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GHC Comments on Firm Zero-Carbon Resources & Hydrogen Workshop

Additional submitted attachment is included below.

August 19, 2025

Email to: docket@energy.ca.gov

Docket Number: 25-IEPR-04

Subject: GHC's Comments on July 29, 2025 Workshop

Re: Comments of the Green Hydrogen Coalition Regarding the July 29 Workshop on Firm Zero-Carbon Resources and Hydrogen

I. INTRODUCTION & SUMMARY

Pursuant to the July 2, 2025 Revised Scoping Order and the Notice of Workshop in Docket No. 25-IEPR-04, the Green Hydrogen Coalition respectfully submits these comments in response to the IEPR Commissioner Workshop on Firm Zero-Carbon Resources and Hydrogen, held on July 29, 2025. The workshop was an excellent continuation of the IEPR's efforts to bring together relevant stakeholders and regulatory agencies to discuss and collaborate on shared efforts to scale firm zero-carbon resources, like clean hydrogen.

The GHC is an educational 501(c)(3) non-profit organization.¹ GHC was formed in 2019 to recognize the game-changing potential of clean renewable hydrogen to accelerate multi-sector decarbonization and combat climate change. GHC's mission is to facilitate policies and practices that advance clean renewable hydrogen production and use in all sectors of the economy to accelerate a carbon-free energy future. Our sponsors include foundations, clean renewable energy users and developers, utilities, and other supporters of a reliable, affordable clean renewable hydrogen fuel economy for all. The GHC's approach is focused on scaling clean renewable hydrogen as a viable and cost-competitive alternative to fossil fuels.

We commend the Commission's efforts to elevate hydrogen as a core component of the IEPR and appreciate the opportunity to provide insights into how future workshops can serve as a

¹ <https://www.ghcoalition.org/>

forum for agency coordination and discussion. Specifically, the Commission should consider how this proceeding can inform other efforts at the CEC (such as with revisions to the RPS Guidebook) and the CPUC (OIR Long-term Gas System Planning, Angeles Link Phase 2, Hydrogen Blending Pilots). The Commission should also consider ways to inform decisions that accelerate buildout to allow developers to access the 45V Federal tax credits while they are still available. The CEC presentation on SB 423 Firm Zero-carbon Resources Update noted that some zero-carbon resources require increased coordination amongst the agencies.² Hydrogen is one of those resources given its unique ability to unlock clean fuels, reduce emissions in the hard-to-abate areas, and provide power generation to the grid as it transitions off fossil fuels.

II. FUTURE WORKSHOPS SHOULD INFORM AND EDUCATE REVISIONS TO THE RPS GUIDEBOOK

GHC would encourage the Commission to utilize the findings from the IEPR to inform and educate the revisions to the RPS Guidebook. The passage of SB 1075 (Skinner, 2022) set the stage for the IEPR to include analysis of hydrogen's role in decarbonizing the electricity and transportation sectors within the 2023 and 2025 IEPRs.³ The GHC applauds the Commission for its work to this point, including integrating hydrogen scenario models and conducting two workshops around the importance of building out the hydrogen ecosystem in California.

GHC believes the next step for the Commission should be finding additional opportunities for leveraging the IEPR analysis to inform key California policies and market signals in support of

² Yang, Chie Hong Yee. "SB 423 Firm Zero-carbon Resources Update" *California Energy Commission*, 28 July 2025, efiling.energy.ca.gov/GetDocument.aspx?tn=265043. Accessed 16 Aug. 2025.

³ *SB-1075 Hydrogen: green hydrogen: emissions of greenhouse gases*, [leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB1075](https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB1075). Accessed 19 Aug. 2025.

renewable hydrogen production and deployment, such as the revisions to the RPS Guidebook for the 10th edition. For example, the IEPR could assess the near-term GHG emissions that would be reduced if the state allowed renewable hydrogen to be RPS-eligible when used in gas turbines. As GHC stated in our comments on the IEPR Scoping Order:

Gas turbines represent a cost-effective mechanism to achieve large-scale green firm power, by cost-effectively repurposing existing infrastructure and limiting the immediate need for significant new firm generation capacity. Gas turbines operating on renewable hydrogen also represent an important source of green grid-scale inertia, a grid service that is increasingly needed with the retirement of spinning generation and increased deployment of inverter-based renewable resources.⁴

Several entities are interested in the ability to use new or repurposed turbines with renewable hydrogen but to be economically feasible they require RPS-eligibility.

