
Building a Sustainable U.S. Offshore Wind Industry



Key Environmental Issues in US EPA Region 2
June 6, 2018



Offshore wind is thriving in Europe



THE EUROPEAN OFFSHORE WIND INDUSTRY

Key trends and statistics H1 2016

JULY 2016

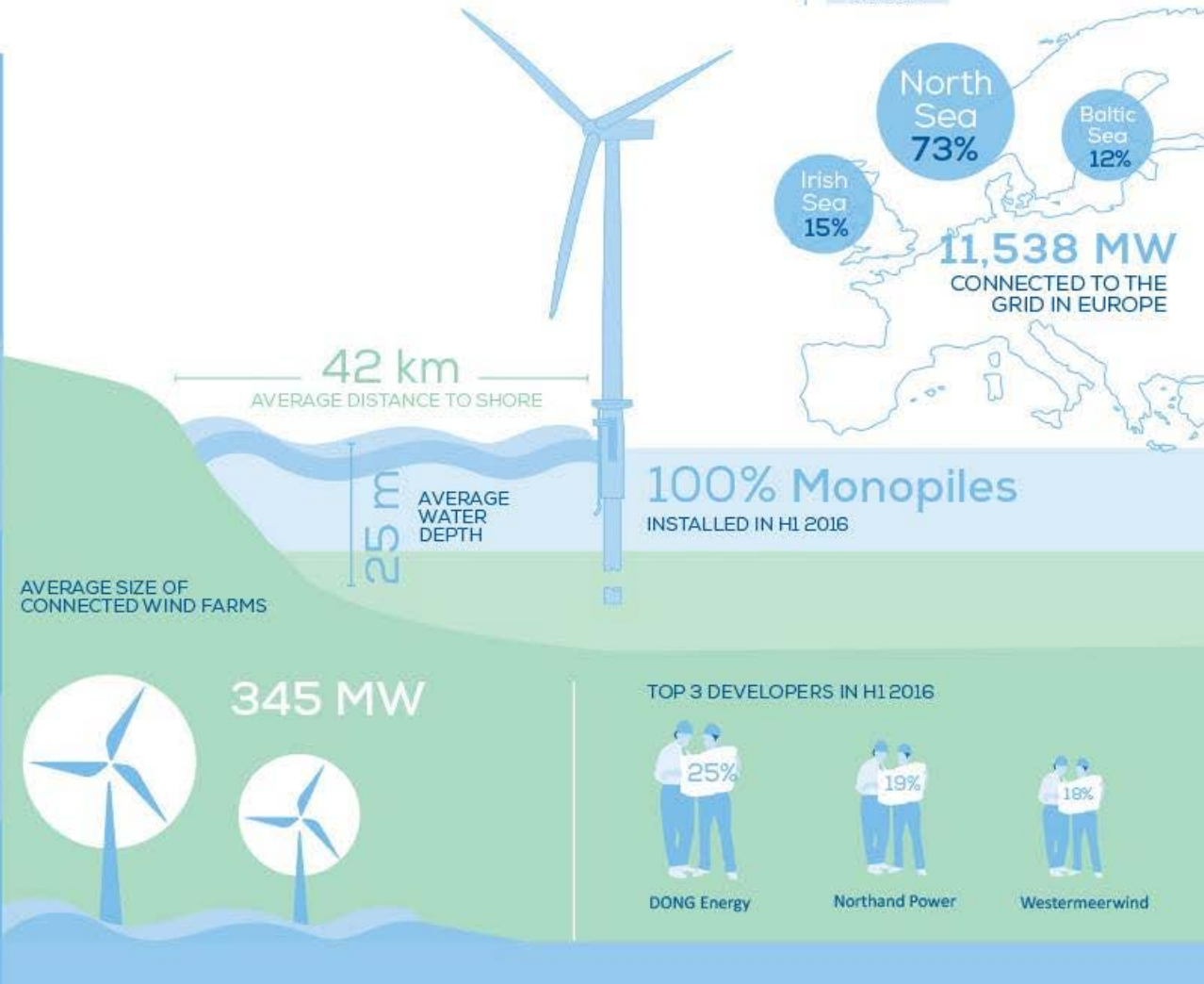
114
new grid-connected offshore wind turbines
IN **4** wind farms

