

Learning from the Experts Webinar Series

Port Development Considerations for Offshore Wind



Brent D. Cooper, P.E. Project Manager COWI

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Meeting Procedures

Webinar recordings and presentations will be available at: www.nyserda.ny.gov/osw-webinar-series

Participation for Members of the Public:

> Members of the public will be muted upon entry.

> Questions and comments may be submitted in writing through the Q&A feature at any time during the event.









Learning from the Experts

This webinar series is hosted by NYSERDA's offshore wind team and features experts in offshore wind technologies, development practices, and related research.

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The views and opinions expressed in this presentation are those of the presenter and do not represent the views or opinions of NYSERDA or New York State.



Port Considerations for Offshore Wind

NYSERDA LEARNING FROM THE EXPERTS - 12 JANUARY 2022 PORT CONSIDERATIONS FOR OFFSHORE WIND

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Outline

- > Introductions
- > Introduction to OSW Ports
- > Typical Facility Specifications
- > New York State OSW Port Activities and Support
- > U.S. OSW Port Activities
- > Federal Incentives
- Conclusions and Takeaways









Introductions



Brent D. Cooper, P.E.

- > Project Manager
- > 14 years experience with coastal / waterfront / offshore engineering















PORT CONSIDERATIONS FOR OFFSHORE WIND

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Services for Offshore Wind Energy Projects

PROJECT DEVELOPMENT PHASE



- > Project development
- > Environmental impact assessments
 - > Feasibility studies
 - > Wind modelling, siting and energy production
 - > Port Facility Identification
 - > Met-ocean studies
 - > Geotech survey support
 - > Design and engineering of foundations and offshore substation(s)
 - > Design and engineering port facility improvements
 - Package management (offshore substation, WTGs, foundations, array cables, export cables, grid connection)
 - > Procurement and tendering
 - > Construction management and support
 - > Optimization of wind farm performance



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Introduction to OSW Ports



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The Role of Ports within Offshore Wind



U.S. Offshore Wind Development Activity





"Traditional" Ports vs Offshore Wind Ports Typical Characteristics

Characteristic	"Traditional" Port	Offshore Wind Staging Port
Cargo	Container, Liquid, Bulk, Breakbulk, Passenger	Foundations, Towers, Nacelles, Blades, Cables
Location	As far inland as possible (near population centers)	As close to the offshore project site as possible
Water Depth	>50 ft.	>30 ft.
Air Draft	>180-215 ft.	Unlimited
Berth Length	1300 ft. (18,000 TEU)	600 ft. (WTIV)
Berth Access	Shared	Inbound: Shared Outbound: Exclusive
Staging Area	250+ acres (container terminal)	40+ acres
Live Load Capacity at Berth	500 - 2000 PSF	4,000-6,000 PSF with locally stronger crane pads (>=10,000 PSF)
Live Load Capacity Storage	500 - 1000 PSF	2,000 – 3,000 PSF



Types of Offshore Wind Ports

- Manufacturing / Fabrication
- > Staging

 Operations and Maintenance







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Controlling Port Characteristics

- > Staging Area
- > Dedicated Wharf Frontage
- Live Load Capacity
- Navigable Depth
- > Air Draft
- Geographic Location
- Proximity to Project
- > Access to / cost of labor
- > Intermodal connectivity





Manufacturing and Fabrication - Turbine



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Manufacturing and Fabrication Ports

Owner/Operators:

- Component Suppliers
 - > Turbine OEM
 - Foundation Fabricators
 - OSS Fabricators
 - > Cable Manufacture





Key Characteristics:

- Assembly Area
- > Quay Load
- Water Depth
- Labor availability
- Intermodal Connectivity



Manufacturing and Fabrication - Foundation



Manufacturing and Fabrication Ports - Foundation



Manufacturing and Fabrication – Electrical

- Cables
 - > MVAC
 - > HVAC
 - > HVDC





Manufacturing and Fabrication – Electrical

- > Offshore Substations
 - > Transformer Platform
 - Converter Platform





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Staging Ports



Owner/Operators:

- Port Authorities
 - > Public or Private
- > OSW Project Developers
- > EPCI contractors



Key Characteristics:

- Staging Area
- > Quay Load
- > Air Draft
- Quay Length / Exclusive
 Vessel Access





Operations and Maintenance Ports

Key Characteristics:

- Proximity to project
- Open and covered staging area
- > Office Space
- Housing for Staff



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Owner/Operators:

- > OSW Project Developers
- Service Providers
- Turbine OEMs





Typical Facility Specifications



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What Specifications to use?

