WHERE THE WIND BLOWS: OFFSHORE WIND OUTLOOK FOR STATE REGULATORS

MODERATOR:

David Littell, Senior Advisor, RAP

PANELISTS:

Joe Martens, Director, New York Offshore Wind Alliance

Hon. Jason Stanek, Chairman, Maryland Public Service Commission

Frederick Zalcman, Head of Government and Regulatory Affairs, Orsted

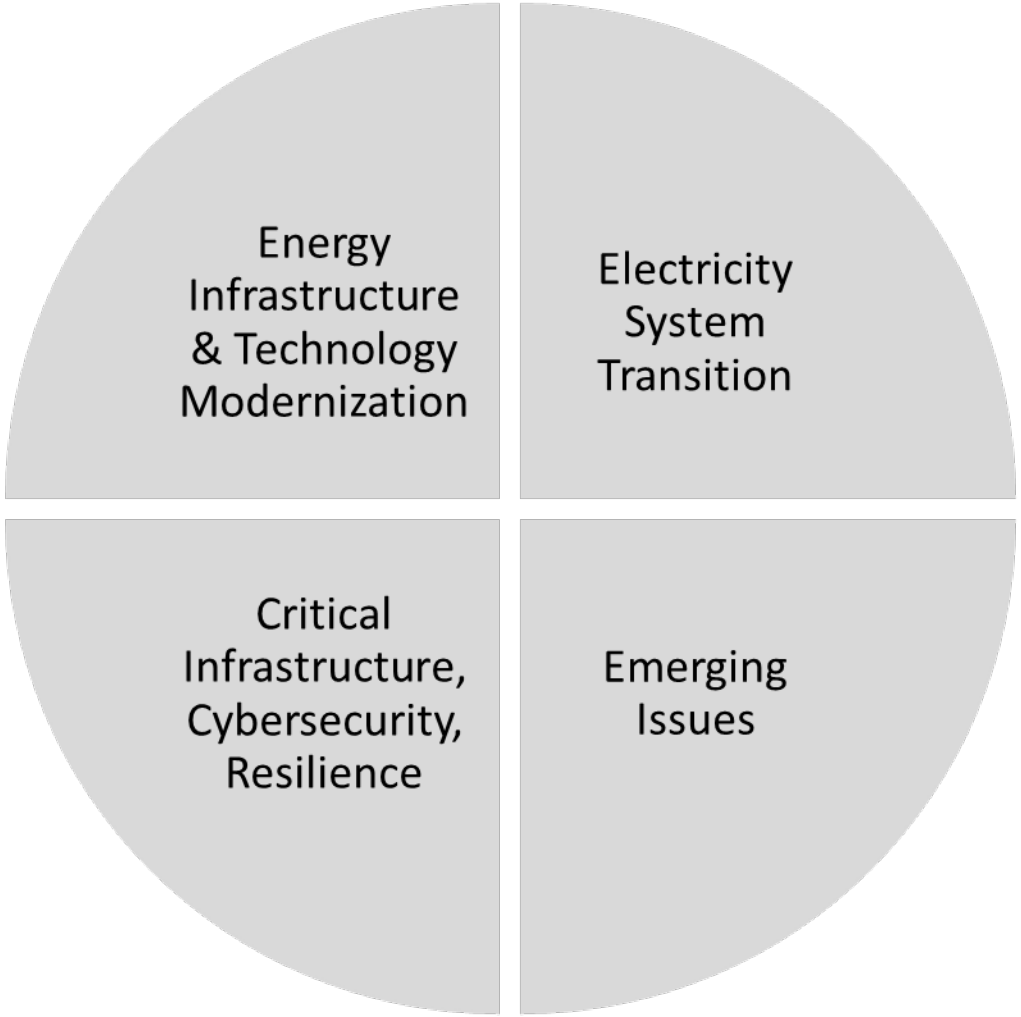
WHAT IS NARUC

- The National Association of Regulatory Utility Commissioners (NARUC) is a non-profit organization founded in 1889.
- Our Members are the state regulatory Commissioners in all 50 states & the territories. FERC & FCC Commissioners are also members. NARUC has Associate Members in over 20 other countries.
- NARUC member agencies regulate electricity, natural gas, telecommunications, and water utilities.

WHAT IS NARUC'S CENTER FOR PARTNERSHIPS AND INNOVATION?

- Grant-funded team dedicated to providing technical assistance to members.
- CPI identified emerging challenges and connects state commissions with expertise and strategies.
- CPI builds relationships, develops resources, and delivers trainings.

NARUC CPI Topical Areas



www.NARUC.org/CPI

WEBINAR LOGISTICS

- We're recording the webinar. It will be posted on the NARUC CPI webpage: https://www.naruc.org/cpi-1/emerging-issues/innovation-webinars/
- Because of the large number of participants, everyone is in *listen* mode only.
- **Please use the Question box to send us your questions** and comments any time during the webinar. You may want to direct your question to a specific panelist.
- The panelists will respond to questions typed in the Question box during moderated Q&A, following all presentations.

