

Renewables, North America - Timeline





2012 CAPE WIND SITE INVESTIGATION

Geophysical and geotechnical offshore site investigation for Cape Wind project.

First offshore site investigation related to offshore wind in the northeast.



2013

VOLTURNUS FLOATING WIND TURBINE

VoltturnUS 1:8 is a 65-foot-tall floating turbine prototype that is 1:8th the scale of a 6-megawatt (MW), 450-foot rotor diameter design. The patent-pending VoltturnUS 1:8, was designed and built at UMaine, assembled at Cianbro's facility in Brewer, successfully towed nearly 30 miles from Brewer by a Maine Maritime Academy tugboat, and anchored for testing off the coast of Castine, Maine in 90 ft of water.

First grid-connected offshore wind turbine in the US; First floating offshore wind turbine in the US.



2016

BLOCK ISLAND WIND FARM COMMISSIONED

Five 6-MW piled jacket turbines installed and commissioned offshore Block Island, Rhode Island.

First US offshore wind farm.



2016 UMASS/NGI OFFSHORE WIND WORKSHOP

Day-long workshop of "Geotechnical Engineering for US Offshore Wind Infrastructure" with 20 presentations.

First offshore wind focused (geo)technical forum held in the US.

OCS Study
BOEM 2017-049

Geophysical and Geotechnical Investigation Methodology Assessment for Siting Renewable Energy Facilities on the Atlantic OCS

US Department of the Interior
Bureau of Ocean Energy Management
Office of Renewable Energy Programs



2017

G&G INVESTIGATION REPORT FOR ATLANTIC OCS

BOEM funded study for assessing geophysical and geotechnical investigation methods related to offshore renewable energy facilities on US Atlantic OCS.

First comprehensive report on site investigation methods for US East Coast offshore wind development.



EFFECTS OF CYCLIC LOADING ON SUCTION BUCKET FOUNDATIONS FOR OFFSHORE WIND TURBINES

Prepared for:
Bureau of Safety and
Environmental Enforcement

August 2016
Project No. 04.76160003



2020

CYCLIC LOADING OF SUCTION BUCKETS IN SAND

Research project sponsored by BOEM and BSEE examining suction bucket behavior in undrained sand under cyclic loading.

First BOEM sponsored project on suction bucket foundations.



2020 Offshore Wind Resource Assessment for the California Pacific Outer Continental Shelf

Mike Optis, Alex Rybchuk, Nicola Bodini, Michael Rossol,
and Walter Musial

National Renewable Energy Laboratory

*Produced under direction of the Bureau of Ocean Energy Management
(BOEM) by the National Renewable Energy Laboratory (NREL) under
Interagency Agreement IAG-19-2123.*

NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC

This report is available at no cost from the National Renewable Energy
Laboratory (NREL) at www.nrel.gov/publications.

Contract No. DE-AC36-08GO28308

Strategic Partnership Project Report
NREL/TP-5000-77642
OCS Study BOEM 2020-043
October 2020

2020 GEOHAZARD REPORT FOR PACIFIC OFFSHORE WIND FARMS

BOEM funded study for assessing geohazard (earthquake, landslide, tsunami) risk related US offshore wind farm
development on Pacific coast.

First comprehensive report on geohazards for US West Coast offshore wind development.