THE OFFSHORE WIND PORT INFRASTRUCTURE NEEDS

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Table 18. Turbine Manufacturing and Fabrication Facility Parameters

	Upland Staging Area	Wharf Live Load Capacity	Air Draft	Navigable Channel Depth	Wharf Length®
Nacelle	10 hectares (25 acres)	20MT/m ² (4,000 psf)	120m (400 ft.)ª 15m (50 ft.) ^b	12m (38 ft.)° 4m (13 ft.) ^d	50m (165 ft.)
Tower	10 hectares (25 acres)	10MT/m ² (2,000 psf) 5MT/m ² (1,000 psf) ^e	120m (400 ft.)ª 15m (50 ft.) ⁰	12m (38 ft.) ^c 4m (13 ft.) ^d	50m (165 ft.)
Blade	10 hectares (25 acres)	10MT/m ² (2,000 psf) 2MT/m ² (500 psf) ^o	120m (400 ft.)* 15m (50 ft.) ^b	12m (38 ft.) ^c 4m (13 ft.) ^d	120m (400 ft.)

Table 21. Staging and Installation Facility Parameters

	Upland Staging Area	Warf Live Load Capacity	Air Draft	Navigable Channel Depth	Wharf Length
Staging and Installation	10 hectares (25 acres)	20MT/m ² (4,000 psf)	120m (400 ft.)	12m (38 ft.) ^a 4m (13 ft.) ^b	200m (650 ft.) ^c 130m (430 ft.) ^d 100m (330 ft.) ^e

Parameter	Phase I	Phase II							
Wharf Length	(1) x 120m (400 ft) Total = 120m (400 ft.)	(2 ea.) x 200m (650 ft.) Total = 400m (1,300 ft.)							
Live Load - Wharf/Stagin g	20T/m² (4,000 PSF)	30T/m² (6,000 PSF)							
Live Load - Storage	10 T/m² (2,000 PSF)	15 T/m² (3,000 PSF)							

			innastructure	
Blade manufacturing	General cargo vessel Tug and barge as compromise	150,000 to 250,000m ² (37 to 62 acres)	Quay length: 200m Bearing capacity: 2t/m ²	Need access to major highways Rail connection highly desirable
Generator manufacturing	General cargo vessel	60,000 to 75,000m ² (15 to 19 acres)	Quay length: 200m Bearing capacity: 5t/m ²	Need access to major highways Rail connection highly desirable
Nacelle assembly	General cargo vessel	70,000 to 100,000m ² (15 to 25 acres)	Quay length: 300m Bearing capacity: 10t/m ²	Need access to major highways Rail connection highly desirable
Tower manufacturing	General cargo vessel Tug and barge as compromise	120,000 to 200,000m ² (30 to 50 acres)	Quay length: 300m Bearing capacity: 5t/m ²	Need access to major highways Rail connection highly desirable
Foundation manufacturing and staging	Tug and barge Jack-up vessel Offshore heavy-lift derrick	120,000 to 200,000m ² (30 to 50 acres)	Quay length: 125m Bearing capacity: 5t/m ²	Need access to major highways Rail connection highly desirable
Submarine cable manufacturing	Cable lay vessel; Tug and barge as compromise	80,000 to 90,000m ² (20 to 22 acres)	Quay length: 125m Bearing capacity: 2t/m ²	Need access to major highways Rail connection highly desirable
Substation manufacturing	Substations will be built 4.13	in commercial shipyards a	and have a different set of	requirements. See Tab
Construction staging	Jack-up vessel	150,000 to 200,000m ² (40 to 50 acres)	Quay length: 200m Bearing capacity: 10t/m ²	Need access to major highways Rail connection highly desirable

Land parcel size

Waterside

Road and rail access

Massachusetts



New York

Virginia

Activity

Vessels used



New York State OSW Port Activities and Support



 NYSERDA LEARNING FROM THE EXPERTS - 12 JANUARY 2022

 PORT CONSIDERATIONS FOR OFFSHORE WIND





Ports & Infrastructure Studies













COWI

25 NYSERDA LEARNING FROM THE EXPERTS - 12 JANUARY 2022 PORT CONSIDERATIONS FOR OFFSHORE WIND

RFQL 4259: Offshore Wind Port Infrastructure



26 NYSERDA LEARNING FROM THE EXPERTS - 12 JANUARY 2022 PORT CONSIDERATIONS FOR OFFSHORE WIND



OREC RFP20-1





Port of Albany – Rensselaer: Beacon Island Expansion



- Operator: Marmen Welcon allied with Smulders
- Use: Manufacturing Wind tower / Transition Piece Manufacturing
- Key Characteristics:
 - 81 acres
 - 500 LF of 6,000 PSF wharf
- Status: Construction Expected 2022
- Investment: \$350M
- Jobs: 550 direct jobs (increased from 350 jobs, due to demand)



