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.

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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WHERE THE WIND BLOWS: OFFSHORE WIND OUTLOOK FOR STATE REGULATORS

Moderator

DAVID LITTELL
Senior Advisor
Regulatory Assistance Project

Panelist

JOE MARTENS
Director
New York Offshore Wind Alliance

Panelist

HON. JASON STANEK
Chairman
Maryland Public Service Commission

Panelist

FRED ZALCMAN
Head of Government & Regulatory Affairs
Orsted
We’re headed in the Wrong Direction

Latest CO₂ reading
May 04, 2017
Carbon dioxide concentration at Mauna Loa Observatory
Full Record ending May 4, 2017

410.52 ppm
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 through 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
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

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

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

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

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.

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

<table>
<thead>
<tr>
<th>Federal Government</th>
<th>State Governments</th>
<th>Local Governments</th>
</tr>
</thead>
</table>
| • 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.
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 (65%) and digital capabilities that will help our customers find success in an increasingly competitive environment.

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
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 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

Huge coastal electricity demand

World class resource offshore

Large buildable continental shelf
Offshore wind market on the East Coast
Potential for 25+ GW

<table>
<thead>
<tr>
<th>State</th>
<th>Current/proposed OSW target (MW)</th>
<th>State procured (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td>430</td>
<td>368</td>
</tr>
<tr>
<td>MD</td>
<td>1568</td>
<td>2304</td>
</tr>
<tr>
<td>CT</td>
<td>1104</td>
<td>1604</td>
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<tr>
<td>MA</td>
<td>3200</td>
<td>12</td>
</tr>
<tr>
<td>VA</td>
<td>5200</td>
<td>1100</td>
</tr>
<tr>
<td>NJ</td>
<td>7000</td>
<td>1568</td>
</tr>
<tr>
<td>NY</td>
<td>9000</td>
<td>1826</td>
</tr>
</tbody>
</table>
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
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.
Thank you

Fred Zalcman
Head of Government Affairs
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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

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