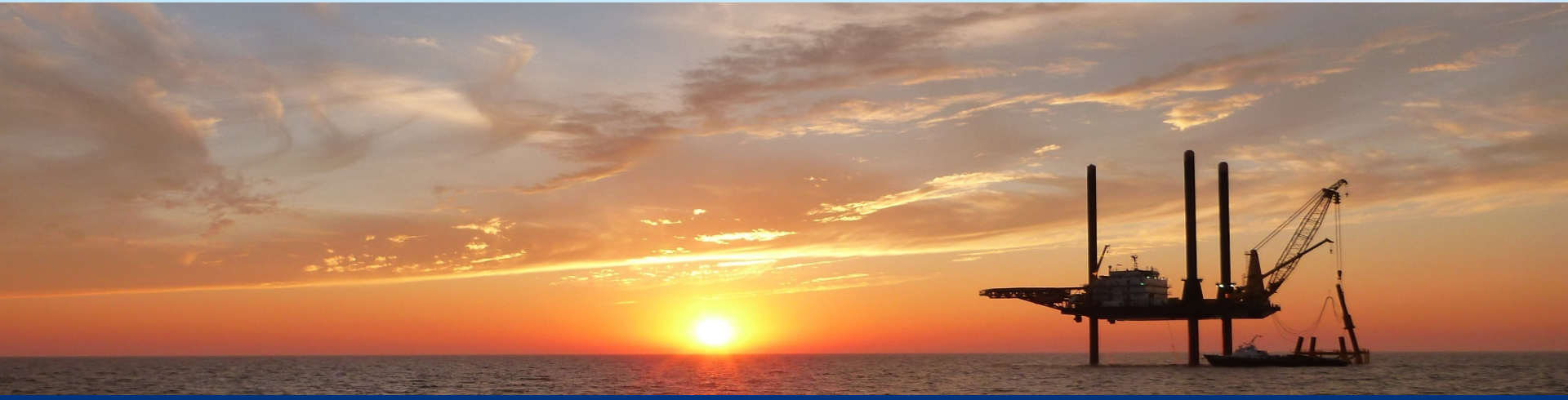
Tetra Tech Offshore Wind Project Support

New York State Bar Association

Environmental and Energy Law Section Fall Meeting

September 23, 2019



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U.S. OFFSHORE WIND POTENTIAL
25,824 MEGAWATTS (MW)

- 30 MW of installed capacity
- 2,043 MW of capacity with site control and offtake pathways
- 19,151 MW of potential capacity (developers have exclusive site control)
- 2,250 MW of potential capacity in unleased wind energy areas (North Carolina)
- 2,350 MW of potential capacity in unsolicited project applications (Pacific region)