3,344
turbines are installed and grid-connected

4.8 MW
average size offshore wind turbines

Work carried out in: **13** wind farms

NEW PROJECTS:
21.7 GW of consented wind farms



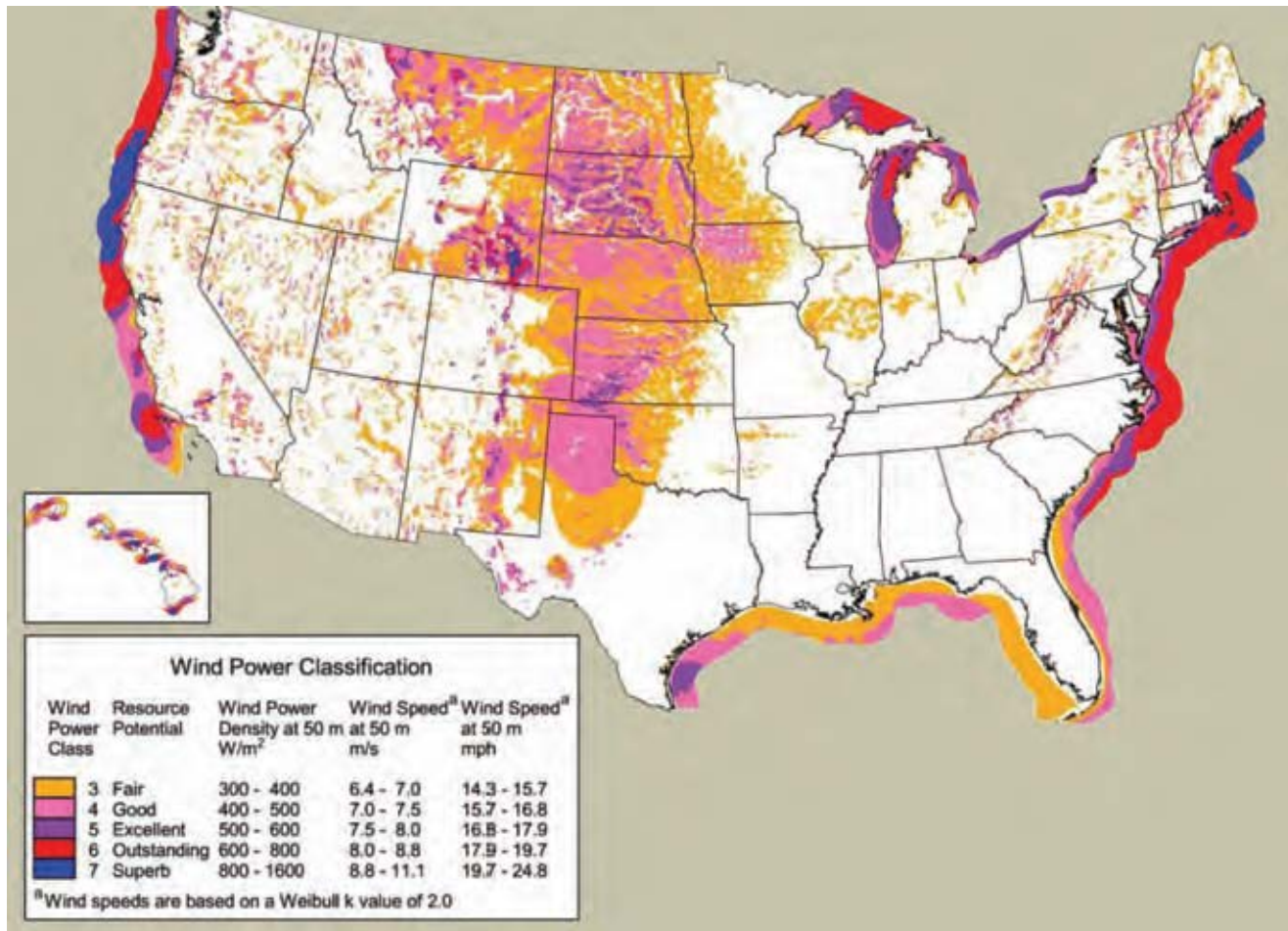
First U.S. Offshore Wind Project: Commercial Operation Started in December 2016



