



A Roadmap for Success:

NEW JERSEY'S OFFSHORE WIND STRATEGIC PLAN

GENERAL STAKEHOLDER MEETING

Atlantic County Government Offices
1333 Atlantic Ave., Atlantic City, NJ 08401
Thursday, December 13, 2018 6:00 pm – 8:00 pm



Opening

REMARKS



Ken Sheehan
New Jersey Board of Public Utilities





New Jersey Offshore Wind

WHY IS IT IMPORTANT FOR THE STATE?

Anne Marie McShea

New Jersey Board of Public Utilities

Stephen Myers

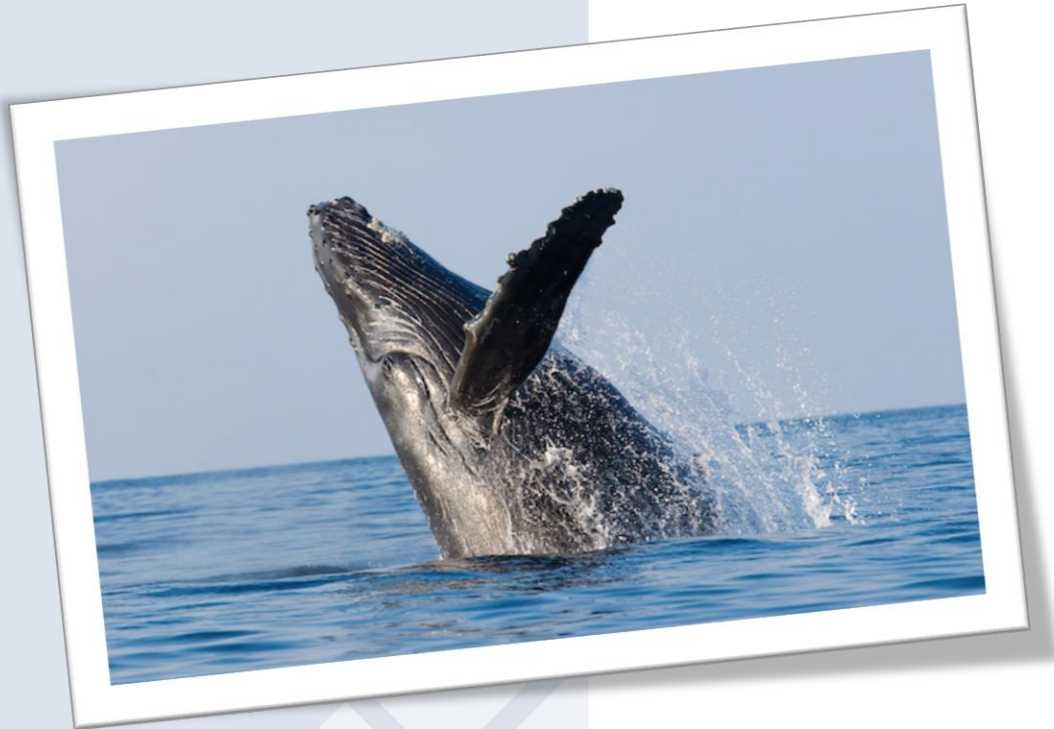
New Jersey Department of Environmental Protection

Hugh Bailey

New Jersey Department of Labor & Workforce Development

Brian Sabina

New Jersey Economic Development Agency





Offshore Wind Expert:

EXPERIENCE FROM A DEVELOPER



Elisabeth-Anne Treseder

Orsted

Ørsted Offshore

Leading the energy transformation

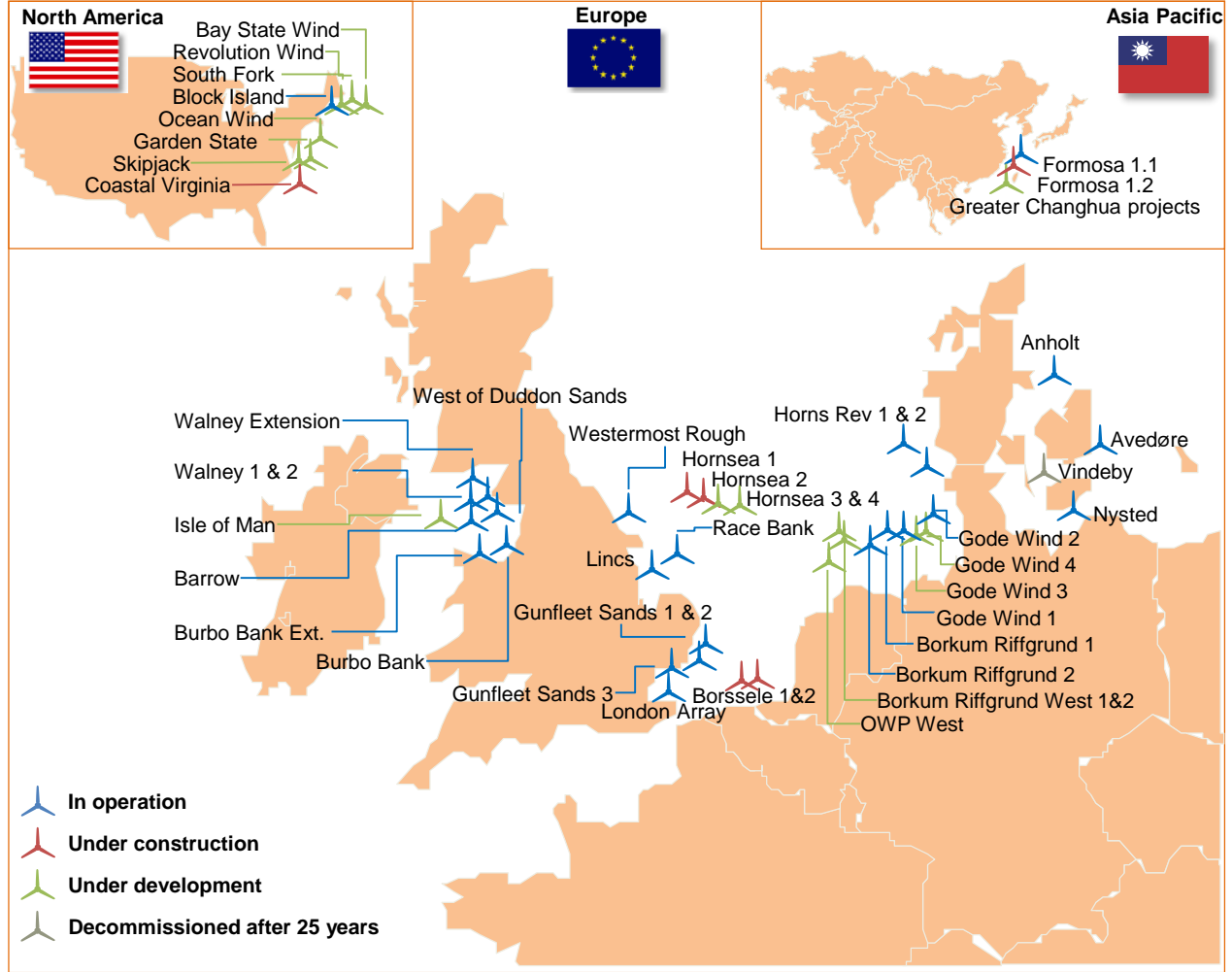




Love your home

Ørsted Offshore overview

Ørsted offshore wind global footprint



Unparalleled experience and track record

1991 → 25+ years of experience and track record in the offshore wind power sector → 2018

25 offshore wind farms in operation 5 offshore wind farms under construction

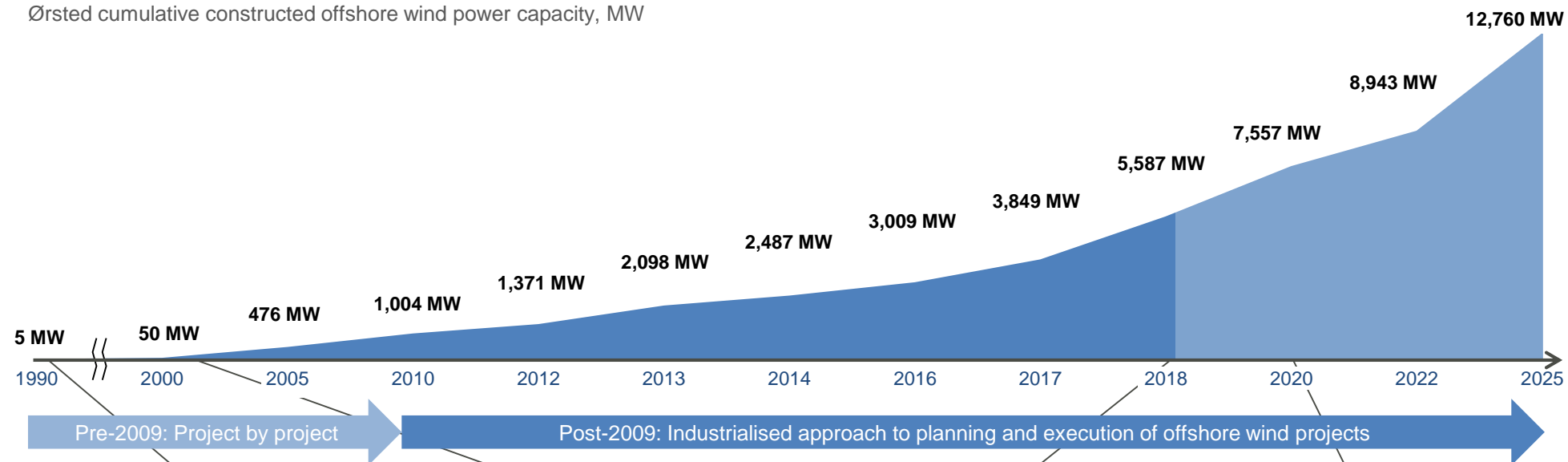
5.6 GW Constructed capacity ~ 2,300 Dedicated employees 3.4 GW under construction

15 million people with clean electricity ~ 1,100 turbines World's leading operator 20 Partnerships