Opening Remarks

NARUC

Where the Wind Blows: Offshore Wind Outlook for State Utility Regulators

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Senior Advisor

Regulatory Assistance Project

Panelist

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Chairman

Maryland Public Service Commission

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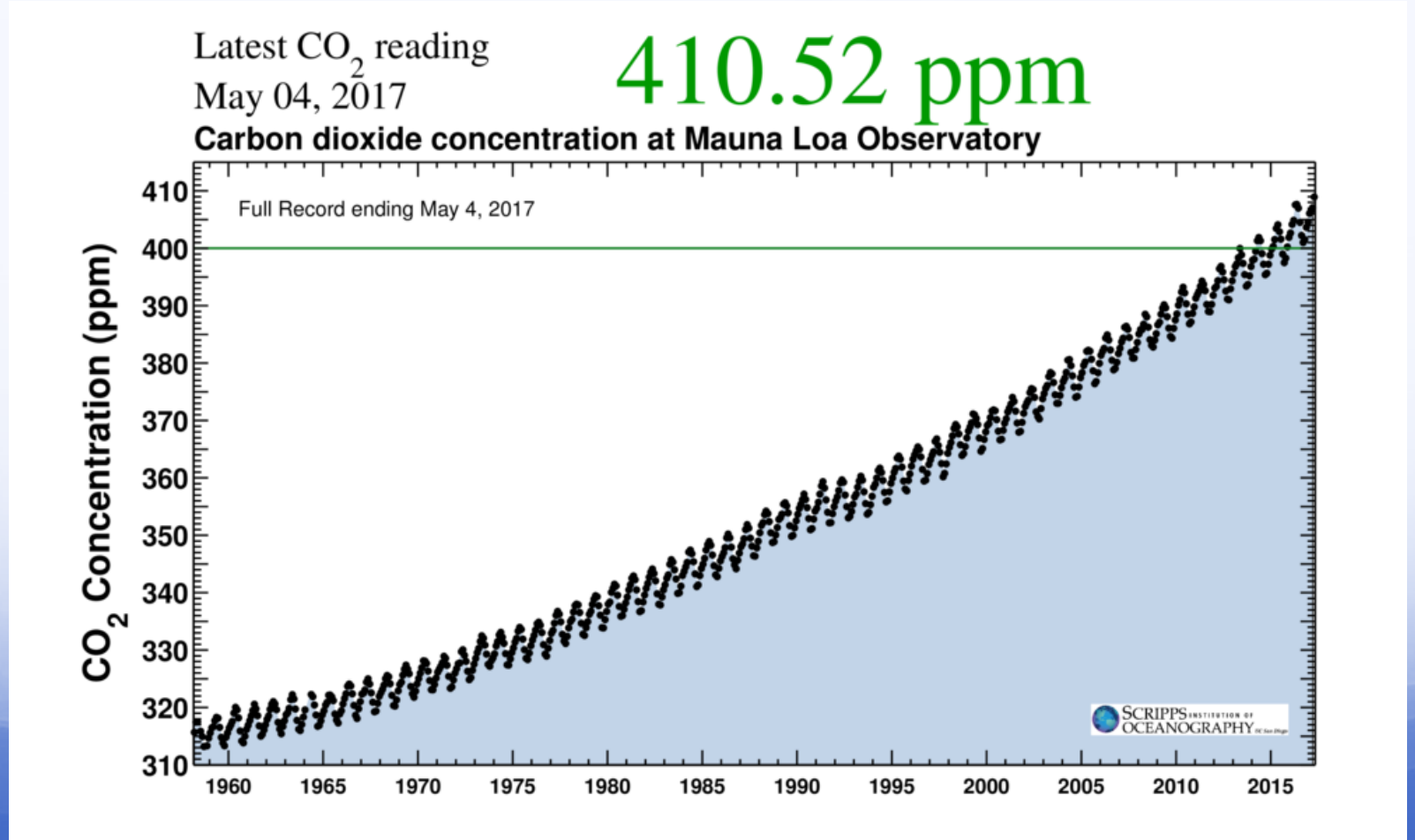
FRED ZALCMAN
Head of Government & Regulatory Affairs

Orsted

NY Offshore Wind Alliance

PARTNERS

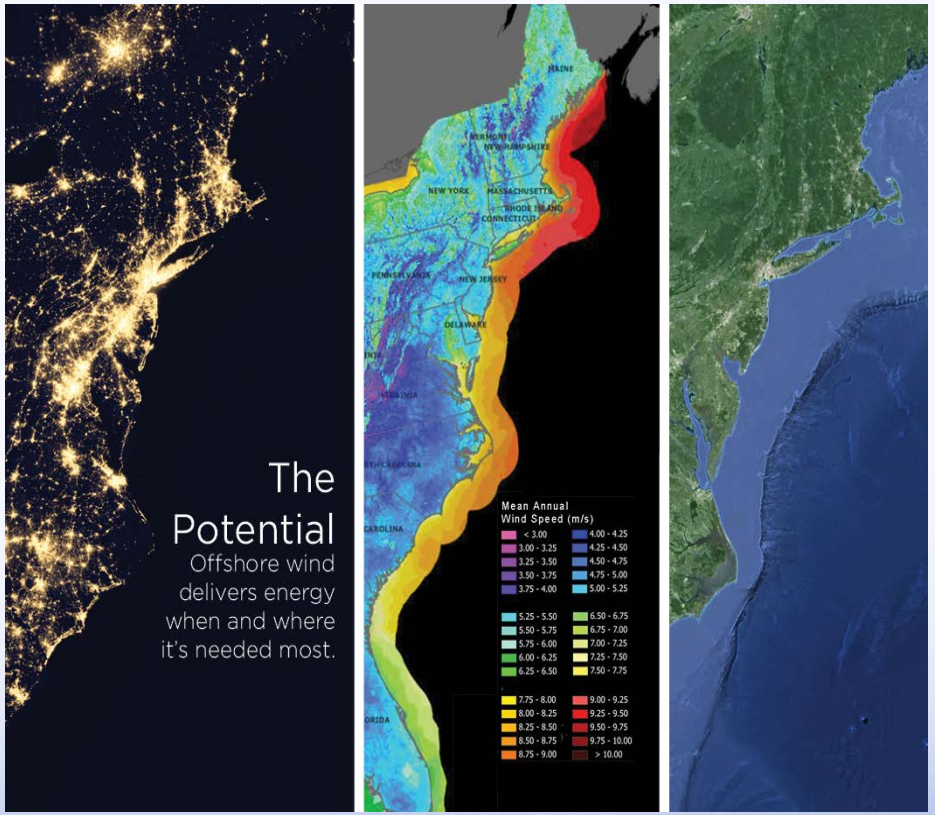
We're headed in the Wrong Direction



Block Island Wind Farm

Why Offshore Wind?

