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## **Floating Offshore Wind Manufacturing and Launch Infrastructure**

*Additional submitted attachment is included below.*

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**Public Comment on Proposition 4 Offshore Wind Port Development Program, Docket No. 26-POPD-01: Floating Offshore Wind Manufacturing and Launch Infrastructure**

Dear California Energy Commission Staff:

**A. Introduction**

On behalf of Sperra, I am pleased to submit comments regarding the California Energy Commission's Proposition 4 Offshore Wind Port Development Program. Sperra is a California based company pioneering **Marine Infrastructure On Demand™** to accelerate deployment of offshore wind and other renewable energy technologies. Our research and development lab is based at AltaSea in the Port of Los Angeles, where we conduct 3D printed prototype fabrication, design work, testing, and validation activities focused on marine energy infrastructure. Sperra is composed of 12 full time employees with a combined 100 plus years of engineering experience and 50 years of renewable energy and concrete design and analysis expertise.

**Sperra strongly supports the CEC's proactive efforts to identify infrastructure gaps and accelerate offshore wind port readiness statewide through Proposition 4 investments.** The CEC workshop materials state that approximately \$183 million remains available for POPD grants and that eligible funding activities include construction for manufacturing, assembly, staging, and integration, expansion and improvement to accommodate vessels, and upgrades to port facilities. These are exactly the categories of investment needed to turn California's offshore wind goals into deployable projects.

**B. Support for Pier Wind and a Multi-Port California Strategy**

**Sperra strongly supports Pier Wind as a critical and long lead step for California offshore wind development and also supports port development in Los Angeles, San Diego, San Francisco, and Humboldt Bay.** Pier Wind in particular addresses the fundamental bottleneck of staging and integration for wind turbines and floating foundations. California needs Pier Wind and other major port investments to succeed.

At the same time, California should not rely on a single class of large, fixed, long lead infrastructure alone. The Proposition 4 solicitation can also support complementary modular infrastructure that delivers earlier benefits, reduces construction schedule risk, expands long term throughput, improves the affordability of floating offshore wind, and allows more California communities and businesses to participate in offshore wind infrastructure development.

**FCS can complement Pier Wind and other California ports including Humboldt Bay, San Diego, San Francisco, the Port of Los Angeles, and the Port of Long Beach.** This is important because



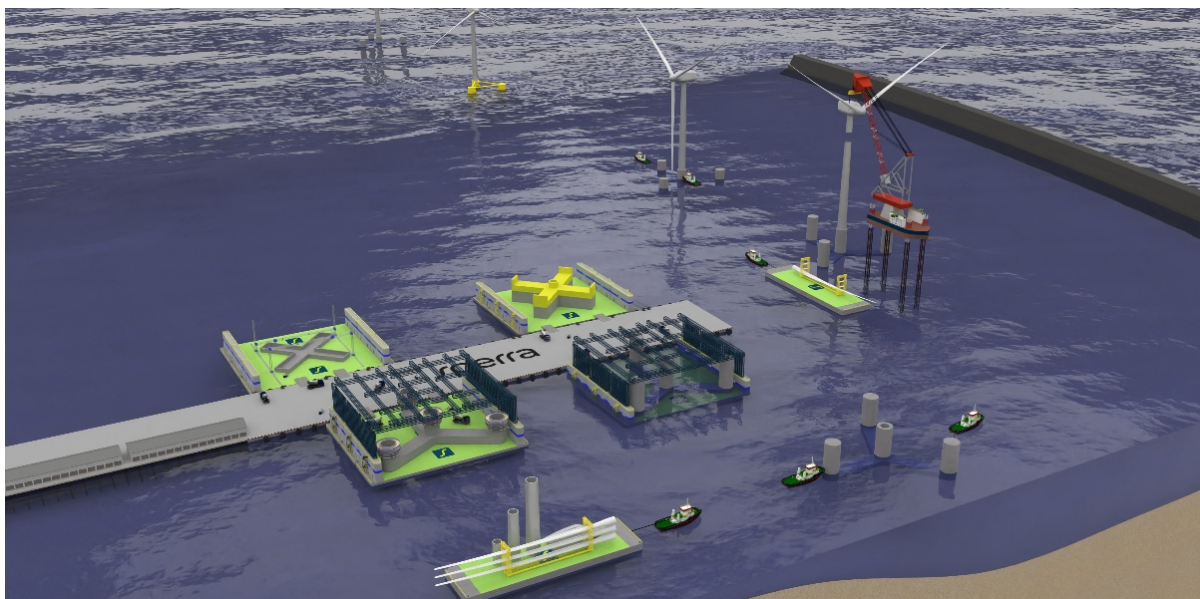
California offshore wind will require a statewide port strategy, not a single port solution. FCS can help multiple California waterfront facilities participate in offshore wind by adding adaptable manufacturing, launching, staging, anchor fabrication, and marine infrastructure capabilities without requiring each port to become a full-scale fixed staging and integration terminal.