The Commission should use this proceeding as an opportunity to model and validate the climate related benefits, cost savings, and increased demand that can be achieved from making renewable hydrogen fuel in gas turbines RPS-eligible. As the CARB 2022 Scoping Plan Update highlighted, the state will need 1700x its current hydrogen supply to meet the decarbonization goals outlined in SB 100.⁵ Prioritizing renewable hydrogen in gas turbines in the near-term makes sense because it is one of few applications that can scale demand in the near-term while being managed in an environmentally responsible way. Additionally, renewable hydrogen fueled turbines will pave way for larger renewable hydrogen production which will drive down cost of hydrogen for heavy duty transport and goods movement applications, displacing diesel quicker.

⁴ Lin, Janice. *GHC's Comments on 2025 IEPR Draft Scoping Order*, at 7. Green Hydrogen Coalition, 11 Feb. 2025,

⁵ "2022 Scoping Plan Update" 5 Dec. 2022, ww2.arb.ca.gov/sites/default/files/2023-04/ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf. Accessed 19 Aug. 2025.

With the Federal government limiting the time range for hydrogen developers to access the 45V tax credits⁶, the IEPR should use the hydrogen proceeding to facilitate strategic demand formation in the RPS.

The current efforts to revise the RPS Guidebook would benefit from the modeling and analysis from the IEPR that explores cost effective ways to utilize hydrogen when implementing the requirements of SB 1075. As our comments to the original IEPR Scoping Order noted, “The main issue hindering the deployment of clean hydrogen is the current cost to produce and use. Cost can be addressed through efforts to help it reach economies of scale. To reach that inflection point requires the CEC, CPUC, and CARB to closely coordinate and prioritize the market development of renewable hydrogen through deliberate measures that reduce the overall burden on ratepayers.”⁷ Finding viable end uses for clean hydrogen in the near term while long lead time resources are being developed is essential to reaching the economies of scale.

III. GHC APPRECIATES THE INCLUSION OF BIOMASS AND LINEAR GENERATORS AS FIRM CLEAN RESOURCES AND ENCOURAGES CONSIDERATION OF HYDROGEN IN DERIVATIVE FUELS

The GHC appreciates the inclusion of firm zero carbon resources in the proceeding, such as biomass, SMR, and linear generators, and encourages more investigation into the unique benefits these pathways and others can provide for hydrogen production. The GHC has been on record supporting the designation of non-combustion and turbine technologies that utilize green

⁶ “One Big Beautiful Bill Act” 14 Aug. 2025, www.congress.gov/119/plaws/publ21/www.congress.gov/119/plaws/publ21/PLAW-119publ21.pdf. Accessed 19 Aug. 2025.

⁷ GHC Comments on IEPR Scoping Order, 2.

hydrogen fuels as RPS-eligible because we believe these innovative technologies are cost-effective solutions for helping California bolster grid reliability and advance decarbonization efforts.⁸ In that vein, the GHC also supports the inclusion of these zero carbon pathways in the demand modeling forecasting efforts.

Linear generators are an exciting pathway that would benefit from further examination and inclusion in the IEPR. The July 29 workshop highlighted that linear generators innovative non-combustion and fuel-flexibility capabilities prevent stranded assets and sunk costs to customers. They can operate on a variety of fuels to speedily energize new loads and are already capable of transitioning to renewable hydrogen fuels when they become more readily available.⁹ This promotes energy affordability for ratepayers as the technology can leverage the existing infrastructure to simultaneously power loads now and contributes to grid decarbonization efforts. The GHC was pleased to see linear generators included in the RPS Guidebook revisions and encourages inclusion of hydrogen fueled resources in the demand modeling forecasting efforts. It is important to include linear generators as a resource that will be deployed in the 2026-2045 modeling because it sends a clear market signal that California will have demand for hydrogen production and use cases. IEPR modeling is an essential component of the IRP process at the CPUC and ensures these additional pathways being discussed can assist in meeting the state's RPS and SB 100 goals.

