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*Comment Received From: Green Hydrogen Coalition  
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**Comments of Green Hydrogen Coalition (GHC) on July 28 IEPR  
Hydrogen Workshop**

*Additional submitted attachment is included below.*



August 11, 2021

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

Docket Number: 21-IEPR-05

Subject: GHC's IEPR Commissioner Workshop on Hydrogen to Support California's Clean Energy Transition Comments

Re: Comments of the Green Hydrogen Coalition (GHC) following the July 28, 2021, IEPR Commissioner Workshop on Hydrogen to Support California's Clean Energy Transition

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## Overview

The Green Hydrogen Coalition (GHC)<sup>1</sup> appreciates the opportunity to provide comments on the California Energy Commission's (CEC) *2021 Integrated Energy Policy Report (IEPR) Commissioner Workshop on Hydrogen to Support California's Clean Energy Transition*. GHC seeks to offer insights on the benefits and opportunities green hydrogen represents for California's state-wide decarbonization efforts and provide actionable recommendations.

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 produced from non-fossil fuel feedstocks that do not produce incremental new (non-biogenic) GHG emissions. This definition is inclusive of, but not limited to 1) renewable hydrogen produced from Renewable Portfolio Standard (RPS) eligible feedstocks, and 2) zero-carbon Senate Bill (SB) 100 eligible hydrogen produced from renewable and SB 100 eligible feedstocks. GHC believes that prioritizing green hydrogen project deployment at scale is fundamental to reduce cost and meet California's climate and carbon goals.

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

In these comments, GHC supports the CEC's IEPR prioritization of green hydrogen to support the state's pressing energy needs and issues. In addition to GHC's presentation and

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



remarks during the July 28 workshop, GHC also provides the following recommendations for the CEC's consideration.

## **Recommendations**

### **1. Support RD&D in green hydrogen blending and injection and geologic storage**

For California to achieve its carbon neutrality goals in less than three decades, green hydrogen must have a significant role in the state's energy mix. Green hydrogen is the only commercially viable, scalable solution to decarbonize hard to abate sectors (e.g., industrial and heavy-duty transport). Blending and injecting green hydrogen into existing natural gas pipelines is an essential early step in progressing toward these goals as it generates demand for green hydrogen and, in turn, lowers the cost of green hydrogen.

Timely real-world demonstration of green hydrogen blending into pipelines (with real-world end-user customers) is critical to developing safety protocols and procedures, understanding the impact on end-use equipment and storage facilities, and developing community engagement strategies. To this end, the CEC should prioritize advancing pilots and scaled demonstrations focused on blending and injecting green hydrogen into existing natural gas pipelines.

The CEC should also research and pilot green hydrogen long-duration bulk storage to address renewable generation surplus and reliability concerns. To take advantage of green hydrogen's long-duration storage capabilities, the CEC should examine cost-effective geologic storage options (e.g., salt dome formations, aquifers, retired natural gas caverns) in California. Compared to above-ground compressed storage tanks, geologic storage can offer substantial storage cost reductions and buffer capacity to meet possible disruptions in supply or changing seasonal demands. The CEC's research can support lower energy storage costs, demonstrate measurable grid service needs, increase energy storage diversity, and support grid reliability.

Overall, the blending and injection of green hydrogen into the existing gas system will significantly boost gas pipeline decarbonization in California. With the CEC's support, gas pipelines can be one of the most cost-effective long-term choices for green hydrogen delivery. Additionally, integrating green hydrogen into the gas system and storing it in existing geologic storage infrastructure could allow for more green hydrogen supply hubs and wider dispersion and access.

## 2. Conduct green hydrogen portfolio modeling, assessments, and forecasts to support California's reliability concerns

Governor Newsom's Emergency Proclamation<sup>2</sup> highlights the need for California to be more proactive in addressing reliability concerns, especially in the face of increased extreme weather events. Drought conditions across the West have led to a gap in hydro capacity, while prolonged extreme heat has considerably increased peak demand. Meanwhile, these extreme weather phenomena heighten the threat of wildfires, which may lead to transmission outages. It is evident via the Emergency Proclamation that California needs to move faster to ensure reliability without compromising climate goals, further exacerbating the climate-dependent reliability concerns. GHC believes the CEC must prioritize green hydrogen portfolio modeling, assessments, and forecasts to support California's reliability concerns.

