SENATE COMMITTEE ON ENERGY, UTILITIES AND COMMUNICATIONS
Senator Ben Hueso, Chair
2021 - 2022 Regular

Bill No:	AB 525	**Hearing Date:**	7/5/2021
Author:	Chiu		
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Urgency:	No	**Fiscal:**	Yes
Consultant:	Nidia Bautista		

SUBJECT: Energy: offshore wind generation

DIGEST: This bill requires the California Energy Commission (CEC) to establish, by March 1, 2022, planning goals for the years 2030 and 2045 from electricity generated by offshore wind (OSW). This bill requires the CEC, in coordination with specified agencies, to develop a strategic plan, as specified, for OSW developments and to submit the plan to the Natural Resources Agency (NRA) and the Legislature by December 31, 2022.

ANALYSIS:

Existing law:

1) Establishes the 100 Percent Clean Energy Act of 2018 as a policy of the state that eligible renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. Requires the California Public Utilities Commission (CPUC), State Energy Resources Conservation and Development Commission (Energy Commission(CEC)), and State Air Resources Board (CARB) to, as part of a public process, issue a joint report to the Legislature by January 1, 2021, and every four years thereafter, that includes specified information relating to the implementation of the policy. (Public Utilities Code §454.53)

2) Requires the CPUC and the CEC to undertake various actions in furtherance of meeting the state's clean energy and pollution reduction objectives. (Public Utilities Code §400)

3) Establishes the California Renewable Portfolio Standard (RPS) Program which requires investor-owned utilities (IOUs), publicly owned utilities (POUs), community choice aggregators (CCAs), and energy service providers (ESPs) to increase purchases of renewable energy such that they each procure a minimum quantity of electricity products from eligible renewable energy resources, as

defined, so that the total kilowatt hours (kWh) of those products sold to their retail end-use customers achieves 25 percent of retail sales by December 31, 2016, 33 percent by December 31, 2020, 44 percent by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030. (Public Utilities Code §§399.11, 399.13, 399.15, 399.30)

4) Defines a "renewable electrical generation facility" as one that, among other requirements, uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts (MW) or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and any additions or enhancements to the facility using that technology. (Public Resources Code §25741)

5) Establishes, as part of the Warren-Alquist State Energy Resources Conservation and Development Act, the CEC and grants the CEC the exclusive authority to certify any stationary or floating electrical generating facility using any source of thermal energy, with a generating capacity of 50 MW or more, and any facilities appurtenant thereto. (Public Resources Code §25000 *et. seq*.)

6) Authorizes the United States Secretary of the Interior, in consultation with other federal agencies, with the granting of leases, easements, or rights-of-way on the outer Continental Shelf for offshore energy development. (Energy Policy Act of 2005, 42 U.S.C. §388)

This bill:

1) Requires the CEC, on or before March 1, 2022, to evaluate and quantify the maximum feasible capacity of offshore wind to achieve reliability, ratepayer, employment, and decarbonization benefits, and to establish OSW planning goals for 2030 and 2045, as specified.

2) Requires the CEC, in coordination with specified agencies, to develop a strategic plan for offshore wind energy developments installed off the California coast in federal waters, as specified requires the plan to include the following four chapters:

   a) *Identification of sea space.* Requires the CEC to coordinate with the California Coastal Commission (CCC), Department of Fish and Wildlife (DFW), Ocean Protection Council (OPC), and State Lands Commission (SLC), and work with stakeholders, other agencies, and the OSW industry to identify sea space sufficient to accommodate the CEC's OSW planning goals for 2030 and 2045.

b) *Economic and workforce development and identification of port space and infrastructure.* Requires the CEC to coordinate with relevant state and local agencies to develop a plan to improve waterfront facilities to support OSW manufacturing, construction, assembly, operation, and maintenance.

c) *Transmission planning.* Requires the CEC to consult with the CPUC and California Independent System Operator (CAISO) to assess the transmission upgrades, including potential subsea transmission options, necessary to support the CEC's OSW planning goals for 2030 and 2045, as specified.

d) *Permitting.* Requires the CEC to convene a working group including all relevant local, state, and federal agencies, as well as interested California Native American tribes, to collectively develop guidelines, timeframes, and milestones for a coordinated, comprehensive, and efficient permitting process for OSW facilities and associated electricity and transmission infrastructure.

3) Requires the CEC to submit the strategic plan to the NRA and the Legislature on or before December 31, 2022.