Ørsted pioneered the offshore wind industry

Unrivalled track-record in offshore wind

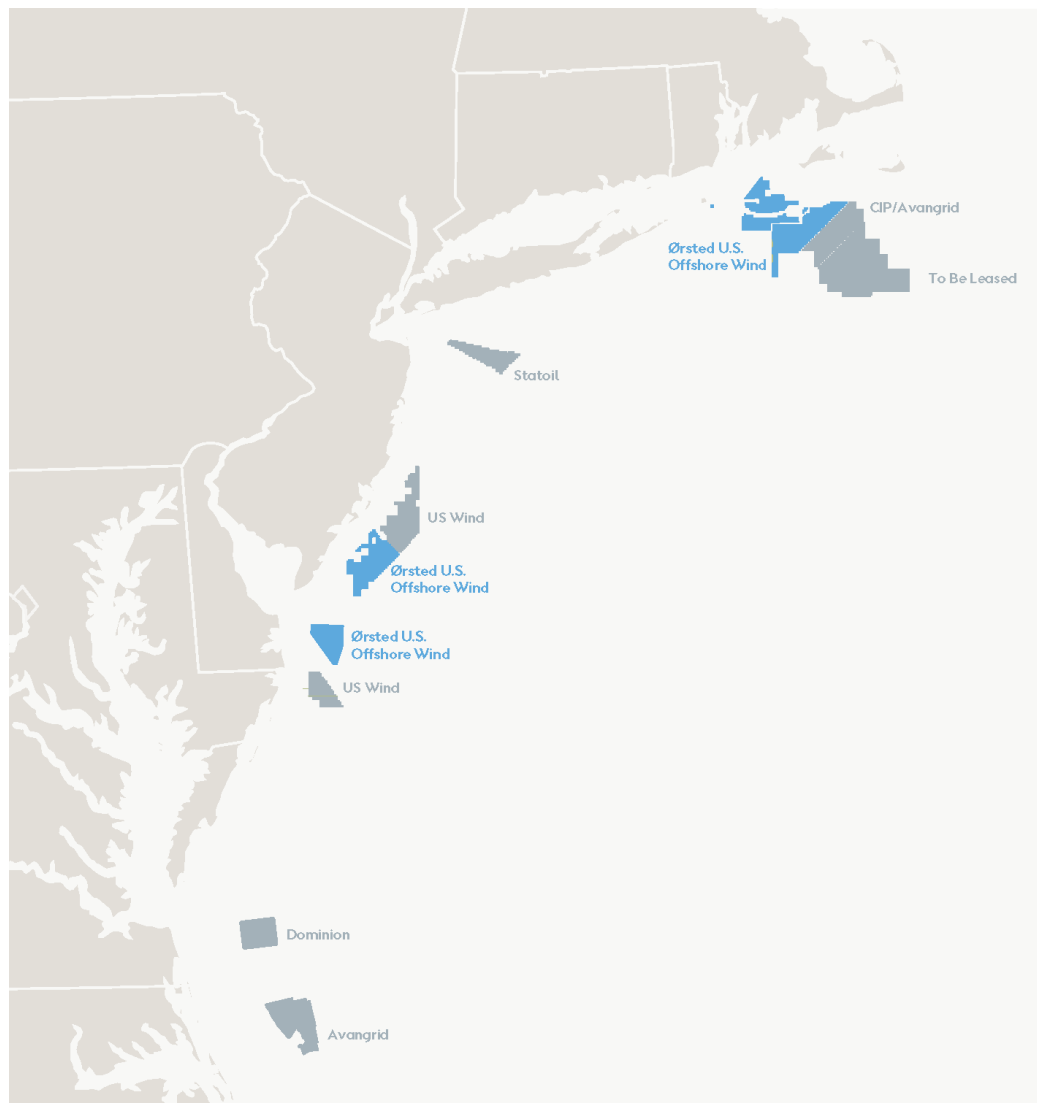
Ørsted cumulative constructed offshore wind power capacity, MW



Selected projects

Vindeby		Horns Rev 1		Walney Extension		Hornsea 1	
First offshore wind farm in the world		First large scale offshore wind farm in the world		The largest operational offshore wind farm in the world		The world's largest offshore wind farm once constructed	
							
5 MW		160 MW		659 MW		1,218 MW	
Turbine capacity	0.45 MW	Turbine capacity	2 MW	Turbine capacity	7-8.25 MW	Turbine capacity	7 MW
Nr. of turbines	11	Nr. of turbines	80	Nr. of turbines	87	Nr. of turbines	174
Rotor diameter	35 m	Rotor diameter	80 m	Rotor diameter	154-164 m	Rotor diameter	154 m
Distance to shore	1.8 km	Distance to shore	18 km	Distance to shore	19 km	Distance to shore	120 km

America's Offshore Wind Leader



Ørsted US Offshore Wind



Comprehensive geographic coverage with opportunity to bid into states from MA to VA



One **30 MW** project in operation



Three projects with **850 MW** in development



1,700 MW pipeline



Offshore Wind in New Jersey



Offshore wind will provide **in-state, clean energy** generation away from population centers.



3,500MW of offshore wind can power more than **1.5 million homes**.



Offshore wind will help to **diversify the state's energy portfolio**, which currently relies on two fuels (nuclear and natural gas) for 95% of the state's net electricity generation.



The development of the offshore wind industry will bring **local jobs** and **economic growth**.





