

# Energy & Technology's Second Informational Formal

An Overview of Offshore Wind

# Ørsted

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# Ørsted develops energy systems that are green, independent and economically viable

# Ørsted

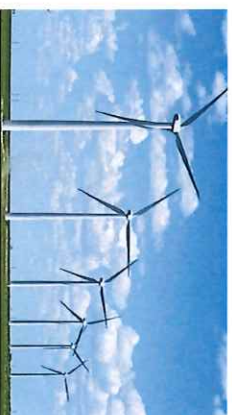
- Revenue (2017): \$9bn
- EBITDA (2017): \$3.4bn
- 5,638 employees
- Active in USA, Scandinavia, United Kingdom, Germany, The Netherlands and Taiwan

## Offshore



- Global leader in offshore wind with 5.6 GW installed
- Develop, construct, own and operate offshore wind farms
- Significant and attractive build-out plan of 3.4 GW towards 2022
- Ambition of 15 GW installed offshore wind capacity by 2025

## Onshore



- US onshore wind portfolio with 513 MW
- Develop, construct, own and operate onshore wind farms
- 300 MW under construction and a pipeline of more than 1.5 GW
- Energy storage solutions and solar

## Bioenergy



- #1 in Danish heat and power generation with 29% of market
- Converting heat and power plants from coal and gas to biomass
- Innovative waste-to-energy technology (Rensecne)

## Customer Solutions

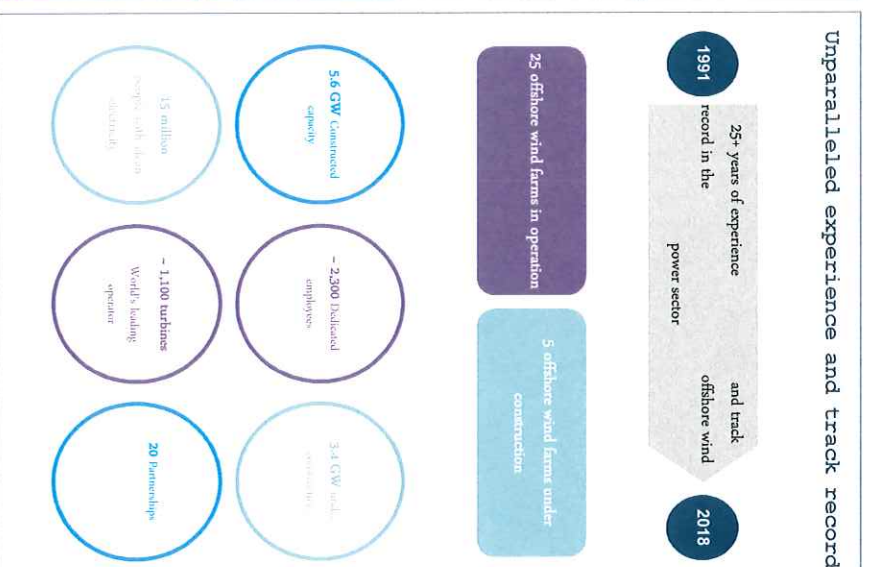
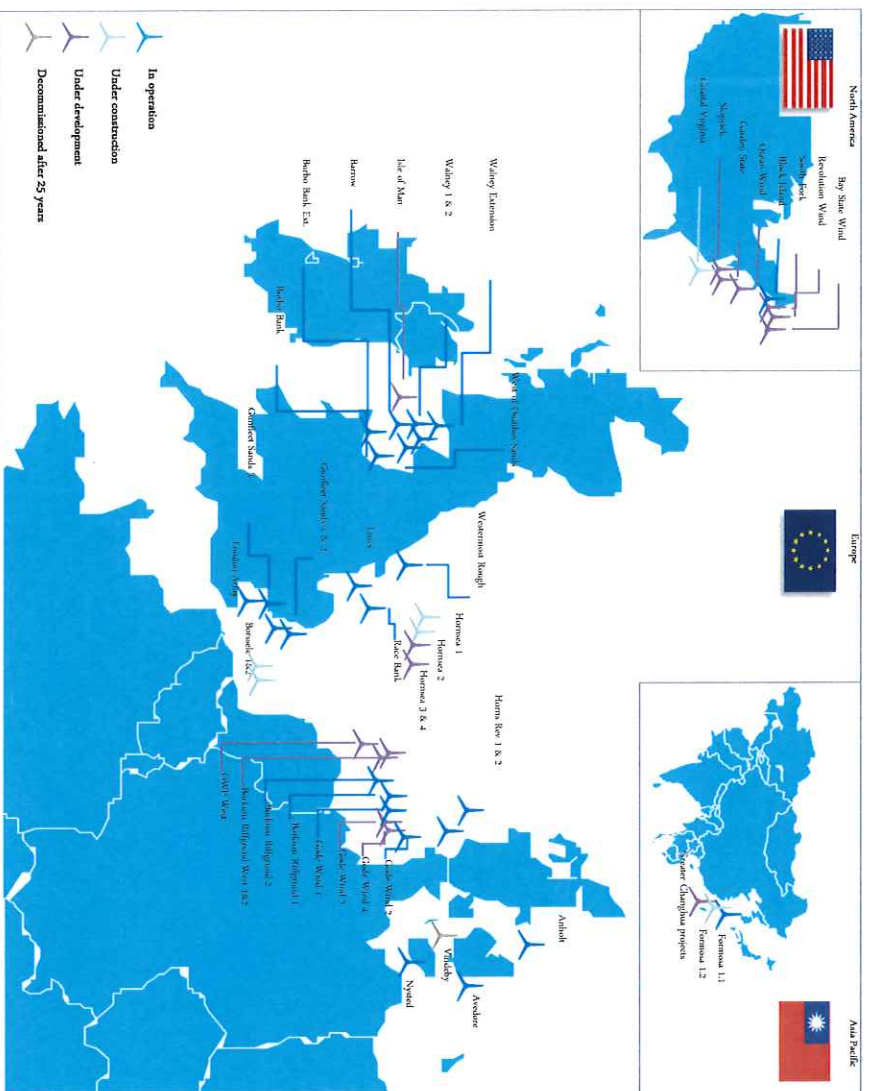


