

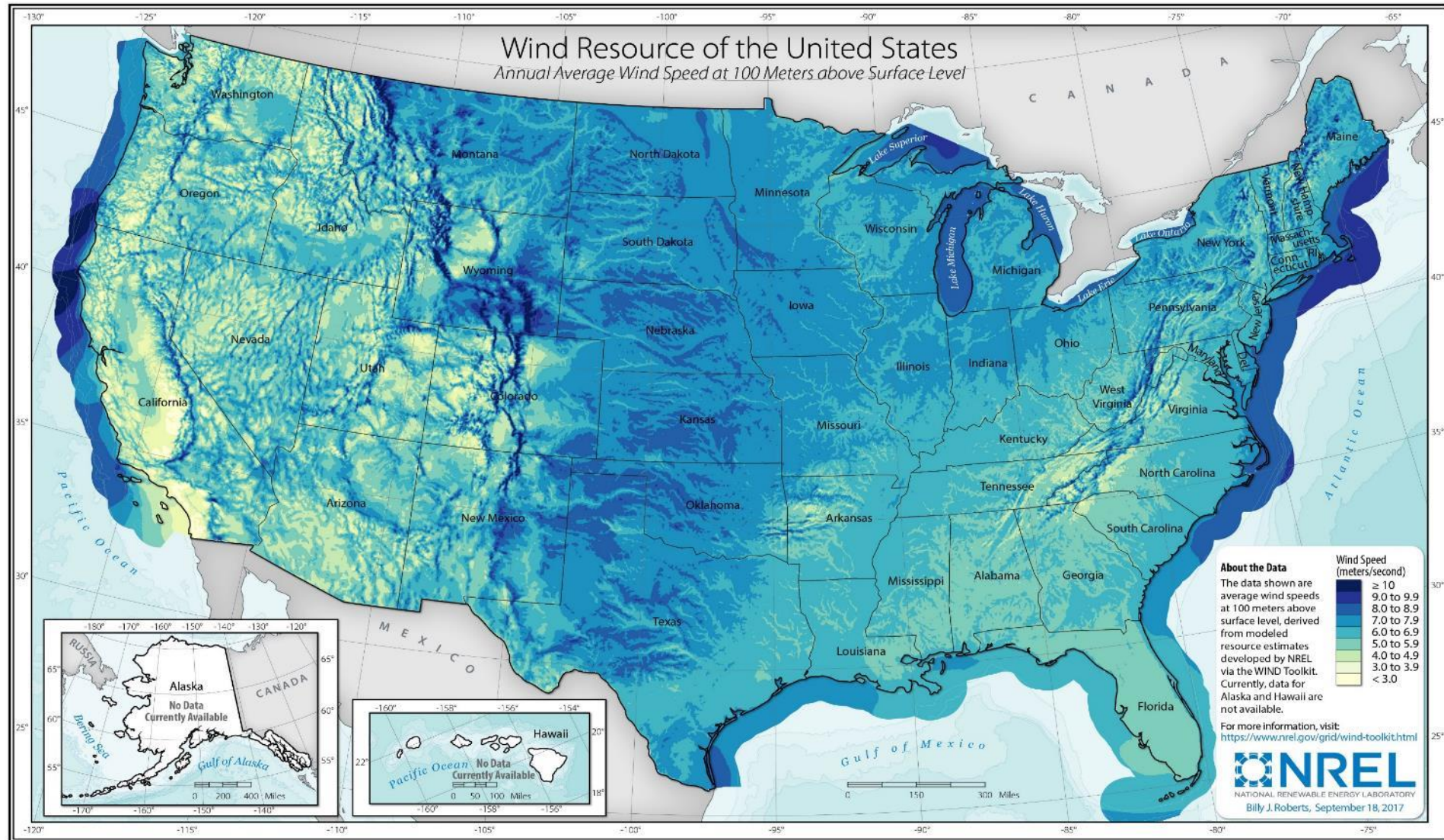


**U.S. Department of Energy
Accelerating Floating U.S. Offshore Wind Development**

**Jocelyn Brown-Saracino
Offshore Wind Lead**

Image by Joshua Bauer, NREL

Significant US Offshore Wind Resource



Offshore resource roughly 2 TW; ~60% in deep water

30 by 30 Goal

DOE's New Offshore Wind Goal of 30 GW by 2030 will:



