MEMORANDUM

November 9, 2023

TO: MEMBERS, PORT COMMISSION
Hon. Kimberly Brandon, President
Hon. Willie Adams, Vice President
Hon. Gail Gilman
Hon. Steven Lee
Hon. Ed Harrington

FROM: Elaine Forbes
Executive Director

SUBJECT: Informational update to the Port Commission on staff's efforts and paths to support offshore wind energy deployment off the California coast in federal waters.

DIRECTOR'S RECOMMENDATION: Information Only – No Action Required

---

EXECUTIVE SUMMARY

Pursuant to California State Assembly Bill 525 (AB 525), the California Energy Commission (CEC) has submitted a report to the California Natural Resources Agency and State Legislature setting forth a strategic plan for California's installation of offshore wind energy developments in federal waters.

The strategic plan recognizes the importance of seaports (or ports) and waterfront facilities for the development of new offshore wind industry in California and as an important driver of economic benefits, including jobs and economic growth opportunities. California ports have the potential to serve as strategic hubs to support a workforce that can assemble, fabricate, install, operate, and maintain offshore wind turbines and related components.

In April of 2023, staff informed the Port Commission about the offshore wind efforts in California and activities that staff has undertaken to position the Port to participate in this nascent industry.

In addition to a general update on the offshore wind industry in California, this staff report provides an update on the Port's actions since the April 2023 presentation, identification of Pier 94/96 as a location for floating turbine foundation and component manufacturing, and intended next steps.

BACKGROUND

On September 23, 2021, Governor Gavin Newsom signed into law Assembly Bill 525 (AB 525) which took effect January 1, 2022. Pursuant to AB 525, the California Energy Commission (CEC) in coordination with a wide variety of stakeholders submitted a strategic plan to the California Natural Resources Agency (CNRA) and the Legislature addressing several issues, including:

- Identification of suitable sea space for wind energy areas in federal waters sufficient to accommodate the offshore wind planning goals for 2030 (2-5 GW) and 2045 (25 GW);
- Economic and workforce development;
- A plan to improve waterfront facilities that could support a range of floating offshore wind energy development activities;
- Transmission planning, to include an assessment, in consultation with the California Public Utilities Commission (CPUC) and the California Independent System Operator, of the transmission investments and upgrades necessary to support the offshore wind planning goals for 2030 and 2045;
- Permitting, to include the permitting roadmap discussed separately below; and
- Information on potential impacts on coastal resources, fisheries, Native American and Indigenous peoples, and national defense, as well as strategies for addressing those potential impacts

As part of the AB 525 strategic plan, the California State Lands Commission issued a strategic plan analyzing available port lands and the necessary investments to improve waterfront facilities for the offshore wind industry. Port staff worked diligently to engage with CSLC staff and provide information regarding the Port of San Francisco's potential contribution to the offshore wind effort. As a result of these efforts, the strategic plan identified the Port as one of several facilities that are well-positioned to play a supporting role in the deployment of the offshore wind industry in California.

The legislative findings for AB 525 recognize the potential for the development of offshore wind energy at scale to advance California's progress toward its renewable energy and climate mandates and to provide substantial economic and environmental benefits to the state and nation. They further state that offshore wind energy presents an opportunity for California to attract investment capital and provide economic and workforce development benefits to communities. This can occur through the development and preservation of a skilled and trained workforce, the creation of long-term jobs, and support for the development of an offshore wind energy supply chain.

CALIFORNIA'S BLUEPRINT FOR OFFSHORE WIND ENERGY DEVELOPMENT

AB 525 establishes the analytical framework for offshore wind energy development off the California coast in federal waters.

To construct floating offshore wind turbines, turbine components will need to be fabricated, assembled, and transported from onshore ports to the offshore wind call areas. Existing port infrastructure on the West Coast is not adequate to support these activities, and significant investment is required to develop potential offshore wind port sites. Since the passage of AB 525, Port staff has participated in numerous meetings with state and federal representatives, offshore wind industry experts, and California port authorities to monitor and track developments related to the offshore wind industry.