### C. FCS as a Complementary Port Infrastructure Technology

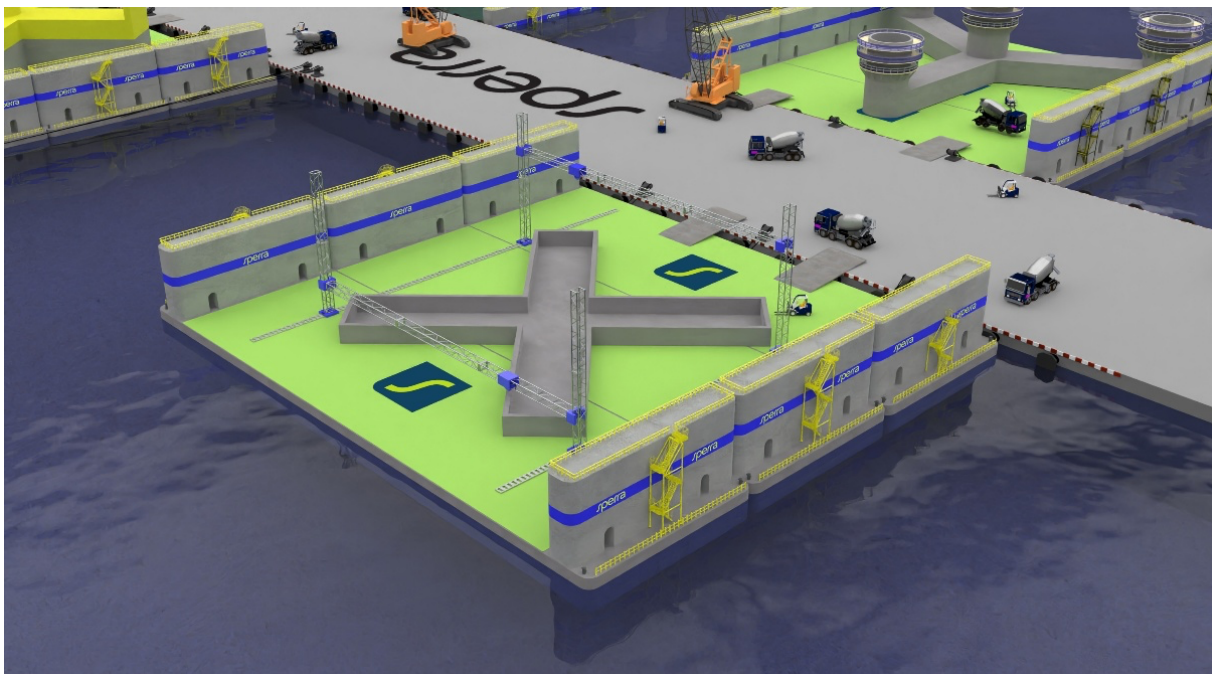
Sperra respectfully recommends that the CEC include innovative floating manufacturing and construction technologies, such as Sperra's Floating Construction Station™, within future Proposition 4 eligibility, evaluation criteria, and infrastructure planning efforts. FCS is not a substitute for Pier Wind or other port infrastructure. It is a versatile, multi-use port infrastructure technology that can complement Pier Wind and other California ports at multiple stages of offshore wind development.

**FCS is designed to perform slipforming, 3D concrete printing, assembly of steel foundations, fabrication of concrete floating foundations, and fabrication of other marine infrastructure such as gravity anchors, suction anchors, torpedo anchors, and floating caisson systems.** This versatility is important because California's port investments can preserve optionality across foundation technologies as the floating offshore wind market matures.

