

Regional Assessment of Offshore Wind Development in Nova Scotia Frequently Asked Questions (FAQ) – Edition Three

Offshore Wind Projects

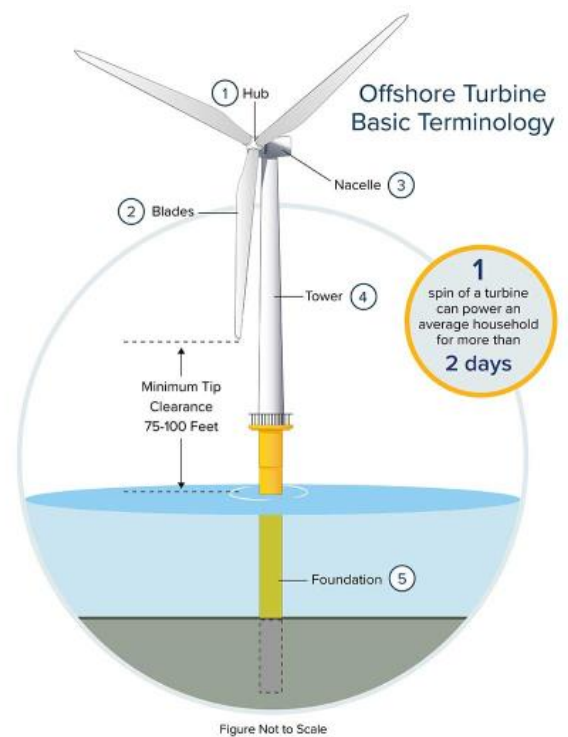
The purpose of this document is to provide responses to frequently asked questions (FAQs) raised during the conduct of the Regional Assessment. New FAQ editions, addressing a variety of topics, will be posted regularly to the Registry throughout the Regional Assessment process.

Q: How does an offshore wind turbine work?

A: Offshore wind turbines consist of five main parts:

1. a foundation ;
2. a tubular steel tower;
3. a hub;
4. blades; and
5. a nacelle.

Wind causes the blades to spin. The blades are connected to a hub which is connected to a nacelle that holds an electric generator that produces electricity as the blades turn. The electricity is transmitted down the turbine tower and along the seafloor through electrical cables to a substation and then to shore to the power grid for use.



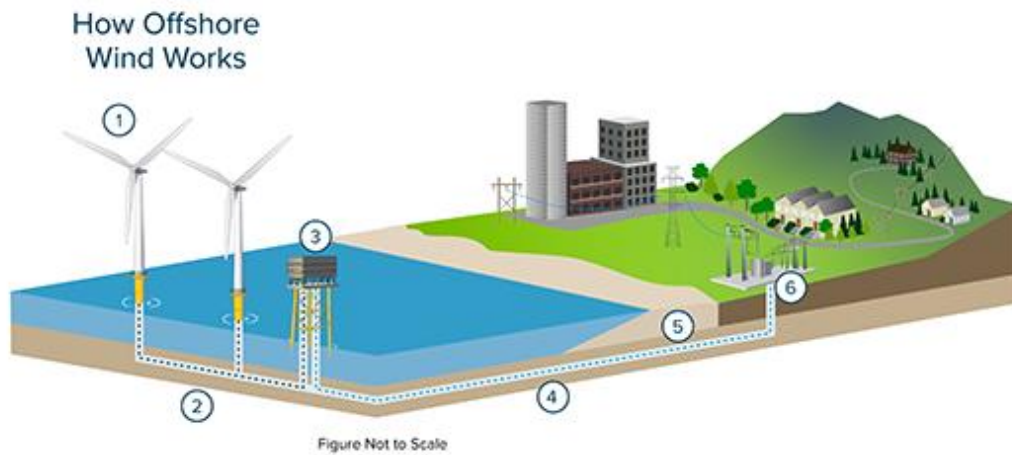
Q: What is the difference between fixed and floating offshore wind turbines?

A: Offshore wind turbines can have different types of foundations, depending on water depth, seabed conditions, and wind conditions:

- **Fixed-bottom platforms** are attached to the seabed on towers.
- **Floating platforms** are anchored to the seabed by mooring cables allowing them to be set in deeper waters (greater than 60 meters).