The Port of San Francisco has been identified by AB 525 reports as a potential manufacturing and fabrication site for offshore wind turbine components. Possible uses for Port lands include construction of floating foundations, mooring cable fabrication, turbine component manufacturing, and workforce training.

LIKELY DEPLOYMENT IN THE LATE 2020S OR EARLY 2030S

As floating offshore wind energy develops off the coast of California, ports and waterfront facilities will play an essential supporting role in realizing the economic benefits of developing this resource. Significant investments are needed to upgrade and expand California's existing port facilities and waterfront infrastructure to support a broad range of offshore wind development activities, including but not limited to the assembly, fabrication, installation, and maintenance of offshore wind turbines and related components. The construction of new facilities may also be needed.

Table 1 identifies a potential deployment schedule for offshore wind resources off the California coast used in a recent study to assess port facility needs. Under these scenarios, California may require more than 10 port terminal sites to support the full offshore wind supply chain needed to meet the 25 GW by 2045 goal.

This could require a multi-port strategy, with sites varying in size (from 5 acres to more than 100 acres) and use: staging and integration, manufacturing of turbine components and floating foundations, and operations and maintenance. The development of port facilities and waterfront infrastructure should consider technology changes and the projected increase in the size of offshore wind components over time so that waterfront facilities and infrastructure can meet the needs of a growing industry. Port staff will continue to meet with state, federal, and industry stakeholders to support a successful launch of the industry.

Table 1: Potential Rates of Offshore Wind Deployment off the California coast

Year	Target Deployment				
	Low		Medium	High	
Rate	0.5 GW/yr	1 GW/yr	1.5 GW/yr	2 GW/yr	2.5 GW/yr
2030	1 GW	2 GW	**3 GW**	4 GW	5 GW
2035	3.5 GW	7 GW	10.5 GW	14 GW	17.5 GW
2038	5 GW	10 GW	15 GW	20 GW	25 GW
2045	8.5 GW	17 GW	**25 GW**	34 GW	42.5 GW
2048	10 GW	20 GW	30 GW	40 GW	50 GW
2050	11 GW	23 GW	33 GW	44 GW	55 GW

Source: Moffat & Nichol, 2022

CADEMO

The CADEMO (California Demonstration) project intends to kick-start the offshore wind industry on the U.S. West Coast by piloting a deployment of four wind turbines in state waters, well ahead of the much larger, multi-gigawatt deployments in federal waters, generating information and lessons learned for future, larger developments. The demonstration project will be situated off the Santa Barbara County coast, just west of the Vandenberg Space Force Base, and will be comprised of four turbines producing 60 MW of renewable energy.

CADEMO aims to have the project operational by 2026, providing a new source of renewable energy for the California market. The demonstration project is further intended to explore workforce development and local industry opportunities, essential for sustainable and responsible development.

Port staff has met with CADEMO's project team in support of the project and to emphasize the project's alignment with the Port's mission and portfolio objectives. Based on these discussions, CADEMO has included the Port as a potential location for fabrication of floating wind turbine foundations in its notice of preparation of an Environmental Impact Report (EIR). After consulting with State Lands Commission staff, Port staff agreed to this inclusion and allowed for further study of the potential use. The Port advised CADEMO that a lease would be required for this proposed use of Port property, subject to the approval of the Port Commission.

State Lands Commission staff are in the early stages of the EIR review process for the demonstration project. On September 26, 2022, the State Lands Commission posted a Request for Qualifications Notice to solicit environmental consultants for the preparation of an EIR. In 2023, CADEMO submitted its environmental impact application for the construction, operation, maintenance, and decommissioning of a floating offshore wind electrical generation facility to the State Lands Commission. The application names the Port of San Francisco as a location for the construction of floating platforms. Port staff

remains engaged with CADEMO in determining the feasibility of CADEMO's proposed demonstration and its compatibility with the Port of San Francisco.

