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**Comments of Green Hydrogen Coalition on July 1 EPIC Hydrogen
Technology Workshop**

Additional submitted attachment is included below.



July 15, 2021

Email to: docket@energy.ca.gov

Docket Number: 20-EPIC-01

Subject: GHC's EPIC Hydrogen Technology Workshop Comments

Re: Comments of the Green Hydrogen Coalition (GHC) following the July 1, 2021 EPIC Hydrogen Technology Plan Workshop

Overview

The Green Hydrogen Coalition ("GHC")¹ appreciates the opportunity to provide comments on the Electric Program Investment Charge ("EPIC") Hydrogen Technology Workshop. GHC seeks to offer insights on the benefits and opportunities green hydrogen represents for California's state-wide decarbonization efforts and provide actionable recommendations towards EPIC's *Green Hydrogen Roadmap and Strategic Plan for a Decarbonized California*.

GHC is a California educational non-profit organization founded in 2019 to facilitate policies and practices to advance the production and use of green hydrogen at scale in all sectors to accelerate a carbon-free energy future. GHC defines green hydrogen as hydrogen that is not produced from fossil fuel feedstocks. Such pathways can include but are not limited to electrolysis of water, steam methane reforming, autothermal reforming of methane pyrolysis of renewable gas, and thermochemical conversion of biomass. GHC believes that the prioritization of green hydrogen project deployment at scale is fundamental to reduce cost and to meet California's climate and carbon goals.

GHC commends the CEC's efforts in including green hydrogen as a research priority under EPIC. This will enable the at-scale production, transport, and storage of green hydrogen necessary to benefit California's power sector and also accelerate decarbonization in multiple hard-to-abate sectors such as transportation, heavy industry, and even shipping and aviation.

In these comments, GHC supports the road-mapping of a green hydrogen strategic plan to achieve California's decarbonization goals. In addition to GHC's presentation and remarks during the July 1st workshop, GHC also provides the following observations and recommendations for the CEC's consideration.

¹ <https://www.ghcoalition.org/>

Recommendations

1. GHC strongly urges the definition of green hydrogen in the *Green Hydrogen Roadmap and Strategic Plan for a Decarbonized California* be revised to include additional pathways for green hydrogen production, not just electrolytic green hydrogen as defined by SB 1369.

GHC defines green hydrogen broadly *as hydrogen that is not produced from fossil fuel feedstocks*. While this may include green electrolytic hydrogen, as defined in SB 1369, it also includes hydrogen produced from eligible organic waste feedstocks via steam methane reforming, autothermal reforming, or methane pyrolysis of renewable gas as well as the thermochemical conversion of biomass. While a broader definition supports market development and resource diversity for green hydrogen production, it can also bring co-benefits in other sectors. In particular, the conversion of both agricultural and municipal solid waste to green hydrogen can help to tackle California's waste problem. In 2018, California disposed approximately 13 million tons of organic waste.² Meanwhile, both agricultural and municipal waste can be transformed using today's technology from a source of pollution and emissions to a useful feedstock for green hydrogen production. As such, GHC strongly recommends the CEC incorporate GHC's more inclusive definition of green hydrogen, which extends beyond electrolytic hydrogen.

In addition to the CEC's assessments and road-mapping efforts in support of green hydrogen, GHC believes EPIC should include funding for the demonstration of each of the various pathways of producing green hydrogen in California. In particular, critical research and demonstration needs for biomass-based pathways to producing green hydrogen include: how to leverage existing processing infrastructure, testing facilities for pollution controls, methods for tracking environmental benefits, measuring volatile organic compounds ("VOC") emissions from steam reformation of biogas, comparing different biogas conversion technologies, determining optimal scale for biogas-to-hydrogen, and understanding of modular configurations and approaches. GHC recommends these R&D gaps be addressed in this upcoming EPIC funding cycle.

2. In recognition of green hydrogen's potential for multi-sectoral decarbonization, GHC recommends the CEC ensure green hydrogen RD&D effort are well-aligned and coordinated between the CEC's various programs including, but not limited, to EPIC, Natural Gas Research Program, and Clean Transportation Program.

GHC shares the CEC's multi-sectoral vision for green hydrogen detailed in the workshop

² <https://www.calrecycle.ca.gov/climate/organics>



presentation.³ Green hydrogen has the potential to decarbonize the power sector and also accelerate decarbonization in multiple hard-to-abate sectors such as transportation, heavy industry, and even shipping and aviation. Notably, the myriad end-use applications for green hydrogen may all rely on shared transport and storage infrastructure. As such, GHC believes it is critical that the CEC coordinate green hydrogen R&D and planning across the CEC's various programs and teams. GHC believes this increased level of coordination is necessary to facilitate the use and production of green hydrogen to reach the CEC's research and planning objectives.

One priority area of coordination should be to align green hydrogen R&D funding between the Natural Gas Research and EPIC programs to the extent possible. Studying potential applications and scale of green hydrogen for decarbonization across several sectors is a complex project that requires considering how to aggregate demand in strategic locations and leverage these large-scale "hubs" to support the development of infrastructure.

Another priority area of coordination should be to consider electric system planning alongside gas system planning. The interface of these two large, complex systems is nothing new, however GHC believes green hydrogen should be accurately reflected in both system planning efforts. Notably, the SB 100 modeling effort did not consider green hydrogen storage and transport using the existing natural gas infrastructure, which GHC believes to be a critical misstep given the opportunity to leverage existing infrastructure in the near- and mid-term. The CEC should consider joint electric and gas system planning in the future to develop a more comprehensive understanding of the way in which green hydrogen can help optimize the broader energy system. For example, GHC believes that a more robust consideration of green hydrogen in the SB 100 modeling effort would have resulted in the selection of green hydrogen blending as a potential form of storage, transport, and/or use in thermal electric generation. Increasing the green hydrogen content in California's natural gas pipelines would be a huge step towards decarbonizing the natural gas system and downstream uses, and would provide a robust pathway for employment, investment and decarbonization across all communities. Lastly, the CEC should consider how to align its efforts to promote fuel cell electric vehicle ("FCEV") refueling infrastructure through the Clean Transportation Program with its green hydrogen R&D and electric and gas system planning responsibilities.

Conclusion

GHC is supportive of the *Hydrogen Roadmap and Strategic Plan for a Decarbonized California* under EPIC Interim Investment Plan 2021-2022. The GHC recommends the CEC to recognize that green hydrogen not only includes electrolytic green hydrogen, but also

³ EPIC - *The Role of Green Hydrogen in a Decarbonized California - A Roadmap and Strategic Plan*. July 1, 2021. <https://efiling.energy.ca.gov/getdocument.aspx?tn=238711> (hereinafter "Workshop presentation"). Slide 17.



other pathways that can enable the decarbonization of numerous sectors and processes *at scale*. The GHC also respectfully urges the CEC to coordinate its various efforts related to green hydrogen to accelerate deep decarbonization across multiple sectors of the economy.

GHC appreciates the opportunity to provide these comments and feedback and looks forward to collaborating with the CEC and other stakeholders in this initiative.

Sincerely,

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