Overview of Block Island Project

- 30 MW demonstration project – five 6 MW turbines
- Installation for the foundation jackets for Block Island began in July 2015
- Turbines were installed in the summer of 2016 and the project commenced commercial operation in December 2016
- Benefits for Block Island
 - Replaces diesel fuel generators
 - Lowers electricity bills
 - All that, plus better Internet service!
- Key to success?
 - Starting small
 - Stakeholder outreach
 - Strong environmental/ecosystem values

U.S. Offshore Wind: Huge Potential Ready to Be Tapped



Recent Headlines

- Block Island 30MW Online 12/20/16
- Statoil winds lease off NY 12/20/16
- Gov Cuomo proposes 2,400MW 1/10/17
- Deepwater wind power purchase from LIPA (90MW) 1/25/17
- Avantgrid win lease off NC 3/17/17
- MD awards 2 projects (~400MW) 5/11/17
- MA utilities issue RFP (800MW) 7/5/17
- Dominion & DONG/Orsted to build 12MW off VA by 2020 7/11/17
- NYSERDA proposes 2 wind areas to BOEM (3,200MW) 10/2/17
- Cape Wind dead 12/4/17
- MA bids submitted 12/20/17
- NYSERDA releases Master Plan (2,400MW) 1/30/18
- RI begins 400MW solicitation 2/6/18
- NYPSC EIS and procurement comment period open (~800MW) 2/23/18
- NJ exec order for solicitation (1,100MW) 3/2/18
- 2 lease areas for sale off MA 4/12/18
- MA & RI select 2 projects (1,200MW)
•5/23/18
- NJ Clean Energy Law signed (3,500MW) 5/23/18
- NY PSC procurement options comments due 6/6/18

OFFSHORE WIND AT-A-GLANCE

\$4.9 MILLION

Annual Rent Payments Collected by BOEM

1.8 MILLION

Total number of acres leased to developers

\$67 MILLION

Total Amount Paid to BOEM for Leases

The data in this chart was collected from publicly available documents. Lease owners and project developers were asked to verify the information presented here.

CURRENT US OFFSHORE WIND PROJECT MAP AND TIMELINE

While it is still early days for steel in the water, the U.S. offshore wind industry is ripe with activity.

The map and chart within offer a glimpse at where projects stand as of April 2018.

