

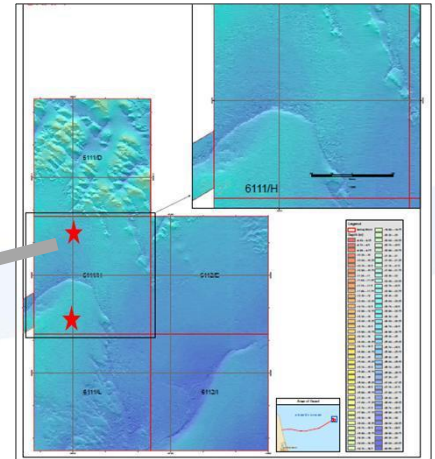
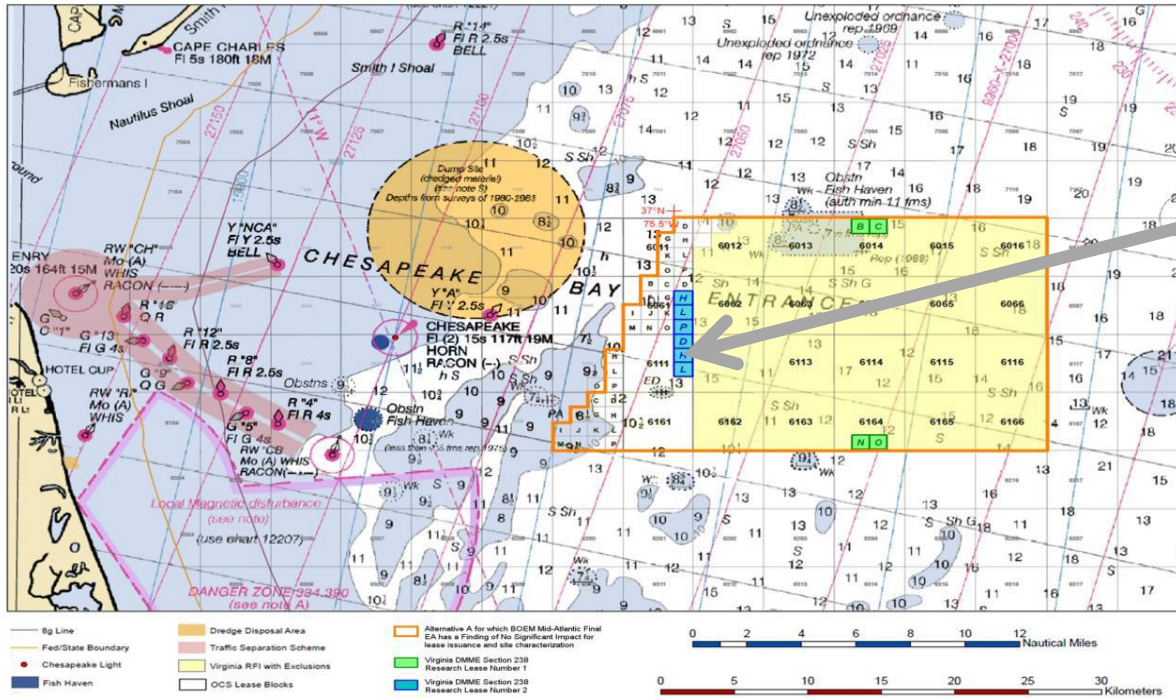
# Virginia Leases

## Commercial Lease & Coastal Virginia Offshore Wind Project

Virginia and North Carolina Task Force  
Meeting

December 7, 2017

# Research and Commercial Lease Areas



**Commercial Lease executed with a November 1, 2013 Effective Date**

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

# Commercial Lease OCS-A 0483 Update

# Commercial Lease Update

- Dominion Energy – Lease Holder
- Site Assessment Plan Approval October 12, 2017
- Next Steps -
  - 4.5 Years to COP Submittal
  - Geotechnical and geophysical investigations
  - Meteorological buoy deployment
  - Maintain Compliance with Lease Conditions



# Research Lease OCS-A 0497 Update

# Research Lease History

The Coastal Virginia Offshore Wind (CVOW) Project was formerly known as the Virginia Offshore Wind Technology Advancement Project (VOWTAP)

- In 2013, DOE selected 7 projects for initial engineering and environmental surveys -\$4 million per project
- In 2014, DOE selected 3 projects, including VOWTAP, for final design and construction -Up to \$47 million per project
- In May 2016, DOE withdrew further funding after Dominion decided to file for state approval, thereby extending the Commercial Operation Date (COD) by up to 2 years.

