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Examining Future Costs of Offshore Wind Energy (OWE) in the U.S.

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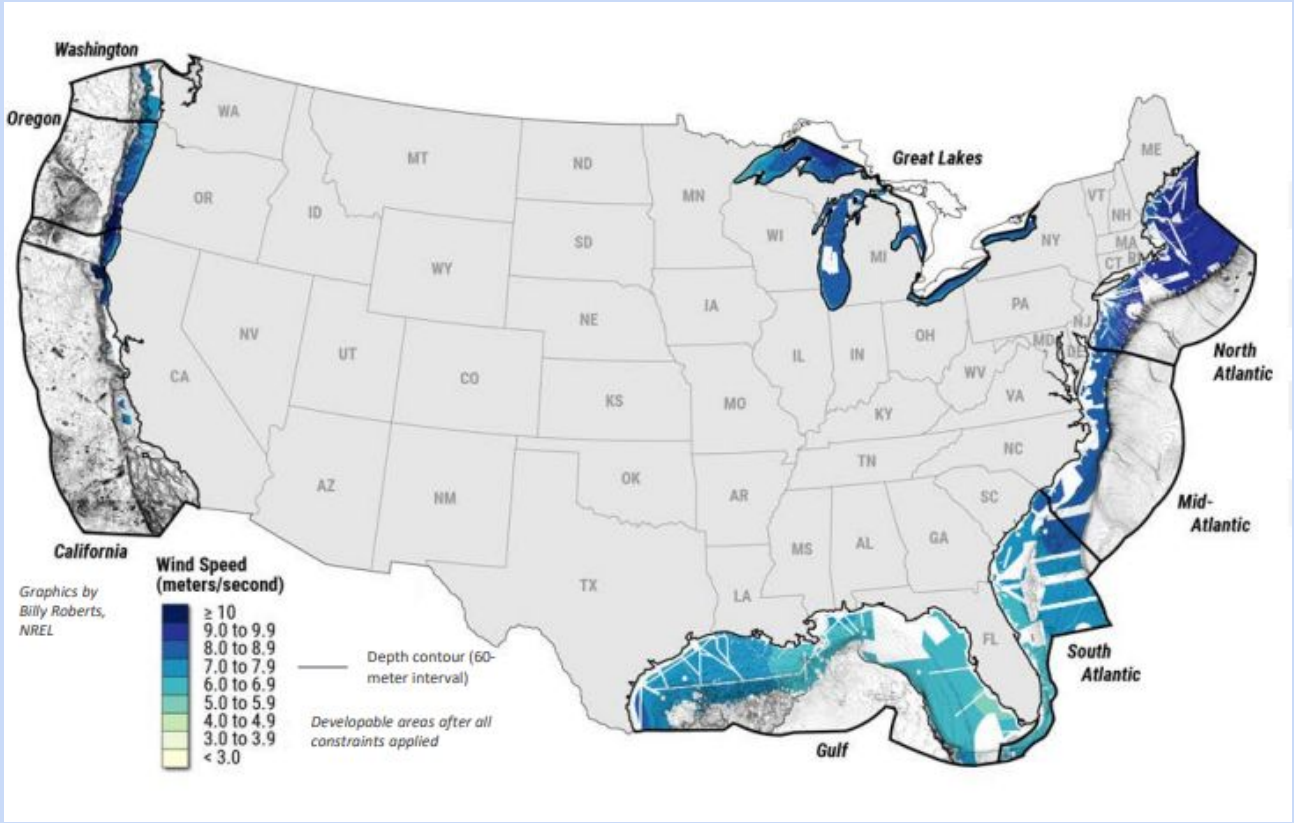
Offshore Wind Energy Technical Potential for the Contiguous United States (NREL, 2022)



Total OSW Energy Technical Capacity Potential (*accounts for siting constraints*):

1,476 GW potential for fixed-bottom

2,773 GW for floating potential

1 GW = 1000 MW

Map from [Offshore Wind Energy Technical Potential for the Contiguous United States (nrel.gov)]

NREL Report Review: The Cost of Offshore Wind Energy in the United States from 2025 to 2050

Authors: Rebecca Fuchs, Gabriel R. Zuckerman, Patrick Duffy, Matt Shields, Walt Musial, Philipp Beiter, Aubryn Cooperman, and Sophie Bredenkamp

Background

- Prior to 2021: decrease in LCOE of ~50% from 2014-2021
- 2021-present: large cost increases due to supply chain constraints and inflation
- Higher OREC prices requested by developers to their purchasers (states)→leads to cancellation of OREC agreements, and (sometimes) rebidding by states

Purpose

- The National Renewable Energy Laboratory (NREL) is a national lab of DOE, conducts energy research
- NREL was commissioned by BOEM to assess how the current status of OSW prices might influence future costs of development
- Results may be used to inform marine spatial planning, RPS development, etc.

