Massachusetts Offshore Wind Ports & Infrastructure Assessment

Phase I: Comprehensive Review of Existing Conditions at Massachusetts Waterfront Properties

May, 2017
Massachusetts is preparing for offshore wind. For more than a decade, the Commonwealth of Massachusetts has been setting the stage for development of this important renewable energy resource, including:

- passing a state law aimed at curbing greenhouse gas emissions;
- leading a comprehensive public engagement effort with the U.S. Bureau of Ocean Energy Management (BOEM) to establish leasing areas for offshore wind that has included over 100 public meetings with federal, state, tribal, and local government officials, fishermen, environmentalists, and the general public;
- conducting surveys of whale, sea turtle and avian activity in the wind energy areas in order to support the responsible and expedited development of offshore wind;
- invested in infrastructure including the New Bedford Marine Commerce Terminal, a first-in-the-nation facility specifically designed to construct, assemble, and deploy offshore wind projects along the Atlantic Coast and the Wind Technology Testing Center in Charlestown, the largest indoor wind blade test facility in North America;
- analyzed the transmission infrastructure necessary to interconnect future Massachusetts offshore wind projects to the regional electric grid including the identification of routes and interconnection locations where offshore wind energy can connect to the ISO-NE grid;
- leading a metocean data initiative with the Woods Hole Oceanographic Institution and AWS Truepower to collect hub-height wind data near federal offshore wind energy areas with a WindCube LIDAR system;
- funding for academic and research institutions across Massachusetts to advance studies relating to offshore wind development, building on the Commonwealth’s existing nation-leading offshore wind innovation activities.

In 2016, Massachusetts added the final critical ingredient by passing legislation to provide offshore wind projects with a pathway to market. Passage of An Act to Promote Energy Diversity, the largest commitment to offshore wind by any state in the nation, puts Massachusetts at the forefront of advancing offshore wind and sets the stage for making Massachusetts a hub for the offshore wind industry. The legislation requires that electric distribution companies, in collaboration with the state, solicit proposals for 1,600 MW of offshore wind over a 10-year period beginning on June 30, 2017.
Massachusetts as a Hub for Offshore Wind

There is a substantial, long-term need for new energy sources for Massachusetts. The regional grid operator reports that coal, oil and nuclear plants, representing almost fifteen percent of the region’s generating capacity, will retire between 2012 and 2020. Offshore wind represents a key means by which the Commonwealth can meet its future energy needs and meet its nation-leading greenhouse gas emissions goals. As such, offshore wind can be a key part of a long-term strategy of energy diversity, and represent a significant economic opportunity for the Commonwealth as these multi-billion dollar projects are constructed in Massachusetts.

The developers of offshore wind lease areas south of Martha’s Vineyard, Massachusetts have extensive experience and financial backing. All three developers intend to build multiple offshore wind projects off the coast of Massachusetts and Rhode Island, with the first projects projected to be operational in the early 2020s. At least five additional offshore wind projects are proposed for sites off the coast of New York, New Jersey, Delaware, and Maryland. All of this development interest adds up to a significant pipeline of offshore wind projects in the region, beginning with Massachusetts’ commitment of 1,600 MW over the next 10 years.

Massachusetts has a skilled workforce able to meet the diverse needs of the offshore wind industry – from project development through manufacturing, fabrication, installation, and operations & maintenance. The four communities that are the subject of this assessment have a proven maritime workforce with deep roots in the construction of ships, other maritime facilities, and power generation facilities.

These key ingredients – a need for new energy, highly capable offshore wind developers, and a workforce with deep maritime history – set the stage for Massachusetts to become a hub for offshore wind development. In that light, the waterside facilities examined in

On the signing of An Act to Promote Energy Diversity that ensures MA purchase of 1600MW of offshore wind power:

“We believe, through the solicitation and procurement of long term contracts for…Offshore Wind Power, Massachusetts and New England can remain a national leader in clean and renewable energy production. (this) bill spurs the development of an emerging Offshore Wind Industry…and ensures this regions ability to continue to lead both on reducing our carbon footprint, but also making sure we have the capacity and the power we need to support the regions families and job creators and businesses…”

Governor Charlie Baker
August 8, 2016
this Assessment represent vital growth opportunities for offshore wind and the region, and valuable economic development opportunities for the Commonwealth.