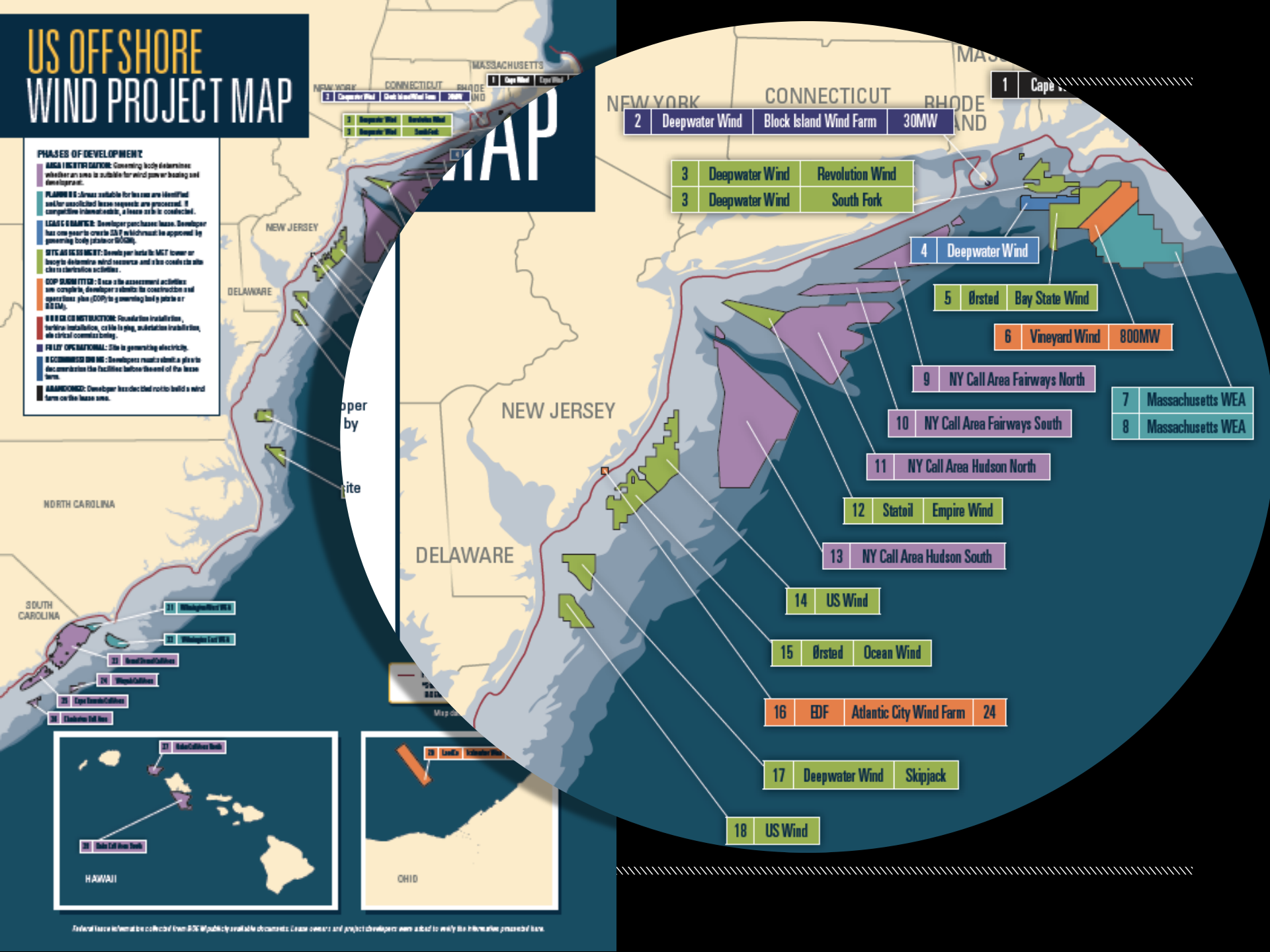
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US OFFSHORE WIND PROJECT MAP

PHASES OF DEVELOPMENT

- PHASE 1: IDENTIFICATION:** Governing body determines whether an area is suitable for wind power leasing and development.
- PHASE 2: PLANNING:** Areas suitable for lease are identified and/or specialized lease requests are processed. If competitive interest exists, a lease sale is conducted.
- PHASE 3: LEASES & BIDDING:** Developer purchases lease. Developer has one year to create EIS/EIS supplement to be approved by governing body (state or SOG).
- PHASE 4: SITE ASSESSMENT:** Developer hires the MCT (owner or lessee) to determine wind resource and a feasibility study for construction activities.
- PHASE 5: EIP SUBMITTAL:** If site assessment activities are complete, developer submits its construction and operations plan (COOP) to governing body (state or SOG).
- PHASE 6: PERMITTING:** Foundation installation, turbine installation, cable to grid, substation installation, etc. critical construction.
- PHASE 7: FULLY OPERATIONAL:** Site is generating electricity.
- PHASE 8: DECOMMISSIONING:** Developers must submit plan to decommission the facilities before the end of the lease term.
- PHASE 9: ABANDONMENT:** Developer is directed to build a wind farm on the lease area.