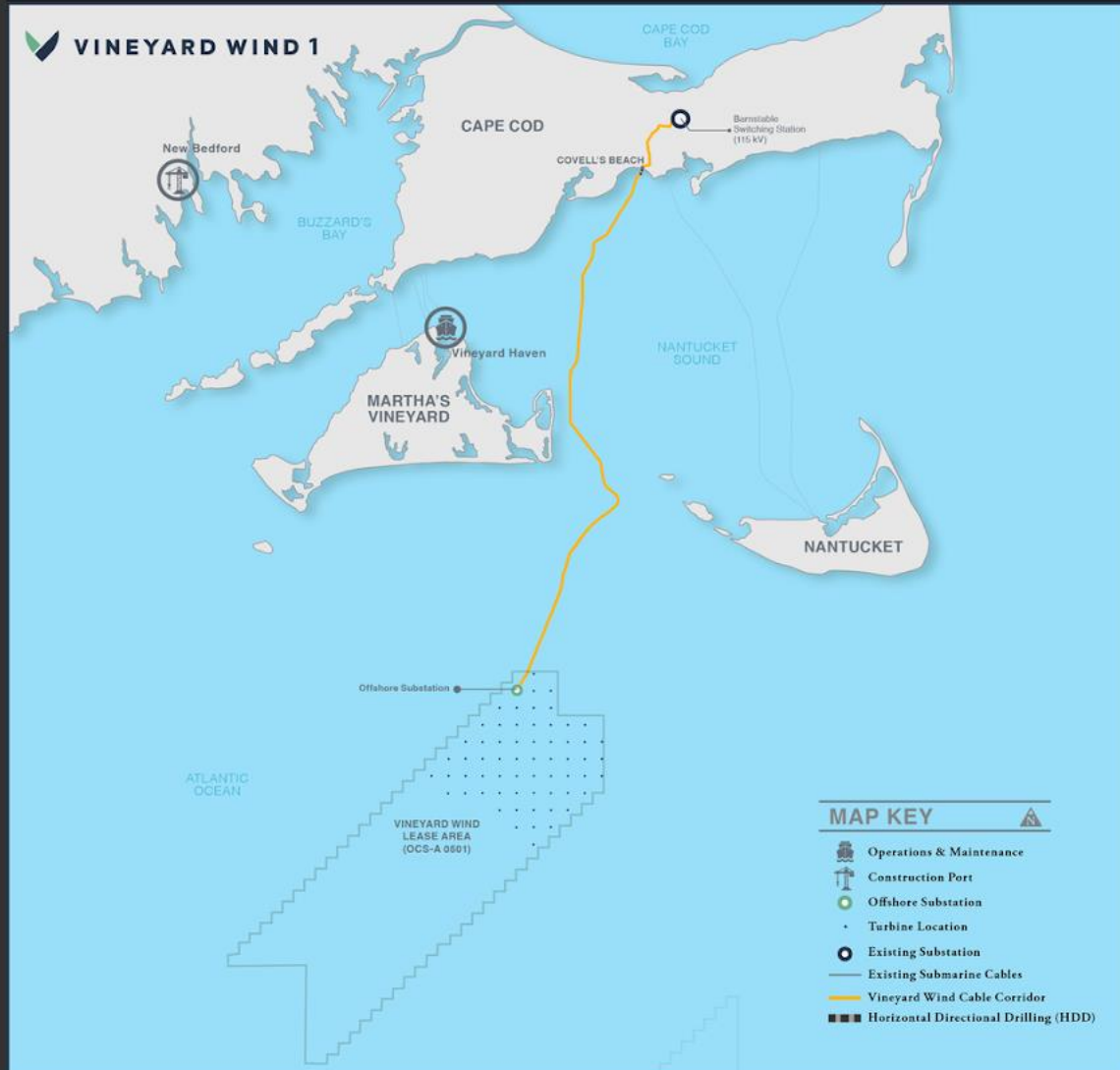


2021 COASTAL VIRGINIA OFFSHORE WIND (CVOW) MONOPILE INSTALLATION

Twin 10-MW demonstration turbines on monopile foundations installed offshore of Virginia.

First monopile foundations for offshore wind in US.





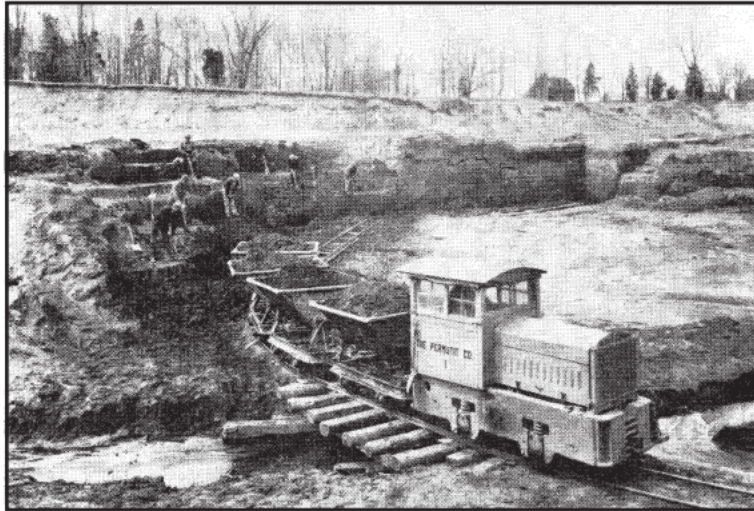
2021 VINEYARD WIND I BOEM APPROVAL

Vineyard Wind I receives federal approval for construction starting 2022.