GHC continues to urge the Commission to explicitly quantify and explore the opportunity available by converting waste biomass to hydrogen for reducing wildfire risk and emissions from

⁸ Id., at 7.

⁹ Leacock, Kent. "Affordable, Reliable, Dispatchable and Low Carbon Power" *Mainspring Energy*, 29 July 2025, efiling.energy.ca.gov/GetDocument.aspx?tn=265036&DocumentContentId=101814. Accessed 19 Aug. 2025.

short-lived climate pollutants (SLCPs), pfas pollution, and landfill waste. We appreciated its inclusion in the SB 423 Zero Firm Carbon Resources presentation and believe this is a great first step. GHC would encourage the Commission to go further by deploying capital and resources into demonstrating the viability of this pathway. For example, building off the GHC's recent white paper on biomass waste to hydrogen that identified nine waste plants in LA County as perfect locations for a non-combustible thermal conversion pathway. The GHC found an abundant amount of feedstock in areas such as LA County.

“A fleet of nine NCTC plants sited in LA County, each processing 125,000 tons per year would establish a total processing capacity of 1.125 million tons of organic waste biomass, avoiding approximately 520,000 tons CO2 equivalent landfill emissions.”¹⁰

Additionally, non-combustible thermal conversion technologies eliminate many harmful pollutants and forever chemicals like PFAS.

“Producing clean hydrogen from LA's waste biomass and biosolids will provide immediate air quality improvements by displacing diesel and other fossil fuel combustion including 6,200 tons of avoided CO2 by reducing diesel truck trips to landfills, and approximately 790,000 tons of avoided CO2 per year if the resulting pure hydrogen is used to displace diesel as a trucking fuel.”¹¹

The report demonstrates the immense potential for biomass to hydrogen as a way to scale clean renewable energy while reducing the state's ever-growing landfills. To truly unlock the potential of bioenergy, the Commission should start with LA County and scale up statewide. Additionally, the IEPR should assess the capacity of feedstock available from this pathway across the state.

¹⁰ Green Hydrogen Coalition, *Transforming Waste Biomass to Clean Hydrogen: A Sustainable Path for Los Angeles and California*, Page 4, June 12, 2025.

¹¹ *Id.*

IV. THE IEPR SHOULD CONSIDER DEMAND SCENARIOS FOR THE USE OF RENEWABLE HYDROGEN IN DEVELOPING CLEAN FUELS

The IEPR should build off the transportation demand scenarios conducted for the SB 1075 report by looking at demand in clean fuels production. The demand scenarios presented during the July 29 workshop appear to focus on direct hydrogen utilization.¹² This is a missed opportunity as using renewable hydrogen to develop clean derivative fuels is gaining traction across the globe; partially because the technology is readily available for their utilization in power generation and transportation. These clean fuels will not only be required for use in California to achieve economywide decarbonization, but also for California to participate in the global economy to refuel international maritime shipping operations, and international flights. Notably, these fuels are also a valuable commodity that in the future, could be exported to energy importing nations such as Japan, South Korea, and Singapore.

Clean fuels can be utilized in many of the pathways highlighted by the IEPR and have greater demand than being projected. "Current technological innovations in gas turbines, fuel cells and linear generators have led to the ability to utilize clean ammonia as a fuel for electricity production."¹³ As noted above, ammonia and methanol are both being used as maritime shipping fuels in place of traditional fossil fuels. The policy scenario for Ocean-Going Vessels (OGV) noted a forecast of 5% energy demand replaced by hydrogen by 2045,¹⁴ but the GHC believes it is much higher when factoring in hydrogen production to make ammonia and methanol. The IEPR

¹² Gee, Quentin. "Hydrogen Demand Scenarios for Use in SB 1075" *Clean Energy Commission*, 29 July 2025, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=265030&DocumentContentId=101810>. Accessed 19 Aug. 2025.