MAP

1 Cape Wind
2 Deepwater Wind Block Island Wind Farm 30MW

3 Deepwater Wind Revolution Wind
3 Deepwater Wind South Fork

4 Deepwater Wind

5 Ørsted Bay State Wind

6 Vineyard Wind 800MW

9 NY Call Area Fairways North

10 NY Call Area Fairways South

11 NY Call Area Hudson North

12 Statoil Empire Wind

13 NY Call Area Hudson South

14 US Wind

15 Ørsted Ocean Wind

16 EDF Atlantic City Wind Farm 24

17 Deepwater Wind Skipjack

18 US Wind

7 Massachusetts WEA

8 Massachusetts WEA

21 Whiting-Peak WEA

22 Whiting-East WEA

23 West-South-Columbia

24 West-Columbia

25 Edge-South-Columbia

26 Charlotte-South-Columbia

27 Lake-Columbia South

28 Lake-Columbia North

29 Lake-Columbia West

30 Lake-Columbia East

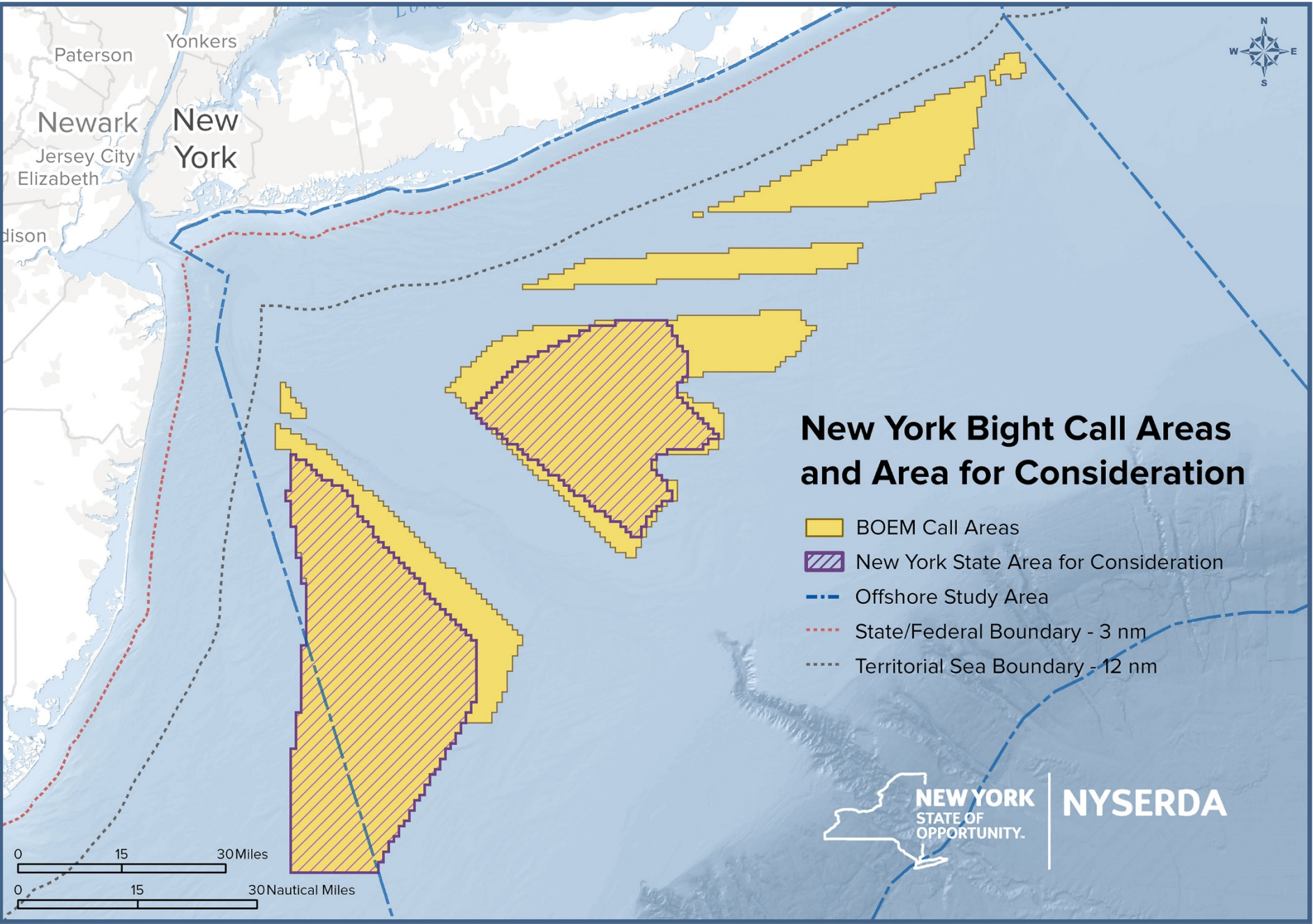
31 Lake-Columbia South

32 Lake-Columbia North






33 Lake-Columbia West

34 Lake-Columbia East

Partial lease information collected from DOE publicly available documents. Lease owners and project developers were asked to verify the information presented here.



New York Bight Call Areas and Area for Consideration

-  BOEM Call Areas
-  New York State Area for Consideration
-  Offshore Study Area
-  State/Federal Boundary - 3 nm
-  Territorial Sea Boundary - 12 nm

0 15 30 Miles
0 15 30 Nautical Miles

 **NEW YORK**
STATE OF OPPORTUNITY.

NYSERDA

Lessons learned and challenges ahead

- Policy matters
- NY and NJ racing to the top
- The North Atlantic Right Whale is critically endangered
- Smart from the start will be faster

What Policies Do We Need to Build a Sustainable Offshore Wind Industry and Achieve Scale?

- Federal level
 - Congress:
 - Tax policy
 - Appropriations
 - DOI/BOEM:
 - Better, faster leasing and siting process
 - Making siting be “smart from the start”
 - Smart mitigation measures, e.g. North Atlantic Right Whale
- State level
 - Build environmental and stakeholder support
 - Smart ocean and ecosystem planning
 - Create state policies to spur demand and create a pipeline of projects
 - Smart procurement
 - Regional approaches

Case Study: Ensuring Protections for the North Atlantic Right Whale

- Agreements between NGOs and developers
 - Many benefits: protective, yet achievable by industry
 - *But not enforceable or uniform...*
- Discussions with federal gov't and states:
- Need better ecosystems measures in:
 - Final lease terms
 - Site Assessment Plans
 - Construction and Operations Plans
 - PPAs



