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C-Power Comments on the 2024 IEPR Update

Additional submitted attachment is included below.

02 January 2025
Chair David Hochschild
Vice Chair Siva Gunda
California Energy Commission
Docket Unit, MS-4
Docket No. 24-IEPR-01
715 P Street, Sacramento, CA 95814-5512

Subject: Comments on the 2024 IEPR Update – Wave and Tidal Energy

Dear Chair Hochschild and Vice Chair Gunda:

Columbia Power Technologies, Inc., dba C-Power, is pleased to submit comments on the Draft 2024 Integrated Energy Policy Report (IEPR) Update.

Previous C-Power Feedback

Previously, C-Power worked with the National Hydropower Association (NHA) to submit responses to the California Energy Commission (CEC) Docket No. 24-IEPR-04 in August 2024. The submission includes comments on both the SB 605 draft report and the Offshore Wind Strategic Plan, while also suggesting near term next steps that the state of California could take to start building a robust California-based marine energy sector. The recommendations of prior referenced submissions are summarized here:

1) Quantify potential savings for California ratepayers resulting from the integration of marine energy technologies into the California grid.
2) Encourage further legislation to create the same pathway for marine energy as offshore wind.
3) Implement statewide marine energy deployment targets of 100 MW by 2030, 500 MW by 2035, and 2,500 MW by 2040.
4) Work with the California Public Utilities Commission (CPUC) to determine the steps required for marine energy to receive an explicit price per MWh as part of the Renewable Market Adjusting Tariff (ReMAT).
5) Provide matching funds for U.S. Department of Energy (DOE) and other federal awards and investments in technology Research, Development, Demonstration, and Deployment (RDD&D) relevant to marine energy.
6) Clarify state regulatory processes for deployment of marine energy projects, and encourage the appropriate federal agencies to clarify federal regulatory processes for deployment of marine energy projects.
7) Partner with the U.S. Bureau of Ocean Energy Management (BOEM) to begin planning efforts related to deployment of marine energy in both federal and state waters off the coast of California, including the potential of expanding offshore wind lease areas for multi-use opportunities to include marine energy.

8) Encourage the Humboldt Bay Harbor, Recreation, and Conservation District to ensure that their $426.7 million investment from the U.S. Department of Transportation (DOT) can also support the marine energy sector.

C-Power Comments on Draft 2024 IEPR Update

The potential benefits to California of cost-competitive electricity generation from ocean energy resources are clear and well-documented in previous submissions to the CEC. However, realizing those future benefits requires immediate and material action by the State. This pathway includes two critical activities: 1) funding and supporting the advancement of marine energy systems, subsystems, and components; and 2) funding and supporting small-scale marine energy demonstration projects. C-Power recognizes that technology maturation and clean energy project delivery are integrated, complex undertakings and thus require coordinated, parallel efforts. Although marine energy is reaching a critical commercialization phase, many of the leading technologies still require development, demonstration, and optimization to reach wide-scale commercial maturity. Activities such as innovating and optimizing key systems, subsystems, and components (e.g., power take-off, mooring, power electronics) must be done in the immediate-term and in parallel with in-water testing and validation. This component and system work can create research, engineering, and manufacturing job opportunities and helps ensure cost and performance improvements are introduced early in technology design cycles.

In addition, and as summarized in the first bullet of the section below, C-Power sees a key part of the strategy to commercialize marine energy technologies as first entering lower risk markets where customer power needs are the greatest. Currently, in the offshore market – where power is produced and consumed offshore – few, if any, power alternatives exist. Because the ocean is a power desert, customers in offshore energy, defense, security, and research markets are stuck using expensive, complex, and carbon-intensive power sources (i.e., long subsea cables, diesel generators, or crewed ships). C-Power is commercializing our technology in these markets today, building channel partners and a strong customer base and driving the scale and revenue growth necessary for entering the higher risk, more competitive grid-scale markets. The offshore market is an immediate- and near-term opportunity for California that enables a practical and efficient move into grid deployments.