- Develop green, innovative and cost efficient solutions for our B2B customers
- Provide competitive route-to-market for own and customers' generation portfolio
- Optimize activities within natural gas
- Market trading operations to optimize hedging contracts

Process to move Distribution and Residential Customer business has been initiated



# Ørsted Offshore Overview – Globally



# Ørsted U.S. Offshore Wind

Attractive and geographically diverse portfolio of offshore wind assets:  
potential for 8-10GW



## In Operation

**Block Island Wind Farm:** 30MW

Projects with revenue contracts (secured or soon to be secured)

**South Fork Wind Farm:** 130MW

**Skipjack Wind Farm:** 120MW

**Revolution Wind:** 700MW (400MW to RI, 300MW to CT)

## Development projects

**Ocean Wind:** potential for up to 3.5GW of development

**Garden State Offshore Energy:** potential for up to 1.2GW of development

**Bay State Wind:** potential for up to 2GW of development ( 50/50 JV with Eversource)

**Coastal Virginia Offshore Wind:** 12MW demo project

## Additional lease areas

**MA/RI lease area(s):** potential for up to 1.5GW of development

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# Revolution Wind

## Overview

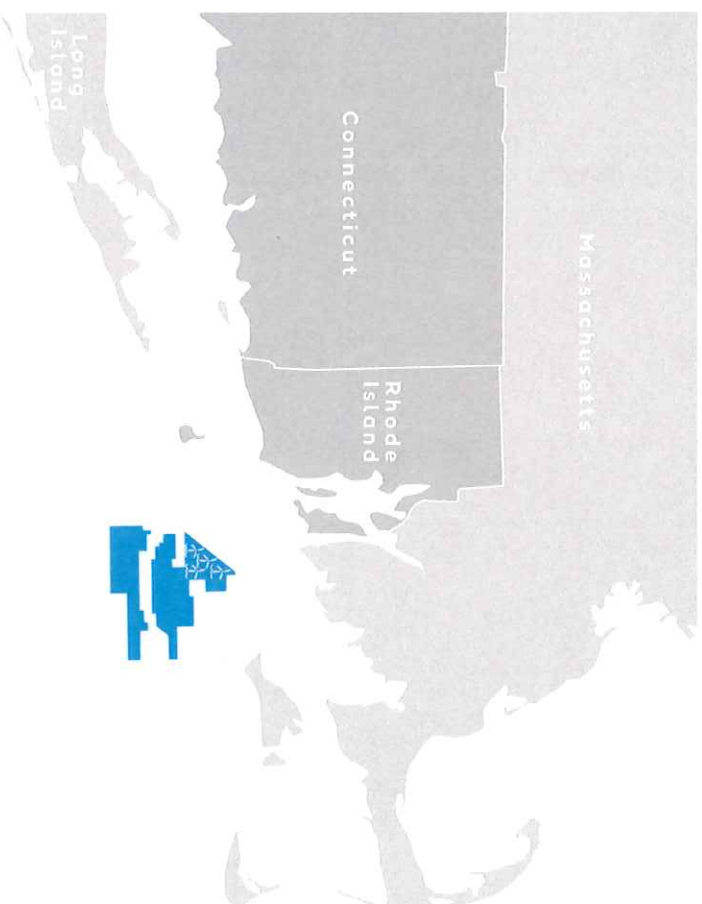
- 300 MW wind farm; paired with 400 MW wind farm for Rhode Island
- 35 turbines
- 40 miles from Connecticut coast

