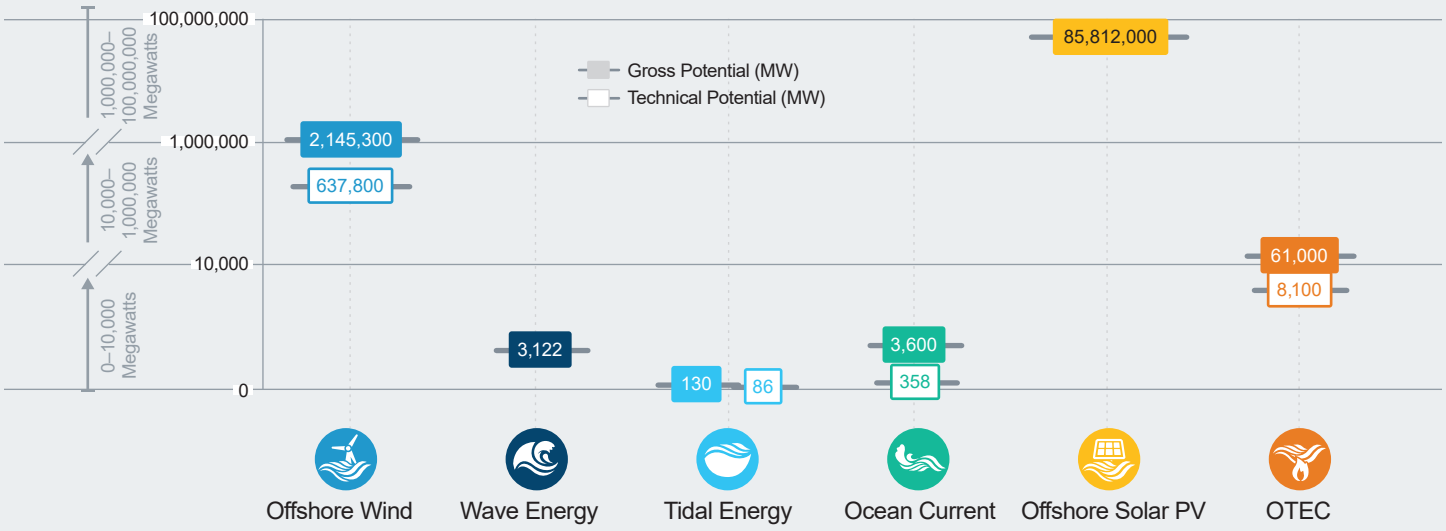
BOEM
Bureau of Ocean Energy Management

FACT SHEET

Offshore Renewable Energy Technologies in the Gulf of Mexico

During a study funded by the Bureau of Ocean Energy Management (BOEM), researchers from the National Renewable Energy Laboratory (NREL) analyzed the following offshore renewable energy technologies to determine which are best suited for development in the Gulf of Mexico. As offshore wind showed the most resource adequacy in the Gulf of Mexico region, and is technologically mature, the study concluded that a site-specific economic analysis of offshore wind in the Gulf of Mexico was warranted.

Technology Type	Resource Adequacy	Tech Readiness	LCOE Range
Offshore Wind	HIGH	MATURE	$0.095/kWh to $0.19/kWh
Offshore Solar Photovoltaics (PV)	HIGH	EARLY	$0.14/kWh to $0.35/kWh
Ocean Current	MEDIUM	EARLY	$0.15/kWh to $0.38/kWh
Ocean Thermal Energy Conversion (OTEC)	MEDIUM	EARLY* *Small-scale demonstration	$0.14/kWh to $0.98/kWh
Tidal Energy	LOW	MATURE	$0.15/kWh to $0.31/kWh
Wave Energy	LOW	EARLY	$0.14/kWh to $1.00/kWh