Support **tens of thousands**
of good-paying jobs



Avoid **78 million metric tons**
of carbon dioxide pollution



Generate abundant, clean electricity
to power over **10 million homes**

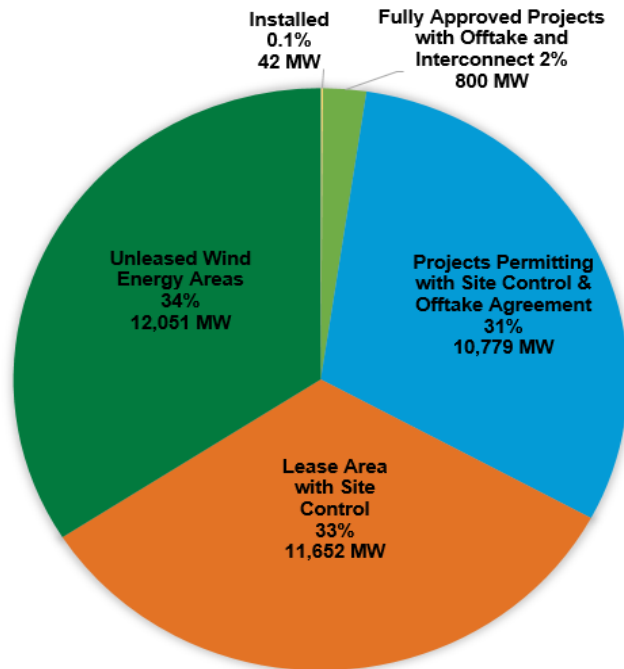


Could help unlock a path to **110 GW** or more of capacity by 2050

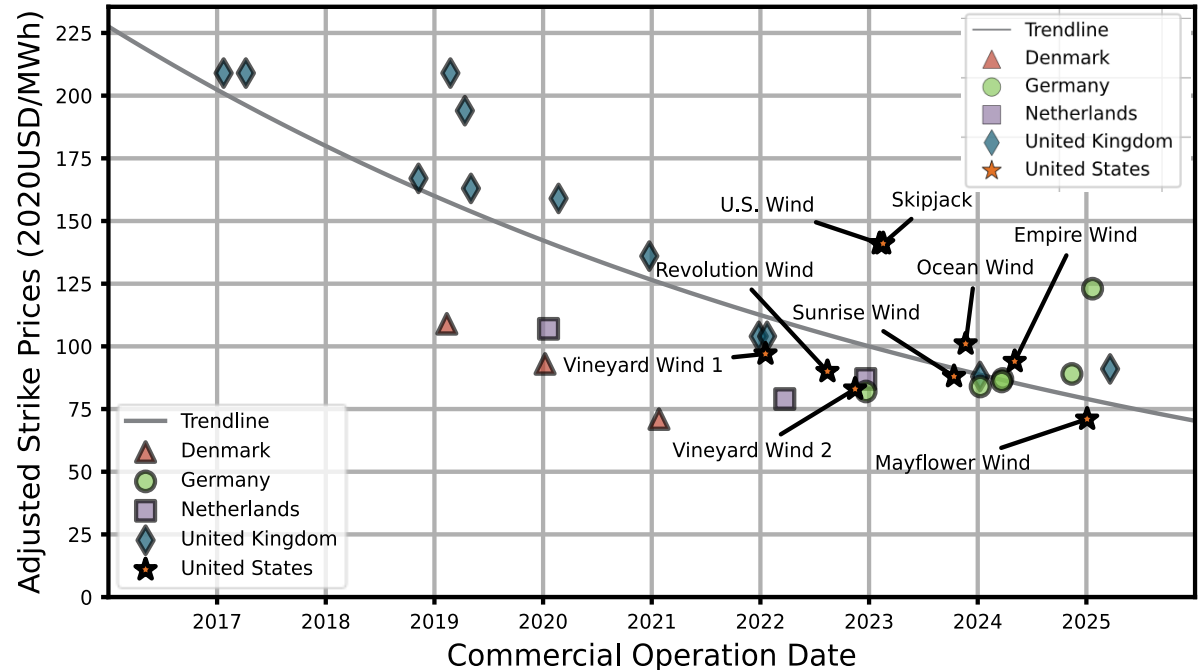
DOE's 2021 Offshore Wind Market Report

Offshore wind: U.S. pipeline up 24% in 2020 - early 2021. Costs continue to fall.