Environmentally Responsible

OFFSHORE WIND DEVELOPMENT

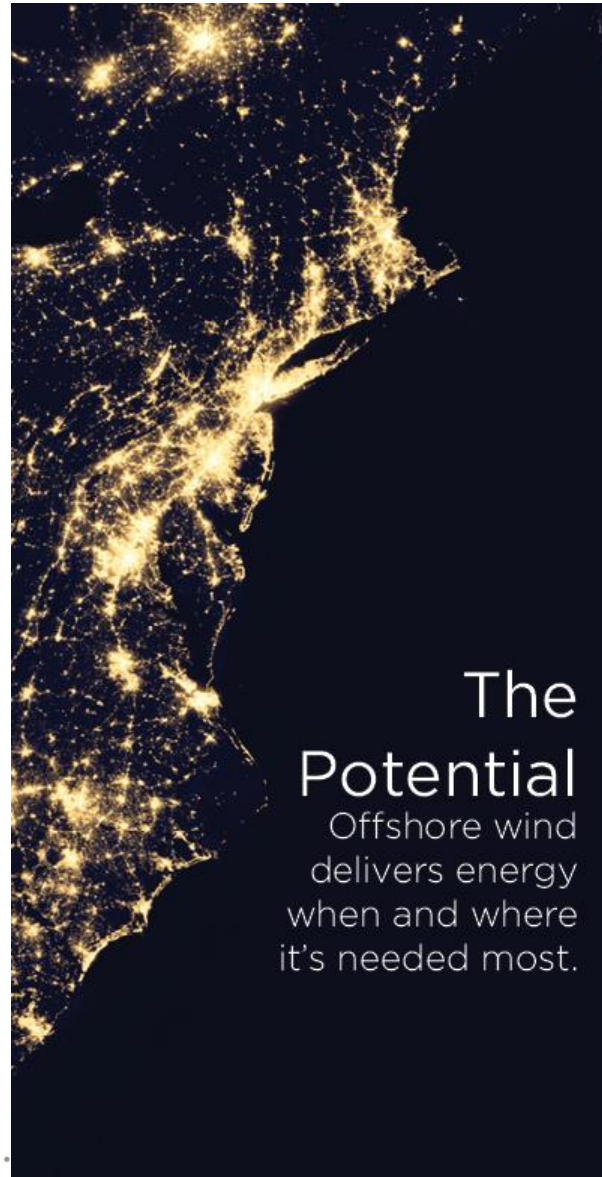
Debra Coyle McFadden

New Jersey Work Environment Council

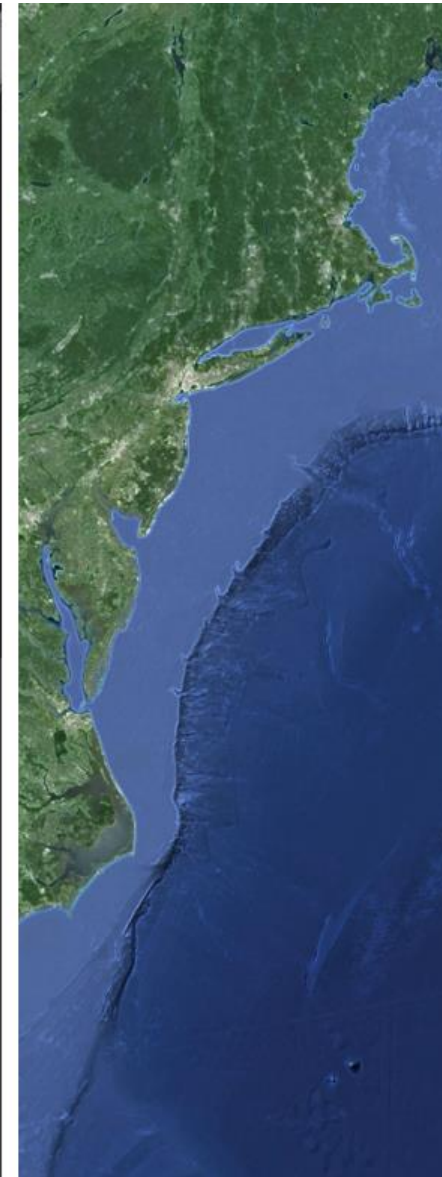
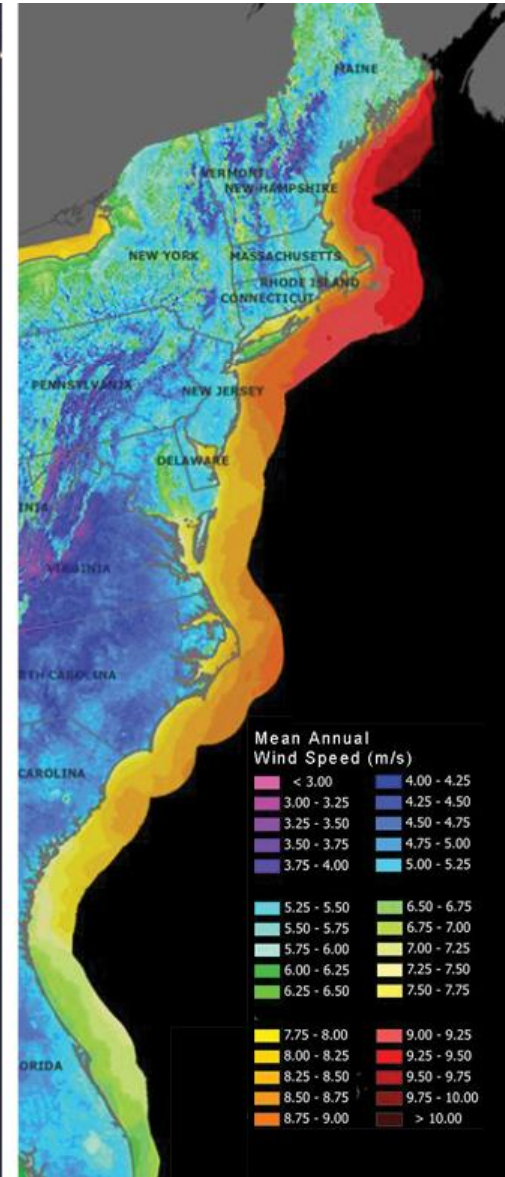


Why Offshore Wind Power?

