



Opportunity Knocks

John Warren
Director, DMME

for the

**Virginia Ship Repair
Association**

Portsmouth, April 17, 2018

Virginia offshore wind port readiness evaluation



Report 3: High-impact investment opportunities

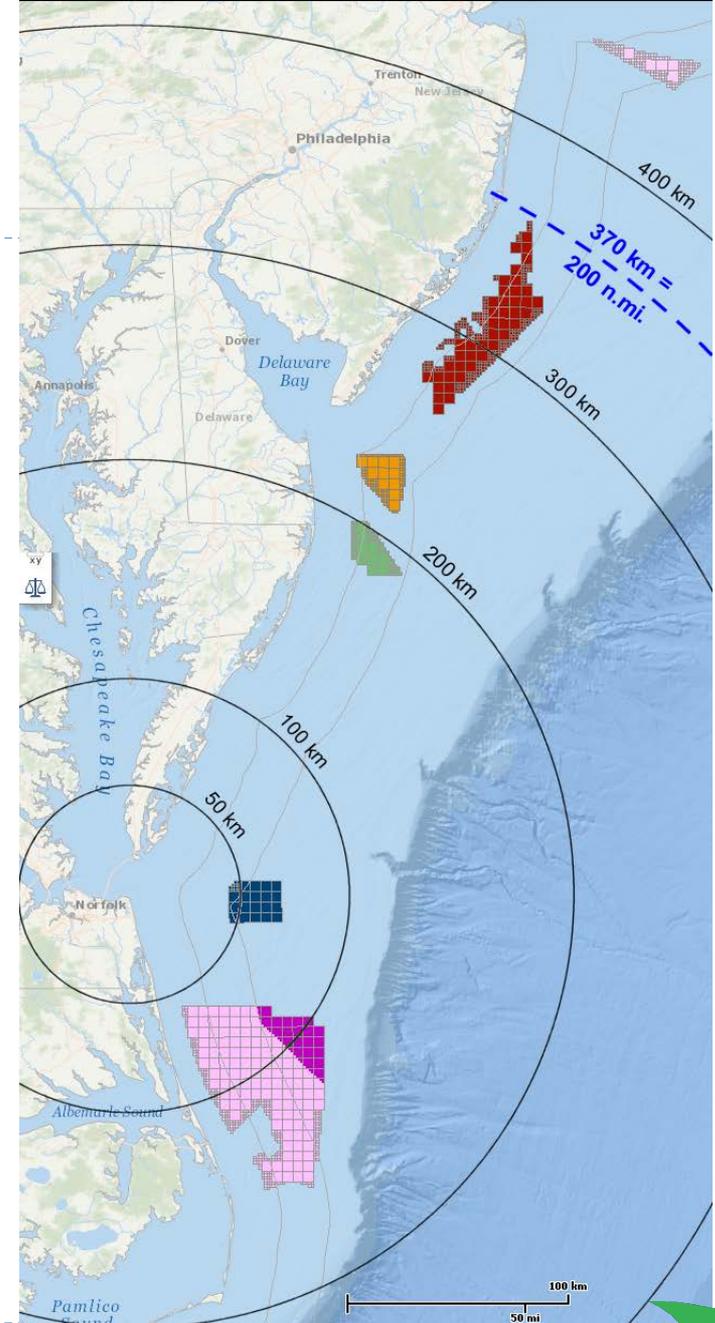
A report to the Virginia Department of Mines, Minerals and Energy