First US utility scale offshore wind farm using monopile foundations is approved.



Greensand and Greensand Soils of New Jersey: A Review



Greensand pit Birmingham, New Jersey

Courtesy Permutit Company

J.C.F. Tedrow

Department of Ecology, Evolution and Natural Resources
Rutgers University, New Brunswick, NJ 08901

2002



2022 PIGS JIP LAUNCHED

Joint industry project Piling in Glauconitic Sand launched by Equinor and Orsted.

First offshore wind related JIP focused on offshore geotechnical challenges in US.



**UMaine R&D
in Floating
Offshore Wind**
*New England
Aqua Ventus I*

*DOE Advanced Technology
Demonstration Program for
Offshore Wind*

Maine Science Festival
Feb 16, 2021

Presented by:
Prof. Habib Joseph Dagher, PhD, PE
Director, ASCC Center

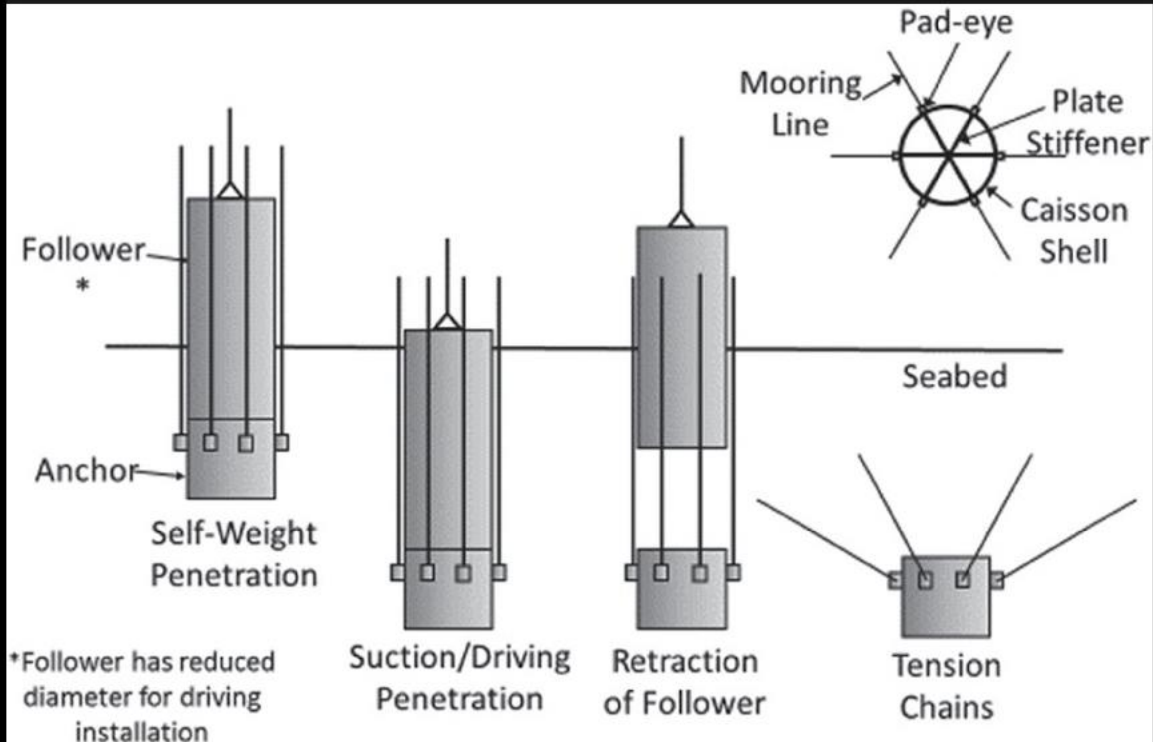


2022

AQUA VENTUS I DEMONSTRATION PROJECT

11 MW floating offshore wind demonstration project offshore of Maine.

First floating offshore wind turbine planned for US.



2022

MULTI-LINE RING ANCHOR PATENTED

Patent pending for foundation concept comprising ring anchor foundation tethered to multiple floating structures.

Innovative solution for floating offshore wind developed by US universities (TAMU, UMassA).