1. **A Critical Climate Change Solution:** America's abundant offshore wind resource is a game-changer for transitioning to a clean energy economy
2. Available in **close proximity to America's largest electricity markets** currently facing significant coal & nuclear plant retirements
3. Energy production **corresponds with peak electricity demand**, offering an increasingly valuable & cost-competitive energy choice
4. Opportunity to create **hundreds of thousands of jobs** & spark massive economic development for coastal & inland communities
5. **Offshore wind power can be developed responsibly with minimal impacts to coastal & marine wildlife**



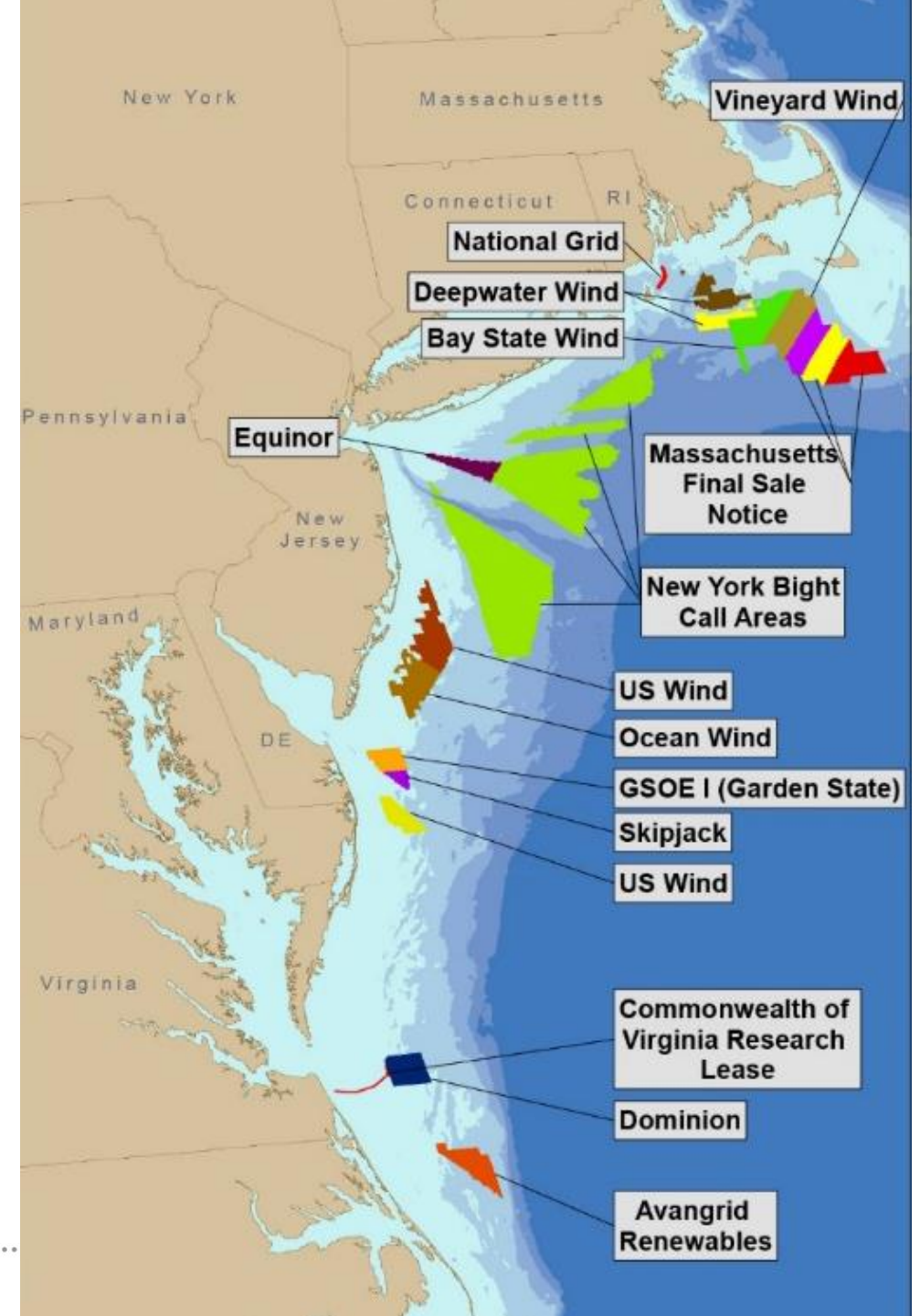
The
Potential
Offshore wind
delivers energy
when and where
it's needed most.



State Market Commitments: **8,480 MW by 2030!**

- **NJ: 3,500 MW by 2030** (increased state goal passed 2018; open solicitation for 1,100 MW)
- **NY: 2,400 MW by 2030** (Gov. commitment; open solicitation for 800 MW or more)
- **MA: 1,600 MW by 2027** (state legislation passed 2016; expansion authorized in 2018; RFP for 800 MW expected early 2019)
- **MD: 368 MW projects committed** (2 projects awarded ORECs May 2017)
- **RI: 400 MW project committed** (awarded May 2018; open clean energy RFP)
- **CT: 200 MW project committed** (awarded June 2018; open clean energy RFP)
- **VA: 12 MW demonstration project committed** (August 2018 Gov. announcement)

www.boem.gov/Renewable-Energy/



Responsible Offshore Wind Development for New Jersey

- ✓ Every megawatt of offshore wind power built for New Jersey can and must be developed responsibly in a manner that:
 - ✓ protects our valuable marine and coastal resources
 - ✓ maximizes job creation and other economic benefits for the state



On Average 1 Megawatt of Wind Capacity Requires:

103 tons of steels

402 tons of concrete

6.8 tons of fiberglass

3 tons of copper

20 tons of cast iron



Domestic Sourcing has Many Benefits

- ✓ Helps to maintain and increase good, family-sustaining jobs by expanding existing industrial capacity.
- ✓ Mitigates greenhouse gas emissions by manufacturing and transporting products nearby.
- ✓ Creates opportunities which leads to significant investments in the domestic supply chain in New Jersey.