2020 Pipeline – 35,324 MW



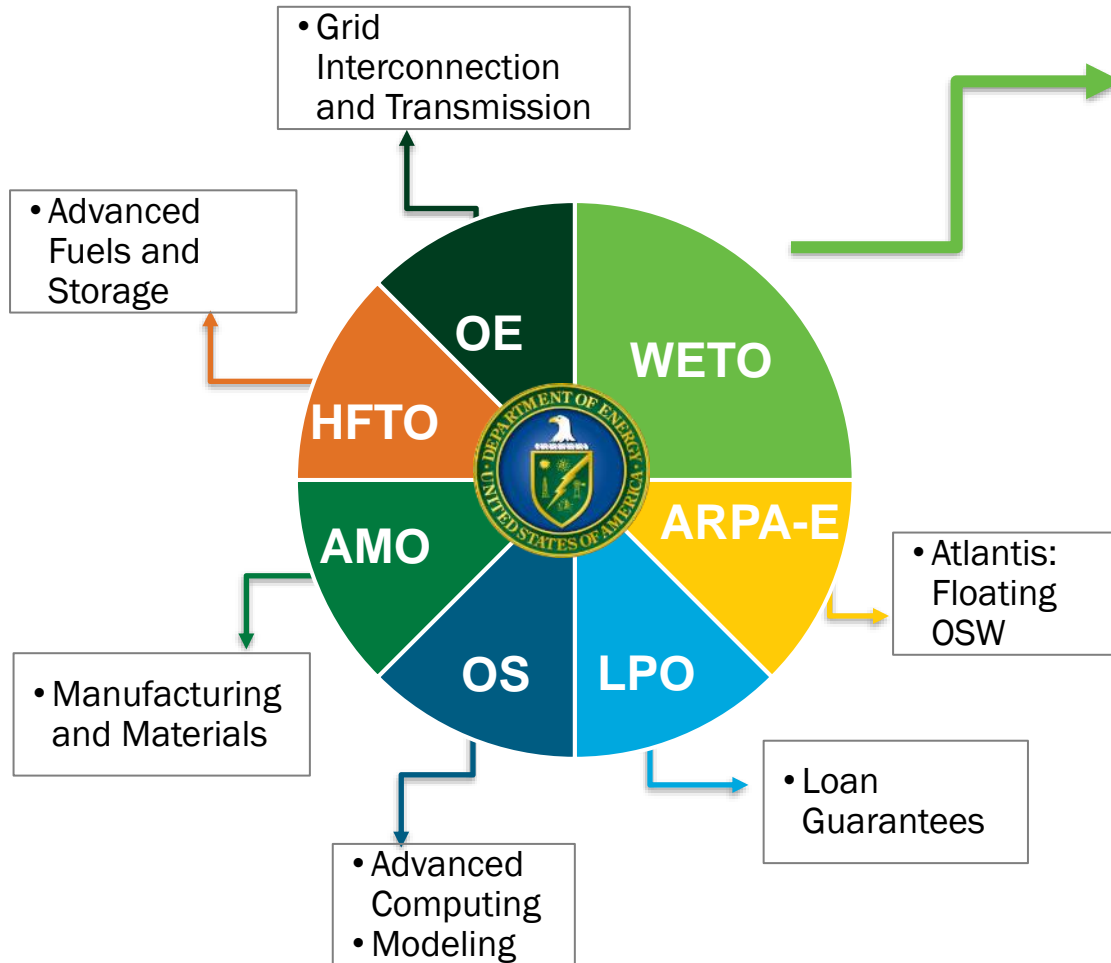
Offshore wind contract prices by commercial operation date



- State-level commitments grew to nearly 40 GW by 2040
- Cost reductions key in long-term: Global offshore wind costs fell 16% from 2019 to 2020

US Department of Energy Offshore Wind Capabilities

- DOE funds research and activities to lower the cost of energy and address siting, environmental, and grid interconnection issues.



