CONGRESSIONAL BRIEFING
Offshore Wind Energy
Briefing Series: Scaling Up Innovation to Drive Down Emissions

Materials will be available at: www.eesi.org/062922tech
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Wednesday, June 29, 2022
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**Non-partisan Educational Resources for Policymakers**
A bipartisan Congressional caucus founded EESI in 1984 to provide non-partisan information on environmental, energy, and climate policies

**Direct Assistance for Equitable and Inclusive Financing Program**
In addition to a full portfolio of federal policy work, EESI provides direct assistance to utilities to develop “on-bill financing” programs

**Commitment to Diversity, Equity, Inclusion, and Justice**
We recognize that systemic barriers impede fair environmental, energy, and climate policies and limit the full participation of Black, Indigenous, people of color, and legacy and frontline communities in decision-making

**Sustainable Solutions**
*Our mission is to advance science-based solutions for climate change, energy, and environmental challenges* in order to achieve *our vision of a sustainable, resilient, and equitable world.*
Policymaker Education

**Briefings and Webcasts**
Live, in-person and online public briefings, archived webcasts, and written summaries

**Climate Change Solutions**
Bi-weekly newsletter with everything policymakers and concerned citizens need to know, including a legislation and hearings tracker

**Fact Sheets and Issue Briefs**
Timely, objective coverage of environmental, clean energy, and climate change topics

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Active engagement on Twitter, Facebook, LinkedIn, and YouTube
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Living with Climate Change
- Polar Vortex – April 13
- Sea Level Rise – May 18
- Wildfires – June 13
- Extreme Heat – June 24

Scaling Up Innovation to Drive Down Emissions
- Green Hydrogen – April 27
- Direct Air Capture – May 25
- Electric Vehicle Charging – June 02
- Offshore Wind Energy – June 29
Outer Continental Shelf (OCS) Energy

**OCS Lands Act:** "... vital national resource ... expeditious and orderly development ... environmental safeguards"

**Energy Policy Act of 2005:** "... energy from sources other than oil and gas ..."
Atlantic OCS Renewable Energy: State Leadership
### Atlantic OCS Renewable Energy: State Leadership (cont.)

#### Offshore Wind Goals (MW)
- Maine: 80% by 2030
- Massachusetts: 35% by 2030
- Rhode Island: 100% by 2030
- Connecticut: 48% by 2030
- New York: 70% by 2030
- New Jersey: 50% by 2030
- Maryland: 50% by 2030
- Virginia: 30% by 2030
- North Carolina: unspecified

#### Offshore Wind: “Offtake” Awarded (MW) + Scheduled (MW)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Maine</td>
<td>80% by 2030</td>
<td>144</td>
<td>0 + 0</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>35% by 2030</td>
<td>5,600</td>
<td>1,600 + 1,600</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>100% by 2030</td>
<td>unspecified</td>
<td>430 + 600</td>
</tr>
<tr>
<td>Connecticut</td>
<td>48% by 2030</td>
<td>2,300</td>
<td>1,108 + 0</td>
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<tr>
<td>New York</td>
<td>70% by 2030</td>
<td>9,000</td>
<td>4,316 + 0</td>
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<tr>
<td>New Jersey</td>
<td>50% by 2030</td>
<td>7,500</td>
<td>1,100 + 6,400</td>
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<tr>
<td>Maryland</td>
<td>50% by 2030</td>
<td>1,568</td>
<td>368 + 1,200</td>
</tr>
<tr>
<td>Virginia</td>
<td>30% by 2030</td>
<td>5,212</td>
<td>2,652 + 0</td>
</tr>
<tr>
<td>North Carolina</td>
<td>unspecified</td>
<td>2,800</td>
<td>0 + 0</td>
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Atlantic OCS Renewable Energy: State Leadership (cont.)

