GREEN HYDROGEN COALITION

2024 IMPACT REPORT

Advancing Green Hydrogen Solutions for Climate Action

ADVANCING GREEN HYDROGEN SOLUTIONS FOR CLIMATE ACTION AND ENERGY EQUITY

As a 501(c)(3) educational nonprofit, the Green Hydrogen Coalition (GHC) is committed to advancing renewable hydrogen educational and market development efforts to address climate change and achieve deep, economywide decarbonization. As the climate crisis intensifies, the need for effective solutions has never been more pressing.

Since 2019, the GHC has pursued policies and practices that support the widespread production and use of green hydrogen. Our work has focused on overcoming the barriers that hinder the growth of a robust green hydrogen market—challenges like limited shared infrastructure, regulatory uncertainty, and misconceptions about the green hydrogen value chain. By engaging in targeted educational campaigns, coalition building, and policy and regulatory interventions, our core activities are designed to dismantle these obstacles and accelerate the deployment of green hydrogen at scale, fostering an equitable and rapid transition to clean energy.

We sincerely thank you for your invaluable donations that have driven the progress of our work at the GHC. Your unwavering support has been instrumental in advancing our initiatives. The significant strides we have made thus far are a direct result of your belief in our mission and your generous contributions.

As 2024 comes to a close, we invite you to consider making a tax-deductible gift to the GHC by December 31. Your continued support is crucial to move our shared goals forward and to help us build a more sustainable and equitable future.

Individual donations can be made at gh2forclimate.org!

KEY HIGHLIGHTS OF OUR ACCOMPLISHMENTS FOR 2024

I. EDUCATION | ENHANCING GREEN HYDROGEN EXPERTISE AND FOSTERING COLLABORATIVE STRATEGIES FOR BUILDING A SCALED GREEN HYDROGEN ECONOMY

- This year, the GHC hosted its annual **Green Hydrogen Education and Lobby Day** in Sacramento, CA. It was a successful and impactful gathering where supporters across the value chain and other green hydrogen champions could strengthen connections and provide needed education for key legislators on green hydrogen-related issues and legislation. Three teams comprised of GHC staff, GHC supporters, and associated guests successfully met with 12 California State Senators and 24 Assembly members.

  Key highlights from the impactful event included legislators expressing interest in the role of renewable hydrogen for our energy transition and wanting to know more about what they could do in the next legislative season.

II. COALITION BUILDING | FACILITATING STAKEHOLDER ALIGNMENT FOR CRITICAL CAPITAL AND INFRASTRUCTURE INITIATIVES

- The GHC served as an active Public Advisory Group (PAG) participant throughout Phase 1 of SoCalGas' Angeles Link, which concluded on December 17, including participation in PAG meetings and submitting written comments.

- In collaboration with Denmark's Ministry of Foreign Affairs, the GHC, a partner of the US-DK Green Hydrogen Alliance, led the California 2024 delegation on an impactful energy transition fact-finding trip to Denmark, inviting key decision makers from Southern California such as representatives from Los Angeles City Council, Los Angeles World Airports, Los Angeles Department of Water and Power, and the California Energy Commission (CEC) to witness firsthand Denmark's world-leading green hydrogen and e-fuel infrastructure.

III. MARKET DEVELOPMENT | SHAPING POLICIES, STANDARDS, AND PRACTICES TO DRIVE GREEN HYDROGEN PRODUCTION AND ADOPTION

Policy and Regulatory Intervention

- Supported the successful passage of **SB 1420** and **AB 1921**, two important bills that expand California Environmental Quality Act permitting benefits to renewable hydrogen and the inclusion of linear generators in California's Renewable Portfolio Standard (RPS). The GHC also served as the expert witness in support of **SB 993** and **SB 1018**, two critical bills that together, if passed, would have addressed renewable electricity access and cost for electrolytic hydrogen production—needed foundational legislation that the GHC will continue to pursue in 2025.