NARW mother and calf, photo credit: NOAA

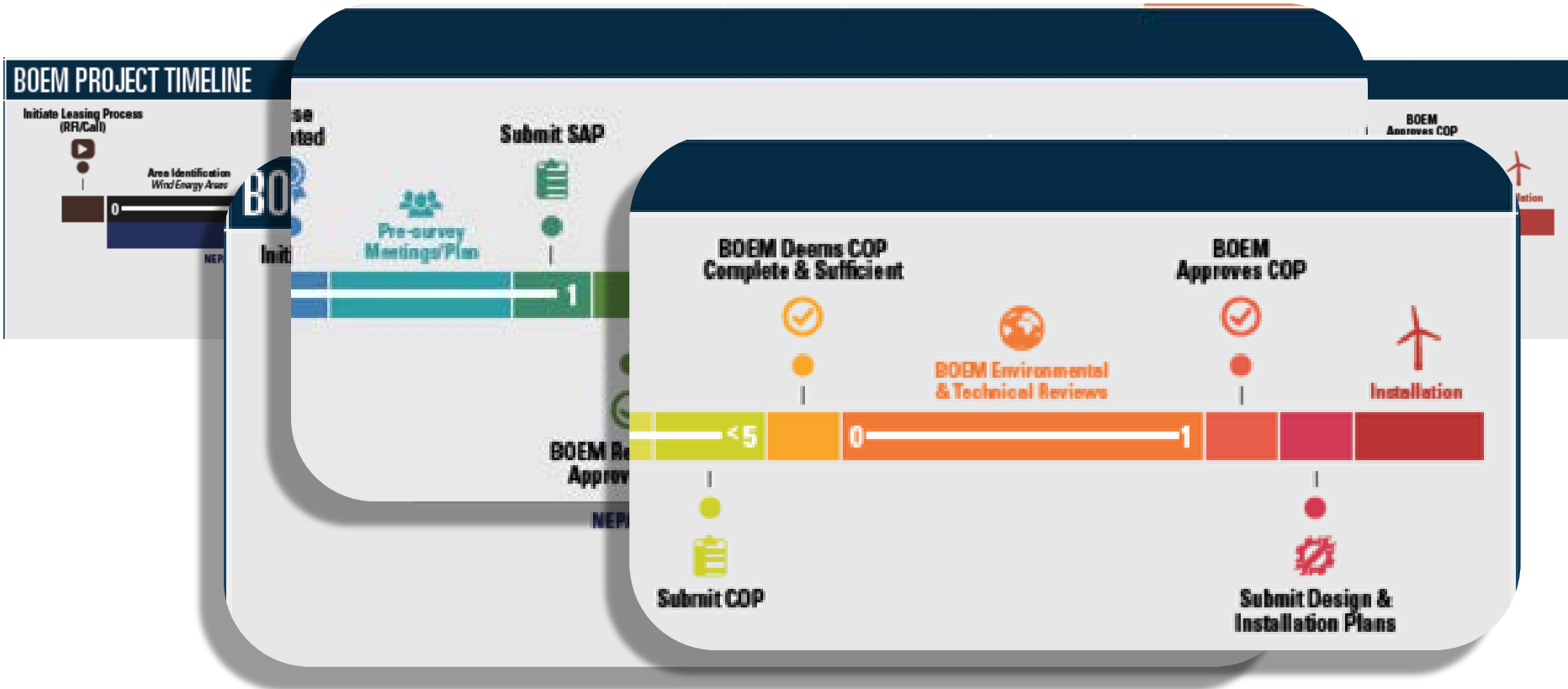


NRDC, NWF, & CLF meeting with BOEM in July 2015

Achieving Scale: Are Speed and Sustainability in Conflict?

- What are the lessons from Cape Wind?
 - Hard to go First
 - Location, Location, Location
 - Failure or Success?
- Truncated NEPA review: not the solution
 - Litigation risk
 - Public backlash
 - Short cuts aren't fast
- Smart from the Start:
 - Stakeholder outreach: early and often
 - Smart Planning
 - Build Success Stories
 - Sustainability Builds Long-Term Scale and Speed