## Energy and Environmental Impacts

- 150,000 CT homes powered
- 150,000 cars off the road

## Schedule

Ongoing	Stakeholder meetings
2019	Apply for permits
2021	Permit approvals
2021	Installation begins offshore
2023	Commercial operations

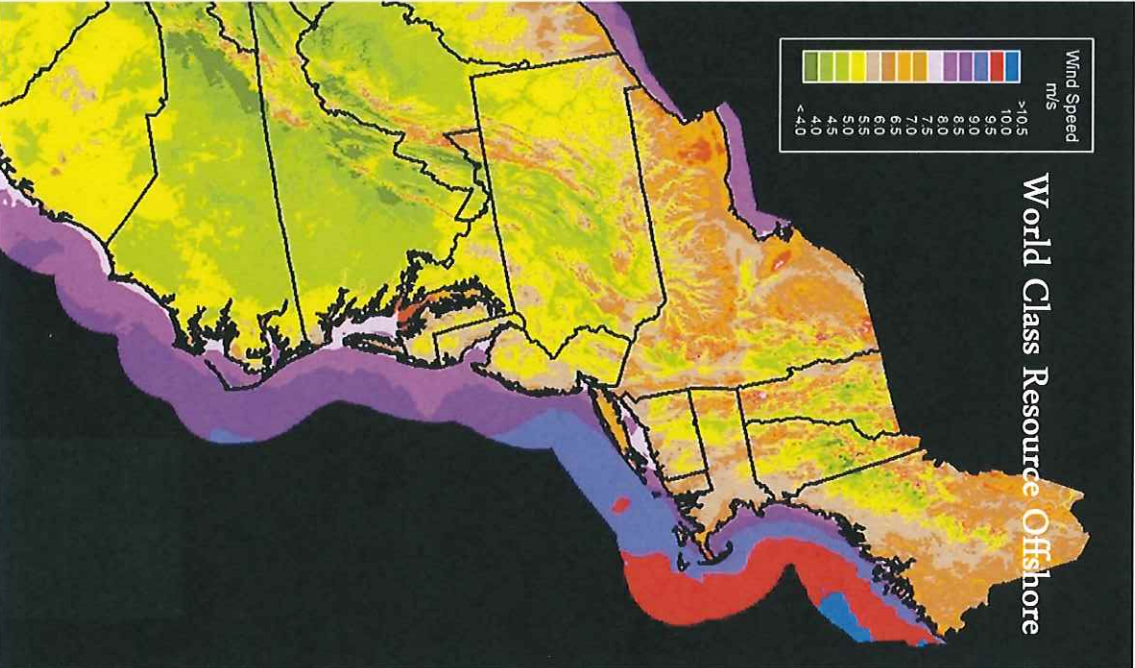




# Revolution Wind: Economic Impact



- \$147 million economic impact
- 300 local development and construction jobs
- \$32 million in greater New London investments
- \$1.5 million in Revolution Wind host community payments to New London over 2 years
- \$3 million grant to Port of New London to improve maritime facilities used by commercial fishing industry
- Connecticut boat builder for crew transfer vessel construction
- \$4.5 million in grants supporting workforce and supply chain studies as well as research and STEM education at regional institutions.
- Spring 2019: New London office opening





