



**Hampton Roads Planning District Commission
Resolution 2018-02**

**Resolution of the Hampton Roads Planning District Commission supporting
offshore wind development off the coast of Virginia**

Whereas, recent reports by the Virginia Department of Mines, Minerals and Energy have identified the potential for significant economic development opportunities for the Commonwealth of Virginia and the Hampton Roads region from the emerging offshore wind industry; and

Whereas, the U. S. East Coast opportunity for offshore wind extends from South Carolina to New England and has a twenty-year buildout potential of 20,000 megawatts of installed capacity (2,000 - 3,000 wind turbines) with the potential to generate over 14,000 jobs in the construction, maintenance, manufacturing and other service related industries; and

Whereas, Dominion Energy contracted in 2017 with a global wind leader, Orsted Energy of Denmark, to build Coastal Virginia Offshore (CVOW), a two turbine, 12 MW demonstration project located 23.5 nautical miles offshore from the Virginia Beach coastline. The CVOW project is targeted for completion in 2020 and will lay the groundwork for potential large-scale commercial development up to 2,000 MW; and

Whereas, studies of the market opportunities for attracting the offshore wind industry to the U. S. East Coast have identified several unique competitive advantages for Virginia and the Hampton Roads region, including:

- Pro-Business Climate
- America's Largest Shipbuilding Industry
- Unmatched Port Infrastructure
- Congestion-Free Harbor Navigation
- Progressive State Energy Policy
- Zero Air Draft for Ocean-Going Vessels
- High-Quality Workforce
- Abundant Waterfront Land and Infrastructure
- Strategic Geographic Location.

Whereas, offshore wind development offers several opportunities for a better energy future and improved quality of life for Virginia residents, including:

- Reduced Reliance on Out-of-State Electricity by 30%
- Elimination of 3 Million Tons of Carbon Dioxide Pollution per Year
- Powering More than 500,000 Homes with Renewable Energy
- Improving Energy Resiliency and Security

Whereas, planning and development of offshore wind projects undergoes a federally mandated environmental review and permitting process which includes input from all affected stakeholders from the local, state and federal levels including environmental agencies, commercial fishing interests and the Department of Defense; and

Whereas, reports by HRPDC, Reinvent Hampton Roads, the Hampton Roads Economic Development Alliance and GO Virginia Region 5 have identified the need to diversify the Hampton Roads economy and create higher-paying jobs by working collaboratively as a region and focusing limited resources on target business sectors; and

Whereas, several organizations have adopted resolutions or provided letters of support for the development of offshore wind off the Virginia coast, including the City of Virginia Beach, the Virginia Chamber of Commerce, the Hampton Roads Chamber of Commerce, Reinvent Hampton Roads and the Northern Virginia Regional Commission.

Now therefore, be it resolved that the Hampton Roads Planning District Commission hereby:

1. Agrees to support the Department of Mines, Minerals and Energy as well as other state, regional and federal agencies to proactively pursue regional economic development efforts related to the offshore wind supply chain.
2. Agrees to support state and regional workforce development agencies in their efforts to develop new and strengthen existing workforce development programs to further advance the offshore wind supply chain.
3. Agrees to support state and regional partners to develop a Virginia offshore wind branding campaign.
4. Agrees to work with federal, state and regional partners and the Hampton Roads Delegation to identify economic development incentives and infrastructure funding programs to promote development of the offshore wind supply chain.

Approved and Adopted by the Hampton Roads Planning District Commission
this 15th day of November 2018.

Michael J. Hipple
Chair
Hampton Roads
Planning District Commission

Robert A. Crum, Jr.
Executive Director
Hampton Roads
Planning District Commission



I. Virginia's Offshore Wind Supply Chain and Service Industry Opportunity

The offshore wind energy market is just emerging in North America. With a potential build-out of at least 20,000 megawatts (MW) of installed capacity (or 2,000-3,000 wind turbines) along the East Coast over the next two decades, Virginia is well positioned as a prime location for the offshore wind supply chain and service industry. As the demand for wind energy increases, experts predict that over 14,000 jobs will be created in Virginia in the construction, maintenance, manufacturing and other service-related industries. Visit the Commonwealth's one-stop shop for offshore wind information at www.vaoffshorewind.org.