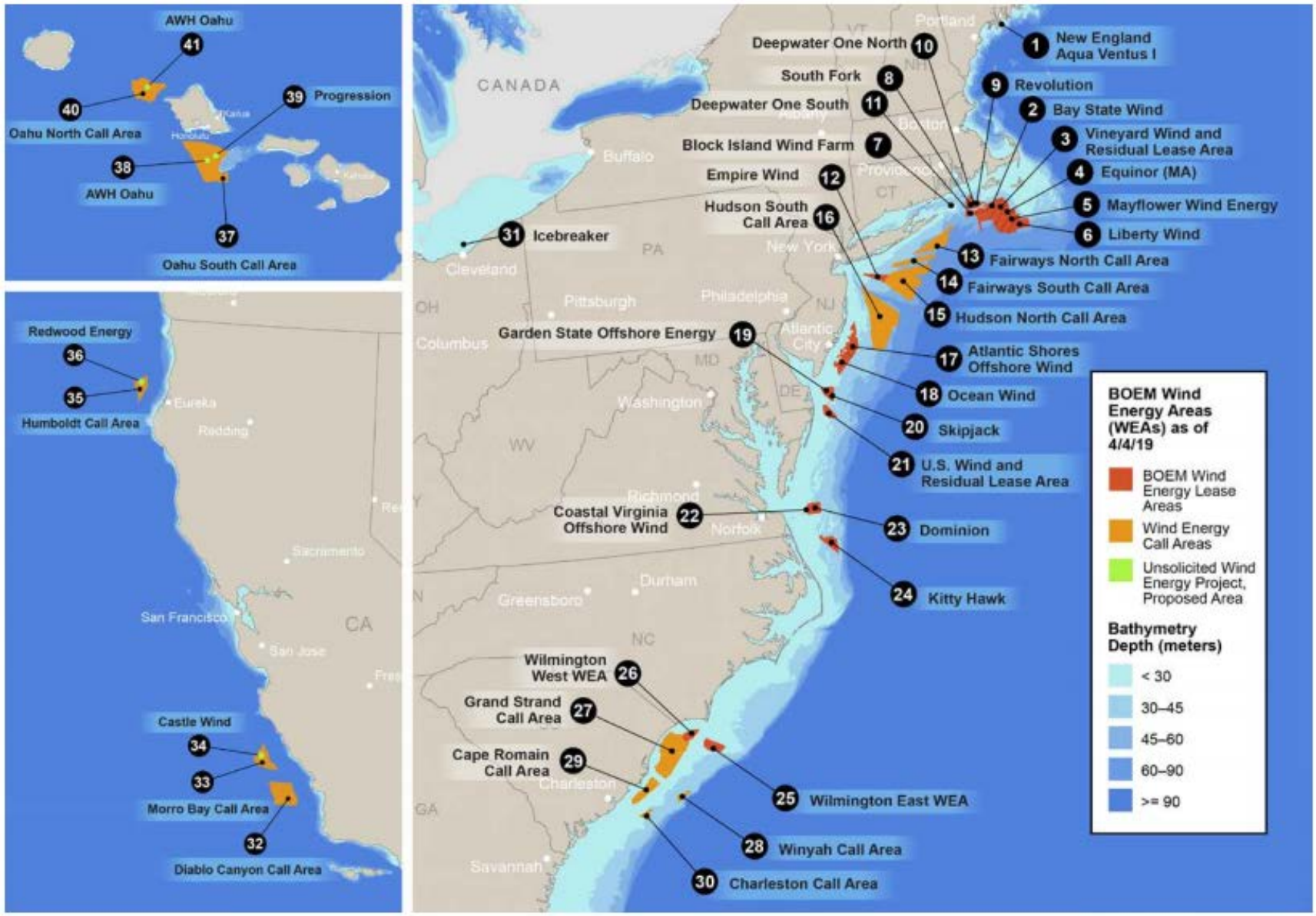
Federal Activities

- DOE released "Offshore Wind Technologies Market Report"
- Increased competition at auctions for new renewable energy lease areas. Three lease areas in Massachusetts were each sold for $135 million, more than tripling the previous highest winning bid.
- Department of Interior's Bureau of Ocean Energy Management (BOEM) considering establishment of an Intergovernmental Task Force for New Hampshire.
- BOEM is examining new "Call Areas" for offshore wind development.
    - Assessed commercial interest in multiple Call Areas in the New York Bight (2018). Final WEA expected in fall 2019. Lease auction expected in 2020.
    - Designated Call Areas along central and northern California coast (2018). Lease auction expected in 2020.

State Activities

- State-level policies continue to drive the U.S. market.
- State offshore wind targets increased to 11,468 MW to be operating in 2030 and 19,968 MW to be operating by 2035 (as of June 2019).
- 4 projects awarded offshore wind renewable energy certificates (US Wind Maryland project, Deepwater Wind Skipjack project) or a power purchase agreement (PPA) (Deepwater Wind South Fork project)

U.S. OFFSHORE WIND DEVELOPMENT ACTIVITY



Source: NREL 2019

NEW YORK AND OFFSHORE WIND

What is the driver?

- Climate Leadership and Community Protection Act
  - 100% zero-carbon electricity by 2040
  - 70% of state's electricity from renewable sources by 2030
  - 9,000 MW of offshore wind by 2035, enough to power up to 6 million homes