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<td>California</td>
<td>100% by 2045</td>
<td>3,000</td>
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<td>Hawaii</td>
<td>100% by 2045</td>
<td>unspecified</td>
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<tr>
<td>Oregon</td>
<td>50% by 2040</td>
<td>unspecified</td>
<td>unspecified</td>
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<tr>
<td>Louisiana</td>
<td>80% by 2050</td>
<td>5,000</td>
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<td><strong>TOTAL</strong></td>
<td><strong>--</strong></td>
<td><strong>42,124 MW</strong></td>
<td><strong>21,374 MW</strong></td>
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</table>
Technology & the Growth of the Wind Turbine

Comparing the heights of various structures:
- Statue of Liberty: 305 ft (93 m)
- Golden Gate Bridge: 746 ft (227 m)
- Washington Monument: 555 ft (169 m)
- One World Trade Center: 1,792 feet (546 m)

Comparing wind turbine sizes:
- 500 kW: Vestas V39 197 ft (60 m)
- 2 MW: Vestas V80 394 ft (120 m)
- 3.6 MW: Siemens SWT 120 487 ft (148.5 m)
- 6 MW: Alstom Haliade 150 569 ft (173.5 m)
- 8 MW: Vestas V164 607 ft (185 m)
- 12 MW: GE Haliade-X 853 ft (260 m)

Year Comparison:
- 1991
- 2000
- 2007
- 2013
- 2015
- 2021

Theoretical: ARPA-E (DOE-sponsored)
Renewable Energy Leasing Process: From RFI/Call to Operation

[ Planning & Analysis ]
- Initiate Leasing Process (RFI/Call)
- Wind Energy Areas
- Area Identification
- Publish Leasing Notices
- NEPA/Environmental Reviews

[ Leasing ]
- Lease Granted
- Submit SAP
- Pre-survey Meetings/Plan

[ Site Assessment ]
- Site Assessment & Surveys
- BOEM Deems COP Complete & Sufficient
- BOEM Approves COP
- BOEM Environmental & Technical Reviews
- Installation

[ Construction & Operations ]
- BOEM Reviews & Approves SAP
- Submit COP (with Project Design Envelope – optional)
- Submit Design & Installation Plans
- BOEM

- **RI-MA**: $3,838,288
  - Orsted (Deepwater Wind New England LLC)
  - July 2013

- **VA**: $1,600,000
  - Virginia Electric and Power Comp
  - Orsted (Deepwater Wind New England LLC)
  - September 2013

- **MD**: $3,841,538
  - U.S. Wind Inc.
  - August 2014

- **MA**: $4,859,560
  - U.S. Wind Inc.
  - January 2015

- **MA**: $166,886
  - Vineyard Wind LLC
  - August 2014

- **NY**: $281,285
  - Orsted (Bay State Wind LLC)
  - January 2015

- **NJ**: $880,715
  - Orsted (Ocean Wind LLC)
  - November 2015

- **NY**: $1,006,240
  - (Atlantic Shores LLC)
  - December 2016

- **NY**: $42,469,725
  - Equinor Wind US LLC
  - December 2016
Atlantic OCS Renewable Energy Lease Record Sales

Offshore Energy Bids Total $4.37 Billion

- Mid-Atlantic Offshore Wind LLC: $285M (OCS-A 0544)
- Invenergy Wind Offshore LLC: $645M (OCS-A 0542)
- OW Ocean Winds East LLC: $765M (OCS-A 0537)
- Atlantic Shores Offshore Wind Bight LLC: $780M (OCS-A 0541)
- Attentive Energy LLC: $795M (OCS-A 0538)
- Bight Wind Holdings LLC: $1.1B (OCS-A 0539)
Provisional Winners of the Carolina Long Bay Lease Areas, $315M in High Bids

- OCS-A 0545
  TotalEnergies Renewables USA, LLC
  $160M

- OCS-A 0546
  Duke Energy Renewables Wind, LLC
  $155M
Atlantic OCS Renewable Energy: Onshore Supply Chain Activities

- Ørsted Foundation Platform Manufacturing Facility
- Marmon Utility LLC - Marmon Utility - Array Cable
- ALLEGHENY Tower and Transition Piece Manufacturing Facility
- Sunrise Wind Offshore Wind Foundation
- EEW Monopile Manufacturing Facility
- Siemens Gamesa Blade Factory
- Nexans Submarine Cable Facility
- Block Island Foundations - Jacket
- Offshore Wind Substation
Atlantic OCS Renewable Energy: Onshore Supply Chain Activities (cont.)

VESSELS

- Atlantic Pioneer
- Atlantic Endeavor
- ECO Service Operations Vessel
- Charybdis
Atlantic OCS Renewable Energy: Onshore Supply Chain Activities (cont.)