*It is important for the offshore wind sector to understand both near- and longer-term **impacts of cost pressures** to continue strategically developing the industry with the momentum these activities have generated (pg vi)*

LCOE

Levelized cost of energy (LCOE) = the **average unit cost of energy** over an electricity plant's lifetime; expressed in $/MWh

- Can compare costs between different renewable energy types
- LCOE values in this report are estimates for **broad scales** of space and time

Report calculations *do not* include:

- Stakeholder or environmental considerations
- Detailed supply chain assessment
- Effects of climate change on wind resource
- Potential costs of upgrading ports or points of interconnection
- Direct project subsidies (ITC)
- Regional variation in labor rates

How LCOE is calculated

LCOE =

Base-year cost calculation

- Wind resource assessments
- Infrastructure data
- Technology trends

+

Project cost trajectories

- Long-term projections: based on global industry
- Near-term corrections:
  - supply chain disruptions
  - Inflation
  - Rising interest rates

Authors use multiple scenarios to help decision makers plan for different possibilities

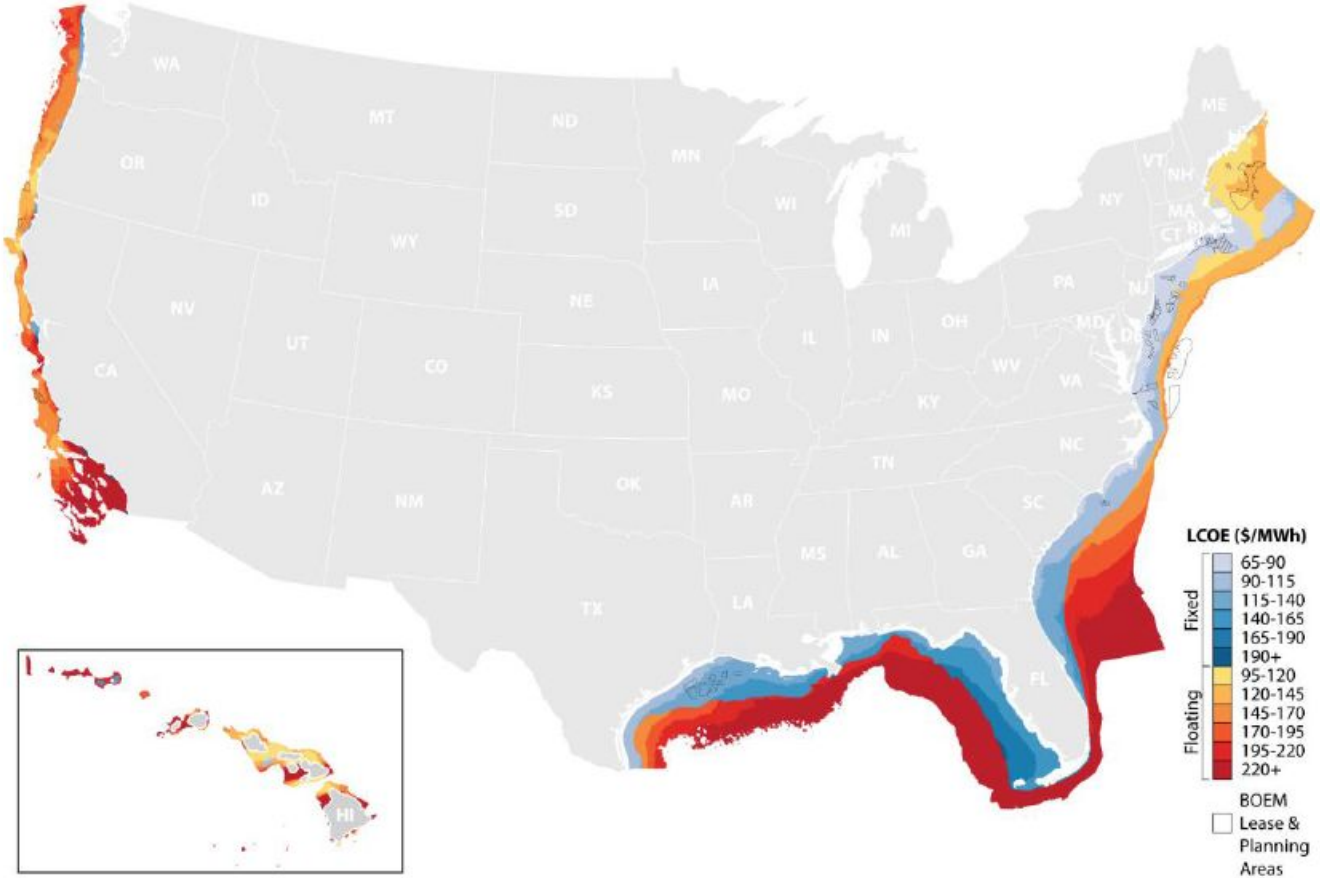


Figure ES-2. National LCOE ($/megawatt-hour [MWh]) for 2035 in 2022 U.S. dollars. *Figure from Gabriel R. Zuckerman, NREL*

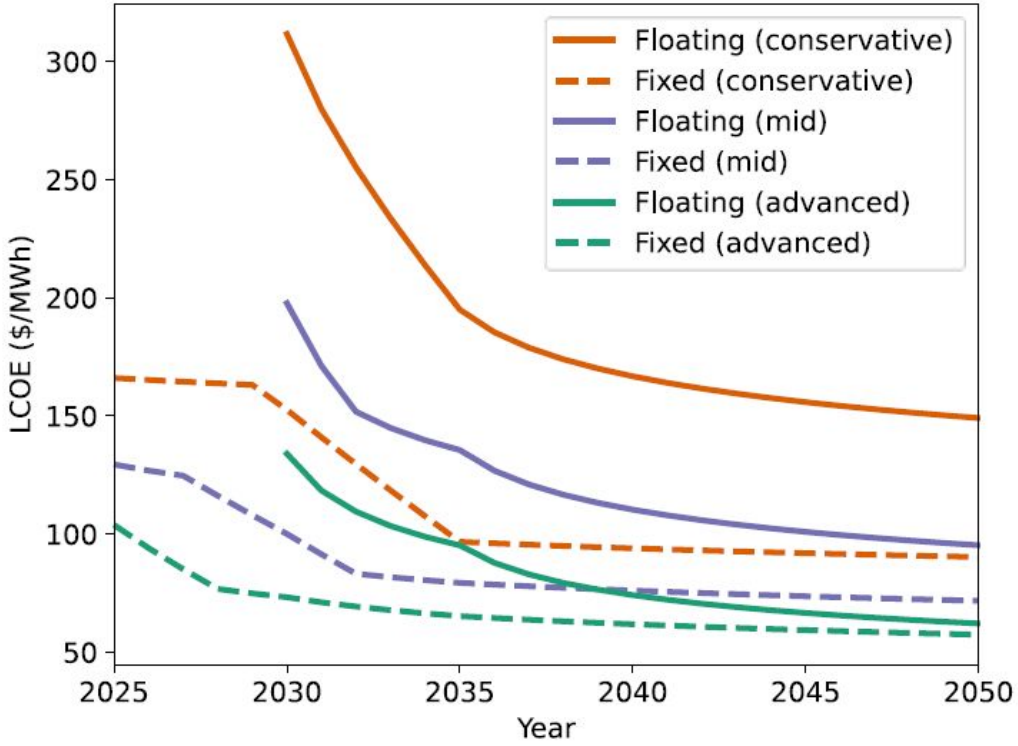


Figure ES-3. LCOE ($/MWh) for reference fixed-bottom and floating offshore wind projects.

Note: LCOE values are calculated at the point of interconnection.

East Coast fixed-bottom project: **$129/MWh** for commercial operation in **2025** (mid scenario)

- Further decreases possible under mid scenario by 2035 and 2050 as industry matures

Key Takeaways

- Reported OSW project cost **increases** of ~50% since end of 2020
- **Progress** in offtake agreements, federal permitting approvals, expanded leasing plans
- Near-term trends in inflation, interest rates, and supply chain bottlenecks are **highly uncertain**
- Generally expect **decrease in prices** over time as industry matures