- Excellent wind resource
- Near load centers
- Helps address transmission bottlenecks
- Easier to site??
- Shallow outer continental shelf
- Retiring peaking & nuclear plants
- Costs are dropping rapidly



NY: We've Come Far/Fast

- 2016: Governor call for OSW Master Plan
- 2017: Governor Announce 2,400 MW Goal, LIPA signs contract for 90/130 MW South Fork Project
- 2018: OSW Master Plan Released, Governor calls for OSW solicitation, NYSERDA released State's first OSW solicitation in fall
- 2019: 4 Bids, 18 OSW options submitted to NYSERDA
- 2019: Governor Signs Climate Law and Announces 2 OSW contracts totaling 1,700 MW
- 2020: New R.E. Siting Law Approved
- 2020: PSC Approves 70x 30 Order

Climate Leadership and Community Protection Act (CLCPA)

On July 18, 2019, Governor Cuomo signed the CLCPA, establishing New York's renewable energy goals in statute for the first time.

CLCPA Electric Sector Provisions:

- 70% of utilities' electricity demand must be met with renewables by 2030
- 100% of statewide electric system must be zero emissions by 2040
- 6,000 MW photovoltaics by 2025 (distributed solar)
- 3,000 MW electricity storage by 2030
- 9,000 MW offshore wind by 2035
- NY's current efficiency goal referenced in law – 185 Tbtu.

Note: The rest of the law covers all sections of the economy. Reducing carbon pollution from transportation and building heating will require electrification of transportation and heating. This will increase electricity demand.

Renewable Energy Growth and Community Protection Act (REGCPA)

- Complete overhaul of former “Article 10” NY Siting Law for large-scale power projects
- New Office of Renewable Energy Siting
- One-year timetable for approval
- Directs the PSC to study onshore and offshore transmission system. To be competed by December 2020
- Accelerates transmission siting approval process (Article 7, PS Law)

We’re Not Alone

- State’s up and down the east coast have set ambitious offshore wind goal’s/targets. NY leads the nation.
- NY: 9,000 MW Target in Law
- NJ: 7,000 MW Goal
- Mass: 3,200 MW Goal
- CT: 2,000 MW Goal
- MD: 1,200 MW
- RI: 400 MW

NY's Offshore Wind Approach

1. First Offshore Wind Solicitation
   - Price/Economic Benefits/Viability (70x20x10)
   - Prevailing Wage/Project Labor Agreements
   - Environmental and Fisheries Mitigation Plans
   - Stakeholder Outreach
   - Establishment of E-TWG, F-TWG, M-TWG and J&SC-TWG

2. Second Offshore Wind Solicitation (Bids are In)
   - Port Infrastructure Investment Required
   - Successful bidder must commit to $10K/MW regional wildlife and fisheries fund
   - Identify benefits to disadvantaged communities

We’re on a Fast Track

- PSC 70x30 Order Gives NYSERDA Authority to Issue Future Solicitation Without Its Approval
- 750-1,000 MW per year though 2027
- Great Lakes Feasibility Study
- Winners of the second solicitation will be selected soon (and we could be nearly halfway to reaching 9,000 MW by 2035 standard)