# Research Lease History

- In March 2015, BOEM issued the first of its kind Research Lease offshore Virginia to DMME
- In July 2015, BOEM Issued the Revised EA and FONSI
- In March 2016, BOEM issued final Research Activities Plan (RAP) approval
- **In July 2017, Dominion announced a strategic partnership with Ørsted (formerly DONG Energy of Denmark) for development and construction of the newly named Coastal Virginia Offshore Wind Project (CVOW)**

# Research Lease Team

- Virginia Department of Mines Minerals and Energy (DMME) – Research Lease Holder
- Dominion Energy - Research Lease Designated Operator
- Ørsted Wind Power–Engineering, Procurement and Construction Contractor



# Research Lease Team

## Dominion Energy Profile

Primary Operating Segments

### Power Delivery



#### Electric Transmission

- ❖ 6,600 miles of transmission lines
- ❖ Favorable regulatory environment

#### Electric Distribution

- ❖ 57,600 miles of distribution lines
- ❖ 2.6 million franchise retail customer accounts in VA and NC

### Power Generation



#### Utility Generation

- ❖ 21,500 MW of capacity
- ❖ Balanced, diverse fuel mix
- ❖ Favorable regulatory environment

#### Merchant Generation

- ❖ 4,700 MW of capacity, including nuclear, gas and renewable power
- ❖ Active hedging program for energy revenue/margins

### Gas Infrastructure



#### Gas Transmission

- ❖ Together with Gas Distribution, operates one of the largest natural gas storage systems in the U.S.
- ❖ 15,000 miles of pipeline in eleven states
- ❖ Cove Point LNG import facility
- ❖ Well positioned in Marcellus and Utica Shale regions

