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Joint Parties Response to the Draft 2023 IEPR

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RE: Joint Parties Response to the Draft 2023 IEPR

1. INTRODUCTION

Together, the Green Hydrogen Coalition (GHC), the California Hydrogen Business Council (CHBC), and the California Hydrogen Coalition (CHC) (together the Joint Parties) submit our response to the California Energy Commission (CEC)'s Draft 2023 IEPR.

The GHC[1] is an educational 501(c)(3) non-profit organization. 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.

The CHBC[2] is a 501(c)(6) non-profit organization comprised of over 135 companies and agencies involved in the business of hydrogen. The CHBC's mission is to advance the commercialization of hydrogen in the energy sector, including transportation, goods movement, and stationary power systems, to reduce emissions and help the state meet its decarbonization and air quality goals. CHBC enhances market commercialization through effective advocacy and education of policymakers directly and through coalition building.

The CHC[3] is a 501(c)(6) non-profit organization formed in 2019. CHC is dedicated to enabling California's transition to zero emission vehicles by expanding the availability of reliable, convenient and affordable hydrogen fueling. Our membership is comprised of hydrogen producers, station developers, fuel cell electric vehicle and fuel cell electric truck manufacturers.

As the Joint Parties, we extend our sincere appreciation to the CEC staff for their unwavering dedication to guiding California's clean energy transition, with a specific emphasis on clean and renewable hydrogen. As the imperative to combat climate change intensifies, we applaud the foresight demonstrated by the CEC staff in recognizing the critical importance of "early exploration of new resource requirements for proactive planning."[4] The analysis conducted aligns seamlessly with the Joint Parties' vision for California: a robust portfolio of renewable resources driving economy-wide decarbonization. We propose the integration of the U.S. National Clean

[1] https://www.ghcoalition.org/
[2] https://californiahydrogen.org/
[3] https://californiahydrogencoalition.org/
[4] https://efiling.energy.ca.gov/GetDocument.aspx?tn=253086

Hydrogen Strategy and Roadmap[5] into the CEC's strategy to align state goals with federal initiatives.

2. RESPONSE OF THE JOINT PARTIES

The Joint Parties are appreciative of the Draft 2023 IEPR's dedication to exploring the future role of clean and renewable hydrogen in the electric and transportation sectors as well as outlining the of the future research that will be conducted under the 2025 IEPR. In the following sections, the Joint Parties will focus our comments on the future analysis to be conducted under the 2025 IEPR to highlight the areas in which the next iteration of analysis and research can be as comprehensive as possible.

A. Conduct a Robust Analysis for Evaluating Renewable / Clean Hydrogen Pathways

While we acknowledge the focus of the Draft 2023 IEPR analysis was on electrolytic hydrogen production pathways, we respectfully urge the CEC staff to expand their scope in the forthcoming 2025 IEPR. Specifically, we advocate for the inclusion and comprehensive evaluation of biogenic production pathways, as envisioned in Senate Bill 1075 (Skinner, 2022). Incorporating these diverse methods will enrich the assessment, presenting a more comprehensive understanding of the various environmentally beneficial hydrogen production routes available. By broadening the analysis to encompass diverse production methodologies, including those based on biogenic sources, the evaluation process will better reflect the breadth of viable and sustainable hydrogen production methods. We believe this inclusive approach will not only deepen our understanding but also pave the way for a more resilient and adaptable hydrogen market that reflects the needs for achieving carbon neutrality. Leveraging hydrogen to mitigate the negative climate impacts of biogenic waste streams, as recognized by the Legislature[6] and California Air Resources Board (CARB),[7] should be fully incorporated into the Draft 2023 IEPR.

In summary, we request that the CEC staff consider and include diverse hydrogen production pathways in the 2025 IEPR. This deliberate expansion will play a crucial role in unlocking the full potential of hydrogen as a clean energy source, thereby fostering innovation, and contributing significantly to a clean, renewable, and more sustainable future.

B. The Joint Parties Strongly Support CEC staff prioritizing a comprehensive systems-level planning approach.

The Joint Parties strongly advocate for prioritizing a comprehensive systems-level planning approach within the CEC, as articulated in the Draft IEPR. This approach, outlined for future analysis in the 2025 IEPR, emphasizes an integrated perspective encompassing both the electricity and transportation sectors, including midstream distribution infrastructure like pipelines and trailers. We firmly endorse this methodology, recognizing its pivotal role in realizing a large-scale clean renewable hydrogen economy. The current modeling in the Draft

[5] https://www.hydrogen.energy.gov/library/roadmaps-vision/clean-hydrogen-strategy-roadmap
[6] SB 1383 (Lara, 2016): https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383; SB 155 (Committee on Budget and Fiscal Review, 2021),
[7] The SLCP strategy page 28 states, *"In addition, this biogas can help the State meet its 33 percent renewable mandate for hydrogen transportation fuel."*

2023 IEPR by E3 is limited in its approach to hydrogen, relying solely on curtailment for production and failing to fully integrate hydrogen into California's energy system. This narrow focus overlooks the broad-based demand and cost-effectiveness achievable through a comprehensive energy plan that efficiently balances energy needs across economic sectors.