Thank you

Where the Wind Blows: Offshore Wind Outlook For State Utility Regulators

Jason Stanek, Chairman
Maryland Public Service Commission

NARUC Center for Partnerships & Innovation
November 19, 2020

MARYLAND
Public Service Commission

Mid-Atlantic Offshore Wind Potential

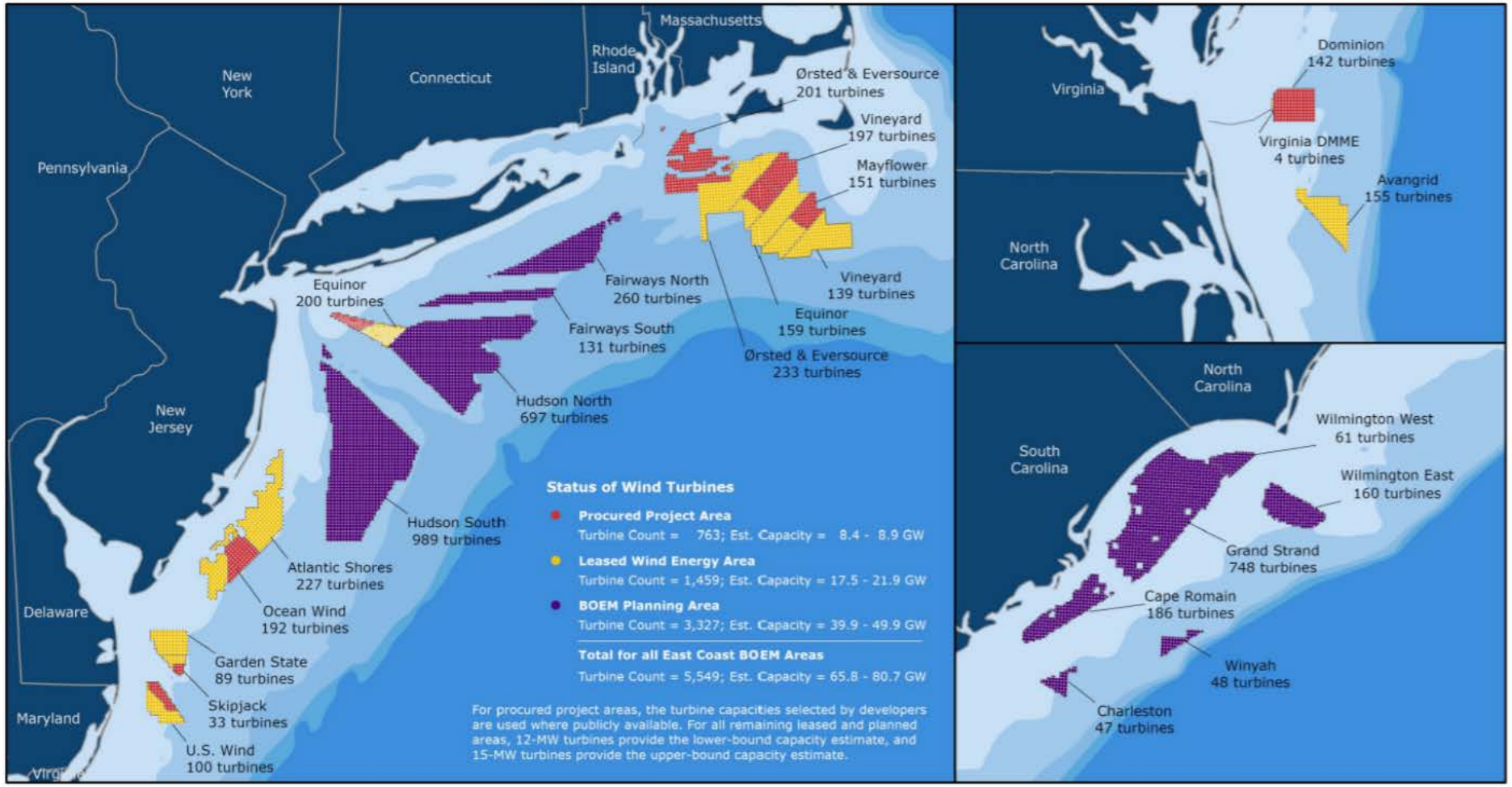


Chart courtesy of Tufts Power Systems and Markets Research Group, Tufts University School of Engineering, The Fletcher School of Law and Diplomacy

State Commitments & Development Status

At $4,000/kW total capital cost, current commitments by East Coast states represent a $120 billion investment by 2035.

State	Offshore Wind Capacity (MW) Committed [3]	Procured	Remaining	Completed Procurements	Procurements Slated by 2022
Massachusetts	3,200	1,604	1,596	*Vineyard Wind (800 MW)* *Mayflower Wind (804 MW)*	1,600 MW [4]
Rhode Island	430	430	0	*Block Island (30 MW)* *Revolution Wind (400 MW)*	
Connecticut	2,300	1,104	1,196	*Revolution Wind (300 MW)* *Park City Wind (804 MW)*	
New York	9,000	1,826	7,174	*South Fork Wind (130 MW)* *Sunrise Wind (880 MW)* *Empire Wind (816 MW)*	2,500 MW [5]
New Jersey	7,500	1,100	6,400	*Ocean Wind (1,100 MW)*	2,400 MW [6]
Maryland	1,568	368	1,200	*MarWin (248 MW)* *Skipjack (120 MW)*	1,200 MW [7]
Virginia	5,200	2,662	2,538	*CVOW Pilot (12 MW)* *CVOW (2,650 MW)*	
Total	**29,198 MW**	**9,094 MW**	**20,104 MW**	**9,094 MW**	**7,700 MW**

Table courtesy of Tufts Power Systems and Markets Research Group, Tufts University School of Engineering, The Fletcher School of Law and Diplomacy

Ports, Staging and Manufacturing

New port, staging and manufacturing capacity is needed and is under development all along the East Coast.

Ørsted has leased 50 acres at Tradepoint Atlantic, the former Sparrows Point iron and steel mill site, for its wind energy staging center. The leased area sits next to Tradepoint's deep water inner berth.

Regulatory Framework

Federal Government	State Governments	Local Governments
• FERC: interstate wholesale sales and transmission • BOEM: offshore renewable energy development • controls leases, easements, and rights of way in federal waters	• Generation • Distribution • Retail Sales • RTOs, ISOs • PSCs/PUCs	• Interconnection • Siting • Party in Federal and State cases

State Financial Support & Recovery

- **ORECs and PPAs: Fixed price through competitive bidding.**
  - ORECs:
    - MD Skipjack and US Wind: $131.93/MWh
    - NJ Ocean Wind: $98.10/MWh
  - PPAs:
    - MA Vineyard 1: $74/MWh
    - RI Revolution Wind: $98.34/MWh
    - CT Revolution Wind: $94/MWh
    - NY South Fork: $163/MWh
- **Regulatory Assets/Base Rates: Costs are recovered through regulated utility rates.**
  - VA: $300 Million recovered through base rates for 12 MW Dominion Project

Project Approval Processes

- Federal/BOEM: planning, leasing, site assessment, and construction and operation
- Approval Process by States Varies:
  - Environmental
  - Interconnection
  - Financing Mechanisms

Photo Credit: Matthew Prensky, delmarva.now

MD "Round 1"

- **Maryland Offshore Wind Energy Act of 2013:** created an offshore wind carve-out of Tier 1 resources under the Renewable Portfolio Standard (RPS) of a maximum of 2.5% of electricity sold in Maryland in 2017 and later.

- **US Wind**: 248 MW plant approved for 913,845 ORECs per year for 20 years.
- **Skipjack Wind Farm:** 120 MW plant approved for 455,458 ORECs per year for 20 years.


