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Response to HDVD Substations RFI

Additional submitted attachment is included below.

VINEYARD OFFSHORE

Boston | New Bedford | New York | Eureka

Aug 15, 2024

California Energy Commission
715 P Street
Sacramento, CA 95814
Docket 23-ERDD-01

RE: RFI HVDC substations for floating offshore wind

Vineyard Offshore appreciates the opportunity to provide comments on the California Energy Commission's (CEC) Electronic Program Investment Charge (EPIC) RFI "Deep-Water High-Voltage Direct Current (HVDC) substations for floating offshore wind."

I. Introduction

Vineyard Offshore is a leading offshore wind developer in the United States. Vineyard Offshore's Vineyard Wind project located off the coast of Massachusetts is the first grid scale offshore wind (OSW) project to be operational in the United States. Vineyard Offshore is currently developing additional lease areas off the coast of Massachusetts and New York, as well as lease area 562 off the coast of Northern California. Vineyard Offshore offers the following information in response to the California Energy Commission's (CEC) RFI.

II. Responses to selected questions

General:

1. What information or analysis is needed to inform timely and cost-effective development and deployment of deep-water substations and associated offshore electrical infrastructure in existing and future California WEAs? How can publicly funded research and development (R&D) address technological, economic, and environmental uncertainties and better inform strategic technology advancement, feasibility, standards development, and component selection and procurement?

VO: Deepwater transmission concepts are constrained to HVAC technology, while HVDC systems are constrained to floating platform concepts. Vineyard Offshore recommends the CEC review ongoing work focused on floating HVAC and HVDC solutions. Examples of ongoing studies include:

- Floating HVDC solutions: Floating HVDC platform – oceangridproject.no
- Floating HVAC solutions: DNV concludes Phase 1 of joint industry project to optimize design of floating substations

Publicly funded R&D can motivate engineering firms and fabricators to focus on California as a potential new revenue source and pave the way for more efficient and cost-effective future support

of California's offshore wind targets. Vineyard Offshore recommends considering publicly funded R&D of floating foundations and dynamic cables as this technology is still developing and would benefit from public investment.

2. What key metrics or factors are required to inform systems integration of offshore wind components, deep-water substations, associated electrical infrastructure, communication networks, data collection, environmental monitoring, and ancillary services such as secondary generation, hydrogen production, and storage?

VO: Data gathering on geological conditions (soil thermal, structural integrity) in the lease areas, cable routes, landings and onshore will be needed. This information will assist developers in understanding dynamic to static cable transitions, cable thermal needs, and energy capacity potential of each lease area. This information is typically gathered during site survey, public funding for post-survey engineering work with representative data may be appropriate.

3. What specific technical, economic, or other factors are crucial for understanding the viability and success of offshore electrical infrastructure technologies for FOSW development in California? What key performance characteristics and metrics are anticipated to be challenging for California's existing and future WEAs?

VO: No response provided.

4. What environmental, ecosystem, health, and social impacts, including, both direct and indirect impacts, should be evaluated in deep-water substation and offshore electrical component design, procurement, and deployment for California's existing and future WEAs? How should knowledge about these impacts be used to better inform more sound design, procurement, and deployment of deep-water substation and offshore electrical components?

VO: No response provided.

5. Are there other pressing needs or challenges relating to FOSW electrical infrastructure or transmission R&D that EPIC should consider?

VO: Publicly funded R&D can help pave the way for market interest while de-risking the most commercially viable solutions and helping to spur scaling and cost reductions of new technologies. Vineyard Offshore recommends research into enabling wind turbines to operate at higher kVs. Reactive power components with the ability to respond to dynamic and steady state events will be key to addressing electrical challenges at the greater depths of floating offshore wind lease areas. Vineyard Offshore recommends further research of this technology.

HVDC Technology and Cost:

6. What technical barriers will have the largest impact on development of deep-water HVDC substations in California? How could publicly funded R&D be most effectively applied to help increase timely and cost-effective deployment of new offshore deep-water HVDC substations in existing or future California WEAs?

VO: See response to question 1.

7. What key cost factors are critical to the timely deployment of deep-water HVDC substations and associated offshore electrical infrastructure that could be addressed through technology advancement or analysis?

VO: VO defers to HVDC OEMs.

8. What novel technologies or design concepts proposed for HVDC substations have been successfully demonstrated in a physical or simulated dynamic offshore environment and can provide economic benefits and costs savings for California ratepayers? Are there any specific substation platforms, mooring systems, HVDC electrical components, or other substation technologies that provide clear benefits and advantages for use in the existing or future California WEAs? How could R&D funding be most effectively applied to improve and optimize these technologies further to reduce cost and improve their technical suitability for California's WEAs?

VO: See response to question 1.

9. What key technologies or capabilities are needed in-state, regionally, and nationally to facilitate supply chain, manufacturing, installation, and operations and maintenance needs for deep-water HVDC substations and associated electrical infrastructure? What are the environmental, ecosystem, health, and social impacts associated with these technologies or that should be evaluated for these technologies?

VO: No response provided.

10. What technologies or processes can monitor the condition and performance of deep-water HVDC substations and offshore electrical infrastructure? What are the current resolution capabilities of these technologies? Are these technologies or processes adequate for application in existing or future California WEAs? What are additional operations and maintenance needs for deep-water HVDC substations?

VO: No response provided.

11. Are there any other questions or information the CEC should consider for research on deep water HVDC substations for offshore wind that is not otherwise covered by the questions above?

VO: Vineyard Offshore recommends CEC undertake an investigation of the studies, concepts etc. that are already being done globally as of now. These studies offer valuable lessons regarding technical challenges, supply chain challenges and mapping which may help to advance key investments in California. See response to question 1.

Vineyard Offshore appreciates the opportunity to respond to the CEC's RFI and looks forward to further engagement on this important topic.

/s/ Rick Umoff
Director, Government and Regulatory Affairs
Vineyard Offshore
Email: rumoff@vineyardoffshore.com
Phone: 202-603-0883

/s/ Alex Sloan
Sr. Development Manager
Vineyard Offshore
Email: asloan@vineyardoffshore.com
Phone: 615-715-3144