- Salem Harbor
- Brayton Point
- New London State Pier
- New Jersey Wind Port
- New Bedford Marine Commerce Terminal
- Bridgeport (Barnum Landing)
- Portsmouth Marine Terminal
Atlantic OCS Renewable Energy: Onshore Supply Chain Activities (cont.)

- University of Massachusetts Wind Energy Center
- Bristol Community College
- United States Coast Guard Academy
- SUNY Farmingdale Stony Brook University
- University of Delaware
Atlantic OCS Renewable Energy: Onshore Supply Chain Activities (cont.)

West Ocean City Operations and Maintenance Facility
Renewable Energy Program by the Numbers

- Competitive Lease Sales Completed: 10
- Active Commercial Offshore Leases Issued: 27
- Active Research Offshore Leases Issued: 2
- Site Assessment Plans (SAPs) Approved: 14
- General Activities Plans Approved: 1
- Construction and Operations Plans (COPs):
  - Approved Since 2021: 2
  - NEPA Process Underway: 10
  - Other COPs Submitted: 5
  - Anticipated Within Next 12 Months: 2
- Guidance: 11
- Leasing Under Consideration: 5
- Steel in the Federal Waters: 2020
**STEEl IN THE WATER! Coastal Virginia Offshore Wind Project (CvOW)**

- Lessee: Virginia DMME
- Operator: Dominion Energy
- Engineering Contractor: Orsted
  - Construction (May/June 2020)
  - Two 6-MW turbines
  - Staging: Halifax, Hampton Roads, Camp Pendleton
  - Commissioning: 2020
### Atlantic OCS Renewable Energy: “Projects in the Pipeline”

<table>
<thead>
<tr>
<th>Year</th>
<th>Project</th>
<th>Company</th>
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<td>2020</td>
<td>Coastal Virginia Offshore Wind Pilot</td>
<td>Dominion Energy, Orsted</td>
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<tr>
<td></td>
<td>South Fork</td>
<td>Deepwater Wind</td>
</tr>
<tr>
<td></td>
<td>Vineyard Wind I</td>
<td>VINEYARD WIND</td>
</tr>
<tr>
<td></td>
<td>Revolution Wind</td>
<td>Deepwater Wind</td>
</tr>
<tr>
<td></td>
<td>Skipjack Windfarm</td>
<td>Deepwater Wind</td>
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<tr>
<td></td>
<td>Empire Wind</td>
<td>Equinor</td>
</tr>
<tr>
<td></td>
<td>Bay State Wind</td>
<td>Bay State Wind</td>
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<tr>
<td></td>
<td>U.S. Wind</td>
<td>US Wind</td>
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<tr>
<td></td>
<td>Sunrise Wind</td>
<td>EVERSEURCE</td>
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<tr>
<td></td>
<td>Ocean Wind</td>
<td>Ørsted</td>
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<tr>
<td></td>
<td>Coastal Virginia Offshore Wind Commercial</td>
<td>Dominion Energy</td>
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<td></td>
<td>Park City Wind</td>
<td>PARK CITY WIND</td>
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<td></td>
<td>Mayflower Wind</td>
<td>MAYFLOWER WIND</td>
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<td>Atlantic Shores</td>
<td>ATLANTIC SHORES</td>
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<td></td>
<td>Kitty Hawk</td>
<td>AVANGRID</td>
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<td>2030</td>
<td>OCS-A 0522</td>
<td>VINEYARD WIND</td>
</tr>
</tbody>
</table>
Renewable Energy Project: Rhode Island / Massachusetts

South Fork (OCS-A 0517)

- Lease Issued: Oct 1, 2013
- Current Stage: Installation
- Max # of WTG Locations: Up to 15
- Interconnection State: New York
- Power Purchase Agreement: NY, 133 MW
- Commissioning Date: 2023
- Lessee: South Fork Wind, LLC
Renewable Energy Project: Massachusetts

Vineyard Wind I (OCS-A 0501)

- Lease Issued: April 1, 2015
- Current Stage: **Installation**
- Next Milestone Facility Design Report (FDR) Fabrication & Installation Report (FIR) Review
- Max # of WTG Locations: 62
- Interconnection State: MA
- Power Purchase Agreement: MA, 800 MW
- Commissioning Date: 2024
- Lessee: Vineyard Wind 1, LLC
President Biden issued Executive Order 14008 that called for the Interior Department to identify steps to increase responsible renewable energy development on public lands and waters.