Our support is substantiated by tangible evidence from the GHC's HyBuild™ Los Angeles Initiative. This initiative enabled us to envision the future, employing a systems-level approach to analyze the feasibility and competitiveness of a scaled clean renewable hydrogen economy in Los Angeles. This rigorous analysis revealed hydrogen's commercial viability by leveraging existing salt domes and significant infrastructure investments. We are happy to share comprehensive details regarding the modeling approach and methodologies used during this analysis with the CEC.

Expanding this approach statewide within the IEPR framework can establish a vital long-term vision for California. This effort should focus on unveiling potential scaled clean renewable hydrogen hubs across the state, alongside strategies for swift local implementation. Drawing inspiration from successful initiatives like the European Hydrogen Backbone Initiative,[8] this strategy would emphasize the pivotal role of hydrogen infrastructure, repurposing existing systems, and establishing essential hydrogen pipelines. Aligning with our collective goal of expediting California's decarbonization journey, we strongly recommend integrating this systems-level planning approach into the CEC's policy framework to accelerate the transition to a clean renewable hydrogen economy in the state.

C. Strategies for Zero-Emission Transportation and Comprehensive Cost Analysis

Establish a Comprehensive Network for Zero-Emission Transportation: Drawing from the frameworks of AB 2127 (Ting, 2018) and SB 671 (Gonzalez, 2022), there is an urgent need to expand the concept of a minimum viable network beyond freight transportation. Aligning with Advanced Clean Cars II, Advanced Clean Trucks, Advanced Clean Fleets, and Innovative Clean Transit rules necessitates an accelerated transition to zero-emission transportation. While charging infrastructure requirements are well understood, the absence of a similar strategy for hydrogen infrastructure is apparent. The CEC must equitably analyze the necessity for fuel cell electric vehicles (FCEVs), incorporating projections from reports such as CARB's Mobile Source Strategy.[9] Predicting infrastructure needs for both charging and hydrogen refueling with reasonable utilization rates is critical for equitable planning and a just transition**.**

Integrate Historic Cost Data for Holistic Pricing Insights: The CEC's analysis should encompass diverse economic sectors beyond nascent retail refueling, especially considering historic price trends and transit fleet contracts, which often reflecting significantly lower costs due to volumes. Anticipated cost reductions as California scales hydrogen under initiatives like the Biden Administration's Earth Shot[10] and the Regional Clean Hydrogen Hubs Program (H2Hubs)[11] should be factored in. Additionally, examining price reductions through various distribution

[8] https://ehb.eu/
[9] https://ww2.arb.ca.gov/resources/documents/mobile-source-strategy
[10] https://www.energy.gov/eere/fuelcells/hydrogen-shot
[11] https://www.energy.gov/oced/regional-clean-hydrogen-hubs-0

methods (e.g., pipelines, liquid hydrogen trailers, and high-pressure gaseous trailers) is imperative for developing comprehensive pricing insights. The extensive cost-reduction strategies proposed in California's H2Hub,[12] which is currently absent from the draft 2023 IEPR, merit thorough examination and incorporation for a more comprehensive understanding of cost dynamics and potential savings.

D. Conduct future assessments of thermal generating facilities, reliability, safety frameworks, and pipeline infrastructure.

To ensure the 2025 IEPR considers all key factors related to a clean renewable hydrogen ecosystem, the Joint Parties would like to recommend that the following analysis be conducted:

- *Comprehensive Study of Thermal Generating Facilities:* The CEC should spearhead a comprehensive investigation into adapting thermal generating facilities for hydrogen integration. This research should encompass feasibility studies and cost-effectiveness assessments regarding retrofitting existing power plants to operate using hydrogen, either as a primary or blended fuel source. Additionally, this initiative should explore the design, construction, and operational considerations for new facilities optimized for hydrogen compatibility. Pilot projects should be conducted to test hydrogen-blended combustion within existing facilities, generating practical insights into operational challenges, efficiency gains, and safety parameters. The research must also identify facilities suitable for potential phase-out or repurposing to streamline future investments and decrease reliance on fossil-based backup systems.

- *Reliability Considerations for Hydrogen Use:* The CEC should conduct a thorough analysis of hydrogen utilization for reliability, specifically examining the infrastructure, operational methodologies, and maintenance requirements. This research should aim to redefine reliability strategies, thereby ensuring adaptability within the energy grid while exploring innovative solutions to ensure system stability when transitioning to hydrogen-based reliability systems. This work should support SB100 goals.

- *Develop a Safety and Permitting Guidebook:* Given the comprehensive safety standards and protocols for hydrogen production, storage, and utilization, the CEC can work with entities like the Center for Hydrogen Safety (CHS)[13] and the Compressed Gas Association (CGA)[14] to develop safety training programs essential for industry professionals to safely operate in hydrogen-based environments.