June 2015



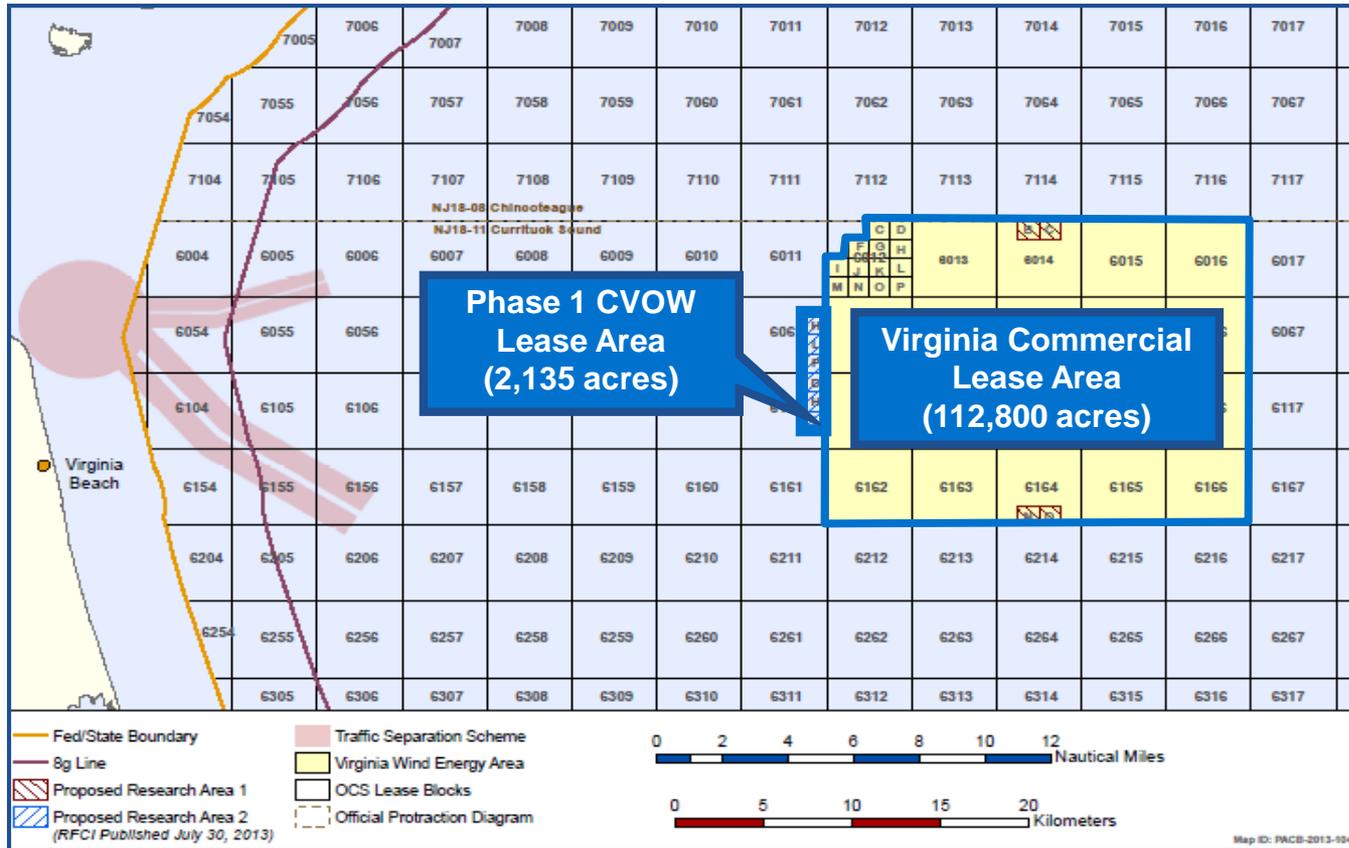
Supply Chain Initiatives

- ▶ Hampton Roads is well positioned to localize foundation and substation fabrication for a substantial portion of the Mid-Atlantic commercial offshore wind market region
- ▶ Commercial leases off NJ, DE, MD, VA, and Kitty Hawk, NC can be reached in less than 24 hours by installation vessels traveling at 10 knots
- ▶ In the past six months, the Port of Virginia has hosted site tours by globally recognized offshore wind developers, procurement & logistics specialists, European foundation fabricators and other potential supply chain businesses.



Coastal Virginia Offshore Wind Project: Lease Update

Research and Commercial Lease Areas



Research Lease directly adjacent to Dominion's Commercial Wind Energy Area

Ørsted Wind Power North America Pipeline

Secured project rights for approximately 4 GW of capacity

NaiKun

- Good seabed conditions
- Strong wind resource



Bay State Wind

- 50/50 JV with Eversource
- 2,300 MW potential capacity¹
- ISO-NE interconnection in MA
- 187,500 acres lease area
- 15 miles from Martha's Vineyard
- 100 – 125 feet water depths

Ocean Wind

- 2,000 MW potential capacity¹
- PJM interconnection in NJ
- 160,500 acres lease area
- 10 miles from shore
- 65 – 100 feet water depths

Coastal VA Offshore Wind

- Ørsted acting as EPC contractor
- 12 MW demo windfarm
- PJM interconnection in VA
- 2,100 acre site
- 22 miles from shore
- 80 – 100 feet water depths