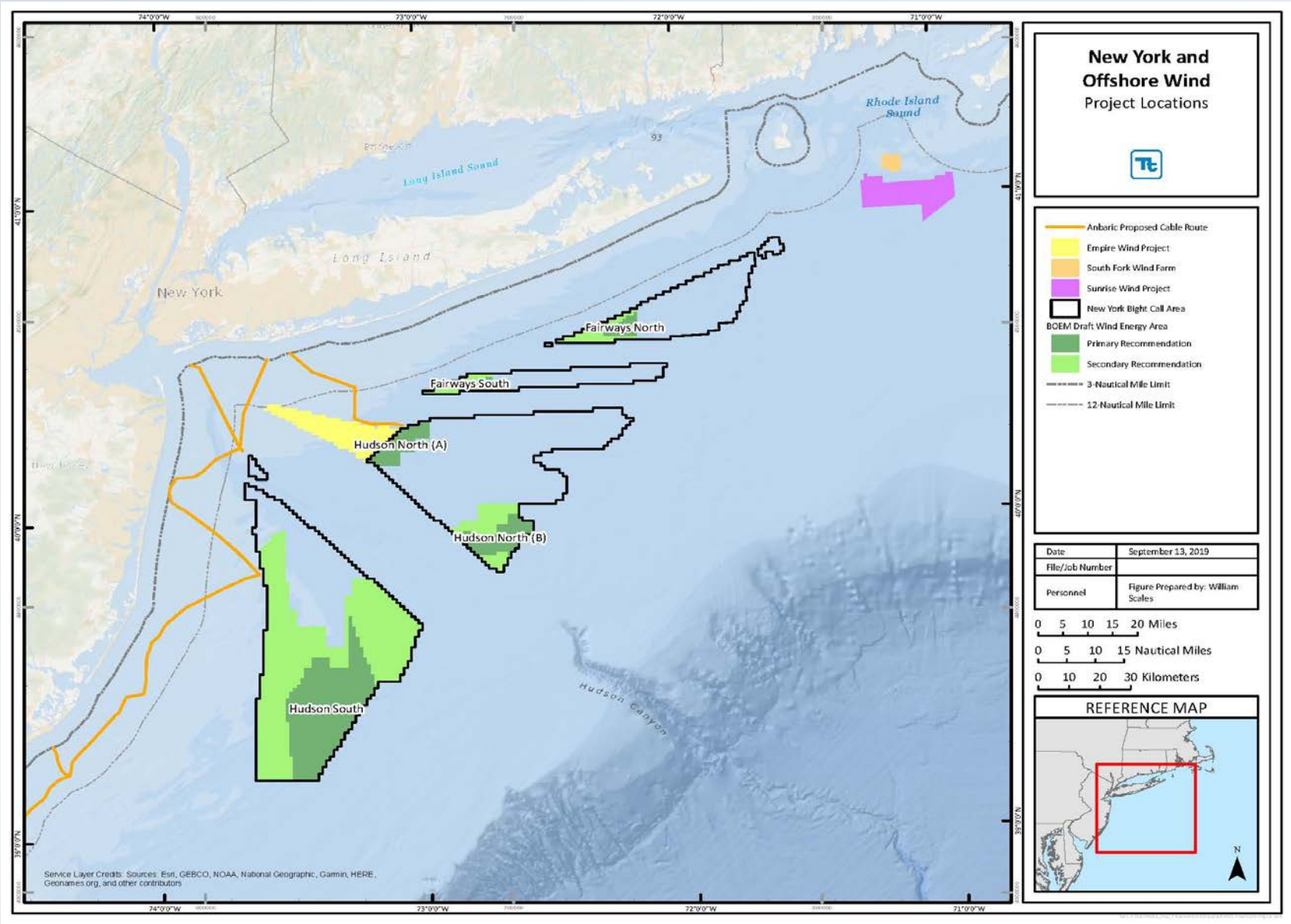
What is the status of projects?

- **South Fork Wind Farm**: Ørsted U.S. Offshore (Deepwater Wind) and Eversource Energy
  - 132 MW, enough to power 70,000 homes
  - 35 miles east of Montauk Point, Long Island
  - Operational by 2022
- July 2019—NYSERDA negotiated 25-year offshore wind RECs for 2 offshore wind farm projects
  - **Empire Wind**: Equinor
    - 816 MW of capacity
    - 14 miles southeast of Manhattan
    - Operational by 2024-2025
  - **Sunrise Wind**: Joint venture between Ørsted U.S. Offshore and Eversource Energy
    - 880-MW project
    - 30 miles east of Montauk Point, Long Island
    - Operational by 2024
  - Combined capacity to produce 1,700 MW of electricity (enough to power 1 million homes), or 20% of Gov Cuomo's goal for offshore wind.
  - 1,600 jobs and $3.2 billion in economic activity

What is next?