PORT STAFF ANALYSIS AND ENGINEERING WORK TO DATE

Port Executive, Engineering, Maritime, and Legislative Affairs staff have engaged with a range of stakeholders to learn more about the offshore wind energy opportunity. Based on information shared by potential developers, Bureau of Ocean Energy Management (BOEM), and CEC staffers, the Port of San Francisco is well situated to compete for a key role in the development of the California offshore wind industry based on several key attributes, including but not limited to:

- Deep water berths next to available underutilized wharves at Pier 92-96 and nearby backlands;
- Potential support opportunities at other maritime assets such as Pier 80 for receiving equipment and components from ships and storage, as well as the former shipyard Pier 68 for workforce training facilities;
- Access to San Francisco and Bay Area workforce; and
- Reasonable proximity and equidistant to both Central and Northern California wind energy call areas.

To further the Port's understanding of the upgrades needed to facilitate this business opportunity, in March 2023, Port Engineering contracted with Moffatt & Nichol, through the Port's engineering on-call contract, to provide a conceptual analysis of the Port's role in the offshore wind industry. Pier 94 and Pier 96 were the focus of this analysis, reviewing the site's potential for serving California's renewable energy goals.

Moffatt & Nichol's contracted efforts included:

- Review of existing and historic data
- Comprehensive outreach effort to the offshore wind industry
- Site use study
- Preliminary assessment of required permitting and regulatory approvals
- Site-specific conceptual engineering including a cost estimate and schedule

Over the past six months, Port Engineering, Maritime, Planning, and Legislative Affairs divisions have worked closely with the Moffatt & Nichol team on the efforts listed above. Outreach was led by Moffatt & Nichol and attended by these Port divisions, and included meetings with over twenty offshore wind developers, operators, manufacturers, West Coast ports, and federal and state government agencies. Design criteria were refined through this outreach and used to inform a site use recommendation.

The Moffatt & Nichol report suggests the best offshore wind industry use of Pier 94 and Pier 96 would be as a wind turbine component manufacturing site and the National Renewable Energy Laboratory's (NREL) 2022 U.S. Offshore Wind Workforce Assessment reports the largest number of local jobs can be provided using the site as a manufacturing facility of floating offshore wind platforms, specifically. The AB 525 strategic plan states that at least four foundation manufacturing sites are necessary for the state to meet

California's 2045 offshore wind energy goal, and, if met, by the early 2030s there would potentially be a wind turbine supply chain workforce demand of approximately 1,000 workers in the Bay Area.

To prepare Pier 94 and Pier 96 for this use, the Moffatt & Nichol report assessed site grading and stabilization, wharf strengthening, and utility needs that must be provided for safe and efficient offshore wind manufacturing operations. The Moffatt & Nichol's report suggests at least three years of design and permitting, and three years of construction, with a preliminary cost estimate of $900 million. This work includes a new 1,550-foot heavy lift wharf and 95 acres of heavy lift uplands area for operations. These port infrastructure assets would be unique on the West Coast and could open the Port to other long-term business opportunities. The report is attached herein.

COMMUNITY ENGAGEMENT

In June of this year, Port staff made a presentation before the Southern Advisory Committee (SAC). Overall, comments and questions received from the SAC were positive and staff advised the SAC that community stakeholder engagement will continue throughout the Port's effort in exploring the feasibility of OSW opportunities in San Francisco.

NEXT STEPS

- Ongoing Stakeholder Engagement
- Review and Analysis of CEC Strategic Plan
- Pursue State and Federal Grant Opportunities to pursue design and construction of needed facility improvements on an incremental basis

RECOMMENDATION

Port staff proposes to continue exploring utilization of Port facilities to support California's offshore wind development, subject to Port Commission feedback at today's meeting.

Prepared by:	Simon Betsalel Capital Projects Manager
For:	Andre Coleman Deputy Director, Maritime

Attachments: Moffatt & Nichol – Pier 94/96 Concept Phase, Final Conceptual Report