Supply Chain Database: Proposed Categorization

Primary categories	Sub-categories
1. Manufactured Products	Wind Turbines Gearboxes Lighting Subsea HVAC Cables Terrestrial HVAC Cables Transformers Paints and Coatings Composite Materials
2. Manufacturing and Fabrication Services	Machining Casting Painting Injection Moulding Shipbuilding and Outfitting
3. Vessel Services	Tugs (Supply) Jack-up Heavy Lift Vessels (Supply) Cable Laying Ships (Supply) Remote Operation Vessels (Supply) Crew Transfer Vessels (Supply) Turbine Installation Offshore Substation Installation Crew Supply
4. Other Construction Services	Diving Construction Civil Works Electrical System Installation Cable Pull-in Landfall Construction Onshore/Other Heavy Lift On-site Maintenance Works
5. Specialist Services	Personnel Supply (Stevedoring) Land Vehicle Hire Helicopter Other Logistics Service Survey (Geotechnical) Survey (UXO) Specialised Waste Disposal Security
6. Consulting Services	FEED (Electrical) Detailed Engineering Design (Structural) Consents and Planning Wind Resource and Layout Financial Advisory Logistics Management O&M Support
7. Other Organisations	Offshore Wind Farm Developer Offshore Wind Farm Operator Transmission System Operator Port Authority (Construction-suitable) Government Authority Investment Bank Research Institute

Key Principles for Environmentally Responsible Offshore Wind Development

Guided By Science & Comprehensive Input - All siting & permitting decisions informed by:

- best available data
- effective expert & stakeholder engagement
- current ocean planning efforts
- ongoing, comprehensive monitoring

Mitigation Hierarchy Approach at All Stages of Development - Avoid, minimize, &/or offset impacts through:

- **SITING/DESIGN:** Avoid locating projects in sensitive, critical wildlife habitat areas (i.e. near shore areas, shoals, boulder reefs, etc.)
- **CONSTRUCTION:** Adjust timing & method of survey & construction activities to protect sensitive wildlife, with specific attention to highly endangered North Atlantic Right Whales
- **OPERATIONS & MAINTENANCE:** Lighting, vessel speeds
- **DECOMMISSIONING:** Ensure long-term planning for all project development sites



A Team Effort To Advance Responsibly Developed Projects

Federal Agencies

- NEPA review of all leasing decisions & development plan approvals
- Ongoing, robust stakeholder outreach & engagement
- Advance research (baseline, post-construction, cumulative impact analysis)

State Governments

- Procurement process that prioritizes responsibly developed projects & local labor & supply chain efforts
- Technical Advisory Groups to inform decision making (ie: NYSERDA Environmental & Fishing Technical Working Group; MA Habitat & Fisheries Working Groups; RI Habitat & Fisheries Advisory Boards)
- Ongoing, robust stakeholder outreach & engagement
- Permitting reviews of cable routes & near/onshore infrastructure
- Advance research (baseline, post-construction, cumulative impact analysis)

Industry

- Commitments to responsible development practices
- Ongoing, robust stakeholder outreach & engagement
- Advance research (baseline, post-construction, cumulative impact analysis)
- Ensuring the development of good, family sustaining jobs in this burgeoning industry

NGOs & Other Stakeholders

- Engage early & often, in all of the above





A Road Map For Success:

NEW JERSEY'S OFFSHORE WIND STRATEGIC PLAN



Rich Baldwin
Ramboll



Dan Grenier
Stantec



Josh Kohut
RU-COOL



The Board of Public Utilities (“BPU”), the Department of Environmental Protection (“DEP”), and any other New Jersey state agencies ... shall take all necessary actions ... to promote and realize the development of wind energy off the coast of New Jersey to meet a goal of 3,500 megawatts of offshore wind energy generation by 2030.”

~ Executive Order 8

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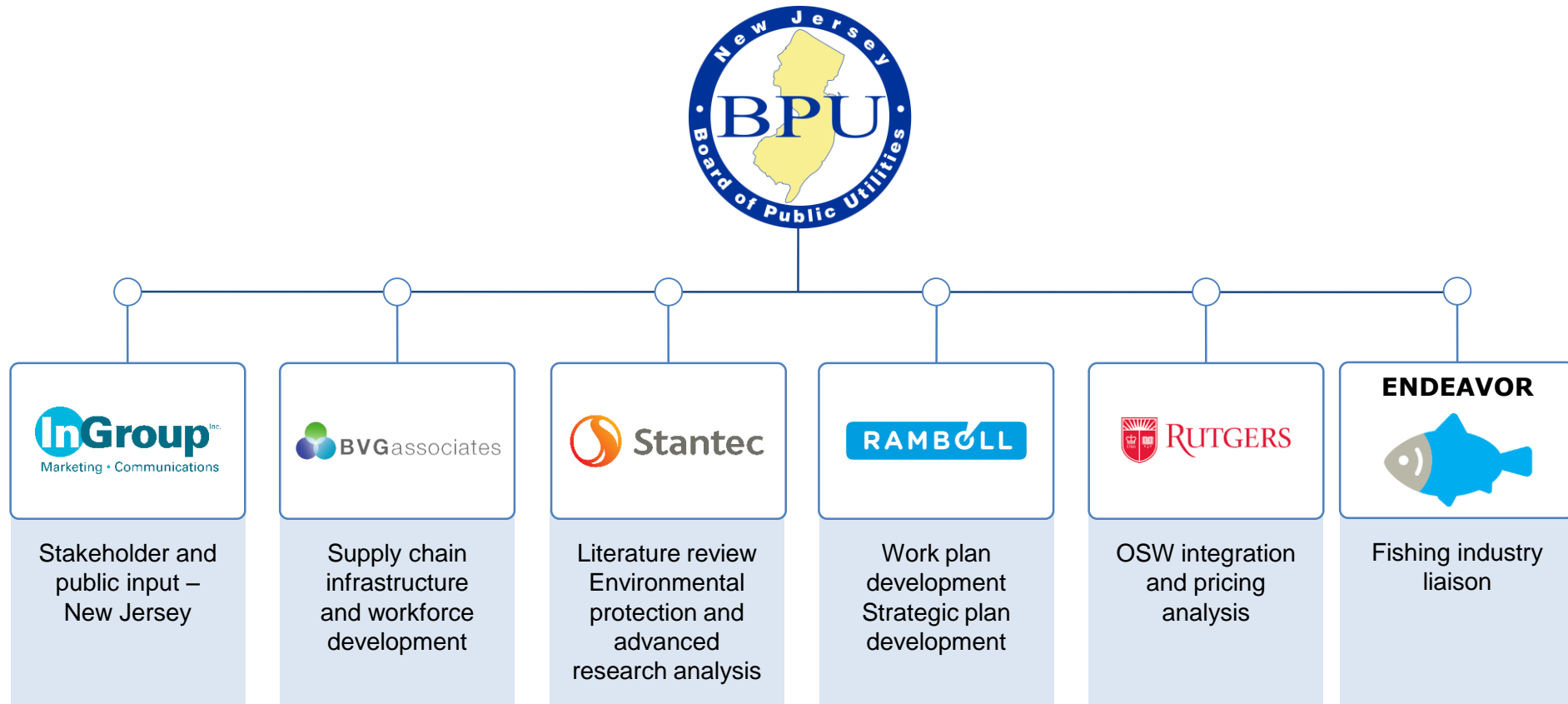
- Unique offshore wind resources
- Address global climate change threat
- Want to be THE leader in assembly and manufacturing facilities
- New Jersey ports and harbors key to attracting infrastructure to New Jersey





