

Bending Wind to Green the Economy

Economic and Social Benefits of the Offshore Wind Industry

By Climate and Clean Energy Committee

This article was adapted from the Committee's full report: [Economic and Social Benefits of Offshore Wind Industry](#).

California is moving toward clean energy sources to replace dirty fossil-fuels that pollute our air and contribute to climate change. Renewable energy has the potential to create significant benefits by stimulating economic growth, generating revenue, creating jobs, improving local infrastructure and services, and providing energy security and resilience. It can also provide substantial environmental, climate, and public health benefits to California while avoiding the price volatility of fossil fuels such as natural gas.

Offshore wind (OSW) promises to be an important energy source for California as it strives to comply with its climate mandates, by replacing the need for energy generated by burning natural gas, oil, and other fossil fuels.

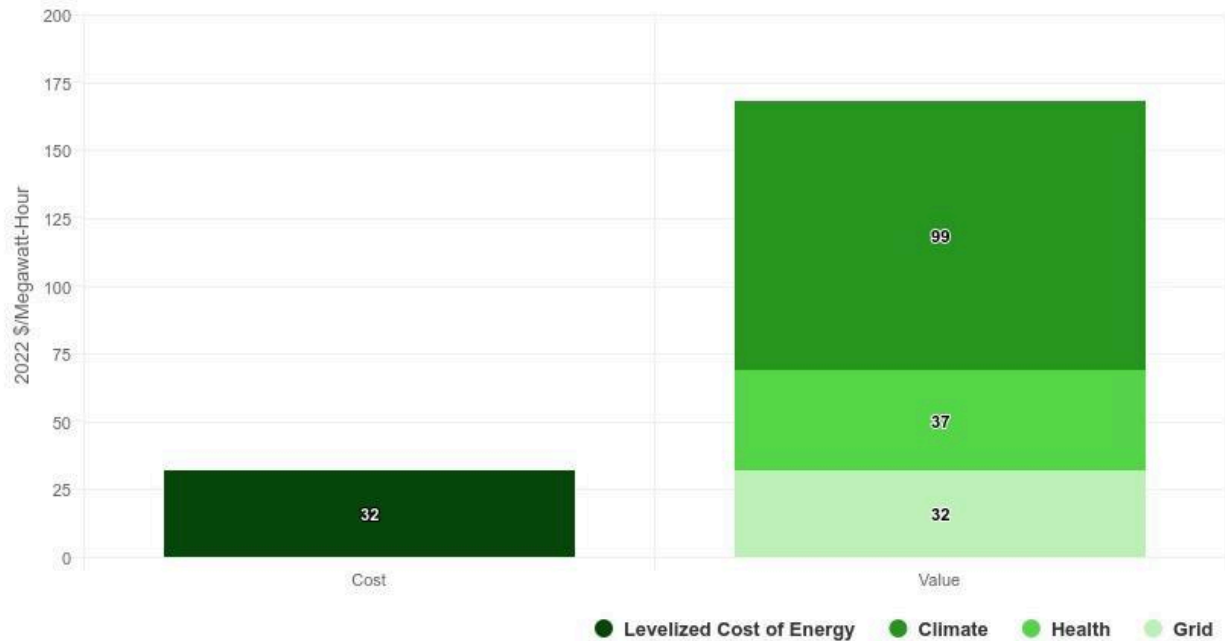
When the sun goes down, solar energy production ends, but the demand for energy doesn't. Energy storage (e.g. batteries) can help meet evening-hour demand, but currently too much early evening electricity is generated by gas peaker plants, which are mostly located in low-income communities and communities of color. With the addition of OSW, California should be able to shut down these polluting energy sources.

Economic Benefits of Offshore Wind Energy

Offshore wind is a clean and cost-effective energy source that should protect Californians from energy price shocks, contribute to climate goals by providing green energy when solar can't, and reduce the health impacts of air pollution. The chart below shows that the economic benefits (called "value" in the chart) of land-based wind energy far exceed the costs. Offshore wind energy is expected to have even greater benefits due to stronger offshore winds, and lower costs per kilowatt hour of electricity produced due to the economies of scale of the larger turbines that can be used for OSW.

2022 Costs and Benefits of U.S. Land-Based Wind Energy

These bars show the marginal health and climate benefits from new wind plants versus levelized cost of energy in 2022.



Source: Land-Based Wind Market Report: 2023 Edition, U.S. Department of Energy Wind Energy Technologies Office

Avoided Costs from Offshore Wind in California

Offshore wind most consistently offsets the demand for solar and energy storage. As the grid becomes increasingly solar saturated in future years, the amount of storage needed to shift midday solar production to meet peak evening hour demand increases. The savings from avoided investment in storage is one reason that offshore wind increases in projected value over time. Another reason is the reduction in carbon emissions when fossil fuel plants are shut down.