  The CEC should also refer to the resources available from the California Governor's Office of Business and Economic Development (GO-Biz)[15] and the CHS such as comprehensive guidance focusing on safety and permitting guidelines and training. These serve as a valuable resource for understanding the intricacies involved in hydrogen-related projects,

[12] https://www.gov.ca.gov/2023/10/13/california-selected-as-a-national-hydrogen-hub/
[13] https://www.aiche.org/chs
[14] https://safehydrogenproject.org/?gad_source=1&gclid=CjwKCAiApaarBhB7EiwAYiMwqtSd2DEkG8fVgHrEapqf6lYyZX4nG4F7E6R0jhtNbgWuk9f8kLwm_xoCzJQQAvD_BwE
[15] https://business.ca.gov/industries/zero-emission-vehicles/hydrogen-readiness/

including production, storage, and utilization. We encourage CEC to work with industry to streamline processes and promote a safer working environment for industry professionals involved in hydrogen-based endeavors.

Moreover, assisting with the development and socialization of safety training programs will be pivotal in ensuring the proper education and preparedness of individuals working in hydrogen-centric environments. Collaborative efforts with regulatory agencies will further enhance t the establishment of clear and transparent guidelines governing the construction and operation of hydrogen infrastructure. This collaboration will pave the way for a secure and standardized framework, fostering a robust and safe hydrogen ecosystem.

- *Pipeline Backbone Analysis for Hydrogen Infrastructure:* The CEC should conduct an extensive analysis of hydrogen pipeline infrastructure, encompassing optimal routes, material selection, integration with existing gas networks, and advanced leak detection and mitigation strategies. Identifying regions with high hydrogen demand will inform strategic pipeline planning to ensure efficient distribution while prioritizing safety and reliability.

E. Enhance Market Development Through Demand Side Support

The Joint Parties acknowledge the CEC's steadfast commitment through Research, Development, and Demonstration (RD&D) programs, which are crucial in catalyzing the state's transition to clean energy. Emphasizing the pivotal role of RD&D in overcoming adoption barriers for clean and renewable hydrogen – as highlighted in the Draft 2023 IEPR, specifically regarding research in hydrogen combustion and leakage – underscores the staff's commitment to safety and technological advancement in this domain. Moreover, the existing Clean Hydrogen Program, Gas R&D Program, and Electric Program Investment Charge (EPIC) are recognized as vital drivers propelling California's clean energy transition.

To further stimulate the hydrogen economy, the Joint Parties propose expanding the CEC's research focus by establishing a demand-side program. Specifically, the Joint Parties recommend that the CEC follow the U.S. Department of Energy's (DOE) commitment of up to $1 billion toward a demand-side initiative[16] supporting the H2Hubs, which is aimed at stimulating hydrogen demand. Such an initiative, ideally in collaboration with the DOE, would foster market certainty for hydrogen stakeholders, thereby accelerating the hydrogen economy's growth. This aligns with our collective aim of providing market certainty and expediting the hydrogen economy's development within the state.

Overall, maximizing state and federal funding will prove pivotal to jumpstarting this nascent industry. The funding opportunity presented by the Infrastructure Investment and Job Act (IIJA)[17] and the Inflation Reduction Act (IRA)[18] until 2032 offers a critical chance to expedite clean renewable hydrogen deployment that is aligned with the California Air Resources Board's 2022 Scoping Plan[19] for carbon neutrality goals. Since there are long lead times for significant

[16] https://www.energy.gov/articles/biden-harris-administration-jumpstart-clean-hydrogen-economy-new-initiative-provide-market
[17] https://www.congress.gov/117/plaws/publ58/PLAW-117publ58.pdf
[18] https://www.congress.gov/bill/117th-congress/house-bill/5376
[19] https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

infrastructure projects, it is necessary to align state grants and incentives with federal programs to meet mandated GHG reduction targets, such as SB 32 (Pavley, 2016) and AB 1279 (Muratsuchi, 2022). Timely incorporation of clean and renewable hydrogen is essential for leveraging federal funding efficiently while ensuring completion of projects across production, distribution, and end-use sectors all while mitigating increased costs associated with delayed implementation.

3. Conclusion

The Joint Parties appreciate the opportunity to submit comments on the Draft 2023 IEPR. We would like to thank the Joint Agencies for their leadership and look forward to continuing to collaborate with all other stakeholders.

Respectfully submitted,

Nicholas Connell
Interim Executive Director
Clean renewable Hydrogen Coalition
Tel: 949-558-1305
Email: nconnell@ghcoalition.org

Katrina Fritz
Executive Director
California Hydrogen Business Council
Tel: 860-338-1303
Email: kmfritz@californiahydrogen.org

Teresa Cooke
Executive Director
California Hydrogen Coalition
Tel: 916-291-2956
Email: Teresa@calobby.com