Wind Energy Technologies Office

Goals

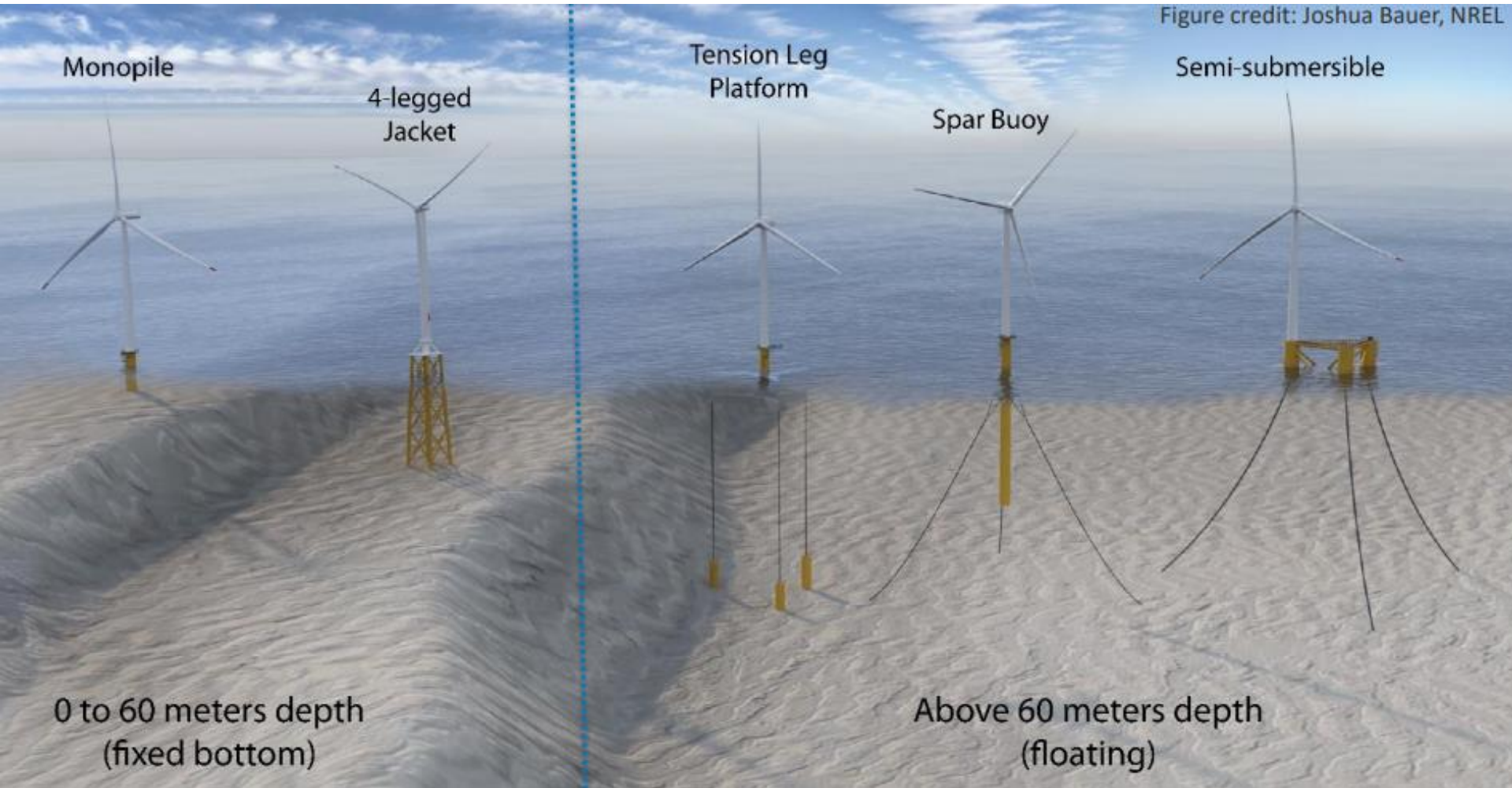
- 30 GW by 2030
- Reduce cost (fixed platform): 5.2¢/kWh in 2030
- Reduce costs (floating): 6.1¢/kWh in 2030

Program Focus Areas





- Technical Innovation
- Siting and Environmental Research
- Grid Interconnection
- Modeling and Analysis



