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Email to: [docket@energy.ca.gov](mailto:docket@energy.ca.gov)

Docket Number: 22-ERDD-03

**Subject: Green Hydrogen Coalition's Response to the Draft Solicitation Concept on Large-Scale Centralized Production for the Clean Hydrogen Program**

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The Green Hydrogen Coalition ("GHC") would like to express our sincere appreciation for the opportunity to submit comments on the Draft Solicitation Concept for Large-Scale Centralized Hydrogen Production ("Draft Solicitation") as part of the Clean Hydrogen Program ("CHP"). We also commend the California Energy Commission ("CEC") for recognizing the importance of clean hydrogen in achieving reliability and deep decarbonization, as well as for its progressive and forward-thinking leadership in California's clean energy transition.

## **I. INTRODUCTION.**

The GHC<sup>1</sup> is a California educational 501(c)(3) non-profit organization established in 2019 with the purpose of recognizing the game-changing potential of "green hydrogen" in accelerating multi-sector decarbonization and combating climate change. Our mission is to facilitate policies and practices that advance green hydrogen production and utilization in all sectors of the economy, ultimately accelerating the transition to a carbon-free energy future. The GHC is supported by foundations, renewable energy users and developers, utilities, and other advocates of a reliable and affordable green hydrogen fuel economy for all.

The GHC applauds the CEC's efforts in developing the CHP and welcomes the opportunity to provide comments and recommendations on the Draft Solicitation. In the following sections, we present our insights and suggestions to ensure that this crucial funding opportunity is as robust as possible.

## **II. AREAS OF SUPPORT.**

The GHC recognizes the significance of this solicitation in jumpstarting the clean hydrogen economy in California and greatly values this pivotal funding opportunity. We would like to express our support in three specific areas:

### ***1.) Goal of the solicitation & project focus***

First and foremost, the GHC fully endorses the goal of this solicitation to "support the adoption of commercially available hydrogen technologies and kickstart large-scale, centralized clean hydrogen production through demonstration and scale-up in California."<sup>2</sup> The GHC's industry

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<sup>1</sup> See <https://www.ghcoalition.org/>

<sup>2</sup> See <https://www.energy.ca.gov/programs-and-topics/programs/clean-hydrogen-program>

experience has repeatedly shown that clean hydrogen is a crucial resource in mitigating climate change by decarbonizing hard-to-electrify sectors. However, for clean hydrogen to realize its full potential, it must be able to scale effectively. We fully agree with the Draft Solicitation's recognition that "hydrogen must be produced cleanly at increased scale and reduced cost" to achieve mass adoption.<sup>3</sup> While clean hydrogen plays a critical role in our fight against climate change, its current cost is higher than that of fossil fuels,<sup>4</sup> making widespread adoption infeasible. Thus, we endorse the objective of this Draft Solicitation to “deploy large-scale quantities of clean hydrogen at centralized locations by leveraging economies of scale and co-locating renewable energy resources to reduce system costs and facilitate distribution to diverse end users.”<sup>5</sup>

### ***2.) The Definition of “Clean Hydrogen” Does Not Restrict Projects to Electrolysis***

Considering the nascent state of the hydrogen market, it is crucial to ensure its robust development by avoiding artificial exclusions of hydrogen production pathways. For hydrogen to emerge as a cost-effective and dependable alternative to fossil fuels on a large scale, the market must foster competition and allow for the identification of the cleanest, most efficient, and economically viable pathways for hydrogen production. The GHC commends the CEC for its definition of "clean hydrogen," which extends beyond electrolytic hydrogen.

To further enhance this definition, the GHC proposes the explicit inclusion of waste-to-hydrogen production pathways that are low-carbon or carbon-negative. As highlighted in the Department of Energy's "U.S. National Clean Hydrogen Strategy and Roadmap" report, “hydrogen derived from biomass and waste feedstocks can be low-carbon or even carbon-negative, depending on the feedstock.”<sup>6</sup> Hence, incorporating this aspect into the definition would support all projects involving low-, zero-, or negative-emission clean hydrogen. It is recommended that this addition be included in the Draft Solicitation to bolster the framework's effectiveness.

### ***3.) Project Elements Includes a Holistic View on the Hydrogen Market***

The GHC supports the holistic approach taken in this Draft Solicitation towards clean hydrogen. Specifically, we appreciate that the Project Elements section not only emphasizes addressing the logistical aspects of each plan but also incorporates considerations for hydrogen safety measures, leakage detection and monitoring, as well as community benefits. While hydrogen usage is not entirely new to our economy, its utilization at the proposed size and scale in this Draft Solicitation is unprecedented. Therefore, we believe that requiring projects to adopt a holistic view and assess all impacts – both direct and indirect – can effectively capture the true potential and benefits of clean hydrogen in the economy.

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<sup>3</sup> See <https://www.energy.ca.gov/programs-and-topics/programs/clean-hydrogen-program>

<sup>4</sup> See <https://www.irena.org/Energy-Transition/Technology/Hydrogen#:~:text=Cost.,10%2D50%25%20more%20expensive.>

<sup>5</sup> See <https://www.energy.ca.gov/programs-and-topics/programs/clean-hydrogen-program>

<sup>6</sup> See Department of Energy's "[U.S. National Clean Hydrogen Strategy and Roadmap](#)", pg. 45.