Our New Jersey

OFFSHORE WIND STRATEGIC PLAN DEVELOPMENT TEAM





Three Primary Elements to the

OFFSHORE WIND STRATEGIC PLAN



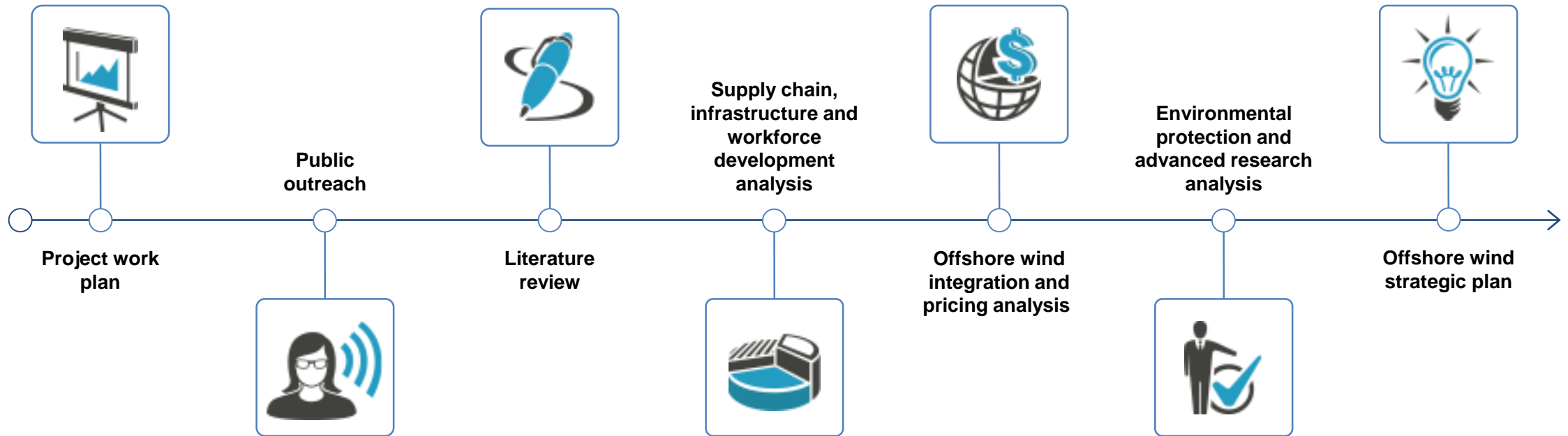
Stakeholder outreach and engagement is important throughout the process.



The New Jersey

OFFSHORE WIND STRATEGIC PLAN SCOPE OF WORK

Project scope of work includes the following:



Stakeholder outreach and engagement is important throughout the process.



SUPPLY CHAIN INFRASTRUCTURE & WORKFORCE DEVELOPMENT



Ports & Infrastructure Assessments

- Which ports can be modified to support OSW development (*assembly and installation*)
- Construction timeline of Jones Act-compliant heavy installation vessel (HIV)
- Include OSW developers in discussions
- Transmission solutions
- Opportunities for redevelopment of industrial and brownfield areas

Supply Chain Studies

- Maximize manufacturing in NJ for economic development and job creation
- Supply chain networking event – November 29, 2018 |

Workforce Development and Job Training

- Skill sets required for construction and operations and maintenance (O&M)
- Training and investment needs



ENERGY PRICING, MARKETS & TRANSMISSION



Opportunities to lower energy costs

Levelized Cost of Energy (LCOE) for offshore wind project development

Interconnection to Energy Market (PJM)

- Integration of electricity generation from offshore wind into the PJM grid
- Load forecasting and optimization
- Macroeconomic impact modeling (e.g., wholesale electricity pricing for NJ consumers)

Offshore Renewable Energy Credits (OREC) Pricing

- Pricing analyses
- NJ state economic impact

Impacts of technological advancement on economics of offshore wind development



ENVIRONMENTAL PROTECTION



Multi-tiered overlay analysis

- Built off of earlier studies completed by the State of New Jersey
- Individual layers to be weighted by importance