12 MW capacity
220-meter rotor
107-meter long blades
260 meters high
67 GWh gross AEP
63% capacity factor
38,000 m² swept area
Wind Class IEC: IB
Generates double the energy as previous GE Haliade model
Generates almost 45% more energy than most powerful wind turbine available on the market today
Will generate enough clean power for up to 16,000 European households per turbine, and up to 1 million European households in a 750 MW configuration windfarm
HALIADE-X 12 MW
GE Renewable Energy is developing Haliade-X 12 MW, the biggest offshore wind turbine in the world, with 220-meter rotor, 107-meter blade, leading capacity factor (63%), and digital capabilities, that will help our customers find success in an increasingly competitive environment.
1063 ft
324 m
853 ft
260 m
1046 ft
319 m
Eiffel Tower
Haliade-X 12 MW
Chrysler Building

MD “Round 2”

- **Clean Energy Jobs Act of 2019:** added a second round of offshore wind procurement for a minimum of 1,200 MW with a residential rate cap of $0.88 per month and nonresidential cap of 0.9% of annual bills.
  - January 1, 2020, 2021, and 2022: application periods for 2026, 2028, and 2030 respectively.
  - At least 400 MW per application period for a minimum of 1,200 MW .
  - Exceptions if not enough applications are submitted or if the maximum customer impacts are exceeded.

Where the Wind Blows: Offshore Wind Outlook for State Utility Regulators

NARUC CPI Webinar

Fred Zalcman
Head of Government Affairs
November 19, 2020

Overview

- Offshore wind represents the dawning of a new industry in the U.S.
- It has huge potential to achieve both economic and environmental goals
- There is no clear rulebook for how this new industry can and should develop
- Without a rulebook, offshore wind faces several major challenges
- States and the federal government can set the stage for success

Ørsted Offshore: Global overview

25+ years of experience and unparalleled track record

The global leader in offshore wind

- **6.8 GW** installed capacity
- **3.1 GW** under construction
- **1,500+** turbines spinning
- **26** offshore wind farms in operation

The world's first

Vindeby, 1991

5 MW

America's first

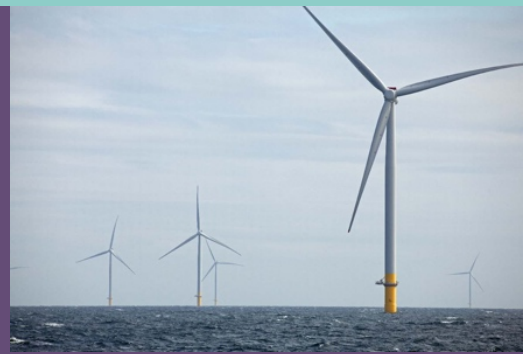
Block Island Wind Farm, 2016

30 MW

The world's largest

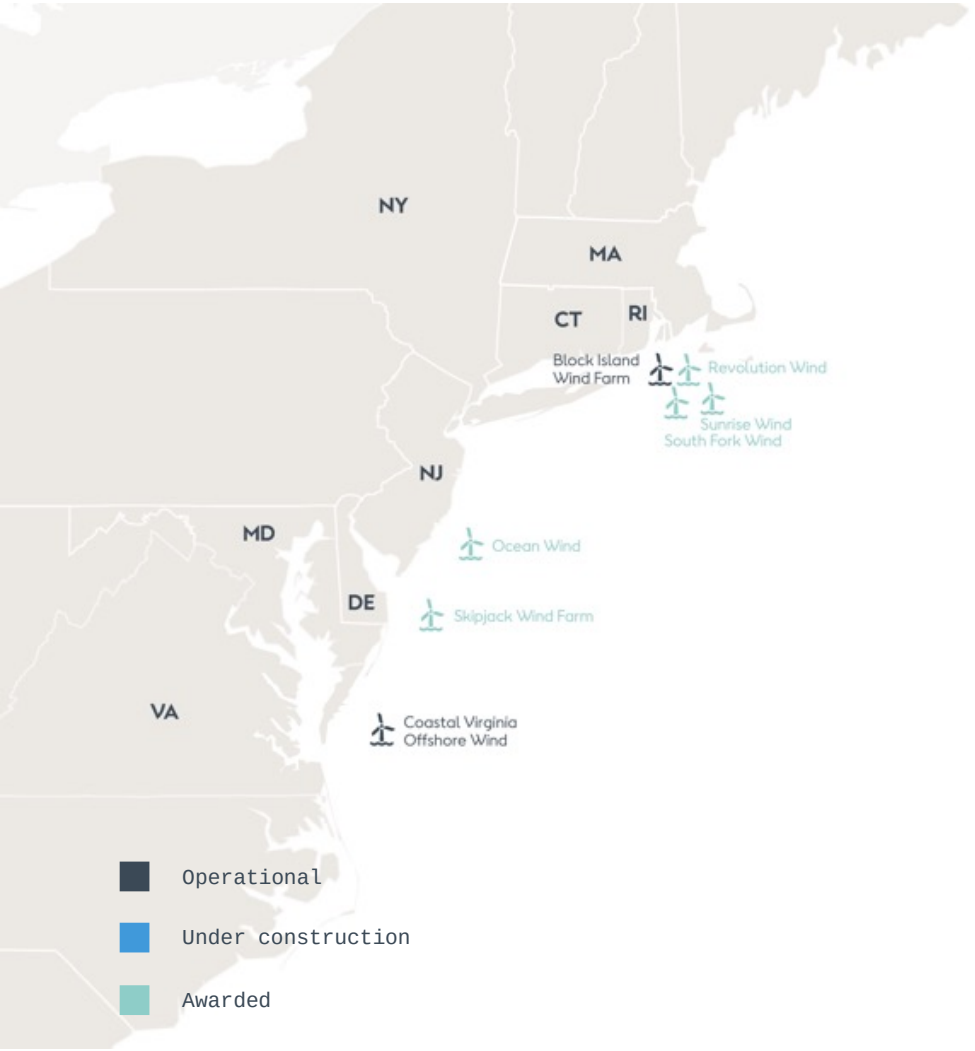
Hornsea 1, 2020

1.2 GW



Ørsted

Ørsted Offshore North America portfolio
Awarded over 2,900 MW of offshore capacity on the East coast