II. Virginia's East Coast Advantage

Virginia's Hampton Roads region offers a number of unique competitive advantages over other offshore wind business locations on the East Coast. The Virginia Offshore Wind Team is working with BVG Associates on an opportunity analysis to illustrate Virginia's existing advantages, which will assist offshore wind supply chain companies and other decision makers in their due diligence process. This analysis will articulate why Virginia offers the greatest chance for business success and low exposure to risk. It will also define factors important to industry and decision makers and address how Virginia can demonstrate that it is the location of choice for the offshore wind supply chain.

- ✓ Pro-Business Climate — CNBC ranks Virginia as the fourth top state in the nation and the first on the East Coast for business. Virginia leads the way in education and workforce development to support its thriving economy.
- ✓ Strategic Geographic Location — With commercial offshore wind leases located off the coasts of NJ, DE, MD, VA, and NC at a travel time of less than 20 hours by installation vessels traveling at 10 knots, Virginia's port assets are strategically located in the Mid-Atlantic with direct open access.
- ✓ Unmatched Port Infrastructure — As the second largest on the East Coast in tonnage and the third largest in container volume, Virginia's ports have the ability to handle any type of cargo. Virginia is one of the few states offering "plug in and play" port facilities to the supply chain.
- ✓ Congestion-Free Navigation — Hampton Roads enjoys open shipping channels and navigational flexibility eliminating maritime congestion as a concern. The Port of Virginia is the deepest port on the East Coast and recently gained approval for a dredging project that will take the channels to 55 feet deep and widen them in select areas to allow for two-way traffic of ultra-large containerships.
- ✓ Progressive Energy Policy Stance — In a bipartisan fashion, Virginia's legislature

passed the Grid Transformation and Security Act in 2018, which deems 5,000 MW of solar and wind energy generation to be in the public interest.

- ✓ Zero Air Draft Restrictions — Virginia port facilities have direct access to sea with no overhead obstacles to impede the shipping of large and upright infrastructure and components, an advantage that differentiates it from every other East Coast states.
- ✓ High-Quality Maritime Workforce — Hampton Roads boasts a civilian and military maritime labor force unmatched by any other East Coast state. Its proximity to the largest naval base in the world presents the opportunity to hire retiring military personnel for high-skilled offshore wind jobs.
- ✓ Abundant Waterfront Land and Infrastructure — Virginia's ports offer existing dock capacity and ample on-water marshaling areas. The Virginia coastline is geographically rich with waterfront properties and development or redevelopment opportunities.
- ✓ America's Largest Shipbuilding Industry — Hampton Roads is home to the largest shipbuilding market in the United States. This provides numerous advantages in existing physical and workforce assets. Unmatched infrastructure and workforce resources for design, construction and maintenance of vessel and other marine infrastructure are well developed, diverse and flexible — including capacity for the construction of new specialized vessels and modification of existing vessels.

III. Positioning Virginia as a Prime Location for the Offshore Wind Supply Chain and Service Industry

Following its May 2018 Request for Proposals (RFP), the Virginia Department of Mines, Minerals and Energy (DMME) awarded BVG Associates (BVGA) a contract in July to help deploy strategies that will strengthen Virginia's position in attracting the offshore wind supply chain and service industry to the Commonwealth.

BVGA is leveraging its North American and global partners with extensive offshore wind industry experience, including Ramboll Group A/S, Timmons Group, Greentree Consulting, LLC and the Business Network for Offshore Wind. BVGA and its team are evaluating Virginia's advantages and opportunities as well as providing recommendations to further enhance the Commonwealth's maritime workforce and its favorable business climate.

BVGA and its partners join the DMME-led Virginia Offshore Wind Team that also includes representatives from the Governor's Office, Virginia Economic Development Partnership, Port of Virginia and the Virginia maritime industry.