¹³ GHC Response to IEPR Scoping Order, at 9.

¹⁴ Hydrogen Demand Scenarios for Use in SB 1075.

should clarify if the figures used for the bookend projections on hydrogen demand include end uses in clean fuels; and if they do not, then add that as a layer of modeling and analysis moving forward.

V. THE HYDROGEN COMPONENT OF THE IEPR SHOULD INFORM AND EDUCATE CPUC PROCEEDINGS, SUCH AS LONG-TERM GAS SYSTEM PLANNING, ANGELES LINK PHASE 2, HYDROGEN BLENDING PILOTS, AND IDENTIFY NEAR-TERM OPPORTUNITIES TO ACCELERATE SCALED DEMAND

The IEPR modeling, analysis, and recommendations related to hydrogen production are critical inputs for informing several active CPUC proceedings around decarbonization and long-term planning efforts. The IEPR is uniquely positioned as the go-to program for sourcing accurate and reliable forecasting data. As many agencies rely on the IEPR's modeling, it is paramount that zero carbon resources, such as clean hydrogen, are incorporated into the forecasts.

The IEPR should continue studying and modeling near term pathways for the potential growth for hydrogen. The Bloomberg presentation during the July 29 workshop noted that binding offtake remains elusive for renewable hydrogen producers, and that binding off take is key to securing financing and successful project implementation.¹⁵ The GHC recommends that the IEPR specifically focus on near-term pathways to accelerate the realization of binding offtake, particularly in the next two years while federal tax credits are available.

A way to spur near-term demand is assessing opportunities for immediate utilization that can be utilized in other proceedings focused on decarbonization. The CPUC is currently in the midst of the OIR on Long-Term Gas System planning with the goal of determining how California

¹⁵ Kaur, Payal. "US Clean Hydrogen Market Outlook" *Bloomberg NEF*, 29 July 2025, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=265044&DocumentContentId=101823>. Accessed 19 Aug. 2025.

is going to transition off fossil fuels while meeting the demands in the near and midterm.¹⁶ The IEPR could provide valuable inputs for the proceeding by modeling hydrogen demand scenarios for a modest amount of hydrogen blending and quantities that could be utilized in the near term to decarbonize dispatchable clean firm power generation. Notably, both of these uses of renewable hydrogen would help California achieve its decarbonization and clean energy goals. Longer term, as additional uses of hydrogen are scaled up, such as for transportation (both as a direct fuel and for the production of renewable derivative fuels), the IEPR can help inform the CPUC with understanding the aggregated future demand. The IEPR can also provide valuable input on likely production locations connected to out-of-state geologic storage opportunities to help inform the CPUC's Long Term Gas Planning rulemaking.

California will ultimately require a dedicated statewide hydrogen pipeline transport system to manage the scale of demand forecasted by CARB and others. As the PUC notes on their website, "The state's natural gas utilities operate over 100,000 miles of transmission and distribution pipelines, and thousands more miles of service lines."¹⁷ Repurposing these pipelines will be necessary to prevent stranded assets and sunk costs, and renewable hydrogen is the logical resource to replace fossil fuels. The IEPRs analysis also confirms the need for a pipeline transport system by pointing out the need to connect to out of state geologic storage.¹⁸ This has been further validated by many countries/jurisdictions/studies around the world. Indeed, Germany is already

¹⁶ Proposed Decision "OIR Long Term Gas System Planning" California Public Utilities Commission, June 23, 2025, <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M570/K400/570400950.PDF>. Accessed on 19 Aug. 2025.

¹⁷ "Natural Gas and California" www.cpuc.ca.gov/industries-and-topics/natural-gas/natural-gas-and-california. Accessed 19 Aug. 2025.