- Final NY Bight Wind Energy Areas to be announced by BOEM

NEW YORK AND PROPOSED OFFSHORE WIND PROJECTS



OFFSHORE WIND PROJECT ELEMENTS

Marine Surveys
- Geophysical & Geotechnical
- T&E Species
- Cultural Resources

Permits
- NEPA process through BOEM
- Federal, state, and local permits

Site Control
- Lease from BOEM

Financing
- Investor or bank funding to construct

Offtake Agreement
- Revenue stream for power produced
- Unlocks development funding

Marine Construction and O&M

Subsea Cable Design and Installation
- Technology providers
- Owner's engineer
- Installation contractors

PERMITTING PROCESS IN THE UNITED STATES

- Lead Federal Agency: Bureau of Ocean Energy Management (BOEM)
  - 3 nautical miles to U.S. Exclusive Economic Zone
  - Responsible for NEPA review for all project infrastructure from sea to point of interconnection
- State Lead would be site specific

PROJECT COMPONENT[1]	STATE	FEDERAL
Wind turbine array		X[2]
Offshore substation(s)		X[2]
Submarine transmission cable	X	X
Onshore transmission cable	X	X[3]
Tie-in to existing transmission system (e.g., substation and port upgrades)	X	X[3]

[1]Assumption is that offshore wind energy facilities are located on the Outer Continental Shelf ([OCS] federal waters).
[2] State Coastal Zone Management Agency must, however, issue a Consistency Certification for any project if it will "directly, indirectly, or cumulatively affect any natural resources, land uses, or water uses in the coastal zone."
[3] Depending on existing conditions along proposed route (e.g., wetlands, protected species habitat), federal jurisdiction may apply and require a permit (e.g. U.S. Army Corps of Engineers).




FEDERAL AUTHORITIES

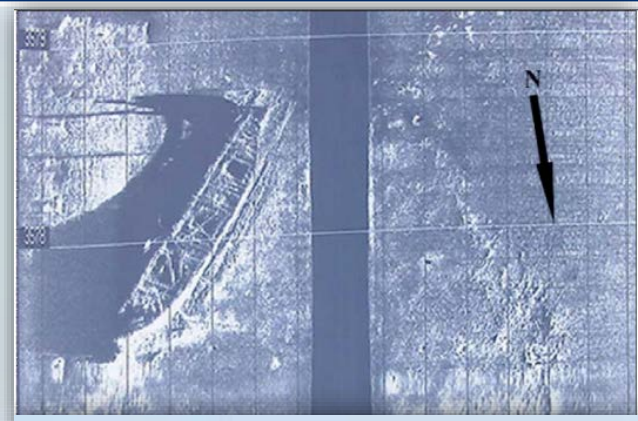
- National Environmental Policy Act
- Endangered Species Act
- Marine Mammal Protection Act
- Magnuson-Stevens Fishery Conservation and Management Act
- Marine Protection, Research, & Sanctuaries Act
- National Marine Sanctuaries Act
- E.O. 13186 (Migratory Birds)
- Coastal Zone Management Act
- Clean Air Act
- Clean Water Act
- Marking of Obstructions
- E.O. 13007 (Indian Sacred Sites)
- E.O. 13547 (Stewardship of the Oceans, Our Coasts and the Great Lakes)
- Ports and Waterways Safety Act
- Rivers and Harbors Appropriation Act
- Resource Conservation and Recovery Act
- National Historic Preservation Act
- Archaeological and Historical Preservation Act
- American Indian Religious Freedom Act
- Federal Aviation Act
- Federal Power Act

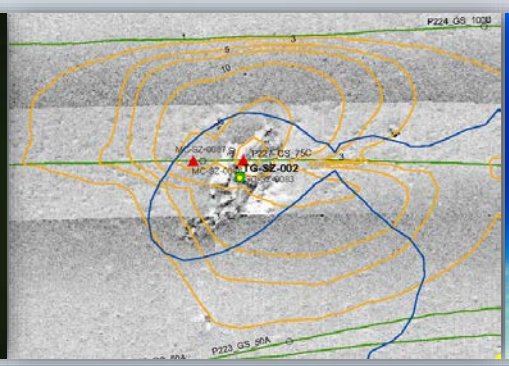
US Army Corps of Engineers

BOEM Bureau of Ocean Energy Management

MARINE ISSUES

- Impacts to marine mammals, fish, and avian species
- Disturbance of benthic habitat
- Suitable substrate (engineering and permitting)/ construction methodology
- Avoidance of sensitive cultural resources
- Avoidance of dumping grounds and UXO
- Minimize impact to Essential Fish Habitat (EFH)
- Water quality and air impacts during construction
- User conflicts especially with fishing interests and commercial shipping interests