GHC believes that California needs an all-of-the-above approach to its reliability concerns and resiliency needs. Given the grid conditions highlighted by the Emergency Proclamation, the state must support resiliency for communities and customers, including California's most vulnerable. GHC recommends the CEC undergo coordinated electric and gas sector optimization in how green hydrogen industrial hubs can serve local resiliency needs during Public Safety Power Shutoff (PSPS) events and other unplanned outages. For example, locally stored green hydrogen can be used in backup generating units for long-duration backup power. Additionally, green hydrogen transported through a gas pipeline can meet energy needs when the electric grid cannot. Notably, the Emergency Proclamation would waive existing restrictions on specific backup generators (BUGs) originally intended to protect local communities and meet California's climate goals. Rather than sacrificing the health and safety of customers and risking climate goals, GHC recommends the CEC consider how to leverage green hydrogen in gas and electric system planning to support resiliency in addition to reliability.

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<sup>2</sup> California, State of. "Governor Newsom SIGNS Emergency Proclamation to Expedite Clean Energy Projects and RELIEVE Demand on the Electrical Grid during Extreme Weather Events This Summer as Climate Crisis Threatens Western States." California Governor Newsom, 30 July 2021, [www.gov.ca.gov/2021/07/30/governor-newsom-signs-emergency-proclamation-to-expedite-clean-energy-projects-and-relieve-demand-on-the-electrical-grid-during-extreme-weather-events-this-summer-as-climate-crisis-threatens-western-s/](http://www.gov.ca.gov/2021/07/30/governor-newsom-signs-emergency-proclamation-to-expedite-clean-energy-projects-and-relieve-demand-on-the-electrical-grid-during-extreme-weather-events-this-summer-as-climate-crisis-threatens-western-s/).

### 3. Help study and provide a vision for accelerating the transformation of existing assets and skilled jobs

Green hydrogen is a resource that can uniquely advance economy-wide decarbonization. While unlocking the potential of green hydrogen will bring decarbonization benefits to a series of currently fossil-based supply chains, the first step is to properly represent green hydrogen within ongoing modeling efforts and supporting this needed solution through policy.

As a critical component of California's toolkit for economy-wide decarbonization, green hydrogen should be acknowledged and supported as a no-regrets investment in California's future. An expanded role for green hydrogen may catalyze an economic development boon, and GHC believes the CEC is well-positioned to advance green hydrogen use and production without delay. California can catch up to Europe, Australia, and other markets to the extent that the state may also realize significant economic benefits from green hydrogen as an export commodity. As a result, the IEPR should consider the job creation and economic benefits of green hydrogen utilization.

In this sense, the benefits of transitioning to a green hydrogen economy cannot be understated or overlooked. Such a significant transformation would lead to thousands of jobs, future-proofing the careers of Californians currently associated with carbon-emitting assets or supply chains.

### 4. Accelerate green hydrogen industrial hub development: electrolytic tariff design; nexus of green ammonia for shipping and agriculture; expand industrial applications

***Electrolytic tariff design.*** Electrolyzers can provide grid services such as frequency support, voltage support, and ramping. However, a knowledge gap exists regarding the future value of such services and the revenue streams available to electrolytic hydrogen production facilities. For this reason, GHC encourages the CEC to research ways to simplify revenue forecasting and value stacking for electrolyzer project developers. Potential design themes include:

- i. Electrolytic projects on real-time rates or dispatchable load tariffs with renewable tariff provisions
- ii. Electrolytic projects directly integrated into the wholesale market providing grid services

***Nexus of green ammonia for shipping and agriculture.*** Europe's Emissions Trading Scheme just made maritime shipping fuel compliant to carbon reduction goals, which will accelerate the shipping community's progress toward alternative fuels. GHC believes this is an excellent opportunity for CEC to evaluate pathways to producing green hydrogen to produce green ammonia for maritime shipping and fertilizer production. Today, California is an importer of ammonia (produced from fossil fuel feedstocks), primarily to support fertilizer production for agriculture. Exploring in-state green ammonia production can help bring more value and jobs into the state and advance decarbonization of this critical sector.