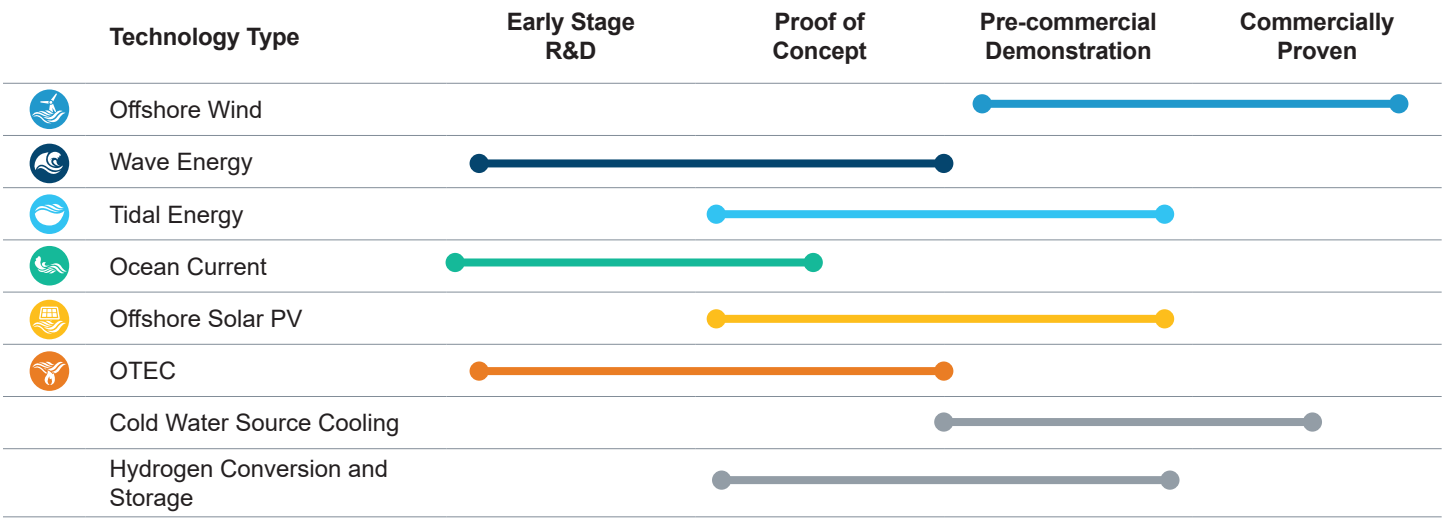


Gross and Technical Offshore Renewable Energy Potential in Megawatts (MW) for the Gulf of Mexico by Technology Type

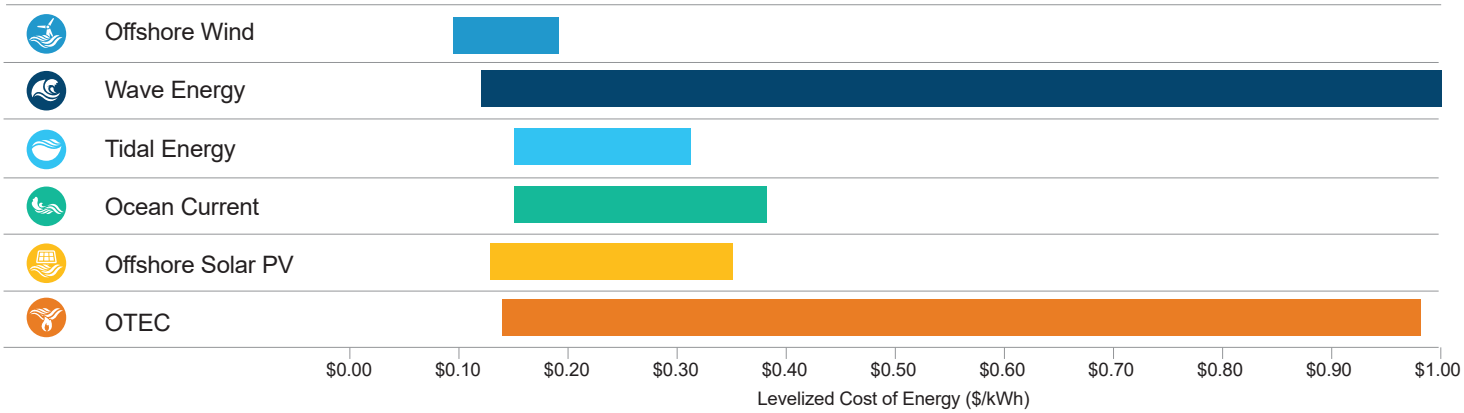
Using resource adequacy, technology readiness, and cost competitiveness to determine which technology produces the best outlook for near-term (2030) offshore renewable energy deployment in the Gulf of Mexico, offshore wind rises to the top. The technical resource potential for offshore wind is 638 gigawatts (GW), the largest of any of the technologies examined. Based on global trends, the economics for offshore wind are improving rapidly, making economic deployment of offshore wind turbines in the Gulf of Mexico likely by 2030, when costs may be approaching acceptable market levels (Beiter et al. 2017). Offshore wind technology innovation is needed to optimize energy capture in the lower wind regimes of the Gulf of Mexico, increase understanding of hurricane risk, and design machines suitable for hurricane-prone areas.

Ocean-based solar has an enormous gross resource potential in the Gulf of Mexico but is severely constrained by extreme wave conditions on the ocean surface that would likely damage conventional PV systems and support structures. State-owned sheltered bays and water bodies closer to urban load centers could better take advantage of ocean-based solar resources but this area needs more research and investment.

All other renewable energy technologies surveyed in this study may present opportunities for energy generation on a limited basis in the long term but require technological and economic improvements in the interim.



Levelized Cost Ranges for Renewable Energy Technologies



About the Bureau of Ocean Energy Management

The Bureau of Ocean Energy Management (BOEM) promotes economic development, energy independence, and environmental protection through responsible, sicience-based management of offshore conventional and renewable energy, and marine mineral resources.

For More Information

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