Offshore wind energy

Development of the offshore wind resource is at an early stage along California's Pacific Coast. Offshore wind turbines that are fixed to the ocean floor have been deployed in shallow waters on the East Coast and in Europe. Because the Pacific Coast waters are much deeper, turbines must be mounted on floating platforms that are tethered to the ocean floor. The technologies required to access powerful Pacific winds have recently become available, and project developers are interested to start planning the first offshore wind farms on the West Coast.

Offshore wind development offers enormous potential to help meet California's 100% clean electricity target by 2045. California's offshore wind resource has the technical potential to produce 392 TWh per year, about 150% of California's annual electricity load. The offshore wind resource near Humboldt Bay is among the best in the nation, with wind speeds often exceeding 10 meters per second at 90 meters above the ocean's surface — and even faster at heights around 120 meters, where the turbines are likely to be centered. Furthermore, offshore wind speeds have a consistent profile between different seasons and throughout the day (with a peak in the early evening), offering the ability to provide stable power throughout the year and help balance the grid as solar power goes offline at dusk.

Alongside the potential for renewable electricity generation comes a suite of auxiliary benefits and challenges. Development of offshore wind energy in California, and in particular on the north coast, requires special attention to the following areas:

- Transmission and interconnection — Development of large scale wind generation in Humboldt County will quickly exceed the capacity of the regional electrical grid. Delivering clean power from Humboldt County to larger load centers throughout

Humboldt Bay may be well situated to become a hub for installation, service, and manufacturing of offshore wind energy components. Cataloging the current condition of port infrastructure and understanding the required improvements can help local and state agencies and private sector companies plan for future port developments.

- Environmental review — Offshore wind development will require a comprehensive environmental review to understand impacts to mammals, fish, birds, plant life, and other organisms in offshore and onshore locations. Studying how ecosystems react to offshore wind farms can help us determine which methods minimize impacts to species and habitats, and whether offshore wind is compatible with this marine environment.
- Stakeholders — Development of offshore wind energy will create benefits (such as jobs) and concerns (such as impacts to other ocean resource uses) for different stakeholder groups. Conducting outreach with stakeholders can help inform strategies to manage potential conflicts and create overlapping benefits for different groups.

Current projects

To better understand the potential of offshore wind for the northern California coast, we are conducting a feasibility analysis funded by California's Ocean Protection Council:

- Offshore wind feasibility study for the northern CA coast

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