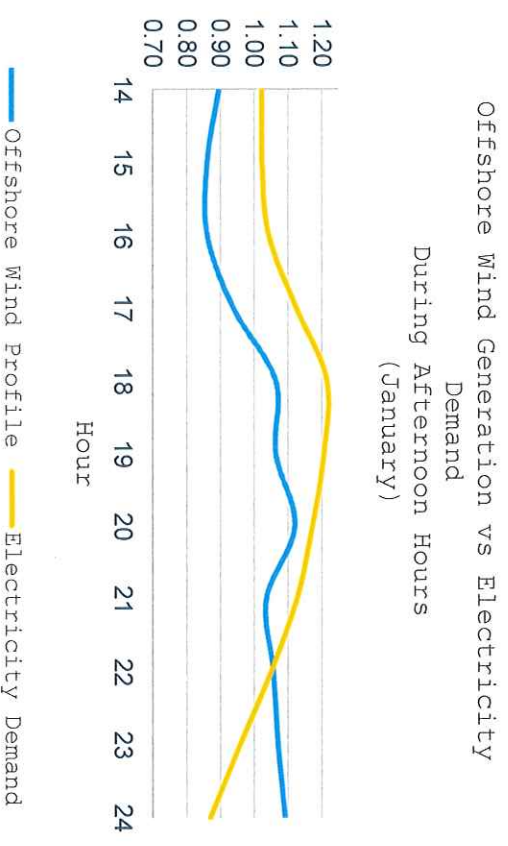
## Winter Reliability

To meet demand during winter months, the region becomes extremely dependent on oil and natural gas.

Offshore wind is most productive in the winter, aligning with the region's electricity needs.

In the winter of 2017/2018 over a two week period:

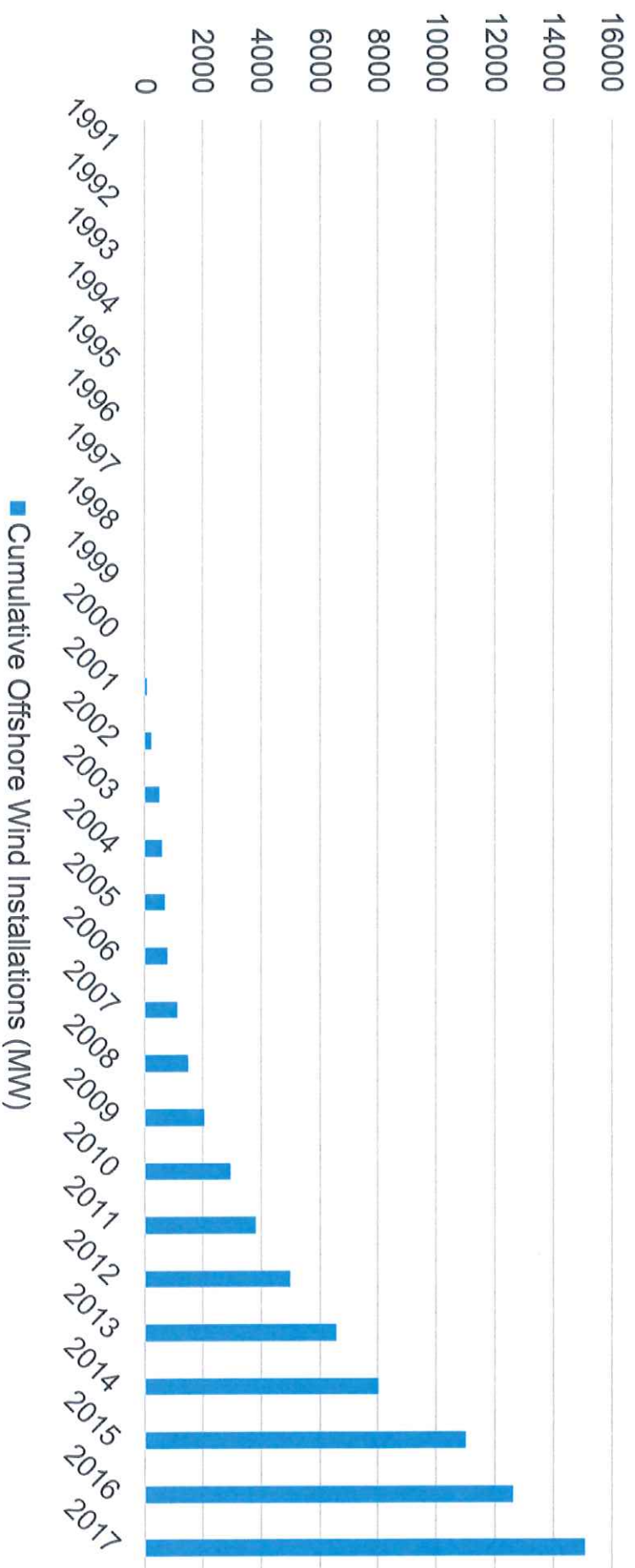
- Customers paid an additional \$700 million dollars in wholesale electricity costs
- 85-90 million gallons of oil was burned, leading to an increase of 1 million tons of greenhouse gas emissions