Three additional teams — Partnerships, Workforce and Business Incentives / Business Climate — support the Virginia Offshore Wind Team's work outlined in the RFP. A host of offshore wind stakeholders and representatives both at the state level and from the Hampton Roads region are engaged in this project.

The final report due late October 2018 will serve as a partnership tool to connect industry prospects with Virginia's robust maritime industry located in Hampton Roads. It will also provide a summary of Virginia's unique advantages, communicate offshore wind-related workforce development and business incentive efforts underway, identify competitive gaps and make recommendations as well as educate state and local economic development and energy policy leaders.

IV. Evaluating Virginia's Port Readiness

DMME contracted with BVG Associates (BVGA) in 2015 to evaluate 10 Virginia ports for their readiness to accommodate seven offshore wind manufacturing and construction activities (blades, generators, nacelles, towers, foundations, cables, construction staging). BVGA also evaluated five Virginia commercial shipyards for their readiness to manufacture offshore substations.

Drawing on intelligence from established offshore wind industry suppliers, the BVGA team developed a set of optimal requirements for each offshore wind activity. The requirements included waterside infrastructure, onshore infrastructure for the activities themselves and access requirements for vessels associated with offshore wind activities. BVGA also developed estimates of construction jobs and permanent manufacturing jobs. It developed port utilization scenarios, including a 'super-port', a series of cluster ports and a distributed network. It also engaged ten industry partners to validate the optimal port requirements and review the port utilization scenarios.

Although offshore wind activity is more demanding on port infrastructure than many other commercial port activities, Virginia's ports offer a high level of readiness. The study concluded that five ports have a realistic potential to be used for one or more offshore wind activities. The five ports include:

- ✓ Portsmouth Marine Terminal;
- ✓ Newport News Marine Terminal;
- ✓ Peck Marine Terminal;
- ✓ Virginia Renaissance Center; and
- ✓ BASF Portsmouth

Each of the ports requires various levels of upgrades to meet offshore wind power requirements. While the full report provides details of the required upgrades specific to each activity at each port, the following is a summary of key findings:

- ✓ Portsmouth and Newport News Marine Terminals have the highest level of port readiness. They each have sufficient space to accommodate multiple, co-located offshore wind activities, making them candidates for a future offshore wind manufacturing and deployment hub. The necessary upgrades to meet offshore wind requirements would cost up to \$10 million at each port.
- ✓ Peck Marine Terminal has the space and vessel access to accommodate many of the offshore wind manufacturing activities. Overhead navigational clearance precludes using Peck Marine Terminal for foundation manufacturing and construction staging. Necessary upgrades at Peck would cost up to \$14 million.

- ✓ Virginia Renaissance Center (VRC) has a high level of readiness but faces navigation constraints. Blade manufacturing and submarine cable manufacturing could be located at VRC and necessary upgrades would cost up to \$5 million.
- ✓ BASF Portsmouth represents an opportunity to develop new port infrastructure and would require a larger investment of \$8 million to \$45 million.
- ✓ Cape Charles Harbor, a privately owned port of the Eastern Shore of Virginia with close proximity to deep water, has the potential to be a strategic offshore wind site but will need basic ground improvements and an upgrade to the waterside infrastructure.
- ✓ Five Virginia shipyards studied are capable of manufacturing conventional offshore substations without further infrastructure investment. Two of these facilities had dry docks suitable for manufacturing self-installing substations.

V. Virginia Offshore Wind Development

Harnessing the offshore wind resource is a win-win for Virginia and allows the Commonwealth to be part of the green revolution across the nation. As more offshore wind areas are developed in the United States, costs, which have declined dramatically over the past decade in Europe, will continue to come down significantly and have come down in other states in the U.S., e.g., Massachusetts and Rhode Island. Virginia's offshore wind research efforts can contribute to these cost declines through learning and efficiencies gained during project deployment. Virginia's unique port and workforce assets provide a tremendous opportunity for the Commonwealth to establish itself as a leader in offshore wind power development by capitalizing on the opportunity to grow a new industry.

Dominion Energy contracted in 2017 with a global wind leader — Ørsted Energy of Denmark — to build Coastal Virginia Offshore Wind (CVOW), a two turbine, 12 MW demonstration project located 23.5 nautical miles offshore from the Virginia Beach coastline.

