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H2U Technologies Comments on ONSITE Solicitation

Additional submitted attachment is included below.

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RE: Docket #22-ERDD-03 Clean Hydrogen Program

Subject: H2U Technologies comments on Docket #22-ERDD-03: Draft Solicitation Concept for Distributed Clean Hydrogen Production with Onsite End Use (H2ONSITE)

Response Date: October 27, 2023

H2U Comments on the Draft Solicitation Concept for Distributed Clean Hydrogen Production with Onsite End Use (H2ONSITE)

H2U Technologies[1] submits the following comments to the California Energy Commission (CEC) on their Draft Solicitation Concept for Distributed Clean Hydrogen Production with Onsite End Use (H2ONSITE).

H2U Technologies is a California-based developer of low-capital cost, iridium-free proton exchange membrane (PEM) electrolyzers that are particularly suited for pairing with renewable energy sources. We leverage our ultra-high speed Catalyst Discovery Engine™ (CDE™) to develop low-cost non-iridium catalysts for use in our electrolyzer systems. The world-class technology featured in our products stems from ten years of research and development at Caltech funded by the United States Department of Energy (DOE). H2U's electrolyzer systems come in plug-and-play, standard shipping containers. By applying low-cost electrolyzers to distributed applications that minimize hydrogen storage and transportation costs, H2U's technology enables the lowest-cost delivered clean hydrogen for customers seeking to decarbonize their business. We support the CEC's Distributed Clean Hydrogen Production with Onsite End Use (H2ONSITE) program and offer some guidance for improvements such that the program best meets its goals of reducing hydrogen costs and supporting development of innovative technologies.

Questions from the CEC:

1. Are the Project Elements in Section IV of this document realistic, reasonable, and feasible?

The suggested range the CEC proposes for hydrogen production at each site (1-5 MT) is too high. Starting with smaller projects, for example a site with 100 kg/hydrogen per day, will allow participants to rapidly develop the demonstration stage (TRL 6 or higher) technology that the CEC is looking to showcase through this funding opportunity. These smaller projects are safer, lower cost, and can be designed to be modular to encourage facile scale-up down the line. Larger sites will be essential as California builds up its hydrogen infrastructure, but setting a higher minimum production capacity now will likely have negative effects by boxing out promising technologies that may not have the ability to produce hydrogen at scale at this point. Furthermore, by beginning with smaller projects, the CEC can support more projects at the same price point. We recommend that the CEC decreases the minimum amount of hydrogen required per site to a maximum of 100 kg/hydrogen per day as a more realistic, reasonable, and feasible target. With this change, the CEC will leave the playing field open for cutting edge hydrogen technologies that will dramatically reduce the costs of hydrogen production.

2. What would be the appropriate level of project funding that would leverage private investments associated with the work proposed in this draft concept and why?
    a. How would limiting the use of grant funds to eligible project costs in section III impact the project? What changes do you recommend, if any, and why?

If the CEC adjusts the minimum production capacity to 100 kg/hydrogen per day per site, funding levels for each project could be around $3M. With this adjustment, the CEC could

[1] See https://www.h2utechnologies.com

fund more projects with the same total funding amount. If the projects are larger, more funding (on the order of $7M-$10M as suggested) may be necessary. Another possibility could be to employ a phased funding approach, where the initial installation is a smaller production facility. Given successful completion and operation of the small-scale facility, a second phase of funding could be granted which would cover the incorporation of additional modular units to scale up production.

ARCHES' successful hub bid will provide an influx of funding to the state in support of large-scale, hydrogen projects. Therefore, we recommend that the CEC prioritize this solicitation, over the large, centralized proposed solicitation, when allocating funds within the Clean Hydrogen Program. The CEC should increase the total funding amount for this solicitation to ensure that distributed hydrogen production projects have the support necessary for commercial liftoff in the state.

3. Provide any feedback on the two-phase solicitation approach. Are the 1-month abstract deadline and 3-month full application deadline realistic?

This timeline seems reasonable, especially if smaller projects that require less coordination are considered.

4. To ensure that funded projects and their impacts can inform future deployment of hydrogen in California, should the CEC consider additional performance metrics beyond those proposed to the M&V plan in Section IV?

A potential additional metric to track could be monitoring the supply chain resiliency and use of critical materials in project technology. The U.S. DOE included several materials related to clean energy technologies, such as iridium catalysts in PEM electrolyzers, in its recently published 2023 Critical Materials Assessment.[2] Minimizing use of these materials will ensure that California projects are robust and sustainable.

5. What type of technical assistance is needed to ensure equitable participation and project success, if any?
6. Are there specific end uses we should target with the one to five metric ton hydrogen capacity? If so, why?
7. Are there any concerns with this solicitation allowing the use of CCUS for a project to be carbon neutral? If so, why?
8. Please provide relevant comments regarding other considerations not explicitly listed above.

H2U supports the CEC's efforts to develop the Clean Hydrogen Program and believes the funding outlined therein will contribute substantially toward the realization of California climate goals. We appreciate the opportunity to provide comments and welcome opportunities to continue to engage as the CEC continues to develop this program. Please do not hesitate to contact us with any questions.

[2] U.S. Department of Energy Critical Materials Assessment (2023). https://www.energy.gov/cmm/what-are-critical-materials-and-critical-minerals