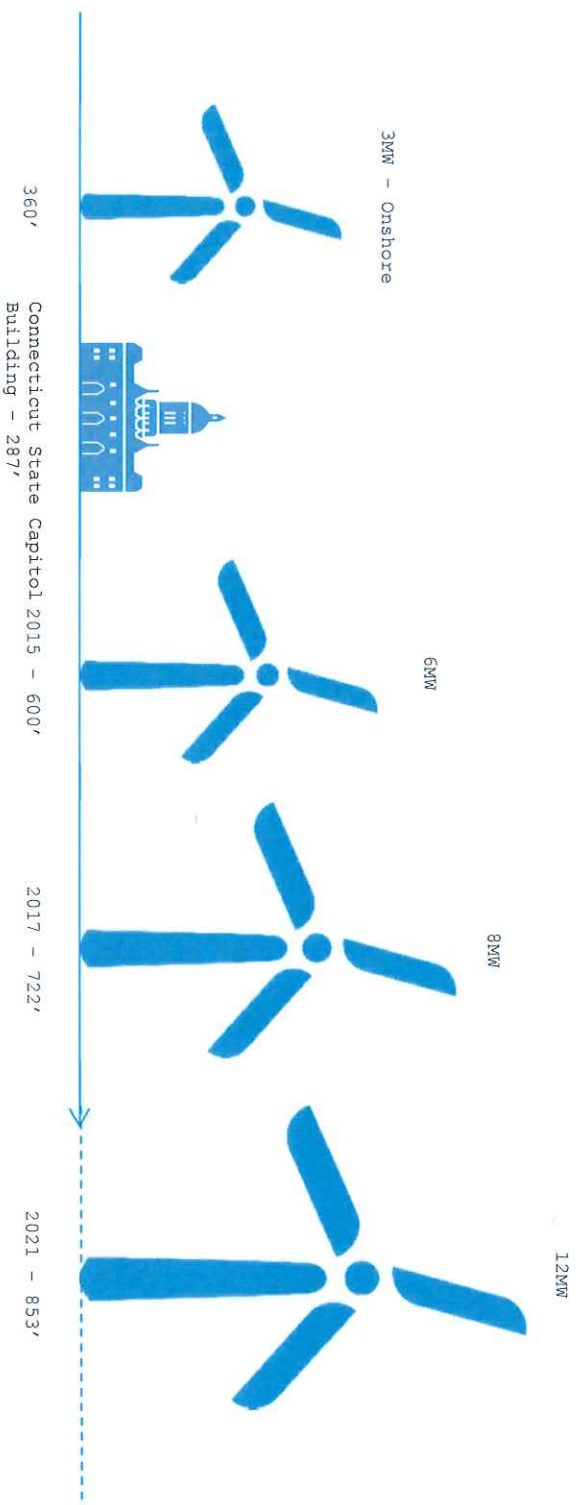


## Growth of Offshore Wind Globally

15.8GW in operation – 4,149 turbines spinning – 3.1GW added in 2017

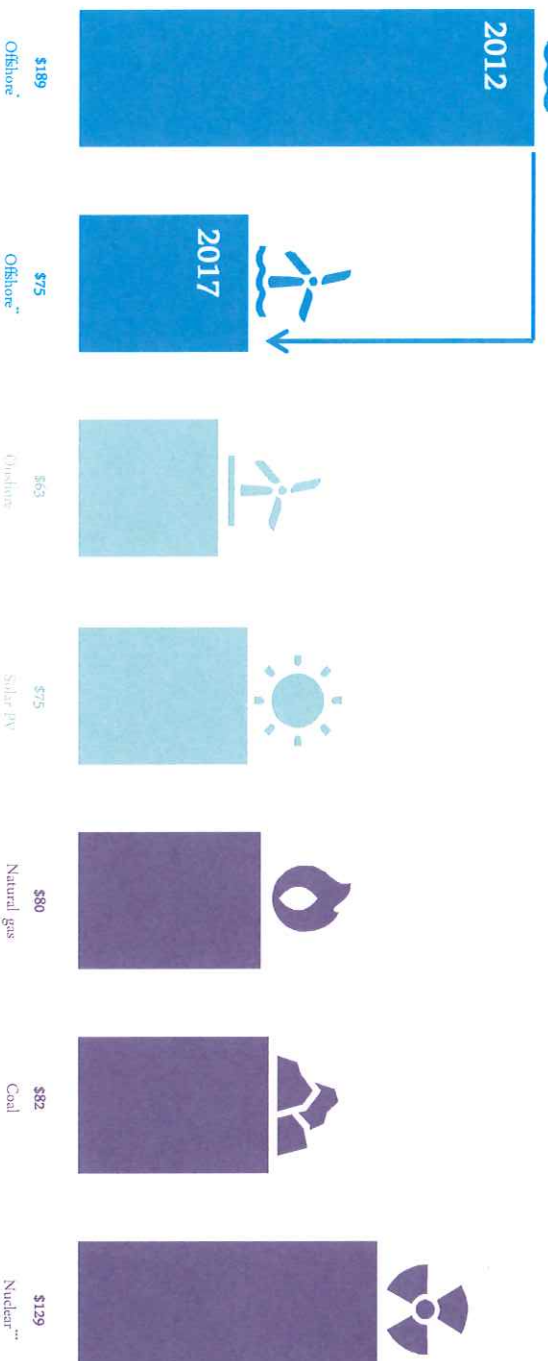


## Rapid Advances in Offshore Turbine Technology



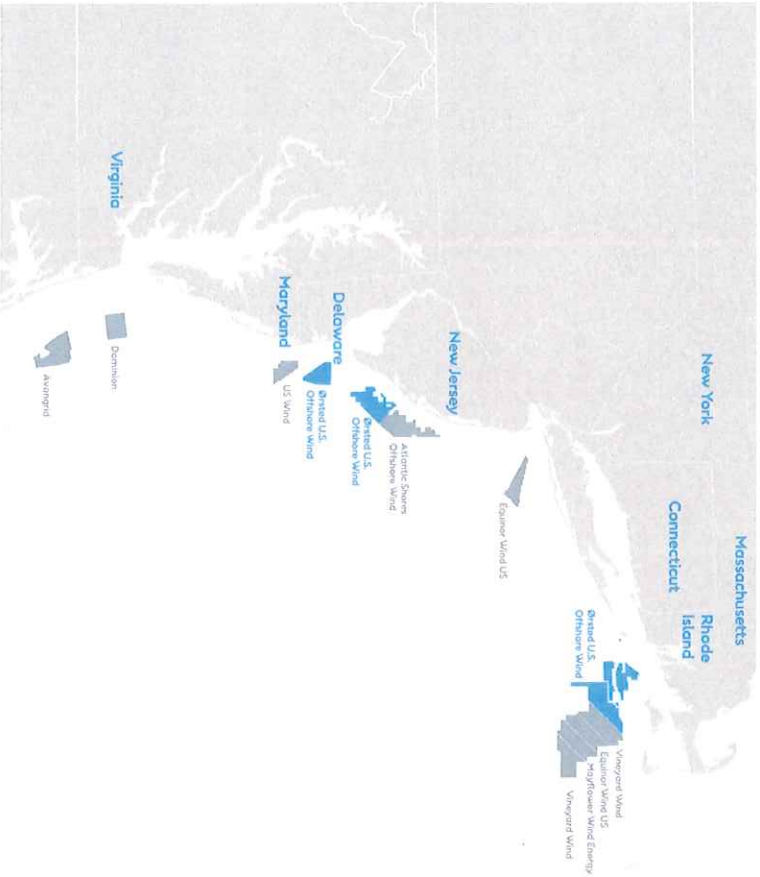
# Levelized cost of electricity for different technologies

The rapid cost reductions in the industry, have made offshore wind power competitive relative to conventional power generation based on fossil fuels  
USD/MWh 2016 prices





# Offshore wind market on the East Coast



## State offshore wind targets

New York	9,000 MW
New Jersey	3,500 MW
Massachusetts	2,400 MW
Virginia	2,000 MW

Total:  
16,900 MW

## State offshore wind procurements

Massachusetts	800 MW
Rhode Island	400 MW
Maryland	368 MW
Connecticut	300 MW

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Asia

- Protections can exist to ensure competition, pricing, pulling out if not commercially reasonable.

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An aerial photograph of four offshore wind turbines in a row, stretching from the top left towards the bottom right of the frame. The turbines are white with three blades each, and their yellow support structures are visible. The sea is a deep, dark blue, and the sky is a lighter blue. The text is overlaid on the left side of the image.

# Q&A

## Contact:

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