The figures below illustrate FCS as a flexible floating manufacturing and launching platform rather than a single purpose offshore wind component. This flexibility is central to Sperra's recommendation that Proposition 4 recognize modular floating manufacturing infrastructure as eligible port infrastructure.



*Figure 1. Sperra Floating Construction Station™ conceptual arrangement. Rendering of four Floating Construction Stations using both slipforming and 3D concrete printing to produce floating foundations in a port. FCS can support slipforming, 3D concrete printing, assembly of steel foundations, launching of completed foundations, and fabrication of other marine infrastructure including gravity anchors, suction anchors, torpedo anchors, and floating caisson systems.*



*Figure 2. Close up rendering of a Sperra Floating Construction Station™. Shown are three submersible pontoons joined together to support onboard 3D concrete printing of a 15 MW floating foundation.*

#### D. Chronological Role of FCS in California Offshore Wind Development

1. **Before Pier Wind is complete, construction of FCS can help build stakeholder support for California offshore wind by delivering early, visible benefits from construction and deployment activities in California ports.** These benefits include local economic development, union jobs, small business participation, engagement with local stakeholders in port adjacent communities, and a practical means for concrete foundation developers to build their foundations in California. By creating a viable pathway for local foundation fabrication, FCS can act as a catalyst for attracting concrete foundation developers to California. This early activity can help build local workforce capacity, demonstrate community benefits, and establish California as a credible location for floating offshore wind foundation manufacturing before full commercial scale port infrastructure is complete.
2. **In the near term, FCS could provide port construction capability to assemble foundations needed for demonstration projects such as CADEMO, which Sperra supports.** This can help California gain practical experience with floating offshore wind foundation construction, launching, wet storage, tow logistics, and port operations before the completion of larger port facilities.
3. **As Pier Wind advances, FCS can provide essential foundation launching capability.** Large floating foundations must be transferred from pier or construction location to the water for wet storage, wet tow, assembly, or deployment. FCS is specifically designed to support manufacturing, launch, retrieval, and related port operations for large floating offshore wind foundations. This capability can reduce reliance on expensive specialized vessels and reduce stress on fixed port infrastructure.
4. **After the first phase of Pier Wind is complete, FCS becomes critically important for increasing throughput.** The 15 percent conceptual design plans for Pier Wind show foundation fabrication and assembly consuming a major share of the staging and integration



footprint (approximately 50% of the Pier Wind acreage). Manson's analysis of the Pier Wind concept found that the terminal layout includes two turbine integration areas, two sections dedicated to fabricating floating foundations, and one section for manufacturing turbine components. In practical terms, foundation fabrication and assembly consume approximately 50 percent of the core staging and integration functional space. Relocating foundation fabrication to FCS would allow Pier Wind to dedicate more scarce terminal space to turbine integration, which Manson identified as the most schedule sensitive and least transferable activity in the deployment process.

5. **After both phases of Pier Wind are complete, FCS can continue to provide additional port throughput capacity.** It can continue supporting foundation manufacturing and assembly, anchor manufacturing, launching and retrieval, refurbishment, and other marine infrastructure operations. Because FCS is modular and deployable, it may also be moved or replicated for use at other California ports, including Humboldt Bay, San Diego, and San Francisco, where additional manufacturing and assembly capacity may be needed.

### E. Manson Report Findings on Throughput, Logistics, and Cost Reduction

The Manson Construction conceptual marine logistics plan, prepared as part of Sperra's NOWRDC funded FCS project, provides a strong quantitative basis for including FCS and similar modular systems in the Proposition 4 solicitation.

**Manson found that the central deployment constraint is how fabrication, staging, and integration functions are distributed across available infrastructure.** The report concluded that approaches that decouple these functions, especially by relocating foundation fabrication away from constrained terminals, deliver materially higher throughput, lower cost, and reduced execution risk.

**In the modeled Pier Wind scenario, moving foundation fabrication to FCS increased completed turbine output from 51 turbines to 108 turbines by 2035.** This is a material increase in facility throughput enabled by using FCS to decouple foundation fabrication from the most constrained staging and integration terminal functions.

Manson also found that FCS can reduce foundation launch costs and simplify marine logistics. In the land-based scenario, foundation launch logistics were estimated at approximately \$626,748 per foundation. In the FCS scenario, launch logistics were estimated at approximately \$155,009 per foundation. Manson concluded that the FCS approach can save roughly \$400,000 to \$500,000 per foundation in marine logistics, or about \$30 million per project assuming 60 to 70 turbines per lease area, excluding vessel mobilization and construction fees.