In Operation

Block Island Wind Farm: 30MW

Coastal Virginia Offshore Wind: EPC contract, 12MW demo project

Awarded

Revolution Wind: 50/50 JV w/ Eversource, 704MW (400MW to RI, 304MW to CT)

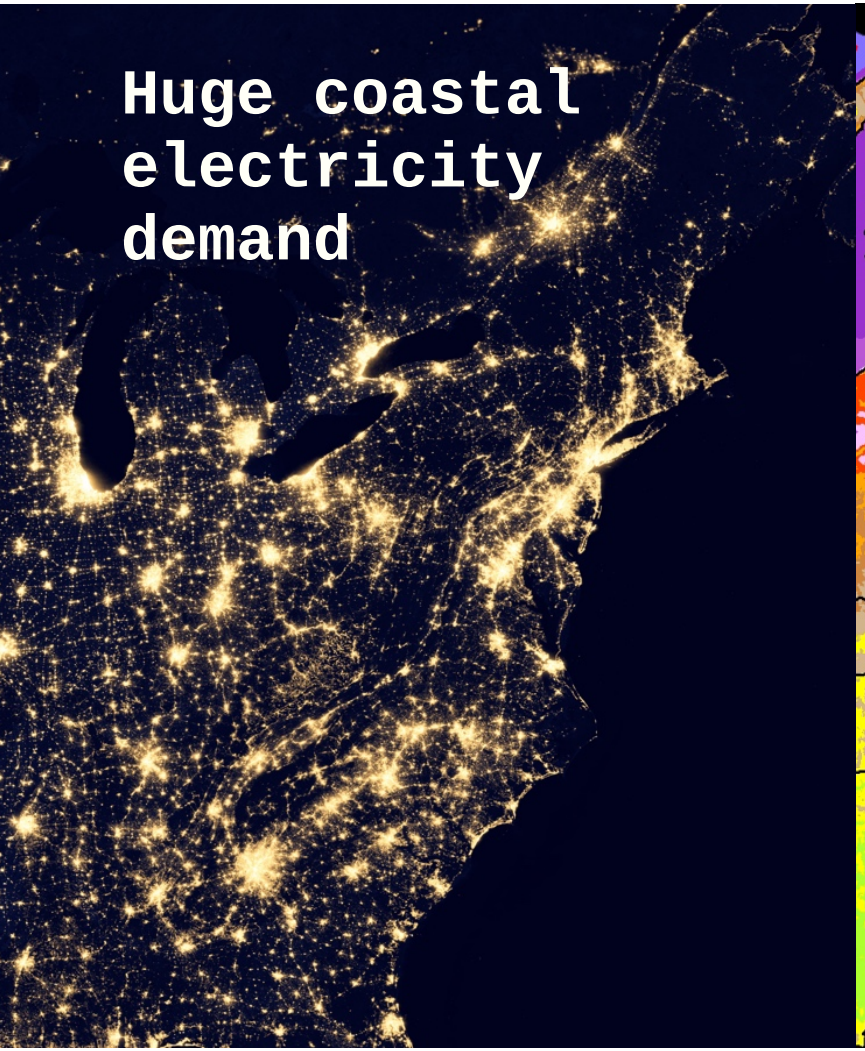
South Fork Wind: 50/50 JV w/ Eversource, 132MW

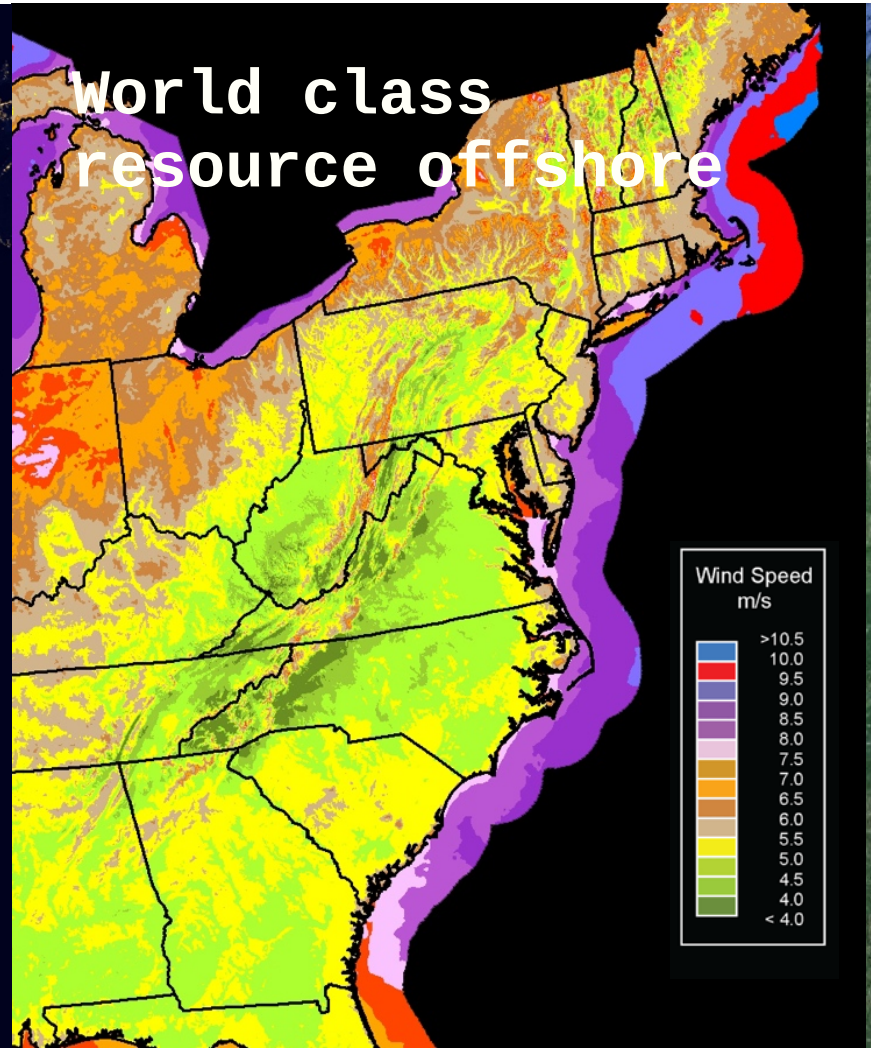
Sunrise Wind: 50/50 JV w/ Eversource, 880MW