Areas of CEC research could include:

- System planning and modeling, including production and transport to support the multiple pathways to produce green hydrogen/green ammonia and use green hydrogen/green ammonia
- Assess logistics needed for safe handling of ammonia, including onshore & offshore storage & bunkering (ship refueling operations)
- Quantify off-take potential
- Understand the ability to re-purpose fossil fuel infrastructure for green hydrogen and ammonia production

***Expand industrial applications.*** Hydrogen is a globally traded commodity currently used in large volumes in several critical industrial applications, namely, oil refining and manufacturing ammonia. These applications are crucial areas for the CEC to explore decarbonization strategies via green hydrogen since they represent vast off-take opportunities. Focus on these sectors, and ideally, specific decarbonization priorities are needed in the CEC's IEPR to encourage rapid transition to green hydrogen to displace current gray hydrogen use.

## **5. RPS Eligibility Guidebook clarifications are needed to enable full-scale green hydrogen eligibility**

Currently, the Renewable Portfolio Standards (RPS) Eligibility Guidebook only allows RPS certification eligibility for fuel cells using hydrogen derived from a non-fossil-based fuel or feedstock. GHC submits that fuel cells *and combustion turbines* using green hydrogen (e.g., non-fossil-based fuel feedstock) should be RPS certification eligible. The CEC should modify the RPS Eligibility Guidebook to ensure that fuel cells and combustion turbines using green hydrogen can participate in the RPS program. This change will undoubtedly increase green hydrogen procurement and support California's clean energy goals. GHC proposes the following redlines to the RPS Eligibility Guidebook, p. 13, section D.:

## D. Fuel Cell or Combustion Turbine Using Renewable Fuel

A facility that uses a fuel cell or combustion turbine conversion technology may qualify for RPS certification if the facility uses either an RPS-eligible renewable energy resource, qualifying hydrogen gas, or both, as described below.

### 1. Fuel Cells or Combustion Turbines Using an RPS-Eligible Renewable Energy Resource

A facility converting gas to electricity in a fuel cell or combustion turbine may qualify for RPS certification if the gas is an RPS-eligible renewable energy resource as described in this Guidebook.

### 2. Fuel Cell or Combustion Turbine Using Qualifying Hydrogen Gas

A facility converting hydrogen gas to electricity in a fuel cell or combustion turbine may qualify for RPS certification if the hydrogen was derived from a non-fossil-based fuel or feedstock through a process powered using an eligible renewable energy resource. The electricity generated by a facility using this type of hydrogen gas is eligible for the RPS only if the electricity that was used to derive the hydrogen is not also counted toward an RPS compliance obligation or claimed for any other program as renewable generation. The applicant must submit information on the hydrogen production process as part of the application.

Lastly, the RPS Eligibility Guidebook states that "facilities using non-renewable energy resources in excess of the de minimis quantity may continue to claim a de minimis quantity of the facility output attributable to non-renewable energy resources as RPS-eligible if the total contribution of the non-renewable energy resource does not exceed 10 percent of the total energy inputs."<sup>3</sup> GHC requests that the CEC clarify the de minimis quantity of non-renewable energy resources requirements for electrolytic hydrogen. Specifically, GHC asks that the CEC clarify that de minimis greenhouse gas emissions would include auxiliary grid loads for electrolytic hydrogen, provided that such loads do not exceed 10 percent of the total energy input.

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<sup>3</sup> Green, Lynette, Christina Crume. 2017. Renewables Portfolio Standard Eligibility Guidebook, Ninth Edition. California Energy Commission, p. 32. Publication Number: CEC-300-2016-006-ED9-CMFREV.





6. Help create alignment with key stakeholders, including labor and environmental justice groups

The green hydrogen economy offers many potential benefits, such as creating high-quality, green-energy jobs and supporting the transition to zero-emission production and transportation solutions. GHC encourages the CEC to align its green hydrogen efforts with key stakeholders, including labor and environmental justice groups. This alignment includes but is not limited to the CEC engaging with key stakeholders to identify green hydrogen demonstration and deployment sites located in, and benefiting, disadvantaged communities and low-income communities. Such alignment could provide net community benefits with local economic development, energy education, and clean-technology deployment.

Conclusion

GHC is supportive of the CEC's green hydrogen thought leadership in the *2021 Integrated Energy Policy Report* and respectfully urges the CEC to incorporate its recommendations. GHC looks forward to collaborating with the CEC and other stakeholders on this initiative.

Sincerely,

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