**These savings arise because FCS eliminates the need to move completed foundations from land to a semi-submersible launch vessel and reduces dependence on scarce specialized vessels.** Manson noted that no semi-submersible vessels of the required magnitude are currently assumed to be available in the Jones Act compliant fleet, creating cost and schedule uncertainty. FCS reduces that risk by allowing foundations to be fabricated on the same floating platform used for launching.



## F. Domestic Manufacturing, Affordability, Jobs, and Community Benefits

### **FCS improves the affordability of floating offshore wind while increasing community benefits.**

By enabling foundation fabrication and launching outside the most constrained staging and integration space, FCS can reduce marine logistics costs, increase facility throughput, reduce schedule risk, and help California capture more of the offshore wind supply chain locally.

**Support structures provide the largest single fabrication opportunity for offshore wind and are the low hanging fruit for manufacturing jobs and local economic benefits.** Locally sourced concrete foundations are expected to reduce manufacturing costs, lower levelized cost of energy, avoid some transportation costs and tariffs, and increase domestic content. For California, the fabrication of support structures is one of the clearest opportunities to create immediate manufacturing jobs, expand local economic benefits, and reduce the cost of floating offshore wind.

FCS can help make this possible by allowing concrete foundations and anchors to be fabricated locally using California labor, California port assets, and regional material supply chains. This would help California avoid a future in which its ports only assemble imported offshore wind components while the highest value manufacturing jobs occur elsewhere.

**Because FCS enables California based concrete foundation and anchor manufacturing, it provides a pathway to create quality local jobs and economic benefits that may otherwise be lost if early projects rely primarily on imported steel foundations.** This is central to the public interest purpose of Proposition 4. California port investments should not only move offshore wind components through ports. They should help build the industrial base needed to manufacture, assemble, launch, maintain, and eventually export floating offshore wind infrastructure.

## G. Carbon and Environmental Benefits

FCS can also support lower carbon offshore wind infrastructure. **Sperra's analysis indicates that concrete floating foundations can materially reduce embodied carbon compared with comparable steel floating foundation approaches, particularly when low carbon concrete materials and local manufacturing are used.**

Concrete foundations can use local materials, low carbon cementitious binders, optimized reinforcement, and manufacturing approaches that reduce long distance transportation of very large components. When compared with imported steel foundation supply chains, locally manufactured concrete foundations can reduce transportation emissions, increase domestic content, and provide a pathway to lower embodied carbon in floating offshore wind infrastructure.

**These carbon benefits reinforce the affordability and community benefits of FCS.** Lower carbon local manufacturing can reduce project cost exposure, avoid some international transportation and tariff risks, support California jobs, and reduce emissions associated with global transport of very large floating offshore wind components.



## H. Technology Status and the Next Step Needed from Proposition 4

FCS is already advancing through funded development programs in both the United States and the United Kingdom. In the United States, the National Offshore Wind Research and Development Consortium selected Sperra to advance pilot scale engineering, fabrication, and demonstration activities for the platform, including development and testing of a scaled prototype in the Port of Los Angeles and commercial scale engineering design for a 16,000 ton lift capacity system. The Manson Construction logistics plan cited above was prepared as part of this NOWRDC funded project and demonstrates the potential for FCS to improve throughput, reduce marine logistics cost, and reduce deployment risk.

Internationally, Sperra's FCS concept is also being advanced through The Crown Estate's Supply Chain Accelerator program in the United Kingdom, which supports infrastructure and manufacturing solutions for floating offshore wind deployment in the Celtic Sea region.

**The next step is to move from funded engineering, logistics analysis, and international concept development toward California port adoption, CEQA analysis, and a large-scale pilot.** Sperra needs incentives for ports to evaluate and adopt modular floating manufacturing infrastructure. Sperra also needs to perform CEQA studies, continue agency and stakeholder engagement, complete site-specific planning, and develop a large-scale pilot, ideally in the San Pedro Bay ports complex, while preserving the ability to replicate the approach at Humboldt Bay, San Diego, San Francisco, and other California waterfront facilities.