Information includes

- Biological systems, including birds, mammals, sea turtles and fish and fisheries
- Atmospheric and oceanographic conditions
- Geotechnical conditions of the ocean floor

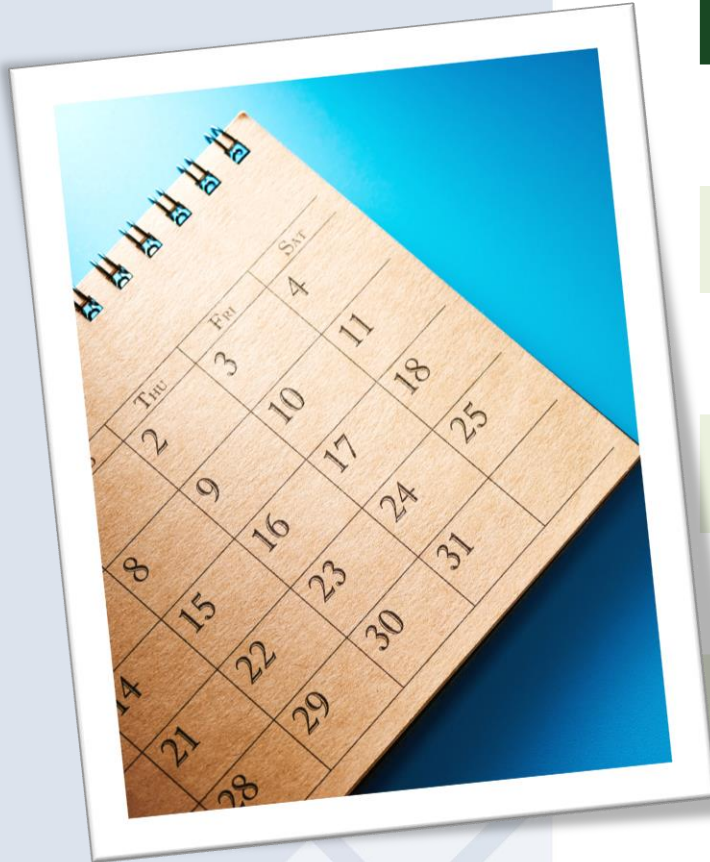
Analyses to include

- Sensitive areas analysis
- Model and mitigation integration
- Potential development scenarios
- Environmental and economic impact on commercial and recreational fisheries
- Stakeholder input





SCHEDULE



Milestone	Projected Date
Data gathering and model development	August – December 2018
Initial stakeholder engagement	December 2018
Initial modeling and analysis	January – February 2019
Subject area specific stakeholder engagement meetings	January – April 2019
Report on Initial Analysis	April 2019
Preliminary Recommendations to NJ BPU	May 2019
Draft Offshore Wind Strategic Plan	June 2019



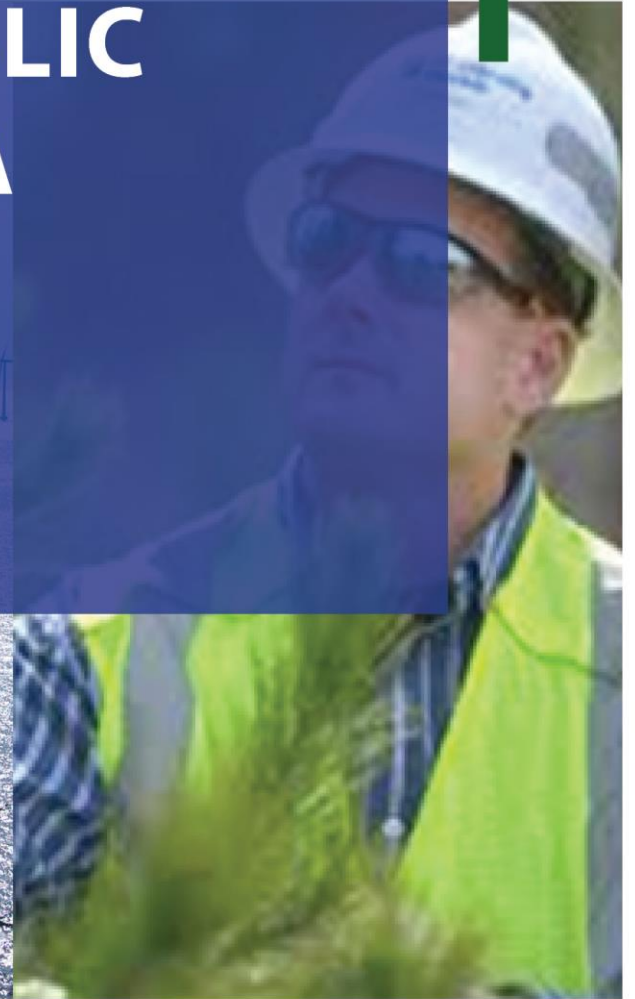
*Your input
will help
structure the
Offshore Wind
Strategic Plan.*

PLEASE PARTICIPATE

New Jersey Board of Public Utilities invites you to become engaged:

- **General Public Meetings**
- **Issues-Focused Meetings on:**
 - Environmental Protection
 - Commercial and Recreational Fisheries
 - Workforce Development
 - Economic Development, Ports, Harbors, and Supply Chain
 - Energy Pricing & Markets
 - Transmission
- **Email comments** to Offshore.Wind@bpu.nj.gov
- **Get more information** on New Jersey's offshore wind initiatives at www.NJCleanenergy.com/NJ-Offshore-Wind
- **Follow the Conversation on NJ offshore wind** #OffshoreWindNJ





**PUBLIC
Q&A**



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