CVOW is located in the Commonwealth's 2,135-acre research lease, the only one of its kind along the East Coast for offshore renewable energy awarded by the Bureau of Ocean Energy Management (BOEM). The project is currently in the final stages of BOEM approval with a 2020 target completion date. CVOW continues Dominion Energy's commitment to 3,000 megawatts of solar and wind energy under development or in operation by the beginning of 2022.

CVOW will lay the groundwork for potential large-scale commercial development (up to 2,000 MW) in an 112,800-acre commercial Wind Energy Area adjacent to CVOW beginning approximately 23.5 nautical miles east of Virginia Beach which Dominion Energy has leased from BOEM. All other lease areas along the East Coast are controlled by private development companies, which must enter into power purchase agreements with utilities in other states.

VI. Virginia Energy Plan Recommendations (2018)

Development of the offshore wind resource — As the CVOW project moves forward, Governor Northam should commit to a goal that the full 2,000 MW of offshore wind potential in Virginia's wind energy area be developed by 2028. This goal would enable development of a strategy to ensure that Virginia continues to diversify its fuel mix through offshore wind resources. To facilitate the development and execution of a strategy, the Commonwealth should consider creating the Office of Offshore Wind within the Division of Energy at DMME. In addition, Dominion Energy should submit a timeline for the various steps and approvals necessary to accomplish the full build-out of the offshore wind resource. The Commonwealth should continue to work with Dominion Energy, BOEM, the Department of Defense, the Port of Virginia, commercial shipping and fishing interests, and other stakeholders to ensure that all stakeholder concerns are addressed and that the resource can be deployed at the lowest possible cost.

Development of the offshore wind supply chain — As the pending offshore wind report provides specific policy recommendations, the Commonwealth should include the offshore wind industry as a priority in future workforce development and economic development strategic plans. A coordinated prioritization of the offshore wind supply chain will send a signal to local and regional partners regarding the crosscutting value that the industry can bring to the Commonwealth. Governor Northam should also initiate regional collaboration with neighboring states, which can help provide greater certainty for the industry as it looks to establish a long-term project pipeline. This may reduce regulatory and administrative burdens for companies as they make investment decisions.

Virginia's Offshore Wind Advantages

- Congressionally Authorized 55 ft. Depth Channels
- Zero Air Draft Restrictions
- 2.5 Hours or Less to Open Sea
- On-Dock Dual Rail Served

PRESENT
ABSENT

New Bedford

New York/New Jersey

Baltimore

Hampton Roads

- Deep
- Tall
- Fast
- Accessible

Wilmington

In 2015, 70% of total revenues for the US shipbuilding industry came from military shipbuilding and repair. With major naval facilities Virginia, our military veterans have become a tremendous resource for companies in Virginia.



500,000+

Veterans Age 17- 64 in Virginia
Department of Veterans Affairs, 2014

Avg. Industrial Electric Rate (¢/kwh) by State, 2017

Massachusetts	13.87
Rhode Island	14.84
Connecticut	13.98
New York	6.39
New Jersey	11.27
Delaware	7.94
Maryland	10.82
Virginia	6.36
Hampton Roads Region	5.88
North Carolina	6.19

Edison Electric Institute, Winter 2017

Avg. Direct Income per Job (\$/Year) by State: Shipbuilding & Repairing Industry, 2013

Massachusetts	\$100,290
Rhode Island	\$103,100
Connecticut	\$107,960
New York	\$126,230
New Jersey	\$76,230
Delaware	\$70,000
Maryland	\$71,590
Virginia	\$81,900
North Carolina	\$71,430

*Maritime Administration, November 2015
"The Economic Importance of the U.S. Shipbuilding and Repairing Industry", Table 8*