Job Creation

Offshore wind is expected to create a wide range of good-paying jobs in the local and regional supply chain and manufacturing sectors. Other jobs, such as dock workers, turbine maintenance, and watercraft operators will also be created. The [AB 525 Workforce Development and Readiness Plan](#) (pages 12-13), using a “medium scenario,” projects approximate annual job numbers for California of:

- ❖ 7,000 jobs during peak offshore wind construction, with many being unionized; and
- ❖ 3,000 jobs for maintenance, watercraft operation, and ocean monitoring from the commercial operation date through the expected 25-year duration of the project.

The Workforce Plan shows the total projected jobs are divided about equally between readily available workforce (e.g., skilled tradespersons and unskilled labor) and a highly skilled workforce (e.g., scientists, engineers, managers, and highly skilled trade specialists).

Creating a new workforce will yield numerous types of economic benefits as the impact of the thousands of good-paying jobs ripple throughout the state economy. Offshore wind-related income will be spent on goods and services, which supports local, regional, and greater state economies. This will bolster economic activity throughout the state but especially around large supply chain facilities where hundreds of jobs could be created. In addition to the direct benefits of creating thousands of new good-paying jobs, systemic economic benefits, such as improved quality of life, property value increases, and decreased unemployment, can also result from workforce development.

Diversified and Resilient Energy Portfolio

Offshore wind can help diversify California's energy portfolio and make it more resilient during power outages. For example, by eliminating natural gas power plants, there will be more gas available for residential and commercial use. Gas prices should then be less volatile and not subject to swings in prices that occur when peaker plants are in use.

Even accounting for recent increases in the cost of OSW development, OSW should lower electricity costs for Californians. Renewable energy sources have negligible operating expenses once installed, so they should be able to undercut the price of fossil-fuel generated electricity.

Health Benefits from Avoided Air Pollution

Gas-powered electricity generating plants contribute to air pollution and respiratory issues and typically are located in low-income communities and communities of color. Replacing these plants with OSW will lead to health benefits, especially for people living near gas plants.

Socioeconomic Benefits of Central Coast OSW Development

Central Coast OSW development will benefit job creation, the SLO County economy, and local workforce training resources. [A report by Cal Poly SLO professors](#) predicts that a 7 GW project could generate 684 annual operation jobs with 617 long-term jobs (20 years or more). The overall impact to California, including spill-over impacts to other regions, is \$3 billion for 5 years (or \$599 million per year).

Another economic benefit of OSW are the Community Benefit Agreements that OSW leaseholders are required to develop. These may include training and educational programs and requirements for local hiring that would benefit port communities and California tribes.

Offshore wind also will generate tax revenues for the local, state, and federal governments. These taxes will come from property taxes on project assets; sales tax on the purchases of materials and services; income tax on the salaries of project employees; corporate taxes; lease revenues; and a federal excise tax on electricity production.

Avoiding Environmental Impacts

Unlike oil and gas extraction, which can have a disproportionate negative impact on low-income areas and communities of color, wind farms can be placed in areas with minimal environmental impact, ensuring construction and operations do not pollute local water or air, such as:

- **Strategic Placement of Wind Farms:** Identifying areas for wind farms that minimize environmental impact on sensitive ecosystems and fisheries.
- **Port Infrastructure Upgrades:** Upgrading existing ports instead of building new ones in pristine areas can lessen environmental damage.
- **Environmental Monitoring:** Implementing measures to monitor and mitigate any potential negative impacts on marine life and ecosystems.

Conclusion

Offshore wind energy presents a compelling opportunity for California to advance its clean energy goals while stimulating economic growth and improving public health. By diversifying the state's energy portfolio and reducing reliance on fossil fuels, offshore wind can mitigate the impacts of price volatility, enhance energy security, and contribute significantly to carbon reduction targets.

The creation of a robust offshore wind industry has the potential to generate substantial economic benefits, including job creation, supply chain development, and increased tax revenue. Moreover, the industry can foster a skilled workforce, revitalize port communities, and promote equitable economic development.

While challenges remain and major investments are required, the potential rewards of offshore wind energy for California are substantial. By strategically planning and implementing offshore wind projects, the state can position itself as a leader in clean energy innovation and reap the associated environmental, economic, and social benefits.

Learn More

For current information, details, and research references on OSW economic benefits in the US, we recommend:

- [People and Economics Section of Offshore Wind Facts](#), a project of [the Special Initiative on Offshore Wind](#) (SIOW) which is funded by [Multiplier](#), a tax-exempt nonprofit 501(c)3 umbrella organization funded by private foundations that do not offer memberships, and have no contractual obligations to any members in the offshore wind sector.
- [“California Offshore Wind: Workforce Impacts and Grid Integration”](#) Berkeley Labor Center
- [Assembly Bill 525](#) (AB 525)
- The three volumes of the California Energy Commission Offshore Wind Strategic Plan, which was required by AB 525, provides economic information specific to California.
 - [Adopted Final Commission Report - Strategic Plan Volume I: Overview](#)
 - [Adopted Final Commission Report - Strategic Plan Volume II: Main Report](#)
 - [Adopted Final Commission Report - Strategic Plan Volume III: Appendices](#)