First-ever national offshore wind goal to deploy 30 gigawatts of offshore wind by 2030, which would create nearly 80,000 jobs.
Our path forward will help achieve the first-ever national offshore wind goal to deploy 30 gigawatts of offshore wind by 2030, which would create nearly 80,000 jobs.
New Jersey’s Offshore Wind Generation & Transmission

Andrea Hart, Esq.
New Jersey Board of Public Utilities
# NJ Offshore Wind Generation Solicitation Schedule

<table>
<thead>
<tr>
<th>Solicitation</th>
<th>Capability Target (MW)</th>
<th>Capability Awarded</th>
<th>Issue Date</th>
<th>Estimated Commercial Operation Date</th>
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<td>1</td>
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<td>1,100</td>
<td>Q3 2018</td>
<td>2024-25</td>
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<td>2</td>
<td>1,200-2400 (2)</td>
<td>2,658</td>
<td>Q3 2020</td>
<td>2027-29</td>
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<td>3</td>
<td>1,200</td>
<td>N/A</td>
<td>Q1 2023 (3)</td>
<td>2030</td>
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<tr>
<td>4</td>
<td>1,200</td>
<td>N/A</td>
<td>Q2 2024</td>
<td>2031</td>
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<tr>
<td>5</td>
<td>1,342</td>
<td>N/A</td>
<td>Q2 2026</td>
<td>2033</td>
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</tbody>
</table>
NJ Offshore Wind Transmission

• PJM Interconnection is New Jersey’s regional grid operator
• BPU identified the potential benefits of soliciting coordinated market-based options for building out the transmission facilities necessary to achieve the offshore wind goal
• November 2020, BPU requested PJM to solicit competitive transmission proposals to support New Jersey’s offshore wind via the State Agreement Approach (SAA)
State Agreement Approach (SAA)

• The SAA is a tool offered by PJM—transmission development, based on policy
• New Jersey is the first state to utilize the SAA
• The SAA is a competitive solicitation for transmission projects from a broad pool of regional developers
• Proposals—lower costs, greater innovation resulting in efficiencies, decreased environmental impacts and increased ratepayer savings.
New Jersey’s 2021 SAA

• PJM with BPU Staff developed a solicitation for transmission project applications under the SAA to meet New Jersey’s public policy of developing 7,500 MW of offshore wind
  • Window Opened: April 15, 2021
  • Window Closed: September 17, 2021
• The solicitation requested Applications for four distinct options shown on the next slide, with each entity having the choice to propose more than one option
• Received Applications from 13 entities proposing a total of 80 projects
SAA Evaluation Process

• BPU Staff is currently working with PJM to evaluate the SAA proposals
• PJM and BPU Staff are also evaluating project costs, constructability, risk mitigation, environmental impacts, permitting plan, quality of proposal and developer experience, flexibility, modularity, and option value, and additional New Jersey benefits
• On April 15, 2022 FERC approved the SAA order (ER22-920)
How does SAA fit into the federal government’s larger goals?

The SAA is one tool states may use to expand the grid to accommodate the expansion of renewables

Congressional Considerations:

• Availability of federal funding
• Regional coordination
• Timing
Thank you

Andrea Hart, Esq.
Andrea.Hart@bpu.nj.gov
U.S. Market Overview & Insights

Business Network for Offshore Wind
Business Network for Offshore Wind

1 Focus on developing US offshore wind industry and its supply chain

2 Not-for-Profit, Membership-Based

3 Provide: Information, Education, Introductions
U.S. OSW Structure

**STATES**
Request call areas, enact policy that drives the market, enforce state and local regulations

**U.S. BOEM / U.S. BSEE**
Siting, leasing, permitting and approval of plans, regulate OSW projects

**PRIVATE DEVELOPERS / LEASEES**
Acquire lease rights and develop projects
State Commitments to OSW
Offtake Pathways

17,578.2 MWs with offtake pathways as of Feb. 2022

8,434.5 State procurements that took place during 2021 (see Fig. 7, p. 18)