Ocean Wind: with the support of PSEG, 1,100MW

Skipjack Wind Farm: 120MW

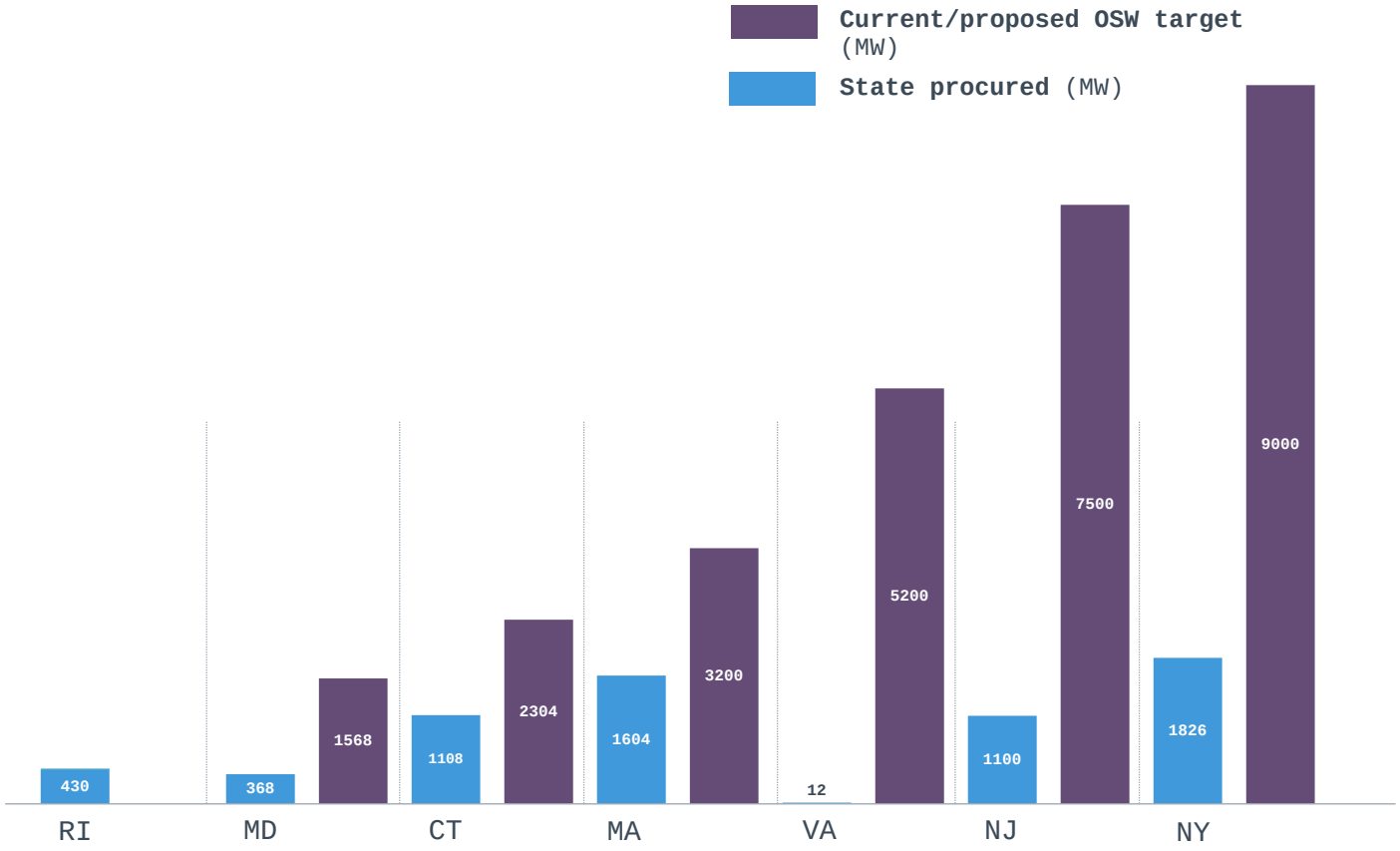
Why offshore wind





Ørsted

Offshore wind market on the East Coast
Potential for 25+ GW



States leading the way: Best practices in competitive procurement

- Flexible procurements with ability to scale
- Long-term and financeable offtake
- Clear bid selection criteria and weighting
- Enforceable local content requirements
- Subject matter expert support

Key Challenges and Opportunities

Key challenge: complex design & permitting uncertainties

Offshore wind farms are complex

- Multi-year design & planning phases
  - Globally ~ 7-year average
- Navigating complicated permitting regime with novel technology
  - Multiple state and federal agencies
  - Enormous uncertainty regarding timelines
  - Significant capital at risk before permits issued