¹⁸ Sallam, Sammy. "Electric Generation and Transportation (2025 IEPR)" *California Energy Commission*, 29 July 2025, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=265050&DocumentContentId=101828>. Accessed 19 Aug. 2025.

deploying a national dedicated hydrogen pipeline transport system, of which 60% will be composed of repurposed natural gas pipelines. Notably, the first ~520km of Germany's national pipeline transport system be in service later this year.¹⁹

The IEPR's more expansive analysis that includes a vision for green fuels production in California would support the CPUC's efforts to determine the usefulness of and potential transformation of California's existing natural gas pipeline infrastructure, such as pipelines for renewable hydrogen transportation. As the CPUC presentation on hydrogen related activities noted, "CPUC is required to ensure that any requests for ratepayer funding are 'just and reasonable.' To do this effectively, (CPUC) need(s) objective data and projections from non-interested sources such as the IEPR and SB 1075 Report."²⁰

The infrastructure needed to transport hydrogen is one of the biggest barriers to reaching economies of scale. The IEPR could greatly assist with this effort by developing reasonable future hydrogen demand scenarios that factor in hydrogen demand from the production of renewable fuels. Additionally, the IEPR could include scenarios for reducing delivered hydrogen costs through the repurposing of existing pipelines and identification of needed new pipelines to achieve an optimized system connected to geologic storage. This type of analysis would link the state's climate efforts together and provide the CPUC with objectionable and verifiable state-backed scientific evidence.

¹⁹ *Hydrogen Infrastructure in Germany*, Webinar, German Federal Ministry for Economic Affairs and Climate Action and the US Department of Energy, January 29, 2025.

²⁰ Cole, Sasha. "Hydrogen-Related Activity at the CPUC" *California Public Utilities Commission*, 29 July 2025, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=265042&DocumentContentId=101820>. Accessed 19 Aug. 2025.

Modeling statewide and regional demand scenarios for hydrogen use in clean fuels production to serve hard-to-abate sectors such as maritime shipping and agriculture can help inform the CPUC proceeding on Angeles Link Phase 2. Angeles Link is envisioned as a “open-access pipeline system dedicated to public use for the transport of clean renewable hydrogen at scale.”²¹ One of the challenges in the Phase 2 approval proceeding is determining if such an expense should be covered by ratepayers as a matter of law and policy.²²

From a policy perspective, there are many reasons that such a pipeline should be approved and built. Shared infrastructure and access to common carrier pipelines are a requirement for off takers in hard-to-abate sectors (power, heavy duty trucking, shipping, aviation, industrial and chemical heat and process applications) to invest in new capital equipment that can utilize clean and renewable hydrogen instead of fossil fuels. Offtakers require availability, security, and affordability of supply that can be provided via pipeline. This point was highlighted during the July 29th workshop stating, “Pipelines would be needed to meet hydrogen demand beyond limited transportation end uses...”²³ As noted above, the IEPR could inform the proceeding by assessing the demand for clean fuels, like SAF, Ammonia, or Methanol that would require clean hydrogen and likely need such a pipeline to scale effectively.

²¹ “Application Of Southern California Gas Company (U 904 G) for Authorization to Implement Revenue Requirement for Costs to Enable Commencement of Phase 2 Activities for Angeles Link” *Southern California Gas Company*, 20 Dec. 2024, <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M549/K795/549795620.PDF>. Accessed on 19 Aug, 2025.

²² “Assigned Commissioner’s Scoping Memo” In the Matter of the Application of Southern California Gas Company (U904 G) for Authorization to Implement Revenue Requirement for Costs to Enable Commencement of Phase 2 Activities for Angeles Link. *California Public Utilities Commission*, July 31, 2025, <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M574/K980/574980331.PDF>. Accessed on 19 Aug. 2025.

²³ Electric Generation and Transportation (2025 IEPR)

VI. CONCLUSION

Building off the valuable contributions the IEPR has already provided to the hydrogen ecosystem, GHC believes the next step is developing a strategy to inform decisions being made by other agencies and policymakers that accelerates buildout. The Federal government has put California proverbially on the clock with the reduction in time to access the 45V credits, and California should be using every tool at its disposal to help developers access the tax credits while they are still available.

GHC appreciates the opportunity to provide these comments on the July 29 Workshop on Firm Zero-Carbon Resources and Hydrogen.

Respectfully submitted,

x Tim Kamermayer
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Affairs

GREEN HYDROGEN COALITION