9,143.7 State procurements that took place prior to 2021 (see Fig. 8, p. 19)

Photo courtesy of Christian Ennerfelt
State Procurements During 2021

- **NEW YORK**
  - 2021 BEACON WIND: 1,230
  - 2021 EMPIRE WIND II: 1,260

- **MARYLAND**
  - 2021 MOMENTUM WIND: 808.5
  - 2021 SKIPJACK WIND II: 846

- **NEW JERSEY**
  - 2021 ATLANTIC SHORES OFFSHORE WIND: 1,510
  - 2021 OCEAN WIND II: 1,148

- **MASSACHUSETTS**
  - 2021 COMMONWEALTH WIND: 1,232
  - 2021 MAYFLOWER WIND: 400

**TOTAL**: 8,434.5
OSW Leasing Path Forward 2021–2025

Our path forward will help achieve the first ever national offshore wind goal to deploy 30 gigawatts of offshore wind by 2030, which would create nearly 80,000 jobs.
Biden Administration 2025 Goals: A Global Perspective

• 16 COPs approved by 2025, representing at least 19GW of OSW
• Currently, ~50GW deployed globally
• UK + Germany combined = 20GW
Supply Chain Development: Major Component Manufacturing

THE BUSINESS NETWORK FOR OFFSHORE WIND

THE BUSINESS NETWORK FOR OFFSHORE WIND

THE BUSINESS NETWORK FOR OFFSHORE WIND
Supply Chain Development: National Opportunities
OSW ACTIVITY DECIDED

OSW LEASE AREAS

OSW ACTIVITY UNDER CONSIDERATION

1. Coeymans (Manufacturing)
2. Port of Providence (Construction, Manufacturing)
3. Brayton Point (Staging & Manufacturing)
4. New Bedford (Staging)
5. Quonset Point (Construction)
6. New London State Pier (Staging/Pre-Assembly & Construction/Installation)
7. Bridgeport (Fabrication, Staging, O&M)
8. Port Jefferson (O&M)
9. South Brooklyn Marine Terminal (O&M)
10. Homeport Pier (Staging)
11. Paulsboro (Manufacturing)
12. Atlantic City (O&M)
13. New Jersey Wind Port (Staging & Manufacturing)
14. Tradepoint Atlantic (Staging & Manufacturing)
15. Hampton Roads (Manufacturing)
16. Portsmouth (Staging)
17. Charleston, SC (Cables)
18. Tisbury (O&M)
19. Port of Albany (Manufacturing)
20. Salem (Assembly & Staging)
21. Ocean City (O&M)
<table>
<thead>
<tr>
<th>Port Name</th>
<th>State</th>
<th>Laydown Area (acres)</th>
<th>Quayside Length (m)</th>
<th>Number of berths</th>
<th>Berth Depth (m)</th>
<th>Channel Depth (m)</th>
<th>Bearing Capacity (t/m²)</th>
<th>Air Draft Limit (m)</th>
<th>Readiness Level (WTIV)</th>
<th>Readiness Level (Feeders)</th>
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<td>New Bedford⁸</td>
<td>MA</td>
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<td>South Brooklyn Marine Terminal</td>
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<td>417</td>
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<td>10.7</td>
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<td>60</td>
<td>Berth depth, quayside length and air draft</td>
<td>Quayside length</td>
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<td>New Jersey Wind Port¹⁰</td>
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<td>9.88</td>
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<td>Port Name</td>
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<td>Laydown Area (acres)</td>
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<td>Number of berths</td>
<td>Berth Depth (m)</td>
<td>Channel Depth (m)</td>
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<td>Air-Draft Limit (m)</td>
<td>Readiness Level (Floating Substructure)</td>
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<td>Port of Seattle</td>
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<td>Astoria</td>
<td>OR</td>
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<td>14</td>
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<td>Laydown and bearing capacity</td>
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<td>Port at Coos Bay</td>
<td>OR</td>
<td>1,335</td>
<td>80</td>
<td>7</td>
<td>11.28</td>
<td>11.28</td>
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<td>Humboldt Marine Terminal</td>
<td>CA</td>
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<td>703</td>
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<td>Morro Bay</td>
<td>CA</td>
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<td>San Francisco</td>
<td>CA</td>
<td>870</td>
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<td>15</td>
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<td>67</td>
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<td>7,800</td>
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<td>11.5</td>
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<td>Bearing capacity and air draft</td>
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<td>Bearing capacity and air draft</td>
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<tr>
<td>Hueneme</td>
<td>CA</td>
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<td>800</td>
<td>5</td>
<td>10.5</td>
<td>11</td>
<td>None</td>
<td>None</td>
<td>Berth depth</td>
<td></td>
</tr>
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</table>
OSW Supply Chain Connect