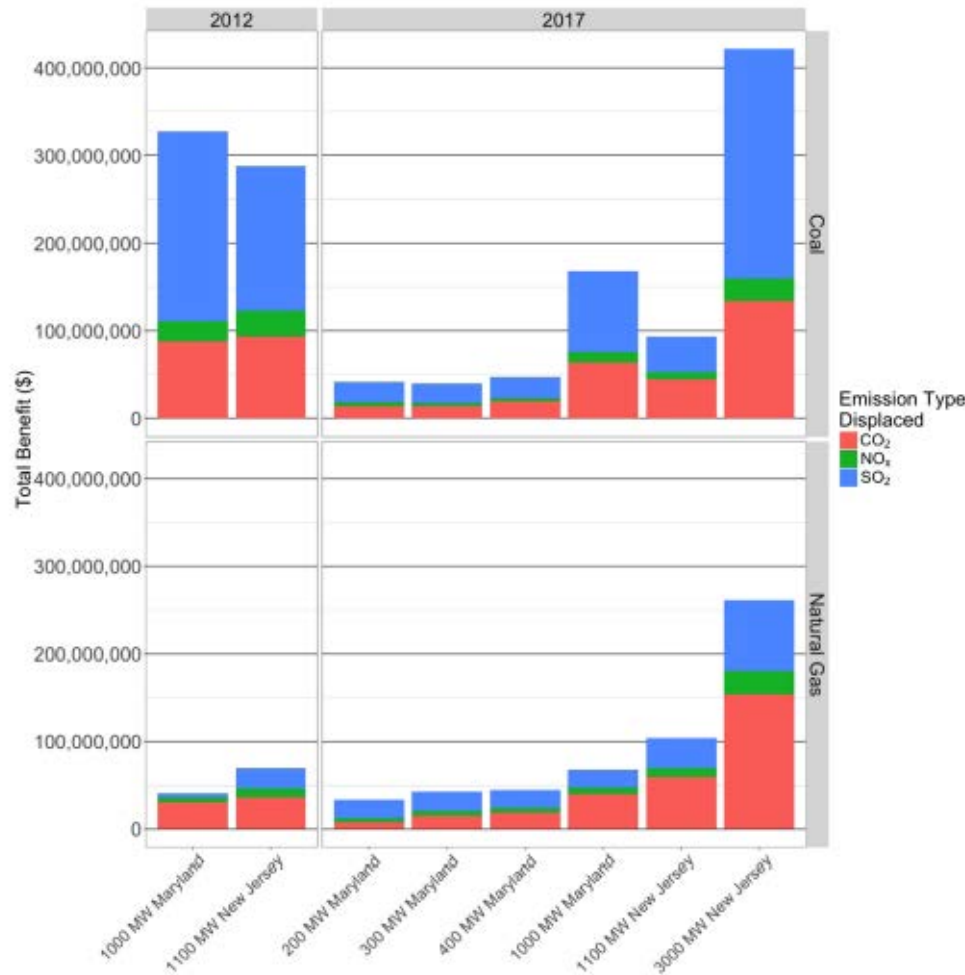
The leasing and permitting process



EPA's role in offshore wind

- Department of the Interior's Bureau of Offshore Energy Management is dominant agency in offshore wind in federal waters
- EPA has 3 formal roles and 1 contextual role
- Formal roles:
 - EPA is a cooperating agency in NEPA process and formally reviews air impacts
 - [Section 309 of the Clean Air Act](#)
 - Environmental justice (under [Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations](#))
 - EPA issues permits under [the National Pollution Discharge Elimination System](#) under [Section 402 the Clean Water Act](#) for upland transmission work requiring storm water discharge or under [Section 404\(b\)\(1\) \(40CFR 230\)](#) for wetland filling
 - EPA issues air permit under the Clean Air Act and [Outer Continental Shelf Lands Act](#)
 - Permits issues under [Section 328\(a\)\(1\) of the Clean Air Act](#) to achieve ambient air standards set under [Part C of Title I of the CAA](#). Rules: [40 CFR Part 55](#)
 - Also EPA designates a "corresponding onshore area" (COA) and permits to air regulations of that state(s) if it has delegated Part 55.
- Contextual role
 - Emissions and public health impact data
 - Social cost of carbon

Offshore wind promises big public health savings



Health and climate benefits of offshore wind facilities in the Mid-Atlantic United States

Jonathan J Buonocore, Patrick Luckow, Jeremy Fisher, Willett Kempton and Jonathan I Levy

Environ. Res. Lett. 11 (2016) 074019
doi:10.1088/1748-9326/11/7/074019

Figure 2. Monetized public health and climate benefits of different offshore wind scenarios, by impact type and fuel type.