Solutions

- Greater involvement of states across region in federal lease area identification process
- Widespread use of “envelope” approach to permitting
- More resources to alleviate permitting bottlenecks and promote adherence to milestones

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Key challenge: Transmission

- Power grid along the U.S. East Coast not designed to take large amounts of power from offshore
- Difficult to find suitable space to come to shore
- Independent System Operator managed process for new generator interconnection process slow and uncertain
  - In ISO NE feasibility studies have a 90 timeline, but in Q2 2020 average completion time of 241 days reported
  - Projects moving in and out of queue result in delays and changing interconnection cost estimates

Solutions & opportunities: large-scale offshore power grid upgrades

- As space at points of interconnection become more limited, states should consider options for backbone transmission
- In order to avoid costly miscues that plagued the first European attempts the following will need to be addressed:
  - Develop revenue and risk allocation mechanisms to protect offshore wind developers from lost revenue in the event of backbone failures
  - Site backbone in locations that accommodate geographically diverse lease areas
  - Develop interconnection standards that can be factored into project design and cost in advance of project bids

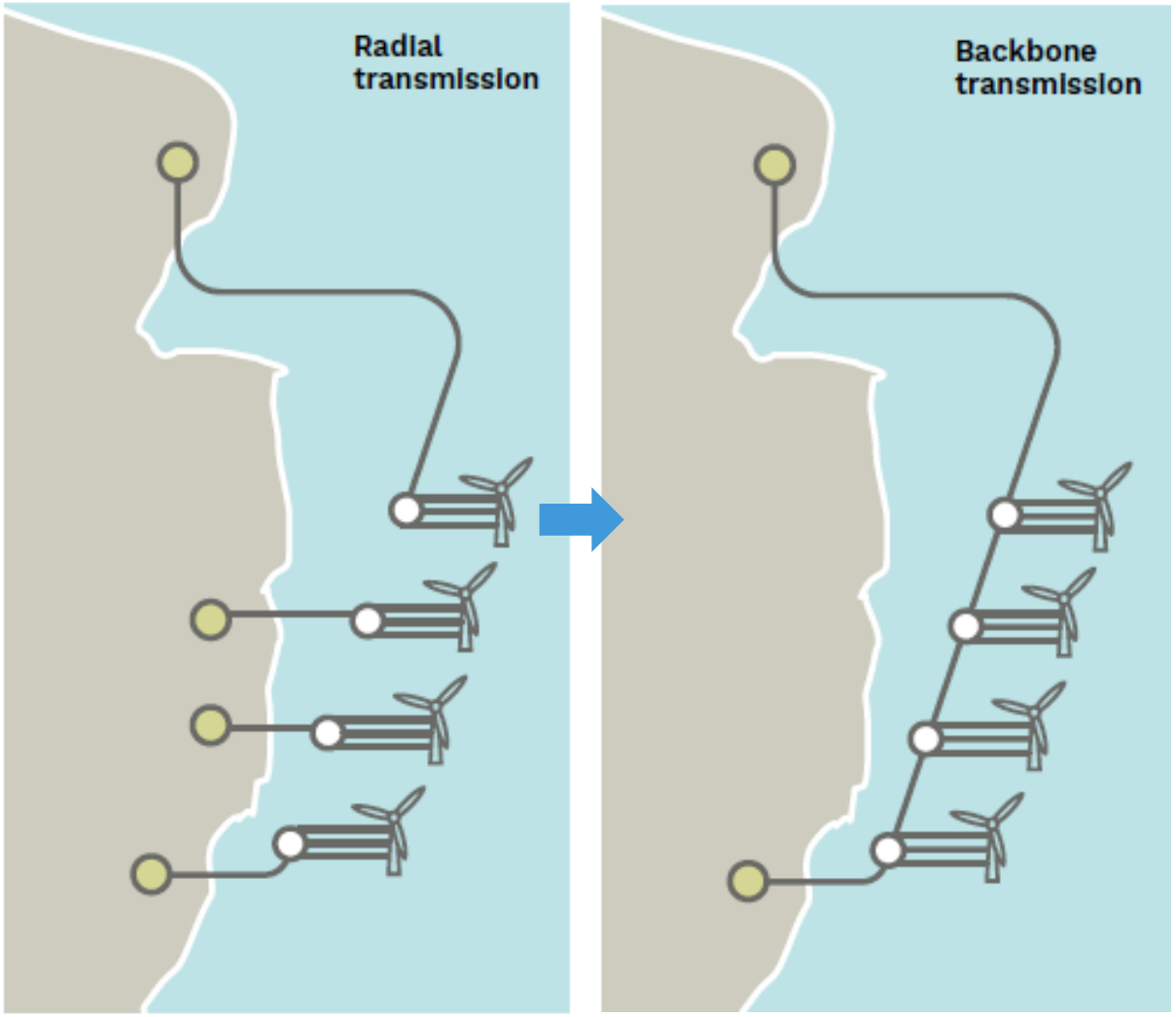

Image source: New Jersey Offshore Wind Strategic Plan

Thank you

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MODERATED Q&A

- All questions welcome!
  - Please use the Question box

~ 10 minutes

NARUC Innovation Webinar series

Hosted one Thursday each month from 3:00 p.m. to 4:00 p.m. ET

- **How Corporate Renewable Energy Procurement Can Fuel Decarbonization, If Only We Let It**

  December 3, 2020 | 3:00 - 4:00 pm Eastern

- **Understanding and Unlocking the Potential of Cloud Computing and Artificial Intelligence to Improve Utility Service**

  January 21, 2021 | 3:00 – 4:00 pm Eastern

*Register at: **https://www.naruc.org/cpi-1/emerging-issues/innovation-webinars/***

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THANK YOU

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