The Business Network for Offshore Wind Supply Chain Connect allows companies to publicly indicate their interest and ability to supply components and services for U.S. offshore wind projects. It is used as a source for identifying potential recipients of Requests for Proposals (RFPs) as well as identifying local, small, minority-owned, women-owned, and/or veteran-owned businesses for partnership with developers and/or Tier 1 suppliers. Please be sure to complete all fields and regularly update and maintain your organization’s profile.

To register, first gather the information requested to identify the products and services you can provide for offshore wind projects. You’ll have 30 minutes to fill out the form before the system logs you out. Your information will be saved.

COMPANY NAME

EMAIL ADDRESS

I agree to have my information shared with developers and other companies looking for partners. (Required)
John Begala
Vice President, Federal & State Policy

Business Network for Offshore Wind
john@offshorewindus.org
OUR MISSION

Grow the economy and help meet the state’s clean energy and climate goals.

Presented By
Lauren Farnsworth, Senior Program Manager – Offshore Wind
Offshore Wind Workforce Opportunities

Planning and development

• Activities that precede construction, including site characterization, research, engineering, and permitting

Construction and installation

• Pre-assembly, installation, and commissioning, with a large roles for skilled trades, organized labor, engineers, project managers, and individuals with maritime and water transportation expertise

Operations and maintenance

• Regular inspection of turbines, foundations, cables, and substations, and process of making necessary repairs or replacements
Conduct targeted **research and analysis** to inform workforce development initiatives

**Engage** directly with OSW industry to ensure programs and efforts align with their needs

**Invest** in and leverage resources for essential, high-need programs to meet needs and fill gaps

Proactively **support** programs and initiatives that build an OSW workforce that is diverse, equitable, inclusive, and just

**Convene**, support, and facilitate practitioners and stakeholders to share information, ideas, challenges, and best practices
## Research and Analysis

### 2018 Massachusetts Offshore Wind Workforce Assessment

**Construction and Installation Jobs**
- 2,200-3,000 direct job-years
- 6,800-9,800 total job-years

**Operations and Maintenance Jobs**
- 140-250 direct annual job-years
- 960-1,700 total annual job-years

**Economic Impact**
- $600-800M in direct economic benefit
- $1.4-2.1B in total economic benefit

### 2021 Offshore Wind Workforce Training & Development in Massachusetts Report

- Deeper examination of capabilities and opportunities, building on 2018 Assessment.
- Quantifies offshore wind occupational demands on an annual basis.
- Maps local labor supply for these occupations to further identify more specific areas of strength and potential gaps in local labor supply.
- Identifies and catalogs 119 distinct occupations across phases of offshore wind development

### Priority Needs
- Skills and safety training programs
- Partnerships w/industry, schools, trades
Offshore Wind Works

OSWW Community of Practice Projects:

- Introductory offshore wind courses and programs;
- Health and safety training programs;
- Trades programs;
- Technical training programs;
- Undergraduate and Graduate programs;
- Diversity, Equity, Inclusion and Justice
Targeted community engagement campaign that will deliver an overview of the offshore wind industry directed towards high schools and community colleges in underserved communities;

Paid experiential learning opportunities in the offshore wind industry for BIPOC, unemployed, and low-income individuals
Offshore Wind Works Spotlight: Massachusetts Maritime Academy

- The first facility in the U.S. to offer all five modules of Global Wind Organisation (GWO) Basic Safety Training for offshore wind
- Plans to develop and offer a 40-hour Basic Seamanship course for the Pile Drivers and Divers Local Union 56, and expand upon existing GWO-certified course offerings.
Offshore Wind Works Spotlight: ACE MV

- Adult Continuing Education Martha’s Vineyard (ACE MV) offers a Wind Power Technician Certificate program specifically for local island workers who will help build and operate Vineyard Wind’s 800MW project.