Background

Offshore Wind potential. Over the last four decades, California has advanced land-based wind energy. As of 2019, almost six gigawatts (GW) of installed wind capacity was generating in the state, the fifth largest amount of wind capacity in the United States. Although California has no commercial OSW generation, the National Renewable Energy Laboratory has identified 200 GW of OSW technical potential for California. However, approximately 96 percent of this potential is located in water deeper than 60 meters, where the mature, fixed-bottom turbine technology is not technically feasible. Off the coast of California, a steep continental shelf and increased wind speeds combine to make floating turbines the primary technically feasible option.

Floating turbines employ mooring (cabling) and an anchored substructure underwater which steadies a platform holding the wind turbine above water. The use of cabling to anchor the turbine allows floating platforms to operate at depths between 60 and 1,300 meters. Depending on the type of floating structure, some assemblage of floating turbines may need to occur offshore, requiring naval cranes and vessels to stabilize such operations, and port infrastructure and specific port water depths.

In contrast, most of the development of OSW globally has occurred via fixed turbine technologies where the turbines are anchored to the seabed through a solid foundation. These designs prevent dynamic motion and do not allow the facility to move significantly in response to wave or wind pressures. Fixed foundations typically exhibit a maximum usable water depth of 50 to 60 meters; beyond this depth, fixed wind designs are generally not economically or technically feasible.

Many East Coast states and foreign countries have developed OSW projects employing fixed foundation turbines. The first was a 0.45 MW farm off the Danish coast in 1991. Since that early project, three markets – the United Kingdom, Germany, and China – account for 82.1 percent of the global installed capacity. In the United States, OSW development is driven by a collection of eight East Coast states including New York, Massachusetts, and New Jersey, which account for at least 22.5 GW of project commitments through 2035. Nearly all project proposals are sited in federal waters – which start three nautical miles from shore out to 200 nautical miles – and fall under the jurisdiction of the federal Bureau of Ocean Energy Management (BOEM). They are all fixed foundation projects.

In total, BOEM has designated 13 active call areas in the United States. Call areas are regions of the ocean designated by BOEM as potential areas for OSW development. In total, these BOEM-designated call areas are estimated to have an energy resource potential of about 21 GW. These areas may be leased through an auction following a call for nominations, a formalized process to gauge interest from potential developers. In California, BOEM identified three call areas in 2018 as potentially suitable for OSW energy leasing: the Humboldt Call Area, the Morro Bay Call Area, and the Diablo Canyon Call Area. These three call areas are currently under consideration for OSW energy development. While there is a significant potential for OSW development off the California coast, considerable barriers remain. Among the challenges are significant transmission requirements and competing coastal uses, including shipping, fishing, recreation, marine conservation, and Department of Defense activities, especially those of the United States Navy.

Federal Action on OSW. OSW industry development is driven primarily by the technology's potential to decarbonize the electric power system, additional drivers on the East Coast include demand for low carbon resources near large, coastal load centers, and constraints on land availability. The primary support for OSW rollout in the United States has been an investment tax credit (ITC; 12 percent in 2019) that in late 2020 was extended through 2021. Also in late 2020, Congress established a 30 percent ITC for any OSW project that begins

construction by December 31, 2025 or began construction before January 1, 2017. Once qualified, the project has several years to reach completion.

Biden White House. On March 29, 2021, the White House announced actions to spur the development of OSW energy projects. These actions include establishing a national target to deploy 30 GW of OSW by 2030; investing $230 million for port and infrastructure projects to bolster OSW development; providing access for OSW projects to the Department of Energy's loan programs office; funding research and development projects to study the impacts and challenges of OSW; and establishing a new BOEM call area off the New York-New Jersey coast.

On March 31, 2021, the White House announced its American Jobs Plan, which included a call to Congress for approximately $15 billion for demonstration projects of climate research and development priorities, including floating OSW. Congress is still in the midst of considering this appropriation.

California Action on OSW. In October of 2016, The BOEM–California Intergovernmental Renewable Energy Task Force was created as a partnership of state, local, and federal agencies, including the CEC, BOEM, and tribal governments. The Task Force promotes coordination and communication among these entities on potential offshore leases for research or commercial development off the California coast. One of the first public meetings of the Task Force was held in April 2017 in San Luis Obispo to share offshore wind planning activities with the local community. Many public meetings and workshops on OSW have been held by the CEC since, with a recent Task Force meeting held on June 24, 2021.