**Opportunities for Massachusetts Ports**

Because proximity translates into cost savings in marine construction and shipping, Massachusetts ports are ideally situated to support and grow the offshore wind industry. With numerous waterside facilities located within 100 nautical miles (185 km) of over 5 GW of potential offshore wind farm development, the ports of Massachusetts represent the ideal place from which to launch the supply chain to serve the industry.

Massachusetts already hosts a key asset created specifically for the offshore wind industry – the New Bedford Marine Commerce Terminal. This multi-purpose facility was specifically engineered to support the construction, assembly and deployment of offshore wind projects off the east coast of the United States. Although the majority of staging and deployment of turbine components will be done at the New Bedford Marine Commerce Terminal, the offshore wind industry has identified additional activities that will require secondary waterside locations.

A range of supply chain manufacturers interested in participating in the offshore wind industry will want to locate in close proximity to where project staging and deployment will occur. Numerous under-utilized waterside facilities exist within Massachusetts ports. These properties may be available for redevelopment to meet the needs of the new offshore wind industry. They include former coastal power plant properties, former shipyard facilities, and industrial and marine industrial facilities. These facilities have existing waterside infrastructure and/or re-developable land and infrastructure that represent significant opportunities for manufacturing, fabrication, and operation and maintenance sectors of the offshore wind supply chain. These properties are the subject of this assessment.
Massachusetts Offshore Wind Ports & Infrastructure Assessment – Purpose and Scope.

In order to ensure that Massachusetts remains the leader in the development of offshore wind, and in recognition of the fact that Massachusetts has a geographic advantage in its close proximity to Bureau of Ocean and Energy Management (BOEM) offshore wind energy lease areas, MassCEC has commissioned this assessment to provide the offshore wind industry, and its associated supply chain, with the critical information it needs concerning existing port infrastructure in Massachusetts that may be suitable for offshore wind component manufacturing and fabrication. The goal of this assessment is to compile accurate and relevant information concerning the existing port assets within the Commonwealth and to make that information available to decision-makers in the offshore wind industry. The assessment will enable developers and supply chain companies to make informed decisions on industry-led investments in local infrastructure for offshore wind.

This assessment will serve to:

- Attract private investment in Massachusetts waterside facilities for offshore wind supply chain manufacturing and fabrication;
- Jump-start the build-out of infrastructure needed to support growth of an American supply chain for the offshore wind industry; and
- Catalyze the development of an integrated offshore wind supply chain in Massachusetts.

The work under this assessment will be completed in two phases:

Phase 1: Existing Conditions Assessment: Collect and make available to stakeholders, interested developers, and members of the supply chain, detailed information concerning the existing site conditions at a series of waterfront properties in Massachusetts that have the potential to support offshore wind supply chain development. Port and/or waterfront facilities included in the assessment are located in four Massachusetts communities: Boston, Quincy, New Bedford, and Fall River/Somerset. This phase of the assessment is represented by the site reports included herein.

Phase 2: Engineering Assessment: In order to understand the port infrastructure needs of the offshore wind industry for each supply chain activity, this phase begins with a study of the European supply chain – how it developed from the first European offshore wind farms over two decades ago, and how it is likely to become involved in the U.S. offshore wind experience today. This also involves understanding the existing supply chain for similar industries that already exist within the U.S., including the supply chain for the oil & gas industry in the Gulf of Mexico, and the U.S. manufacturing companies that are providing components for land-based wind farms in the U.S. The focus is on the needs of the supply chain in relation to the type of
infrastructure that would have to be developed to conduct each supply chain activity in Massachusetts – and in particular the required port infrastructure.