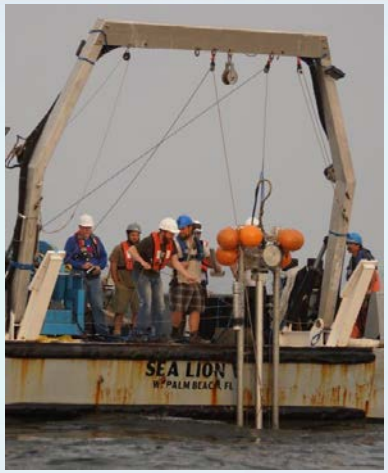


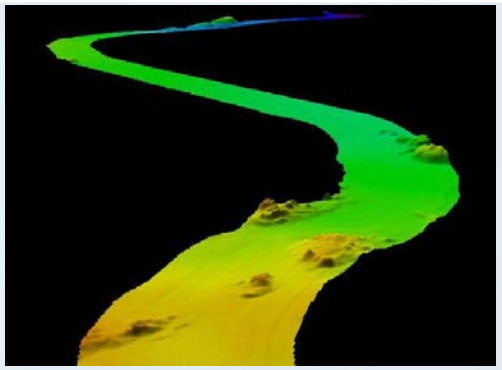
TERRESTRIAL ISSUES

- Sensitive coastal/near shore habitats
- Threatened and endangered (T&E) species
- Wetlands
- Coastal consistency
- Compatibility with existing land use and the power grid (use of existing infrastructure is best whenever possible)
- Submerged aquatic vegetation
- Sensitive cultural resources
- Structures
- Archaeological
- Noise (construction)

SURVEYS AND DESKTOP ANALYSIS

- Marine Geophysical and Shallow Geotechnical Surveys
- Marine Cultural Survey
- Marine Benthic Site Characterization
- In-Air and Underwater Noise Modeling
- Electromagnetic Field Assessment
- Visual Impact Assessment
- Navigational Safety Assessment
- Marine Mammal and Sea Turtle Assessment
- T&E Species Assessment
- Fisheries Assessment
- Air Emissions Analysis
- Sediment Dispersion Modeling
- Historic Properties Surveys





OVERVIEW OF BOEM PERMITTING PROCESS

Wind Energy Area Identification

- Intergovernmental Task Force--BOEM works with federal and state stakeholders to find potential areas with few environmental/user conflicts
- BOEM conducts an Environmental Assessment on lease execution and site assessment
- Request for Information or Call for Information and Nominations

2-3 years

Auction/Lease Execution

- BOEM determines competitive interest in designated wind energy area
- BOEM qualifies interested developers to participate in auction
- Auction winner(s) signs lease(s) including terms and conditions

1-2 years

Lease Preliminary Term (1 year)

- Begins on effective date of a lease
- Conduct site characterization surveys for buoy/meteorological tower deployment
- Submit a Site Assessment Plan (SAP) to BOEM for approval