¹NREL estimates that lease areas have a developable resource density of 3 MW/km²

Bay State Wind
An Ørsted & Eversource Initiative

Ocean Wind
An Ørsted Initiative

Dominion Energy | **Ørsted**
Coastal Virginia
Offshore Wind

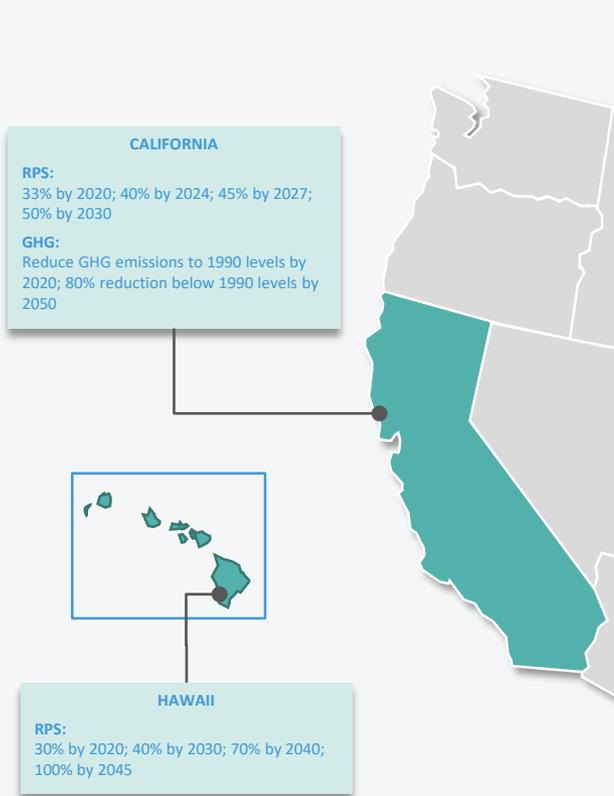
NAIKUN | **Ørsted**
Haida Energy Field

Market Potential for Offshore Wind in the U.S.

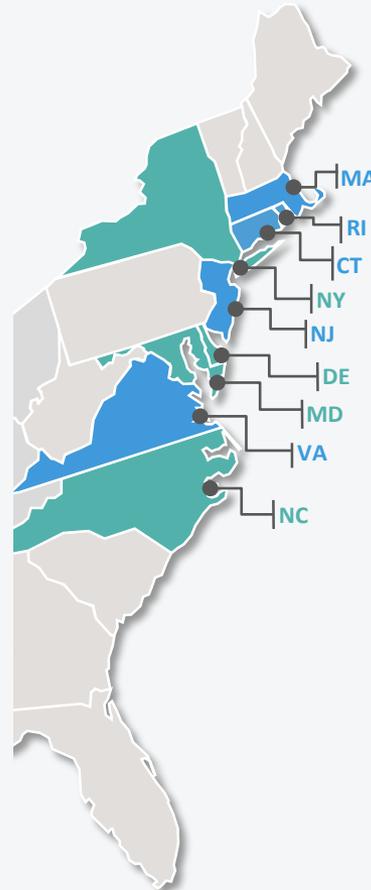
States significantly engaging and supporting offshore wind development

States committed to procure 8 - 10 GW by 2030 -- BOEM has identified 1.4m acres of OSW lease areas