### III. REQUESTED AMENDMENTS.

As noted above, the GHC is very supportive of this Draft Solicitation and believes it will generate competitive and robust projects. We believe it could be further strengthened, however, if the following three important amendments are addressed:

***1.) Adjust The Carbon Intensity Requirement, Setting The Carbon Intensity Threshold At 0.0-0.45 Kilograms Of Carbon Dioxide Equivalent Per Kilogram Of Hydrogen Produced.***

The Draft Solicitation seeks input from stakeholders on the realism, reasonableness, and feasibility of the Project Elements outlined in Section 4 of the document. While we generally believe that most of these elements possess those qualities, we have reservations regarding the mandate for zero carbon intensity.

Firstly, we want to express our full support for implementing a carbon intensity (“CI”) framework. The GHC considers the inclusion of such a framework crucial because it takes a technology-neutral approach. By prioritizing hydrogen solutions based on carbon emissions rather than specific technologies, this approach encompasses all non-fossil fuel feedstock hydrogen pathways. It not only incentivizes emissions reduction – thereby contributing to the state’s emission reduction goals – but also fosters innovation for cleaner technologies. The GHC endorses this perspective as it encourages competition among hydrogen pathways, emphasizing that hydrogen – regardless of its production method – can thrive if it meets the desired emissions threshold. We are therefore fully in favor of a CI framework that promotes clean hydrogen with minimal emissions.

We also acknowledge the importance of reducing barriers to entry for the clean hydrogen market and establishing alignment across federal and state levels to enable market growth. Presently, the Draft Solicitation sets forth the expectation of “0.0 kilograms of carbon dioxide equivalent per kilogram of hydrogen produced,” but this is more stringent than the federal requirement. The Bipartisan Infrastructure Law (BIL), the Inflation Reduction Act (IRA), and the National Hydrogen Strategy all define “clean hydrogen” as hydrogen produced with a carbon intensity equal to or less than 2 kilograms of carbon dioxide equivalent per kilogram of hydrogen produced. We are therefore concerned that the Draft Solicitation’s approach of strictly prohibiting emissions might excessively constrain the market and impede its development at this early stage.

While zero-carbon hydrogen is undoubtedly the ideal option for all parties involved, we believe it is essential to acknowledge the role of low-carbon hydrogen in market development as well. As the Department of Energy has stated, “zero- and low-carbon hydrogen is a key part of a comprehensive portfolio of solutions to achieve a sustainable and equitable clean energy future.”<sup>7</sup> With this in mind, we strongly urge the CEC to amend the Project Element in question to align with federal legislation. Specifically, we propose that this Project Element be revised to match the lowest carbon intensity tier of the IRA’s hydrogen production tax credit, which sets the carbon intensity threshold at 0.0-0.45 CO<sub>2</sub>e/kg hydrogen.

**2.) Clarify Which GREET Model the Draft Solicitation Refers To, Preferably Naming The Federal GREET Model Employed In The Inflation Reduction Act (45V) As Well As The Clean Hydrogen Production Standard.**

While the GHC strongly supports the CEC's requirement of using the GREET model to evaluate the lifecycle emissions of projects, we kindly request the CEC specify the particular GREET model they are referring to. The current wording could be interpreted as either the federal GREET model<sup>8</sup> or California's own GREET model utilized in the Low Carbon Fuel Standard.<sup>9</sup> Considering the objectives of this project, we believe that the federal GREET model would be more suitable, as it can effectively assess clean projects from well-to-gate.

**3.) Implement Flexible Water Sourcing Measures**

The GHC fully endorses the CEC's commitment to promoting water conservation in energy production. As champions of clean hydrogen advancement, we recognize the critical importance of evaluating water usage impacts across different hydrogen production pathways. Currently, the predominant method for producing hydrogen in the U.S. (steam methane reformation (“SMR”) of natural gas) not only produces emissions but also consumes a significant amount of water.

However, the GHC emphasizes the promising potential of electrolytic hydrogen production powered by renewable electricity. This method has a lower water consumption rate than SMR of natural gas, positioning it as a sustainable and water-efficient alternative.<sup>10</sup> By replacing SMR of natural gas production in California with electrolytic hydrogen production fueled by renewables, water savings can be achieved. This will equate to an important annual reduction in water consumption, which aligns with our shared commitment to water conservation.

To maximize the benefits of electrolytic hydrogen production, the GHC therefore recommends the implementation of flexible water sourcing measures. While prioritizing the use of recycled or reused water is ideal, it is essential to acknowledge that certain regions with optimal hydrogen production conditions may face limitations in accessing sufficient recycled or reused water supplies. To overcome these challenges, the GHC advocates for allowing the blending of water sources in situations where recycled or reused water is not readily available in the required quantity. Moreover, we propose that the water requirement be waived for projects located in areas where recycled or reused water resources are scarce. Adopting these measures will foster the growth and development of electrolytic hydrogen production, promoting water conservation, environmental sustainability, and driving the transition towards a clean energy future.

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<sup>8</sup> Employed in the Inflation Reduction Act (45V) as well as the Clean Hydrogen Production Standard.

<sup>9</sup> [https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/ca-greet/cagreet\\_supp\\_doc\\_clean.pdf](https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/ca-greet/cagreet_supp_doc_clean.pdf)

<sup>10</sup> See [https://hydrogencouncil.com/wp-content/uploads/2021/01/Hydrogen-Council-Report\\_Decarbonization-Pathways\\_Part-1-Lifecycle-Assessment.pdf](https://hydrogencouncil.com/wp-content/uploads/2021/01/Hydrogen-Council-Report_Decarbonization-Pathways_Part-1-Lifecycle-Assessment.pdf)



#### **IV. CONCLUSION**

The GHC appreciates the opportunity to submit comments on this Draft Solicitation for the CEC's CHP. We appreciate the CEC's leadership and look forward to collaborating with the CEC and all other stakeholders.

Respectfully submitted,

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