With the information collected on Massachusetts existing conditions, combined with the offshore wind industry needs, the Engineering Assessment will provide a framework that developers and manufacturers can use to assist in deciding where it makes the most sense to locate offshore wind manufacturing, staging, and O&M facilities in Massachusetts. The Engineering Assessment will identify and evaluate the potential redevelopment and upgrades that may be necessary or advantageous at the waterfront properties evaluated, taking into consideration the supply chain components that were found to be compatible with a particular property. The evaluation will involve conducting conceptual design scenarios for those potential upgrades, estimating potential costs of the upgrades, and highlighting local permitting steps associated with design implementation. This final phase of the study is aimed at providing the offshore wind industry with (a) suggestions as to how the marine facilities in Massachusetts could be used, and (b) estimated upgrade costs, timeframes and local permitting pathways.

**Phase 1 – Existing Conditions Assessment for Massachusetts Port Facilities.**

Maritime industries have thrived in Massachusetts ports and harbors for hundreds of years. Deepwater channels and berths were created to provide access to the ocean, and waterfront properties were improved with bulkheads, wharves and piers, utilities, and landside access to accommodate marine-based industries. While some traditional maritime uses have declined in our ports in recent years, public policy and private interests continue to promote the growth and importance of marine industries to the Commonwealth’s economy. In this context, waterfront properties in Massachusetts represent excellent opportunities for manufacturing and deployment infrastructure to support long-term offshore wind industry growth. Many of these opportunities are documented in this catalog.

The properties featured here were selected for their suitability for marine industrial use based on property owner interest, physical attributes of the sites, accessibility to deep water and landside transportation infrastructure, and policy and regulatory compatibility. The properties are located in five Massachusetts municipalities, three along the south coast in close proximity to the Massachusetts and Rhode Island wind energy areas: New Bedford, Fall River, and Somerset. Two Boston Harbor municipalities, the cities of Boston and Quincy, which offer properties with additional unique advantages.
The site assessments were conducted by a team of engineers and planners with specialized expertise in waterfront development. The team researched and compiled all publicly available information and data of relevance to prospective developers in the offshore wind industry. Property owners and/or lessees were contacted for their consent, and site visits were conducted to evaluate, catalog and photograph physical conditions and attributes.

Each property assessment report includes the following information:

- General location;
- Current use and historical use background;
- State and municipal regulatory classifications and description;
- Existing physical site conditions:
  - Ownership details;
  - Acreage and nautical distance from MAWEA and RI/MA offshore wind areas;
  - Existing conditions of site, quayside, and channel;
  - Quayside length;
  - Waterfront and adjacent shipping channel route controlling depths;
  - Load-bearing capacity;
  - On-site power and substation connections and other utilities;
  - Infrastructure and buildings;
  - Key environmental conditions/history/waivers (including wetlands, floodplains, soil, and surface water);
  - Site access and security;
  - Site distance to highways and rail;
  - Overhead restrictions (for both land transit to property and water transit to wind energy areas);
  - Protection from storms/hurricanes;
- Navigable airspace regulations;
- Existing plans, designs, as-built surveys, O&M manuals, covenants, existing use limitations, and other relevant information.
The assessment team conducted on-site inspections and engineering reviews at each of the sites. The team also noted information concerning the site environs, facilities, and operations. Observations and documentation of the site conditions as they related to redevelopment or use by the offshore wind Industry were made at the time of site visit, including:

- Photos of existing site conditions (site visits were conducted in the spring of 2017);
- A narrative created from notes taken by consultant engineers knowledgeable in port facilities and the needs of the offshore wind Industry supply chain; and
- Observations and assessments concerning engineering parameters at the sites such as condition of physical site components (e.g. piers) and estimates of load bearing capacities.