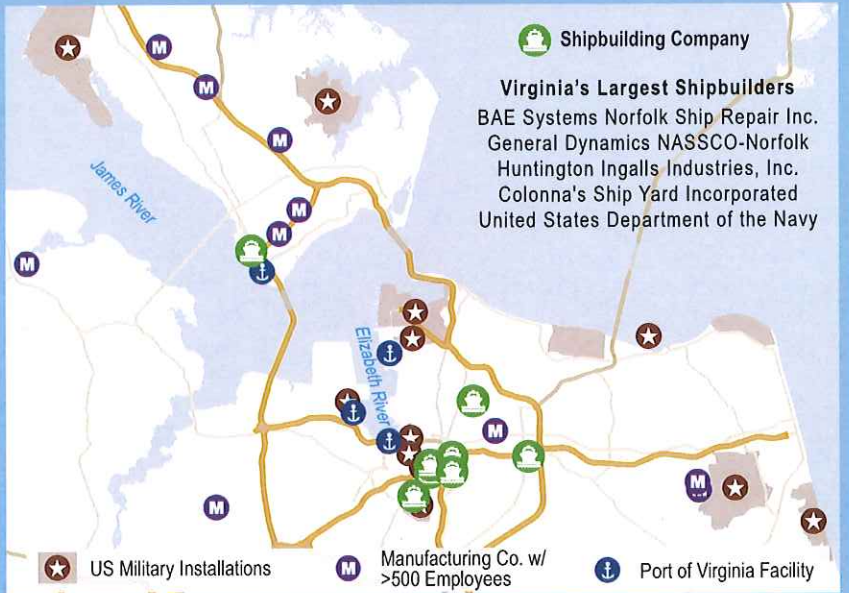
Employment in the Shipbuilding & Repairing Industry, 2017

	Hampton Roads Region	Rest of Virginia
#1 Virginia		23,723
2 Mississippi	12,331	
3 Connecticut	10,641	
4 California	8,483	
5 Maine	5,783	
6 Alabama	5,763	
7 Louisiana	5,022	
8 Florida	4,837	
9 Rhode Island	4,112	
10 Texas	2,975	
19 New York	637	
22 New Jersey	460	
23 Maryland	414	
24 Massachusetts	409	
30 Delaware	60	
31 North Carolina	51	
All Other States	14,024	

Emsi, 2017.3 (NAICS 336611)

In Virginia, our existing shipbuilding workers can meet the demands of the offshore wind industry.

Hampton Roads Region



State	Legislation or Policy Ambition	Offshore Wind Commitment	Developer (Leaseholder)	Estimated Date of Operation
Massachusetts	1,600 MW of offshore wind by 2027, with another 1,600 MW authorized by 2035	800 MW tender award in 2018	Vineyard Wind ¹	2021 2026
Rhode Island	1,000 MW of renewable capacity by 2020	400 MW tender award in 2018	Revolution Wind (MA-RI AMI) ^{2, 3}	2023
Connecticut	RPS of 40% by 2030 ⁴	200 MW tender award in 2018	Revolution Wind (MA-RI AMI) ^{2, 3}	2023
New York	2,400 MW of offshore wind by 2030	90 MW tender award in 2017 800 MW tender offer in 2018	South Fork Wind (MA-RI AMI) ^{2, 5} TBD ⁶	2022 TBD ⁶
New Jersey	3,500 MW of offshore wind by 2030	1,100 MW tender offer in 2018	TBD ⁶	TBD ⁶
Maryland	~480 MW ⁷ of offshore wind by 2020	120 MW tender award in 2017 248 MW tender award in 2017	Skipjack Wind ⁸ (DE lease area) U.S. Wind (MD lease area)	2022 2021
TOTAL:	10,180 MW ⁹	3,758 MW		

¹ Vineyard Wind is a joint venture between Copenhagen Investment Partners and Avangrid. Proposed Construction and Operations Plan envisions 400 MW operating in 2021 and 400 MW operating in 2026.

² (MA-RI AMI) refers to the Massachusetts – Rhode Island Area of Mutual Interest.

³ Revolution Wind is the ~~Deepwater Wind~~ (now Ørsted) project located in a portion of the MA-RI AMI.

⁴ Connecticut's Renewable Portfolio Standard (RPS) calls for Class I renewable energy sources to provide 28% of the state's electrical energy demand in 2022, growing by 2% per year, to 40% in 2030.