C-Power has provided further feedback on three specific topics from the Draft 2024 Integrated Energy Policy Report (IEPR) Update, as well as next steps and recommendations. Those are expanded on below:

1) Marine Energy Applications in California (pages 46-47)

We appreciate the inclusion of both utility-scale grid power and smaller, distributed energy applications for marine energy. We want to note that mini- and micro-grid applications may present more practical and immediately actionable deployments for the state of California in route to meeting the proposed marine energy grid deployment targets. These types of projects are not only often cheaper than larger, grid-connected projects, they also do not touch many of the more time- and resource-consuming permitting processes.

In addition, mini- and micro-grid applications can leverage existing infrastructure and resources from large markets. Military installations and Powering the Blue Economy applications are mentioned in the draft Report. Other examples include providing renewable power and data communications for critical monitoring, surveying, and reporting to offshore energy projects (e.g., offshore oil and gas and offshore wind). C-Power has already gained traction in these markets and believes they are prime early adopter markets for wave and tidal energy. They offer ample opportunity for deploying more devices, de-risking technology at a smaller scale, and gaining critical experience in installing, operating, and maintaining marine energy technologies off the coast of California. C-Power would be happy to brief the CEC on our small-scale commercial application success to date.

2) **Factors Contributing to Increased Use of Wave and Tidal Energy in California** (pages 48-49)

We want to acknowledge that cost reductions, as pointed out on page 49, would be a major factor contributing to the increased use of wave and tidal energy in California. The first two sentences of this section read:

> *"The costs of marine energy projects are expected to decrease with the convergence of technology types and increased capacity installation. Wave and tidal energy must undergo substantial cost reductions to achieve a competitive levelized cost of energy."*

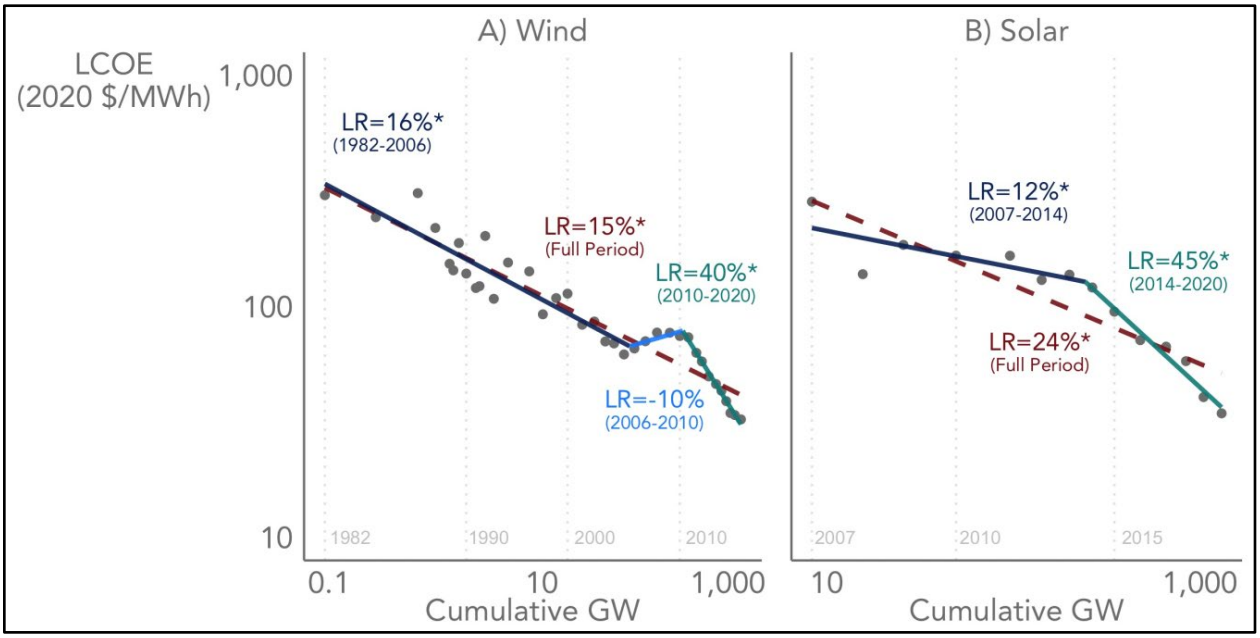
The convergence of technology types and increased capacity installation should directly lead to cost reductions; however, there are additional factors with regard to cost that should be considered, too.