West Coast

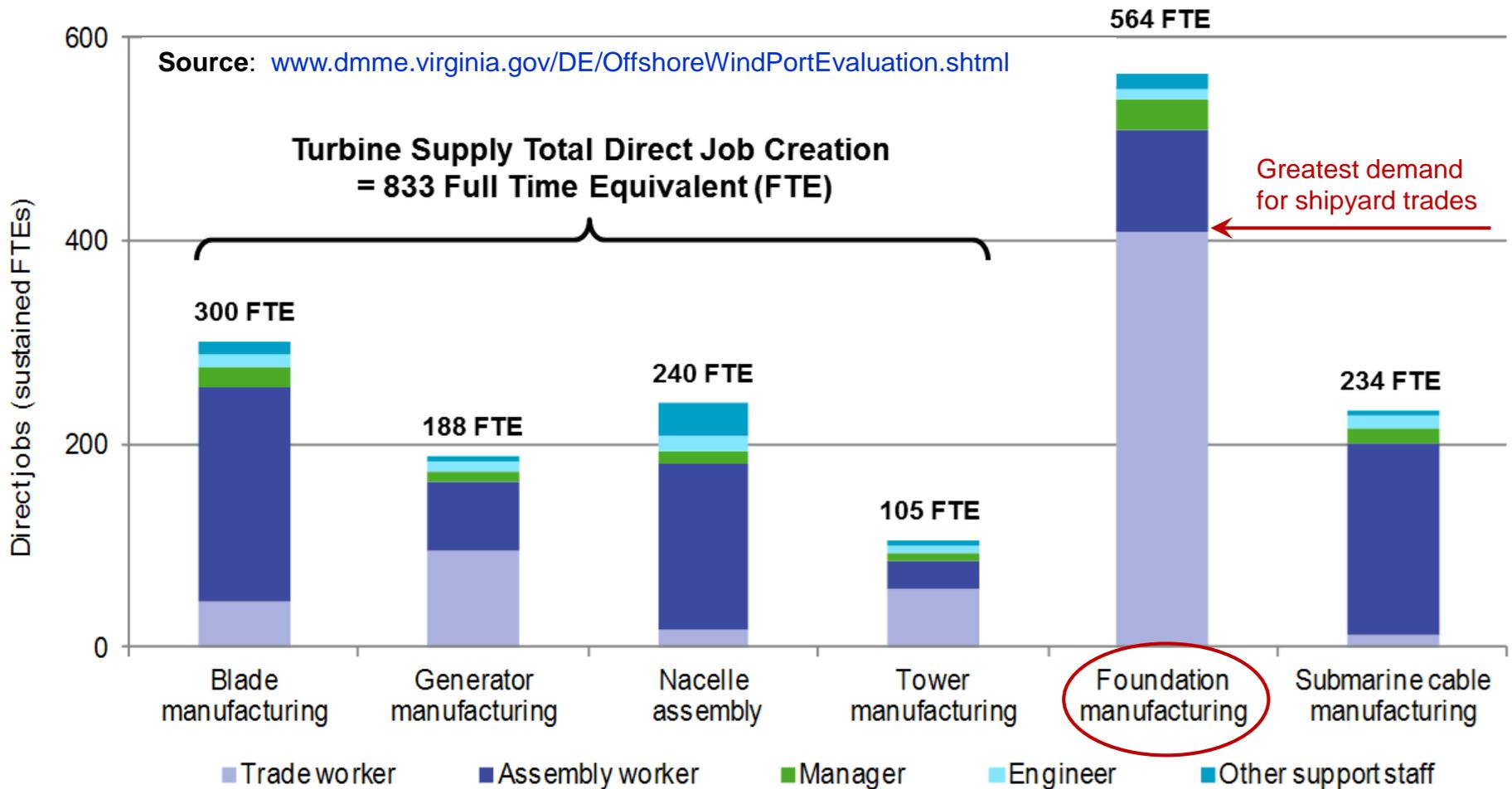


East Coast



<p>MASSACHUSETTS (MA)</p> <p>RPS: 15% by 2020 and additional 1% each year after.</p> <p>OSW Carve-out: 1,600 MW of electricity by June 2027</p>	<p>NEW JERSEY (NJ)</p> <p>RPS: 24.5% by 2020. OSW goal of 1,100MW</p> <p>Governor Phil Murphy (D) enacted Executive Order to procure 3.5GW by 2030</p>
<p>VIRGINIA (VA)</p> <p>RPS: Voluntary, 15% by 2025</p> <p>Dominion has rights to demonstration project and commercial lease area with expected capacity of 2.0 GW</p>	<p>RHODE ISLAND (RI)</p> <p>RPS: 14.5% by 2019, increasing 1.5% ea. year until 38.5% by 2035.</p> <p>Renewable goal of 1GW by 2020. RFP to procure 400 MW of clean energy by Q3 2018</p>
<p>CONNECTICUT (CT)</p> <p>RPS: 27% by 2030, goal to increase to 40% by 2030</p> <p>RFP to procure 200 MW of renewables as part of "best in class" solicitation</p>	<p>NEW YORK (NY)</p> <p>RPS: 50% by 2030</p> <p>On January 2017 Gov. Cuomo announced goal of 2.4 GW of new OSW development by 2030</p>
<p>MARYLAND (MD)</p> <p>RPS: 25% by 2020.</p> <p>Awarded 370 MW PPA's for two OSW projects</p>	<p>DELAWARE (DE)</p> <p>RPS: 25% by 2025-2026</p> <p>350% compliance multiplier for OSW</p>
<p>NORTH CAROLINA (NC)</p> <p>RPS: 12.5% by 2021 for Investor Owner Utilities; 10% for co-operatives and municipal utilities</p>	