⁵ South Fork is the ~~Deepwater Wind~~ (now Ørsted) project located in a portion of the MA-RI AMI.

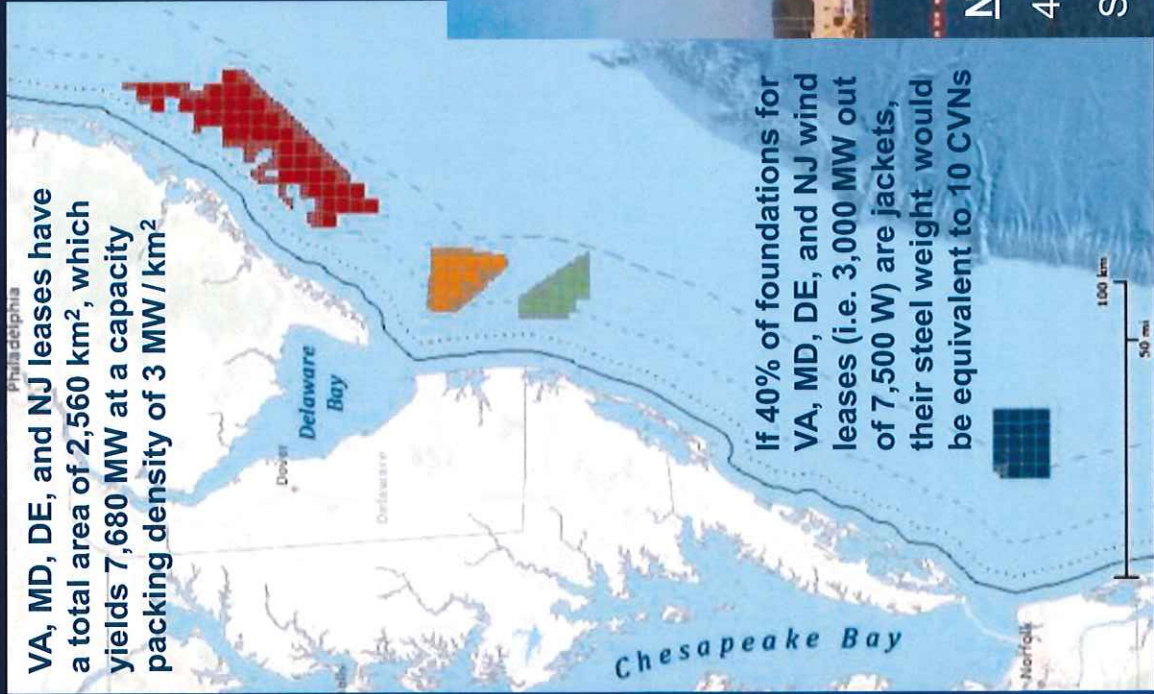
⁶ To be determined by competitive tender.

⁷ Skipjack Wind is a joint venture between ~~Deepwater Wind~~ (now Ørsted) and GSOE.

⁸ Maryland's RPS requires 25% of the state's electrical energy demand be sourced from renewable energy by 2020. The offshore wind "carve-out" is 2.5% of the RPS (estimated to be about 480 MW).

⁹ Includes only the awarded 200 MW for Connecticut, and the awarded 400 MW for Rhode Island, which are the most conservative estimates for those states.

40% of Mid-Atlantic WEA Foundations as Jackets would have Steel Weight of 10 Nimitz-class CVNs



Total Steel in 300 MW Offshore Wind Project

PIN PILES + PRIMARY STEEL + SECONDARY STEEL
= 800 metric tons per jacket x 60 jackets per project
= 48,000 metric tons (47,240 long tons)

Foundation steel for a 300 MW offshore wind project has the same weight as all of the structural steel in a single Nimitz-class nuclear aircraft carrier (CVN)



Nimitz-class Nuclear Aircraft Carrier (CVN)

47,000 long tons of structural steel

Source: www.dailypress.com/news/dp-cvn77-01_0,5744629.htmlstory