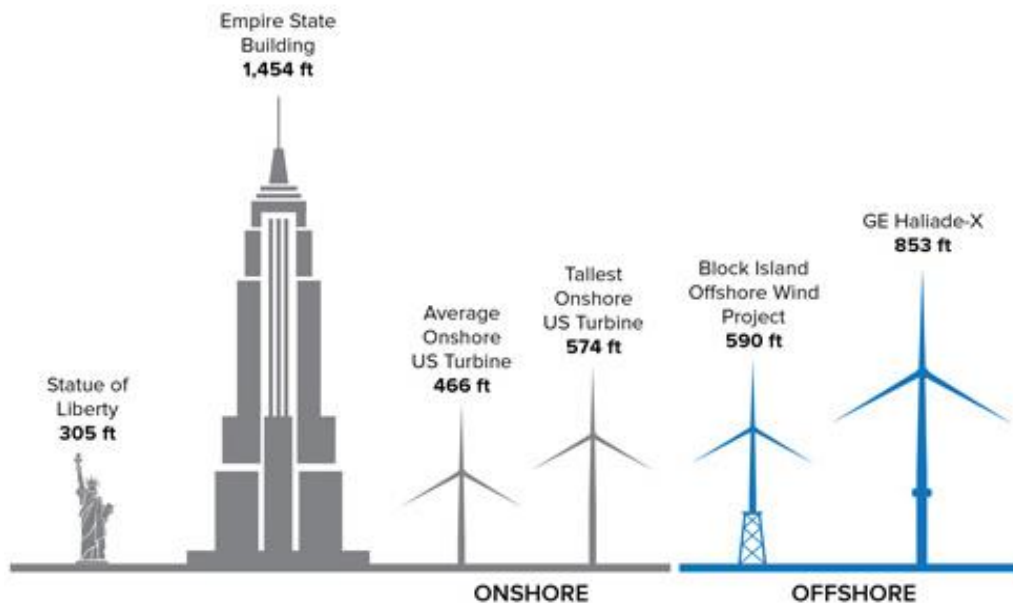
Q: How does an offshore wind farm work?

A: An offshore wind farm is a group of wind turbines (1) that are linked by a series of electrical cables (2). The cables transmit the electricity from each wind turbine to an offshore substation (3) where a larger electrical cable (4) exports the electricity to an onshore substation (5 & 6) to be used in the electricity grid system. Note: offshore substations may not be required if the wind farm is close enough to shore.



Q: How big are offshore wind turbines?

A: Offshore wind turbines are taller and have longer blades than onshore (land) wind turbines. This increased size allows offshore wind turbines to sweep more area, capture more wind, and therefore produce more electricity.



Q: What are the stages of an offshore wind farm?

A: The stages of an offshore wind farm are planning and site assessment; construction and installation; operations and maintenance; and repowering and decommissioning.

- **Planning and Site Assessment** occurs over a 3-5 year period and includes, but is not limited to:
 - Seabed licence acquisition
 - Resource studies and environmental data collection
 - Engineering and design
 - Procurement and financing
 - Engagement and consultation
 - Impact assessment
 - Authorizations and permits
- **Construction and Commissioning** will occur over a 1-2 year period, depending on the number of turbines being installed and includes, but is not limited to:
 - Installation of turbines
 - Installation of cables
 - Installation of the substation, if required
 - Commissioning (testing and verification, activation of cables, start-up)
- **Operations and Maintenance** will occur over a period of 25 years or more and includes, but is not limited to:
 - Lubrication of gear boxes and generators
 - Oil and filter changes
 - Testing and maintenance of the turbines
 - Sensor operation and calibration
 - Inspections of foundations, turbines, and cables
- **Repowering (extending the life of the wind farm) and Decommissioning** activities include, but are not limited to:
 - Replacement of parts and components with newer technologies
 - Dismantling and recycling of components
 - Disposal of non-recyclable materials

Primary source for data and images:

[Offshore Wind 101 - NYSERDA](#)

For more information on offshore wind visit:

[Offshore wind - Government of Nova Scotia, Canada](#)

[Marine Renewables 101 » Marine Renewables Canada](#)

[Renewable Energy | Bureau of Ocean Energy Management \(boem.gov\)](#)

[Tethys | Environmental Effects of Wind and Marine Renewable Energy \(pnnl.gov\)](#)