- Outreach campaign to increase enrollment of women into the industry.
Offshore Wind Works – Investments to Date

Over $7.8M invested in grants to support 20 organizations and institutions since 2017
Thank you

Visit us at www.MassCEC.com/offshore-wind
lfarnsworth@MassCEC.com | 617.315.9388

Sign up for our Offshore Wind Newsletter, Daily News Digest, and more!
masscec.com/email-updates

Follow us on social media
Floating Offshore Wind Technology

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Congressman Golden

**EESI Briefing**

*June 29, 2022*

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DOE Aqua Ventus Project lead
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• 11,561 Student Enrollment
• 866 Faculty
• Carnegie R1 Top-Tier Research University (top 4% of US colleges and Universities in research)
• 16:1 Student to Faculty Ratio
• 3.35 Avg. First Year Student GPA
• $179.3M in R&D expenditures in FY21
• 150+ Research Institutes, Centers and Labs
• Maine’s leading engineering program
• Engineering excellence since 1865
• Largest Univ.-based research Center in Maine
• Founded through the NSF in 1996
• 2,600+ students funded from 35 majors
• 260 faculty, staff, students
• 100,000 ft$^2$ lab
• 10+ spinoff companies
• 1,000 publications
• 120 patents
• 30,000 Visitors
• 1500 media stories
Structural and Material Testing
Alfond W2 Wave-Wind Basin

Wind machine
Rotatable

Tow carriage

Wave basin
Multi-directional

16-actuator wavemaker

0.8 m waves (40m at full-scale)
15m/s wind (105 m/s full scale)
Directional winds and waves
Changing water depths
Global Technology Race in Floating Offshore Wind

Sampling of competing foundation designs
How does a Turbine Float?  There are four Designs

- Tension Leg
- Barge
- Semi-sub
- Spar
US Potential for Floating Wind

60% of US resource requires floating technology

*BOEM to issue three floating leases by 2025: GOM, California & Oregon*

156GW in GOM
Global Pipeline of Floating Wind: 121 GW

Nearly ½ trillion dollars investment

Source: WindLogix, Westwood analysis

UMaine Floating Technology Roadmap

2013
- 1/8 Scale Pilot Project - 1 turbine (Castine – UMaine, Cianbro, MMA)

2023/24
- 11 MW Demonstration Project - 1 turbine (Monhegan – NEAV LLC, UMaine)

2026-2027
- Research Array - 12 turbines or less (State, UMaine, NEAV LLC) LD336

2030+
- Commercial Development - BOEM Leasing and Permitting
Tow-Out Testing
Castine, Maine (2013)
New England Aqua Ventus and MeRA Project Sites

Maine

Northeast United States

Coast of Maine

Aqua Ventus

MeRA
New England Aqua Ventus I

1. UMaine VolturnUS Concrete semisub
2. US DOE Advanced Technology Demonstration Program for Offshore Wind
3. Monhegan Island, Maine
4. COD 25

Locally produced VolturnUS segmental concrete hull

VolturnUS Concrete Semisub
100m water depth
1. Aqua Ventus 1 has relatively shallow water, with 300-330ft water depth. The dynamic cable transitions to a 24-miles export cable.

2. Deeper waters such as off the California coast (>2,400ft) create new challenges.
Beyond the Horizon Farms: Reduce Impacts on Fishing/ Visual
MeRA: Maine Research Array (2027)

Up to 12 turbines, 150 MW, 16 square mile

Prof. Habib Joseph Dagher, PhD, PE
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US Needs East and West Coast Floating Offshore Wind Ports

- Floating-Wind Ports essential
- Likely more than a $250 million investment for one port project
- If 10 GW of floating wind are built in on the East Coast, that’s a $30-$40 billion investment.
Vessels are Needed: Can we Print Some of Them?
Needed: US Floating Wind R&D Investments

WETO
Wind Energy Technology Office

https://nationaloffshorewind.org/


86GW by 2050 Scenario

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www.eesi.org/survey

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www.eesi.org/062922tech

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