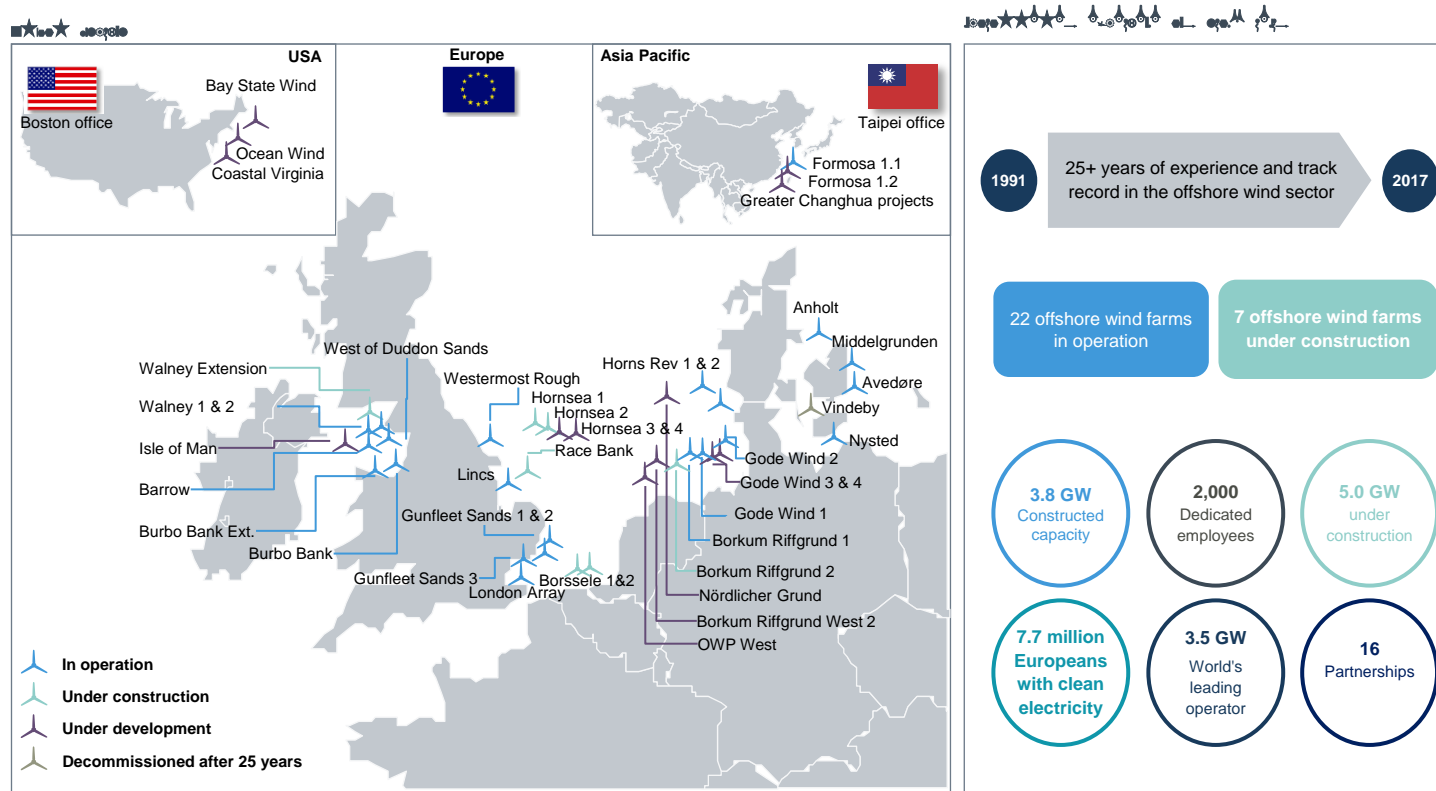
#### Gas Distribution

- ❖ 51,300 miles of distribution pipeline and 2.3 million natural gas customer accounts in five states

#### Dominion Energy Solutions

# Research Lease Team

## Ørsted Wind Power overview



# Industry Contributions

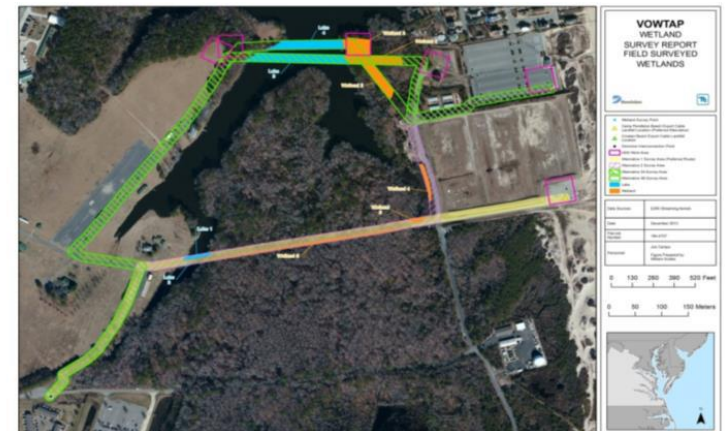
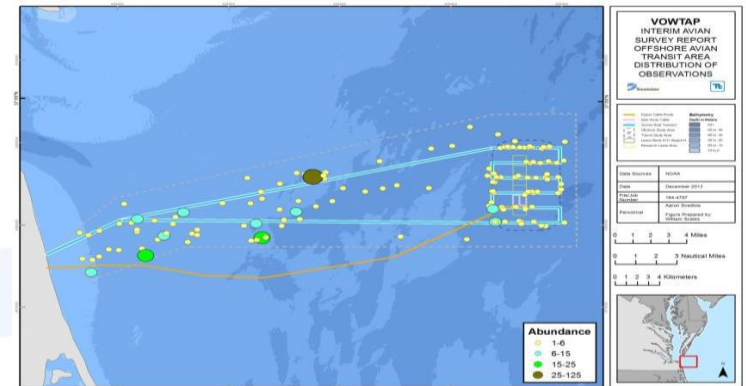
Site Specific Data that has been collected in support of the project also provides a baseline of information that can be utilized for future commercial offshore wind development. Some of the surveys and studies conducted that will inform future offshore wind development in the U.S. include:

- Hurricane Studies;
- Breaking Waves Studies;
- Seabed Mobility Studies,
- Scour Assessment Study;
- Metocean Conditions Studies;
- Geotechnical Campaign Surveys; and
- Laboratory Analysis.

