

Floating Offshore Wind Shot™: Unlocking the Power of Floating Offshore Wind Energy

Overview

The U.S. Department of Energy's (DOE) Energy Earthshots™ Initiative aims to accelerate breakthroughs for more abundant, affordable, and reliable clean energy solutions. Achieving the Energy Earthshot targets will help America tackle the remaining technical challenges to address the climate crisis and more quickly reach the Biden-Harris Administration's goal of equitably reaching net-zero carbon emissions by 2050, while creating good-paying jobs and growing the economy.

Much of the United States' clean energy deployment in the near term will be land-based wind and solar, but a diverse mix of clean energy resources will be required to reach that goal and the Administration's goal of decarbonizing the electric grid by 2035. Offshore wind is especially well-suited to provide clean energy to densely populated coastal regions, which have high energy demand but limited space for utility-scale land-based clean energy and transmission.

Summary

About two-thirds of the United States' offshore wind potential exists over bodies of water too deep for "fixed-bottom" wind turbine foundations that are secured to the sea floor. Harnessing power over waters hundreds to thousands of feet deep requires floating offshore wind technology—turbines mounted to a floating foundation or platform that is anchored to the seabed with mooring lines. These installations are among the largest rotating machines ever constructed.

At commercial scale, the costs of the first floating offshore wind projects are estimated to be more than 50% higher than costs of fixed-bottom offshore wind. While pilot projects have already been deployed in Europe and Asia, with larger projects under development, in the United States planning for development is just beginning.



Goal: Reduce the cost of floating offshore wind in deep waters by more than 70%, to \$45 per megawatt-hour¹ by 2035.



>70% Reduction



2035

¹ For a reference site with 1,000-meter-deep water, 125 kilometers from the point of grid interconnection on shore.

Impact

Investments in floating offshore wind will help usher in America's clean energy future by tapping into 2.8 terawatts of potential power—more than double the current U.S. electricity consumption. While development of these resources in the United States must be guided by an open and transparent regulatory process, capturing even a small amount of that potential could power tens of millions of homes and businesses. Rapidly moving the United States from demonstration projects to commercial-scale deployment requires an all-of-government approach.

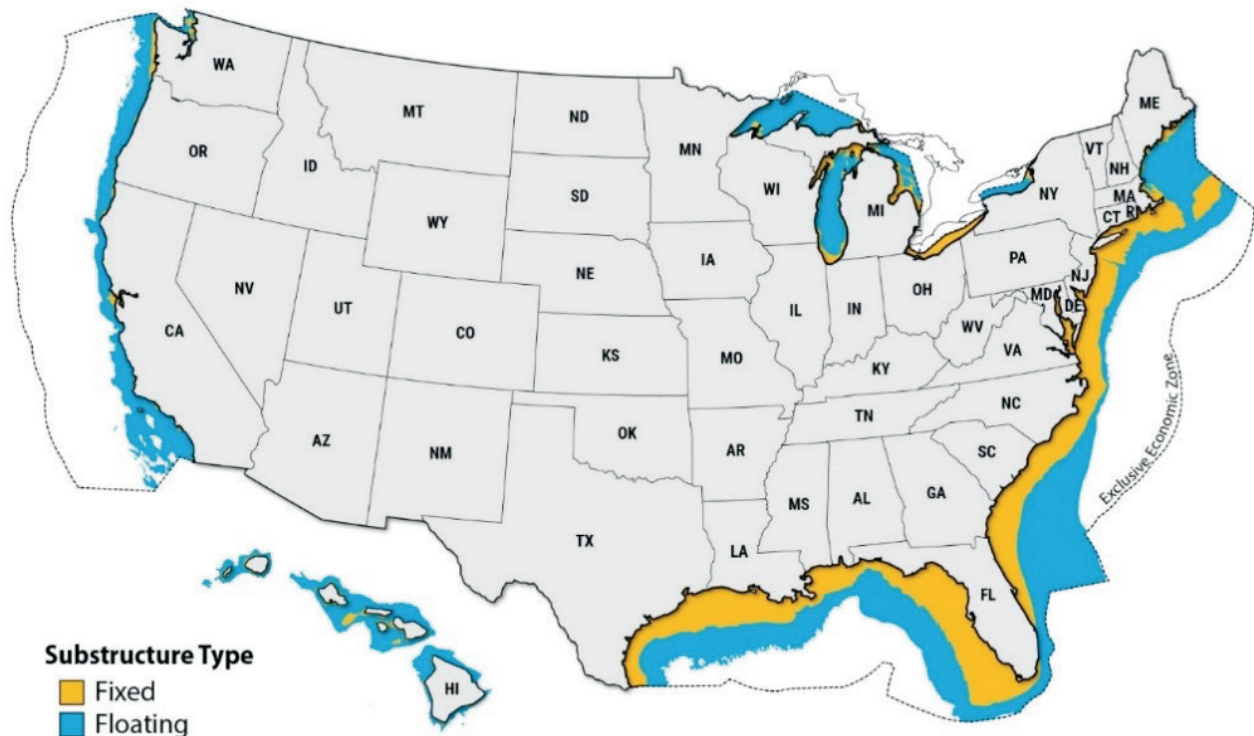
Investments in floating offshore wind will advance both fixed-bottom and floating offshore wind through improved turbine performance, reduced environmental impact, and increased power production enabled by a better understanding of atmospheric science.