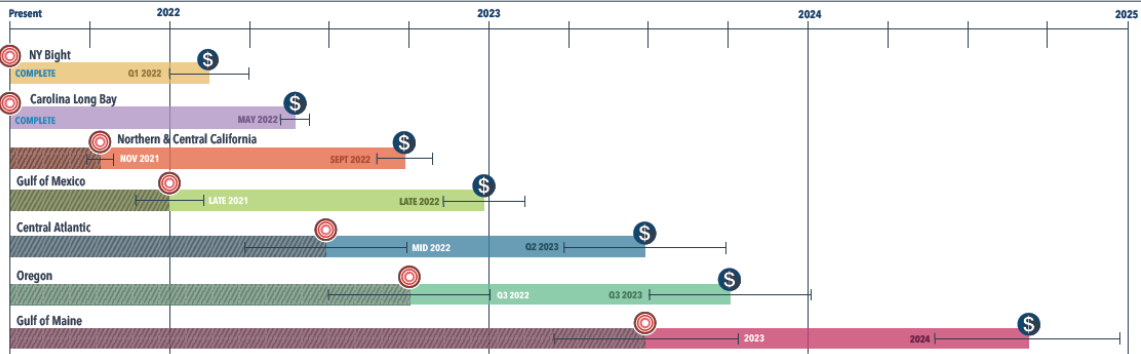
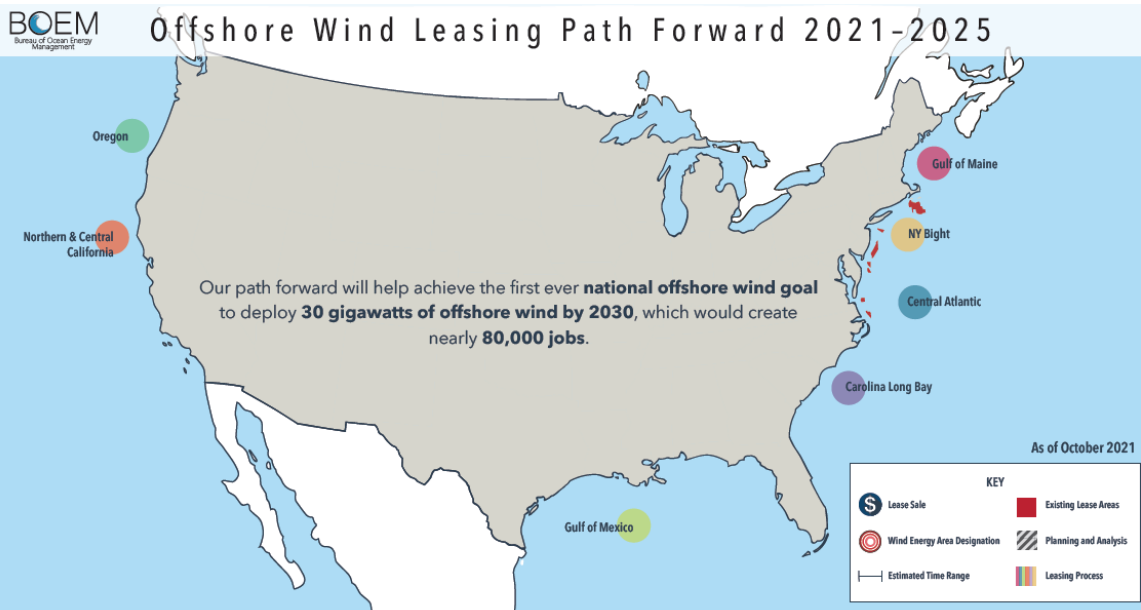
Offshore Wind Foundation Types by Water Depth



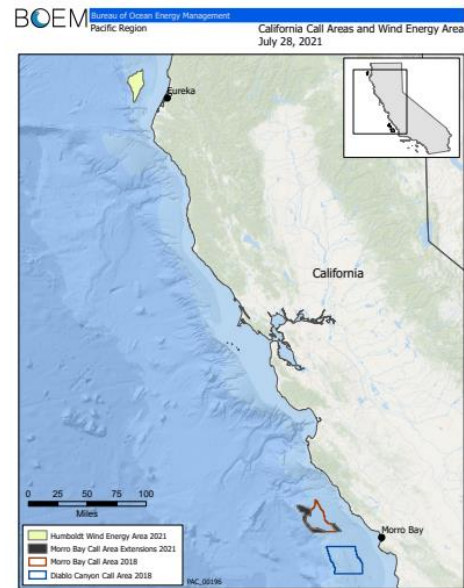
Maximizing Offshore Wind Deployment by 2030 and Beyond

Challenges	Opportunities	Floating Offshore Wind Dynamics
 <p>Cost of Energy</p>	<p>R&D to reduce cost</p>	<p>Costs currently higher than fixed bottom offshore wind</p>
 <p>Siting and Permitting</p>	<p>Increased certainty</p> <p>Increased leased areas</p>	<ul style="list-style-type: none"> • Early stages of leasing processes • Opportunity for proactive stakeholder engagement and research
 <p>Grid Connections, Transmission Adequacy</p>	<p>Access to onshore and offshore transmission</p> <p>R&D to support grid reliability, inform market design, advance potential for renewable energy fuels</p>	<ul style="list-style-type: none"> • Transmission adequacy challenges • R&D needs associated with deep water
 <p>Supply Chain</p>	<ul style="list-style-type: none"> • U.S. turbine component manufacturing and materials • U.S. flagged installation vessels • Port expansion • Workforce development 	<ul style="list-style-type: none"> • Nascent stage of development • Opportunity to design for export market