Information for each site report was compiled from the following sources:

- Past and current site owners – site plans, utility maps, environmental assessments conducted on site, and information on the current and historical use of the site.
- Municipal departments and officials, including:
  - Assessor’s Database – parcel’s size, owner, sales history including last date of sale and price;
  - Building Department – permits and structures on each site;
  - Conservation Commission - reports, notice of intents, order of conditions, and environmental studies conducted on site;
  - Department of Public Works – underground utilities, water, wastewater, roads/infrastructure, and other information;
  - Planning Department – zoning, land use, construction projects, and policies;
  - Town/City/Community websites – details on the community profile, surrounding land use, harbors and waterways, and historical importance.
- State agencies, officials, databases and other sources:
  - Massachusetts Department of Environmental Protection Waterways Program – MGL Chapter 91 licenses;
  - Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup Program – Release Tracking Numbers and Activity and Use Limitations;
  - Massachusetts Department of Environmental Protection Northeast and Southeast Regional Offices;
• Massachusetts Department of Transportation—roads and highways used to navigate to site;
• Massachusetts Port Authority—plans, RFPs, property assessments.

• Federal agencies, databases and sources:
  • The National Oceanic and Atmospheric Administration (NOAA)—navigational charts, waterfront and adjacent shipping channels, including depths and dimensions of channels;
  • U.S. Army Corps of Engineers—channel dredging depths;
  • Federal Emergency Management Agency—floodplains, flood hazard zones, and levees.

The assessment team also reviewed publicly available studies and plans relevant to the site and its environs prepared by other organizations or consultants.

The results of the Phase 1 Assessment work are compiled in a physical report and at the website portal to the study on MassCEC’s website. These property assessments present the data and information in easily accessible graphic, table and narrative formats. The information for each site is organized to provide upfront an overview of essential information on location, use classifications, site characteristics and waterside infrastructure, followed by the body of the report providing greater detail on each of these categories. Full citations for all reports identified as sources of information are listed at the end of each report. Appendices contain tables of permits and licenses and historical photographs of the site. Actual records for the site, such as permits, plans, environmental reports, and site photographs are collected in backup folders accompanying each report.
Next Steps.

Guided by offshore wind industry experts worldwide, a set of offshore wind facility requirements for each offshore wind activity will be established based on current and future offshore wind trends. The team will consult with offshore wind developers and supply chain component manufacturers, primarily in Europe but also domestic suppliers as well, to collect data on the port infrastructure needs for each offshore wind activity. This includes a range of considerations related to how the manufacturer typically uses a site, from general space and building requirements to specific requirements of manufacturing processes (such as quay-side length or power requirements), to the type of vessels used to pick up or drop off components at the sites. Labor needs, technical skills requirements, and the surrounding business support needs are also components of a successful manufacturing operation, and these elements will be considered as well. The information is being gathered through a series of questionnaires sent to supply chain parties and through direct interviews with supply chain representatives, as well as through the databases and knowledge centers within the firms and partners involved with this project. Once a thorough assessment of the supply chain needs has been conducted, a matrix of the supply chain desires, needs, and minimal requirements will be created and used to match up supply chain elements with likely port facility opportunities. This information, combined with information from Phase 1, will be utilized in the final phase of this assessment.

In this final phase, the Engineering Assessment will overlay the facility requirements for each of the offshore wind activities with the existing conditions at each Massachusetts waterfront property and evaluate which locations could best support various activities. For each property, an engineering analysis will lead to a set of detailed upgrade plans, including conceptual redevelopment designs, high-level cost estimates and permitting pathways required for the sites to be able to support offshore wind activities. Focus will be on assessing realistic upgrades or adaptive measures to allow the offshore wind industry to make decisions on the best use of a site and how to make the most effective private industry-led investments in setting up manufacturing, fabrication and long-term operations facilities in Massachusetts.

This comprehensive Engineering Assessment that consolidates the all information generated will be prepared and made available as both a report and an interactive web portal in Summer 2017.

Limitations and Conditions.

The information collected and presented in this May 2017 Phase 1 Existing Conditions Assessment (as summarized in the attached individual site reports) was collected in the Spring of 2017. The information contained herein represents the conditions at the sites at the time of the investigation. Site conditions can change with time, and users of this information and interested stakeholders should confirm all documentation and information through their own due diligence. The information provided herein is intended for planning purposes, and no warranty or guarantee concerning the accuracy or use of this information at any time in the future is given or implied.