# Industry Contributions

## Environmental and Site Characterization Surveys & Studies

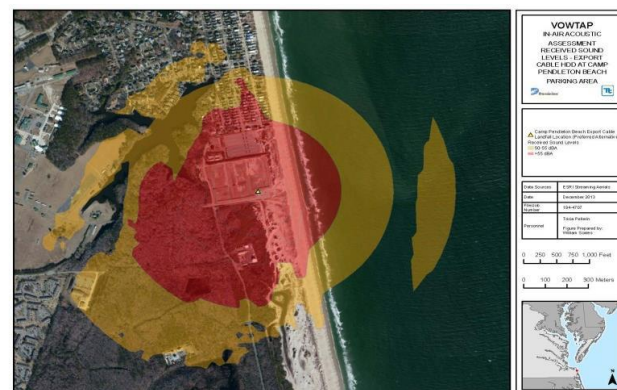
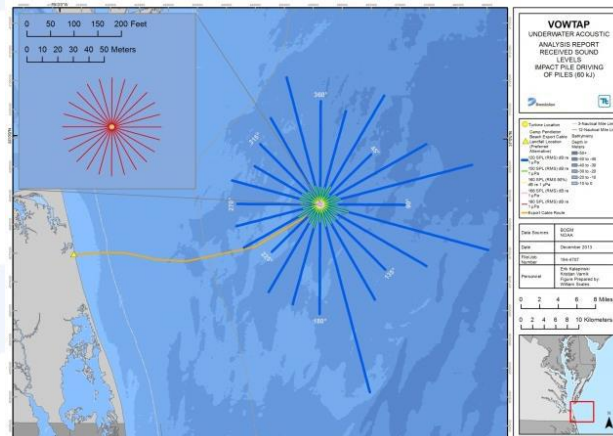
- Terrestrial Archaeology Survey
- Visual Impact Assessment
- Historic Structures Survey
- Avian Surveys (ship-based and onshore point counts)
- Onshore Wetland and Waterbody Surveys



# Industry Contributions

## Environmental and Site Characterization Surveys & Studies

- In Air and Underwater Acoustic Analysis
- Air Emissions Analysis
- Aviation Assessment
- EMF Analysis
- Fisheries Assessment
- Marine Mammal and Sea Turtle Assessment
- Navigational Risk Assessment
- Sediment Transport Analysis
- Threatened and Endangered Species Assessment



# Restrictions and Compliance Issues

## Time of Year Restrictions

- Sea Turtle Nesting on Beaches – May 1 to August 1
- North Atlantic Right Whale Migration Period – November 1 to April 30

# Restrictions and Compliance Issues

## RAP Approval Conditions

- UXO Surveys
- Avian and Bat Protection
- Marine Protected Species and Essential Fish Habitat
  - Vessel Strike Avoidance Measures
    - North Atlantic right whales
    - Non-delphinoid cetaceans other than the North Atlantic right whale
    - Delphinoid cetaceans and pinnipeds
    - Sea turtles

# Anticipated RAP Amendments

Some Project components will be updated due to advancing technologies in offshore wind since submittal of the RAP:

- Purpose and Need
- Project Description
- Schedule



# Purpose and Need

The 5 key elements of this research project identified in the RAP remain valid.