In 2019, the CEC's Energy Research and Development Division began to assess research, development, and deployment opportunities to support cost-effective wind development off the California coast. A final report was released in August 2020 and focused on identifying opportunities to remove or reduce technological, manufacturing, logistics, and supply chain barriers to deployment; lower the development risk of offshore energy projects; and identify opportunities for early pilot demonstration projects. As part of the study, the project team developed a Research Database that aggregates publicly announced OSW research efforts. The majority of the projects in the database are funded by the federal government.

SB 100's Joint Agency Report. In 2018, the Legislature adopted SB 100 (De León, Chapter 312, Statutes of 2018) that established a target for renewable and zero-carbon resources to supply 100 percent of retail sales and electricity serving all state agencies by 2045. The statute calls upon the CPUC, CEC, and

CARB (collectively, the Joint Agencies) to use programs under existing law to achieve this policy and issue a joint policy report. The Joint Agency report was finalized on March 15, 2021, and notes it "is intended to be a first step in an iterative and ongoing effort to assess barriers and opportunities to implementing the 100 percent clean electricity policy." Unlike the CPUC Integrated Resources Plan (IRP) process, which forecasts system needs out for 10 years, the Joint Agency report forecasts system needs out 24 years, to 2045. However, the report notes "the preliminary findings [in the report] are intended to inform state planning and are not intended as a comprehensive *nor prescriptive* roadmap to 2045…future work will delve deeper into critical topics such as system reliability and land use and further address energy equity and workforce needs."

OSW was included as part of the core scenario in the Joint Agency report. he OSW system availability was limited to 10 GW over four resource zones: Morro Bay, Diablo Canyon, Humboldt Bay, and Cape Mendocino. The model was given an input assumption of 2030 as the first available year for bringing OSW online, given the current CAISO interconnection queue and resource development needs of OSW, with costs for the different zones estimated between $69 and $82 per MW hour (MWh) for 2030. Given these input assumptions, nearly all 10 GW of OSW was selected when made available in the model. But this selection only occurred after 2035, regardless of the scenario, with the full 10 GW selected only in 2045.

The Joint Agency report likewise evaluated scenarios where no new out-of-state wind or OSW were selected. In these scenarios where wind resources are not available, the model selects increased geothermal capacity, with utility-scale solar and battery storage meeting the remaining energy system needs. These scenarios result in an additional 22 GW of solar capacity and 15 GW of storage capacity coming online, rather than 10 GW of OSW and 8.2 GW of out-of-state wind.

Integrated Resources Plan (IRP). More recently, the CPUC's recent decision procurement to address on mid-term reliability, specifically the years 2023-26, notes recent developments on OSW. Specifically, the decision now references the announcement made by Governor Newsom and the Biden Administration with a plan to develop OSW resources as a positive development. The decision also notes that OSW is an eligible resource in the decision, but it will also be addressed more fully in the next IRP decision by the end of the year.

AB 525. This bill attempts to develop a strategic plan in preparation for advancing the development of OSW on the coast of California. The strategic plan includes

the relevant agencies and stakeholders – which are many from federal to multiple state agencies, to local agencies, industry, and the public! The bill requires the CEC, by March 1, 2022, presumably two months from the time this bill would be enacted, to assess the maximum capacity OSW to achieve the goals for 2030 and 2045. Such an ambitious timeline presumes some of this work is already in process by the CEC. Given the announcements by the governor, California is no doubt seeking to position itself to benefit from the recent federal announcements to support OSW development. The Senate Committee on Appropriations may wish to consider whether the CEC's resources are sufficient to meet this timeline, as well as the timeline to develop the strategic plan – December 31, 2022. Appropriately, this bill does not prescribe any specific procurement requirements, given the complexities of OSW as a new commercial energy resource for California and its uncertain costs and resource profile. However, the strategic plan and related activities would seem to help better inform the potential of OSW as part of California's energy procurement to achieve its decarbonization and reliability goals.

Prior/Related Legislation

SB 413 (McGuire, 2021) among its provisions, the bill would require the CEC, in consultation with the Offshore Wind Project Certification, Fisheries, Community, and Indigenous Peoples Advisory Committee (created by the bill), to establish a process for the certification of OSW generation facilities that is analogous to the existing requirements for certification of thermal powerplants, and would make the CEC the exclusive authority for the certification of offshore wind generation facilities.