Foundation Fabrication would Diversify Shipbuilding and Ship Repair Industry



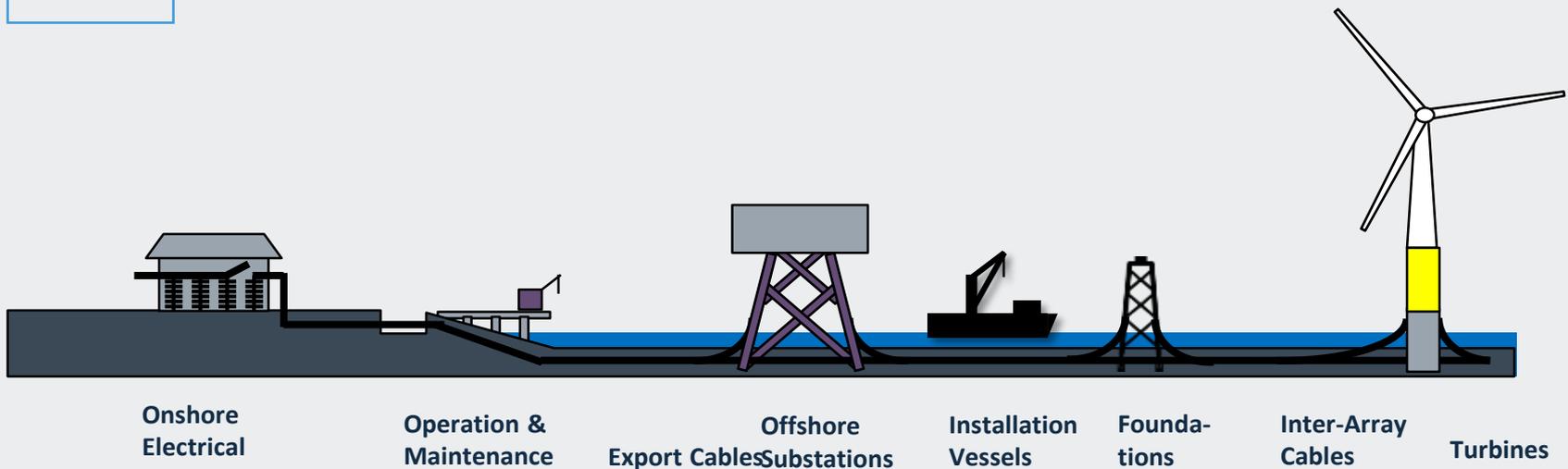
Virginia offshore wind port study (in 2015) estimated numbers of direct jobs created at six different purpose-built facilities to produce 100 turbines annually (i.e., 0.6 to 0.8 GW per year)

Offshore wind can create economic development opportunities in Virginia in terms of Ports and the Supply Chain

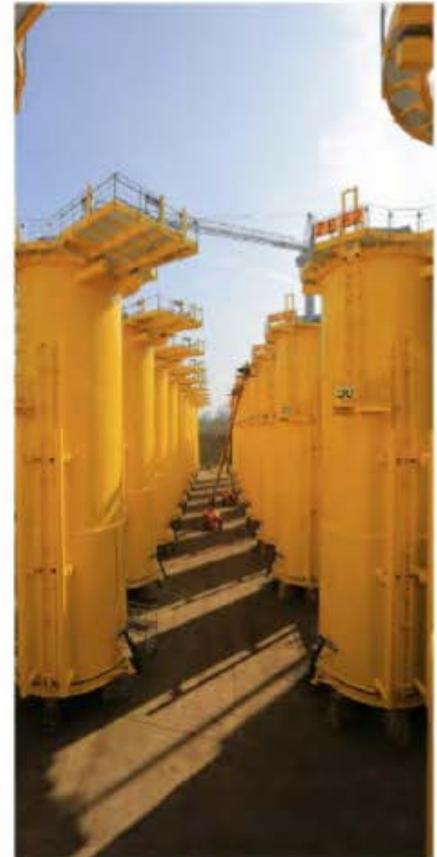
Focus on Ports – Case Study from Belfast Harbor, Northern Ireland, presents Opportunities For Investment in Virginia's Extensive Port Infrastructure



- DONG Energy took the 10 year, multi-project lease for exclusive use of the 60mUSD state of the art Offshore Wind Terminal at Belfast Harbor, the first bespoke installation and pre-assembly harbor in the UK, and the source of 300 full time jobs*



Offshore Wind







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Q&A

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