## ➤ **Technical Innovation and Validation:**

- First turbines to be installed in U.S. Federal waters
- First monopile foundation with 6MW turbines to be installed in the U.S.
- Supervisory control system will monitor turbine operation in real time
- Hurricane resilient design

# Purpose and Need

## ➤ Cost Reduction:

- ❑ CVOW will provide a necessary step towards future commercial-scale offshore development by utilizing latest technologies to reduce CAPEX and O&M costs

## ➤ Removal of Market Barriers:

- ❑ Provide a platform for removing<sup>18</sup> first-of-a-kind risks that constitute barriers to the U.S. offshore wind industry, including:
  - ❖ Navigating permitting process
  - ❖ Installing turbines that are new to the U.S. offshore wind market
  - ❖ Provide a better understanding of U.S. supply chain requirements

# Purpose and Need

## ➤ Identify Potential Improvements to Permitting Process:

- ❑ CVOW will build on experience gained from the permitting process by:
  - ❖ Working with BOEM to gain approval on the RAP amendment in a timely manner;
  - ❖ Being the first project to test the post RAP/COP approval permitting process; and,
  - ❖ Being the first project to undergo the FDR/FIR Review Process.

# Purpose and Need

- **Progressing Environmental Research and Understanding:**
  - ❑ Location of the turbines in proximity to each other will allow research on wind turbine wake effects;
  - ❑ Project will provide valuable data to enhance the understanding of the environmental effects of future offshore wind development in the U.S.

# Proposed Project Modifications

Offshore wind technology has advanced rapidly in the last few years. Some Project components have been updated to incorporate state of the art advancements, including:

## **Turbines**

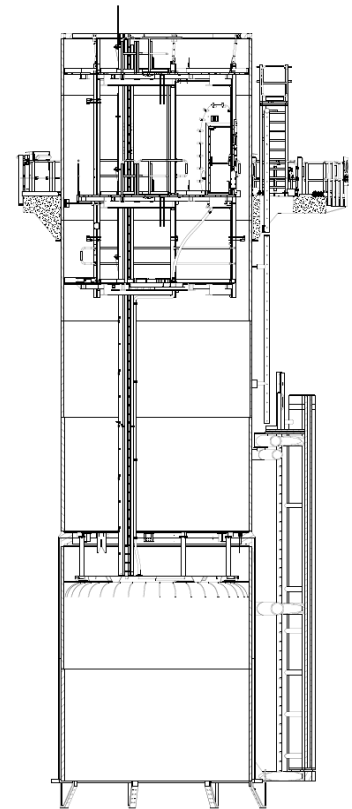
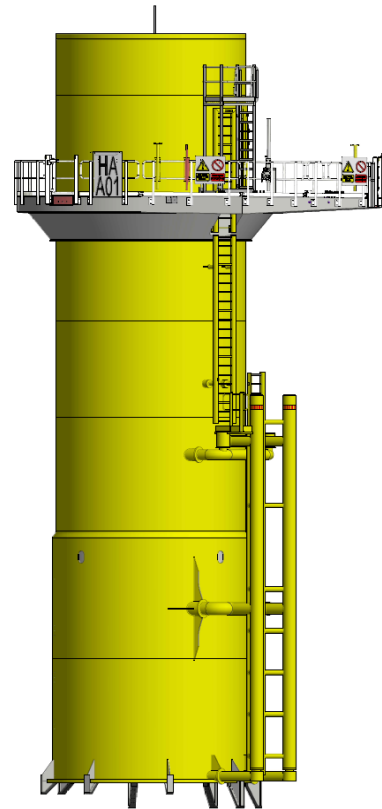
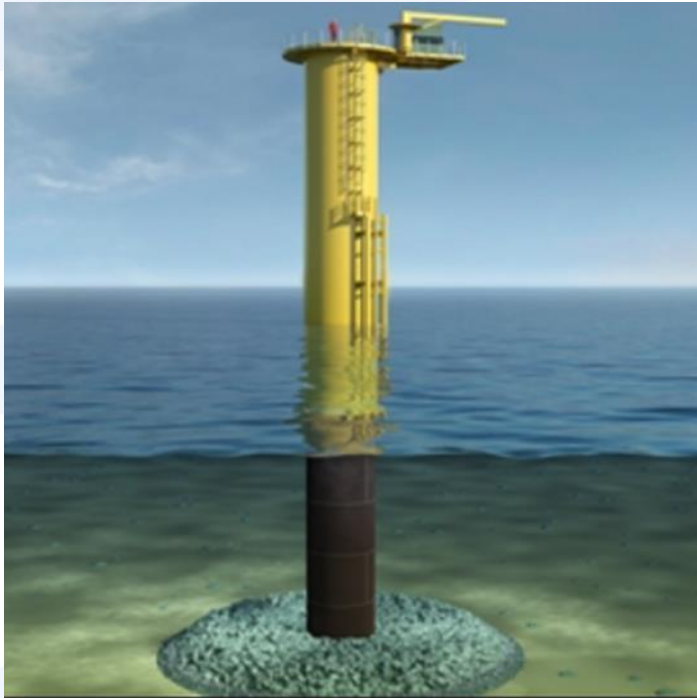
- The CVOW will still utilize 6MW turbines, with option for power boost technology
- Some turbine specifications will be slightly different than previously proposed