AB 1371 (Cunningham, 2019) would have required the CPUC to determine appropriate targets for the procurement of OSW generation on behalf of retail end-use customers of California retail sellers in order to meet the state's RPS and zero-carbon goals.

SB 100 (De León, Chapter 312, Statutes of 2018) established the 100 Percent Clean Energy Act of 2017 which increases the RPS requirement from 50 percent by 2030 to 60 percent, and creates the policy of planning to meet all of the state's retail electricity supply with a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100 percent clean energy.

SB 350 (De León, Chapter 547, Statutes of 2015), among its many provisions, required the CPUC to adopt a process for each LSE to file an IRP starting in 2017 and updating periodically. Additionally required POUs to also file an IRP by January 1, 2019.

FISCAL EFFECT: Appropriation: No Fiscal Com.: Yes Local: No

SUPPORT:

California State Lieutenant Governor Eleni Kounalakis, Co-sponsor
Environment California, Co-sponsor
State Building and Construction Trades Council, Co-sponsor
350 Bay Area Action
350 Humboldt
350 Sacramento
350 Silicon Valley
350 Ventura County Climate Hub
Aker Offshore Wind
Alliance for Nuclear Responsibility
Alliance of Nurses for Healthy Environments
American Clean Power, California
Audubon California
Avocado Green Brands
BlueGreen Alliance
bp America
Brightline Defense
Burton
Business Network for Offshore Wind
California Association of Port Authorities
California League of Conservation Voters
California Legislative Conference of the Plumbing, Heating, and Piping Industry
California-Nevada Conference of Operating Engineers
California State Association of Electrical Workers
California State Council of Laborers
California Wind Energy Association
Castle Wind LLC
Ceres
Clean Power Campaign
Coalition of California Utility Employees
County of San Luis Obispo
DARE Strategies LLC
Democratic Party of Contra Costa County
Democratic Party of the San Fernando Valley
Dignity Health
E2

East Bay Community Energy
ECOS
EDF Renewables
Elders Climate Action, NorCal Chapter
Elders Climate Action, SoCal Chapter
Emerald Cities Collaborative Bay Area
Environmental Working Group
Equinor
Gap, Inc.
Humboldt Bay Harbor, Recreation, & Conservation District
Humbodlt County
Independent Energy Producers Association
International Brotherhood of Boilermakers
International Brotherhood of Electrical Workers, Local 302
Magellan Wind
Mainstream Renewable Power
Marin Clean Energy
National Electrical Contractors Association
Natural Resources Defense Council
Northern California Carpenters Regional Council
Numi Organic Tea
OceanWinds
Offshore Wind California
Orsted
Pacific Ocean Energy Trust
Principle Power
Redwood coast Energy Authority
RWE
Salesforce
Sierra Club California
Sierra Nevada Brewing Company
Silicon Valley Democratic Club
Silicon Valley Youth Climate Action
The Climate Center
The Nature Conservancy
Unilever United States
Union of Concerned Scientists
VF Corporation
West Oakland Environmental Indicators Project
Workday

OPPOSITION:

None received

ARGUMENTS IN SUPPORT: According to the author:

> AB 525 would further the state's goal of 100% clean energy by 2045 by planning for the development of utility-scale offshore wind energy in the state. On the east coast, states have set a total of 29 GW worth of offshore wind development goals, resulting in 16 projects under contract and counting. President Biden has made offshore wind a priority, with a goal of doubling offshore wind energy nationally. On May 25th, the President announced a plan to move forward with leasing in two areas off the California coast in Morro Bay and Humboldt capable of supporting a combined 4.6 GW of offshore wind. This is a big step, but we need complimentary state planning for California to catch up and become a potential leader in the floating offshore wind industry globally.
> Offshore wind could create over ten thousand jobs in the green economy and accelerate progress toward the State's clean energy requirements.
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> California needs to build a diverse fleet of renewables on land and in the ocean to decarbonize the electric system reliably and affordably. One of the biggest challenges for California's current renewable energy sector is supplying consumers with consistent clean power due to the intermittent production of solar. Solar energy tapers off in the late afternoon and evening, just as people return home and are consuming more energy. Offshore wind typically produces energy in the evening and throughout the night. Thus, solar and wind are complimentary, and we will need large quantities of both energy sources for a clean and reliable electric system.
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> Offshore wind development in California has the potential to create a significant number of new labor-fueled jobs. Offshore wind development will create an opportunity to train a new generation of workers to perform high-quality, skilled jobs in manufacturing, construction, maintenance, and operations.

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