### **The Proposition 4 Offshore Wind Port Development Program is critical to these next steps.**

Without solicitation language that recognizes innovative modular infrastructure, public ports may lack the incentive or funding pathway to seriously consider technologies such as FCS, even where those technologies can reduce cost, improve floating offshore wind affordability, reduce risk, increase throughput, create community benefits, and create California jobs.

## I. Recommendations for the Proposition 4 Solicitation

Sperra respectfully offers the following recommendations for the Proposition 4 solicitation.

1. **Recognize modular floating manufacturing, launching, and deployment infrastructure as eligible offshore wind port investments.** These systems should be eligible where they support construction for manufacturing, assembly, staging, and integration, expansion and improvement to accommodate vessels, or upgrades to port facilities.
2. **Include scoring criteria that encourage domestic fabrication of offshore wind foundations and anchors, including concrete foundations and concrete anchors, in addition to steel foundations.** Scoring can reward projects that increase California based manufacturing, develop local material supply chains, and create durable local and union workforce pathways.
3. **Include scoring criteria that reward innovative port solutions that improve floating offshore wind affordability and community benefits.** These benefits include local manufacturing jobs, local economic development, foundation cost reduction, lower levelized cost of energy, greenhouse gas reduction, reduced dredging and fill, reduced wharf reconstruction, reduced land requirements, reduced reliance on scarce specialized vessels,



increased turbine throughput, small business participation, union workforce opportunities, and mitigation of port construction schedule risk.

4. **Minimize cost share requirements for applications in which California public ports include small businesses as major technology, manufacturing, or deployment partners.** Early stage small businesses can provide critical innovation, but high-cost share requirements can unintentionally favor larger conventional infrastructure entities and reduce participation by the companies most capable of delivering lower cost solutions.
5. **Provide bonus points for meaningful California small business inclusion.** Those points can recognize not only subcontracting participation, but also substantive roles for small businesses that provide core technology, manufacturing capability, engineering, construction methods, or deployment infrastructure.
6. **Continue to provide scoring credit for funds spent in California.** Maintaining and strengthening this criterion in the Proposition 4 solicitation would help ensure that public investment produces California jobs, California supply chains, and California economic development.
7. **Reserve or meaningfully allocate a portion of Proposition 4 funding for innovative port development approaches, including modular floating manufacturing and launching systems, distributed manufacturing systems, and other approaches that can complement major fixed terminal projects.** The prior GFO 24 701 Notice of Proposed Awards recommended \$4.5 million for Category I projects and \$38.25 million for Category II projects. Category II awards were recommended for the City of Long Beach Harbor Department and the Humboldt Bay Harbor, Recreation, and Conservation District. For the much larger Proposition 4 POPD solicitation, the CEC has an opportunity to ensure that innovative, scalable, small business enabled port development approaches receive a meaningful share of funding alongside larger conventional port projects.
8. **Support planning, CEQA review, stakeholder engagement, and large-scale pilot activities for modular floating manufacturing systems.** These activities are necessary to move technologies such as FCS from funded engineering and concept development into California port adoption.

## J. Conclusion

**California needs Pier Wind and its multi-port strategy. California also needs complementary infrastructure that can deliver earlier benefits, reduce schedule risk, improve the affordability of floating offshore wind, support demonstration projects, build California concrete and steel offshore wind supply chains, and expand long term port throughput.** FCS provides a flexible, scalable, and lower impact pathway for expanding California's offshore wind port readiness and domestic manufacturing capabilities while increasing the community benefits of offshore wind development.

Its modular and deployable nature aligns well with California's need for a multi-port strategy while creating opportunities for broader regional economic participation, small business involvement, union jobs, workforce development, concrete foundation manufacturing, anchor manufacturing, and lower carbon marine infrastructure.

We appreciate the CEC's leadership and inclusive approach to shaping the future of offshore wind infrastructure in California. Sperra welcomes the opportunity to continue participating in workshops



and stakeholder discussions related to floating infrastructure, distributed manufacturing strategies, innovative offshore wind deployment systems, concrete foundation manufacturing, anchor manufacturing, and California port readiness.

Thank you for considering our comments.

Respectfully submitted,

A handwritten signature in black ink that reads "Jason Cotrell". The signature is written in a cursive, flowing style.

Jason Cotrell  
Founder and CEO  
Sperra