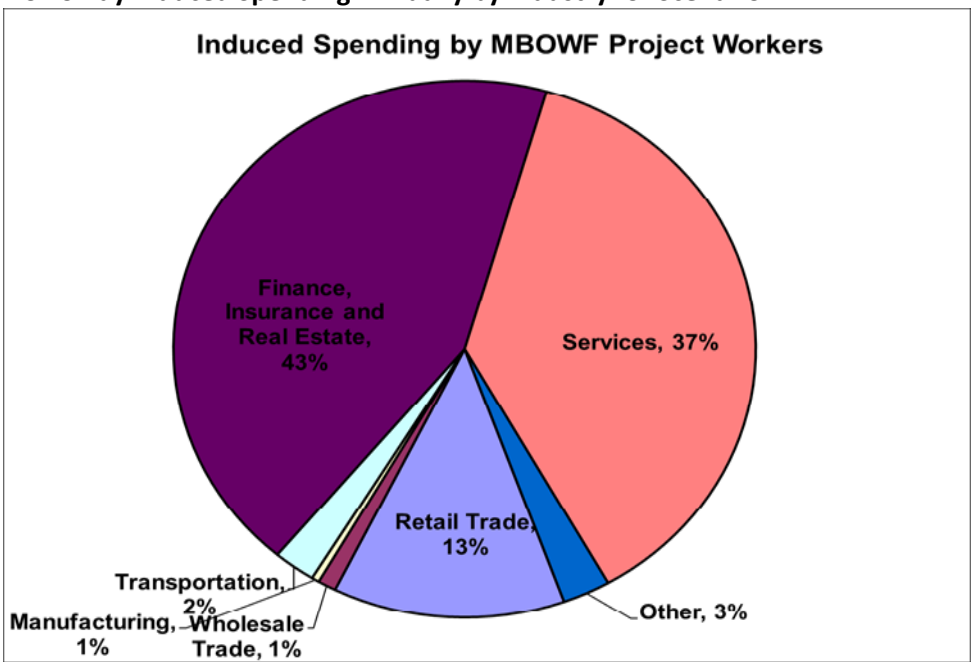
[2] Employee compensation includes wages and fringe benefits paid for by employers

[3] Economic output includes all local spending on labor, materials, and services, and does not include the value of the energy created.

Source: Copyright 2011 Minnesota IMPLAN Group, Inc.

The division of the $759,083 annual induced spending by industry is shown in figure 4.2. Finance, Insurance and Real Estate, Services and Retail Trade making up 93% of the annual induced spending from the Trident Wind Farm.

Figure 4.2: Morro Bay Induced Spending Annually by Industry for Scenario B



e. Commercial Fishery Impact

The Bureau of Ocean Energy Management and US Department of the Interior funded an analysis on potential impacts to commercial fisheries due to offshore wind energy development[14]. The study used data collected from commercial fish tickets on over eight potential wind energy areas (WEA). The results grouped different permit subsets into five separate clusters. The study concluded with a loss of annual revenue net of variable costs (RNVC) of 2.2% in one of the five clusters, with the other four clusters having a RNVC change between a loss of 0.2% and a gain of 0.6%. All effects fell within the normal yearly deviation of the RNVC.

MBOWF could also cause an increase in potential danger to commercial fishermen due to the possibility of boats drifting into the wind farm zone during times with poor visibility such as fog and nighttime. A Danish study[15] has found increased collision frequency after the erection of an offshore wind farm. This increased collision frequency was usually due to a failure on propulsion machinery instead of human or steering failure.

There is also a worry on the effect of electromagnetic fields on the fish population. While some fish species use geomagnetic fields to navigate underwater, current studies have not shown an impact from underwater wind farm cables.[16]

[14]Kirkpatrick et al., 2017
[15] Christensen et al.
[16]Iyre et at., 2007

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Exhibit C

Summary of Fishermen's Agreement

PUBLIC VERSION

Summary of the Mutual Benefits Agreement between

Morro Bay Commercial Fisherman's Organization, Port San Luis Commercial Fishermen Association, and Castle Wind LLC

The Morro Bay Commercial Fisherman's Organization (MBCFO), the Port San Luis Commercial Fishermen Association (PSLCFA), and Castle Wind LLC, a joint venture between Trident Winds Inc. and EnBW North America Inc., have entered into a Mutual Benefits Agreement to minimize the impacts of a future offshore wind project on the local commercial fishing community.

Castle Wind is planning to develop an offshore wind project with a grid connection in Morro Bay that will generate approximately 1,000 megawatts of clean energy for over 300,000 households and businesses. The commercial fishing industry represents a significant part of the Central Coast communities and economy. Castle Wind has been working closely with the local commercial fishing organizations for over two years to develop means to minimize the anticipated impacts in the vicinity of the planned offshore wind project.

The outcome of these negotiations is the Mutual Benefits Agreement, under which:

- MBCFO, PSLCFA, and Castle Wind will form a mutual benefits corporation in the event the Bureau of Ocean Energy Management (BOEM) issues a legally-binding lease to Castle Wind for the proposed offshore wind project.

- Castle Wind will make annual contributions to a fund, to be managed by representatives of MBCFO and PSLCFA, equal to a percentage of the annual operating fees that Castle Wind will be making to BOEM after the commercial operation date.

- The purpose of the fund is to mitigate the anticipated impacts of the offshore wind project on the local commercial fishing community and to help finance new business opportunities for their members.

- The fund will be used for improvements to the infrastructure at Morro Bay Harbor and Port San Luis, as well as to provide grants to reduce impacts to the commercial fishing industry. Those may include improvements to slips and unloading docks, safety equipment, equipment purchases or repair, improvements or repair of storage, fuel docks, or cold storage facilities, among others. The fund may also be used for activities that support the short- and long-term viability of the commercial fishing industry, including low-cost loans, community outreach, college scholarships, and internships.

In addition to the fund, the Mutual Benefits Agreement provides that:

- Members of MBCFO and PSLCFA will have the right of first offer to provide certain qualified services to Castle Wind during construction and operation of the offshore wind project.

- Castle Wind will provide training opportunities to qualified members of MBCFO and PSLCFA to apply their existing skills to the offshore wind industry.

- Castle Wind will consult with MBCFO and PSLCFA about the design of the offshore wind project and will also strive to minimize restrictions on commercial fishing in the project area.