BOEM Leasing: Creating Development Opportunity



Source: BOEM



Source: BOEM



Source: NREL

Enabling Sustainable Development

West Coast Offshore Wind Environmental Research and Tool Development

- Recent joint agency support for floating offshore wind environmental research, with co-funding from BOEM and DOE
- Released in conjunction with NOPP and in coordination with partnering agencies, including: BOEM, NOAA NMFS, and US FWS

Oregon State University will receive \$2 million to conduct visual surveys and acoustic monitoring of marine mammals and seabirds to develop predictive density maps of species present in potential wind energy development areas on the West Coast.

Woods Hole Oceanographic Institution will receive \$750,000 to develop next-generation autonomous robotic technology for environmental monitoring of marine organisms and the seafloor at potential wind energy development areas on the West Coast.



Facilitating Stakeholder Education and Engagement

WINDEXchange: An Online Platform for Wind Energy Information

- Website features information on wind energy market sectors, including **information on Offshore Wind Energy**, state specific energy profiles, and publications.
- A biweekly newsletter with over **22k+ active subscribers** featuring land-based and **offshore wind energy news**
- **Siting and project** development information and considerations

<https://windexchange.energy.gov/>



The screenshot displays the WINDEXchange website interface. The header includes the U.S. Department of Energy logo and navigation links for Market Sectors, Project Development, Technical Assistance, and Education & Workforce Development. The main content area is titled 'Offshore Wind Energy' and features a sidebar with categories: Utility-Scale Wind, Land-Based Wind, Offshore Wind (selected), and Distributed Wind. The main text describes offshore wind energy as a burgeoning industry in the U.S., highlighting America's first offshore wind farm in Rhode Island. It also mentions the Energy Department's Wind Vision Report and a national strategy to facilitate the development of offshore wind energy. A sidebar on the right contains a photograph of offshore wind turbines.

Floating Offshore Wind Overview Webinar
<https://www.youtube.com/watch?v=58EYcYbRkqk&feature=youtu.be>

Lowering Floating Offshore Wind Levelized Cost of Energy

Cost Levers	Opportunities	Example DOE R&D
Industrialization	<ul style="list-style-type: none"> Designing for mass US-based manufacturing 	<ul style="list-style-type: none"> Aquav Ventus demonstration project concrete foundation, designed for US manufacturing capabilities
Turbine Scaling	<ul style="list-style-type: none"> Increasing power production through larger turbines 	<ul style="list-style-type: none"> Super-Conducting Light Weight Generator
Full System Optimization	<ul style="list-style-type: none"> Optimizing full systems, including controls, from seabed to blade tip 	<ul style="list-style-type: none"> ARRA-E Atlantis Program
Reliability and O&M	<ul style="list-style-type: none"> Reducing unscheduled maintenance with prognostic health management Increasing the reliability and lifespan of critical components, Automating minor maintenance activities 	<ul style="list-style-type: none"> Coming soon: SBIR Opportunity Open National Offshore Wind R&D Consortium Solicitation



Image of University of Maine Floating Semi-submersible Concrete Foundation Design

Grid Integration: Transmission Access and Adequacy

- 2020 Request for Information
- National Offshore Wind R&D Consortium funding apply a **cost-benefit valuation methodology** to various **transmission scenarios** for offshore wind in the **Pacific Northwest**.
- Coming soon: [SBIR](#)
- Coming soon: Offshore Wind R&D Consortium [Call for Proposals](#) on Power Systems and Integration



Figure credit: NREL



Supporting Supply Chain Development

- Coming Soon: **Offshore Wind Report to Congress** outlining strategies to accelerate sustainable offshore wind development
- Through the National Offshore Wind R&D Consortium, DOE is supporting the development of a **National Offshore Wind Supply Chain Roadmap**
 - Team: NREL, Business Network for Offshore Wind (BNOW), DNV
- Open DOE [RFI](#) on energy sector supply chain development needs, including sections on wind energy and grid needs



Jim Green / NREL



Dennis Schroeder / NREL



Thank you!