First, the energy density of the waves off California's coast is around 20 times higher, on average, than the energy density of other renewables like wind and solar. Thus, the space and material required to reach the same level of installed capacity is significantly lower. If wave energy reaches the same cumulative manufacturing capacity as wind and solar, the costs may be significantly lower. It is critical that we not directly compare the costs of different technologies at different levels of cumulative manufacturing volume.

Second, LCOE may be the primary cost metric that project developers consider for individual projects, but it is not necessarily the best cost metric to look at when considering the interest of California ratepayers. Instead, we should look at the cost of the entire energy system. Because of their consistency relative to wind and solar, integrating wave and tidal energy into California's generation mix may reduce costs for ratepayers even if individual project LCOE figures are higher than those for wind and/or solar.

Additionally, historical forecasts have consistently underestimated the cost reductions of renewable energy technologies. According to the US Department of Energy, both wind and solar have each experienced extended periods of time with learning rates of at least 40 percent

(meaning costs fall by at least 40 percent with every doubling of cumulative capacity). The industrial average learning rate is only 12 percent.



Although wave and tidal energy technologies are still in the early stages of scaling, this learning rate trend suggests significant potential for cost reductions as production volumes increase. Keeping these factors in mind is essential when evaluating the future role of marine energy in California's energy mix.

Furthermore, in this section, it is stated “As wave and tidal are emerging technologies, there is limited understanding of the potential adverse environmental effects.” However, there have been numerous studies done over the last two decades investigating and documenting the lack of adverse environmental impact from marine energy technologies. We recommend referring to the *2024 State of the Science Report: Environmental Effects of Marine Renewable Energy Development Around the World* published in September 2024.

3) **Next Steps and Recommendations** (pages 60-61)

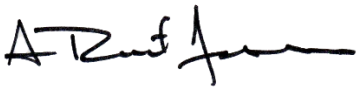
We applaud the CEC’s proposal for “A subsequent report will identify suitable sea space for offshore wave energy and tidal energy projects in state and federal waters.” We recommend CEC personnel work with relevant stakeholders in the state of Oregon who were involved with similar efforts there. They have many lessons learned that can better inform how California approaches the proposed work. C-Power’s CEO Reenst Lesemann participated in sea space planning meetings in Oregon and would be happy to provide insight or connect to appropriate parties.

We appreciate the inclusion of several recommendations to “provide direction and guidance for the responsible and timely development of wave and tidal energy projects.” To strengthen these recommendations even further, we suggest:

- Adopting more specific language around exploring the “potential development of market incentives to support investment in wave and tidal energy technology.” Just as the CPUC is using centralized procurement to help scale offshore wind in California, we recommend that the CEC engage with CPUC to design market incentives to bring wave and tidal energy projects online.
- Focusing early-stage fundamental research less on individual devices and more on the benefits that wave and tidal energy projects can provide to the grid in California. Efforts related to early-stage fundamental research for devices in California should instead be redirected toward building demonstration projects in California state waters.
- Implementing statewide marine energy deployment targets of 100 MW by 2030, 500 MW by 2035, and 2,500 MW by 2040.
- Including federally funded marine energy projects as eligible for cost share by the Electric Program Investment Charge Program (EPIC). Efforts to raise capital as cost share for federal funding can slow down progress toward demonstrating these critical technologies. Because marine projects hold significant potential to reduce total energy system costs and therefore reduce rates for ratepayers, the state of California should play a role in funding these technologies from R&D stages to demonstration and deployment.

C-Power appreciates the CEC considering the above comments. Please reach out with any questions or for additional information. We look forward to working with the CEC and other relevant entities to advance the marine energy sector in California.

Sincerely,



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