# Proposed Project Modifications

## Foundation Type

- Monopile foundation (previously Inward Battered Guide Structure):
  - ❑ One 26.2 foot diameter monopile for each new foundation (previously the IBGS had one 10.2 foot diameter central caisson and three 5.9 foot diameter pin piles per foundation)
  - ❑ Monopile reduces installation from 1 week to less than 1 day per foundation (excluding weather delays)

# Proposed Project Modifications



# Proposed Project Modifications

## Vessels

- Vessels originally proposed for construction may require modification due to requirements for installation and vessel availability.

## Route and landing location

- No change anticipated
- Micro-siting may be required within the 300 m survey corridor based on results of the UXO survey
- One known (MAREA) and at least one more anticipated new fiber optic trans-Atlantic communication cable crossing



# Proposed Project Modifications

## Onshore Interconnection Cable Route

- Due to conflicts with military activities, the Navy has requested that the Onshore Interconnection Cable Route be modified. Working with Camp Pendleton to modify onshore cable route to interconnect station.
- Length of Onshore Interconnection Cable Route will increase by approximately half mile, from approximately 3250 feet to approximately 5800 feet

# Target Schedule

|  | 2017 | 2018 |    |    |    | 2019 |    |    |    | 2020 |    |    |    |
|--|------|------|----|----|----|------|----|----|----|------|----|----|----|
|  | Q4   | Q1   | Q2 | Q3 | Q4 | Q1   | Q2 | Q3 | Q4 | Q1   | Q2 | Q3 | Q4 |
| Submittal of RAP Amendment                       | ■    |      |    |    |    |      |    |    |    |      |    |    |    |
| UXO Identification Survey                        |      |      | ■  | ■  |    |      |    |    |    |      |    |    |    |
| Submittal of Facility Design Report              |      |      |    | ■  |    |      |    |    |    |      |    |    |    |
| UXO Visual ROV Survey and Mitigation             |      |      |    |    |    |      | ■  | ■  |    |      |    |    |    |
| Submittal of Fabrication and Installation Report |      |      |    |    | ■  |      |    |    |    |      |    |    |    |
| Offshore Component Fabrication                   |      |      |    |    |    | ■    | ■  | ■  | ■  |      |    |    |    |
| Onshore Construction                             |      |      |    |    |    |      |    |    | ■  | ■    |    |    |    |
| Offshore Construction                            |      |      |    |    |    |      |    |    |    | ■    | ■  |    |    |

A detailed Project schedule will be provided with the RAP Amendment.

# Stakeholder Involvement

## Federal

- ❖ Department of Defense
- ❖ United States Coast Guard
- ❖ United States Navy
- ❖ United States Army Corps of Engineers
- ❖ National Oceanic and Atmospheric Administration, National Marine Fisheries Service

## State

- ❖ Virginia Marine Resources Commission
- ❖ Virginia Department of Environmental Quality
- ❖ Virginia Department of Mines, Minerals and Energy (DMME)
- ❖ Camp Pendleton State Military Reservation

# Next Steps

- ❖ Submit RAP Amendment
- ❖ Update, Modify or Obtain Other Permits/Approvals as Necessary
- ❖ UXO Surveys
- ❖ Facility Design Report/Fabrication and Installation Report
- ❖ Construction
- ❖ Commercial Operation Date –Target 2020

# Thank You for Your Attention

Commercial Lease & Coastal Virginia

Offshore Wind Project

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