Floating offshore wind can play a key role in transitioning offshore oil and gas industry workers, communities, and infrastructure from the fossil fuel industry to the renewable energy industry.

Expanding offshore wind can help produce clean hydrogen and hydrogen-derived fuels to help decarbonize industrial, shipping and other heavy-duty transportation, and agricultural sectors.

The United States has a **critical window of opportunity** to not only make this technology more affordable but also to become a **world leader in floating offshore wind** design, deployment, and manufacturing. This new industry can provide significant economic benefits for the United States, especially coastal communities, and help to equitably decarbonize densely populated regions.

As part of an all-of-government approach to supporting U.S. leadership in floating offshore wind, the Department of the Interior's Bureau of Ocean Energy Management also announced a goal to deploy 15 gigawatts of installed floating offshore wind capacity by 2035, which is enough energy to power over 5 million American homes.



The Atlantic and Gulf coasts are suitable for fixed-bottom offshore wind installations near the shore. Waters along the Pacific coast, Gulf of Maine, and around Hawaii, as well as waters further from shore along the Atlantic and Gulf coasts, would require floating offshore wind. Generally, water that is at least 60 meters deep is appropriate for floating offshore wind deployment.²

² Musial, Walt, Donna Heimiller, Philipp Beiter, George Scott, and Caroline Draxl. 2016. "2016 Offshore Wind Energy Resource Assessment for the United States." Technical Report NREL/TP-5000-66599. Golden, CO: National Renewable Energy Laboratory.

The Floating Offshore Wind Shot™ is a drive to address key industry challenges by:



DEVELOPING COST-EFFECTIVE

floating offshore wind technologies to harness the power above deep U.S. waters.



SUPPORTING SUPPLY CHAIN

DEVELOPMENT, including informing the development of port infrastructure to support floating offshore wind construction and deployment.



SCALING UP DOMESTIC MANUFACTURING

capacity, especially for turbine platforms and components, while considering local workforce, materials, and infrastructure needs.



DESIGNING TRANSMISSION

NETWORKS and configurations to transmit power from the strongest offshore wind resources to load centers.



PROMOTING ENERGY JUSTICE

with sustainable and just deployment to minimize impacts on ocean users and marine wildlife; benefit coastal and underserved communities; and reduce the climate, health, and environmental impacts of the U.S. energy system.



FOSTERING ECONOMY-WIDE

DECARBONIZATION by advancing floating offshore wind energy storage and clean fuel production.

Partnerships

The Floating Offshore Wind is an all-of-government initiative led by the Departments of Energy, the Interior, Commerce, and Transportation. DOE and the National Science Foundation will also collaborate on floating offshore wind technology research and workforce development in support of the Floating Offshore Wind Shot.

Stakeholder Engagement

DOE plans to engage with federal, state, and local officials, community groups, industry, and others on activities associated with the Floating Offshore Wind Shot. Visit the DOE [Wind Energy Technologies Office website](https://www.energy.gov/eere/wind/floating-offshore-wind-shot) for updates and opportunities.