Port of Coeymans



- Owner/Operator: Carver Companies
- Use: Manufacturing & Fabrication
 - \$86M contract, Riggs Distler & Company, Inc. to construct foundation components for Sunrise Wind (Ørsted and Eversource)
- Key Characteristics:
 - 125 Acres Port Side
 - 275 Acres Industrial Park
 - 30 ft. Draft
 - 300 ft. Heavy Lift Main Dock
 - 900 Ton Marine Travel Lift

29 NYSERDA LEARNING FROM THE EXPERTS - 12 JANUARY 2022 PORT CONSIDERATIONS FOR OFFSHORE WIND



South Brooklyn Marine Terminal

- Owner: NYCEDC
- Operator: SSBMT (Red Hook + Industry City)
- Initial Lease: Equinor
- Use: Staging and O&M
- Investment: \$350M
- Jobs: 350 direct jobs





Port Jefferson



- Owner/Operator: Ørsted
- Use: O&M (SOV)
- Status: in development
- Key Characteristics:
 - Homeport to SOV (Sunrise and South Fork)
 - 60,000 square foot office and warehouse facility
 - 100 permanent direct jobs



Arthur Kill Terminal



- Developer: Atlantic Offshore Terminals
- Use: Staging
- Key Characteristics:
 - Purpose-built
 - 32 acres
 - 1,350 ft. quay (inbound + outbound berths)
 - Status:
 - Detailed Engineering and Permitting underway
 - Construction anticipated 2023
 - Operational 2025



New York State Offshore Wind Ports – What's Next?

- Governor Hochul 2022 State of the State Address
 - \$500M to support OSW port infrastructure and supply chain/manufacturing investments as a key element of third RFP for OSW.



U.S. OSW Ports Activities



34 NYSERDA LEARNING FROM THE EXPERTS - 12 JANUARY 2022 PORT CONSIDERATIONS FOR OFFSHORE WIND



Maine



Searsport Feasibility Study

Massachusetts



- New Bedford Marine Commerce Terminal (Staging)
- Salem (Staging)
- Brayton Point (Interconnect, Cable Manufacturing)
- Vineyard Haven (Vineyard O&M)
- Borden and Remington (Mayflower O&M)



Rhode Island



- Quonset Development Corp Port of Davisville(Staging)
- ProvPort
- Senesco (Fabrication)

Connecticut



- State Pier (Staging)
- Bridgeport (Staging)



New Jersey



Maryland



- NJ Wind Port (Staging + Nacelle Assembly MHI Vestas,)
- Paulsboro (Monopile fabrication EEW)
- Atlantic City (O&M Ørsted)

- Tradepoint Atlantic / Sparrows Point Terminal (Fabrication)
- Ocean City (O&M Ørsted)



Virginia



- Portsmouth Marine Terminal (Staging)
- Portsmouth Blade Facility (Blade Manufacturing – SGRE)

North Carolina



Supply Chain Study



California



- BOEM "Infrastructure to Support Offshore Floating Wind"
- Redwood Marine Terminal 1 (floating OSW)



Federal Incentives

40 NYSERDA LEARNING FROM THE EXPERTS - 12 JANUARY 2022 PORT CONSIDERATIONS FOR OFFSHORE WIND



MARAD Port Infrastructure Development Program (PIDP) Grants



- 2021 Program Funding: \$230M
 - Albany, NY: OSW Tower Manufacturing Port Project \$29.5M
 - New York, NY: SBMT 35th Street Pier Expansion Project, \$25M
 - Portsmouth, VA: PMT OSW Development, \$20M
- 2022 through 2026 Annual Program Funding: \$450M

BOEM Lease Program

- Proposed Sale Notice seeks feedback on:
 - "Mechanisms to provide benefits to underserved communities and investments in a domestic supply chain, consistent with goals and objectives of OCSLA."





Conclusions and Key Takeaways

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Conclusions and Takeaways

- OSW requires purpose-built, high-capacity port facilities
- States are beginning to prepare port facilities for OSW use
- OSW Pipeline will require a large number of improved and/or new port facilities
- The OSW projects that can be built first and the bulk of local economic development will be centered around the facilities that are ready to use
- New York has and is continuing to make great strides to facilitate development of the industry







Thank you

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Coming Next:

January 26, 1:00 p.m. ET Harbor Safety and Navigation Sean Kline, Chamber of Shipping of America

February 9, 2022, 1:00 p.m. ET A Panel on Nature Based Design Enhancements for Offshore Wind Carl LoBue, The Nature Conservancy

Visit wind.ny.gov to register

We want your feedback! Send suggestions for future webinar topics to of shorewind @nyserda.ny.gov.