1 year

Where Tetra Tech gets involved

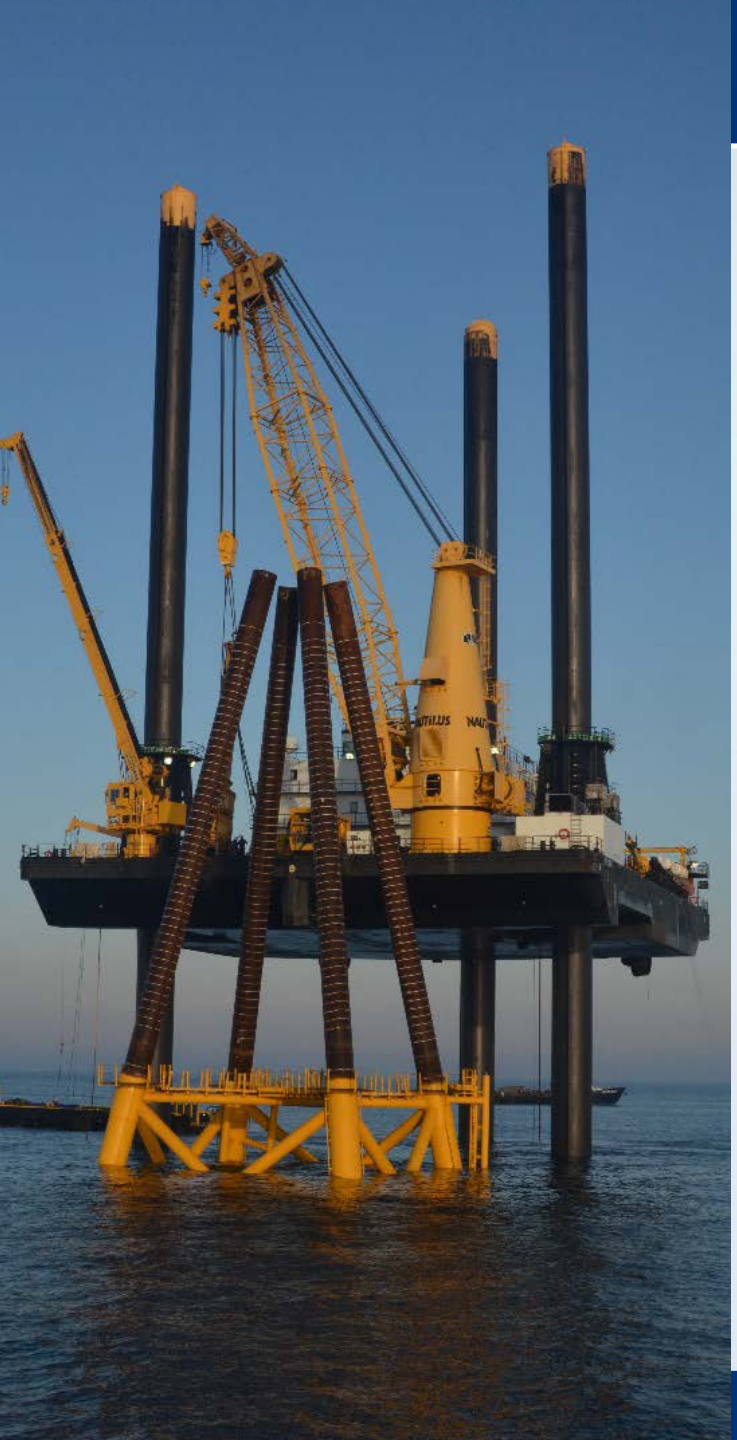
Lease Site Assessment Term (1 to 5 years)

- Begins when SAP approved by BOEM
- Deploy environmental monitoring equipment
- Conduct site surveys for wind project area
- Submit Construction and Operations Plan (COP) to BOEM for approval

2 years

Lease Operations Term (25+ years)

- Begins when COP approved by BOEM
- Construction, commissioning, and operations



COP – NEPA REVIEW

- Agency scoping meetings (BOEM/USACE/USFWS/NOAA/EPA/USCG)
- Publish Notice of Intent to initiate scoping period in *Federal Register*
- Agencies' public notice, public meetings, and comment period
- Third-party contractor prepares Draft Environmental Impact Statement (EIS) for agency review and public comment period.
- Third-party contractor prepares Final EIS for agency review
- BOEM issues Final EIS
- Issuance of Record of Decision (ROD)

CASE STUDY: VINEYARD WIND PROJECT

- 50-50 partnership between Copenhagen Infrastructure Partners and Avangrid Renewables
- $2.8 billion, 800-MW project (energy for over 400,000 homes) 15 miles south of Martha's Vineyard, MA with a transmission system at the Barnstable 115-kV substation
- 2 400MW Power Purchase Agreements (PPAs) approved by MA Dept of Public Utilities:
  - Phase 1: $74/megawatt-hour (MWh)—COD 2022
  - Phase 2: $65/MWh—COD 2023
  - Utilities have agreed to purchase 100% of energy and RECs generated and delivered by the project over a 20-year term
- Fishing conflicts
  - Vineyard Wind reduced project footprint by 20% and changed wind turbine generator layout to E-W alignment.
- Secretary of the Interior David Bernhardt has ordered additional study due to public comments requesting a more robust **cumulative impacts analysis** of offshore wind capacity buildout.
- BOEM is extending the mandatory environmental review in a **Supplemental EIS** (March 2020).
- Onshore construction expected in 2019; first phase of the project was expected to come online in 2022.
  - Qualification for 12% Investment Tax Credit being called into question