Offshore Wind Worldwide


Source: GWEC
Cost of Offshore Wind

Adjusted strike prices from European offshore wind auctions

Source: NREL 2016 Offshore Wind Technologies Market Report
US Offshore Wind Leases

- Block Island 30 MW in operation
- Mass RFP award expected in April 2018
- New York and New Jersey developing compensation mechanisms
- Maryland OREC’s awarded in 2017
- Dominion has contracted with Orsted to complete 2 WTG’s off Virginia
- Additional lease awards expected off Mass & NY in 2018
US Offshore Wind Resource
Design Conditions
Offshore Wind Farm Components

How an offshore wind farm works

1. Offshore wind turbines convert mechanical energy of the wind into electricity.
2. Produced electricity is conveyed through submarine cables protected by rock-dumping to the Offshore High Voltage Substation.
3. It ensures the compliance of the electricity with the requirements of the onshore grid.
4. The electricity is then conveyed by RTE (the French grid operator) through two submarine then underground cables up to the public onshore electricity grid.

Image credit: https://dieppe-le-treport.eoliennes-mer.fr/offshore-wind-power/how-offshore-wind-farms-work/
Wind Turbine Generators

Offshore wind turbines growing by leaps and bounds

Source: Orsted
Foundation Types

- Monopile
- Jacket
- Gravity Base
- Suction Bucket
- Floating
  - Tension Leg Platform
  - Spar Bouy
  - Semi-submersible

Offshore Substations

— Receive Intra Array cables
— House substation equipment
  — CB’s XFMR’s, typically GIS
— Export at higher voltage
— Multiple potential arrangements
Cables

— Intra Array:
  — Connect WTG’s to offshore substation
  — Typically 33–66kV

— Export:
  — Connect offshore substation to interconnection

— Installation:
  — Buried several meters below sea floor
  — Jet plowing commonly used method

Source: Subsea World News
Thank you

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