- Submitted **13 formal regulatory filings** to establish an appropriate legal and regulatory framework to support market development for renewable hydrogen, covering topics at the California Public Utilities Commission ranging from gas pipeline blending to gas system decarbonization and procurement via integrated resources planning. At the California Air Resources Board, the GHC submitted comments in support of the state's hydrogen roadmap planning and the role of renewable hydrogen in the Low Carbon Fuels Standard. At the CEC, the GHC supported the modernization of RPS eligibility to include renewable hydrogen used in gas turbines and linear generators and the inclusion of renewable hydrogen in the state's long-term energy planning efforts.

- Engaged with over 100 stakeholders across the hydrogen ecosystem through the GHC Policy Working Group on policy and regulatory issues from the local to international level.

Initiatives

- **HyBuild™ North America (NA) Contracts Workstream:** Jointly led by Sheppard Mullin, a nationally renowned law firm with a renewable energy practice, the GHC's HyBuild NA Contracts Workstream facilitated national clean and green hydrogen market liftoff by engaging with potential at-scale green hydrogen buyers to identify issues and key risks associated with its procurement. The Consumption Profiles Working Group Report summarizes the findings from the HyBuild NA Contracts Workstream Working Groups. The report defines three green hydrogen consumption profiles, highlights the key themes discussed across all working groups, and identifies the specific needs, challenges, and potential solutions of hydrogen suppliers, off-takers, and financiers in each consumption profile.

- **Accomplishments and Sunset of the Western Green Hydrogen Initiative (WGHI)**: WGHI, a pioneering public-private partnership committed to advancing clean and green hydrogen infrastructure in the Western region for a better economy and environment, announced the conclusion and transition of its activities in 2024. Established in November 2020 through a collaborative partnership between the National Association of State Energy Officials, Western Interstate Energy Board, and GHC, the vision and mission of WGHI was to accelerate the deployment of clean and green hydrogen infrastructure in North America's Western region for interested states and partners as well as enable hydrogen development investments and compensation at scale in the West.

  WGHI coordinated efforts over the past 3.5 years across 11 western states and two Canadian provinces to foster peer learning and information exchange, collect and disseminate knowledge, model, and report on state and provincial planning and roadmaps for clean and green hydrogen as part of their energy and economic planning. From thoughtful workshops to providing essential information and tools, WGHI established a solid foundation for commercializing clean and green hydrogen for energy security, resilience, sustainability, and economic growth. Key accomplishments included:

  - **Workshops and Policy Groups**: Conducted seasonal workshops and quarterly convenings addressing regulatory, policy, and commercial developments associated with clean and green hydrogen production and use.

- **Modeling and Research**: Coordinated and leveraged state, federal, and industry research to guide priorities and scale commercial technology options. Supported regional grid and gas sector modeling efforts to inform coordinated state policy actions and investment for clean and green hydrogen utilizing existing energy infrastructure. Initiated a long-duration energy storage (LDES) study with the Western Electricity Coordinating Council and developed a report on the role of hydrogen for LDES and regional grid reliability.
- **Strategic Dialogue**: Fostered collaboration with key industry leaders across the hydrogen value chain, including industry stakeholders, non-profits, State Energy Offices, and federal agencies, such as the U.S. Department of Energy.
- **Education and Workforce Development**: Identified education and workforce opportunities that support the transition to a local and resilient clean and green hydrogen energy system. Identified key factors and best practices that will enable a just transition, including consideration of energy equity, environmental justice, tribal coordination, industry and employment impacts, workforce development, and community benefits.
- **EPA Climate Pollution Reduction Grants (CPRG) Program**: Produced Climate Pollution Reduction Grant: Program Summary and Clean Hydrogen Opportunities, a brief that provides information to state agencies and other key partners and stakeholders on how states can access CPRG funds for hydrogen deployment, which are available to the GHC community.
- **Webinar Presentation on 45V Hydrogen Production Tax Credit (PTC)**: The webinar focused on key components of the draft 45V PTC guidance released by the Internal Revenue Service. It explored the challenges and opportunities related to the 45V hydrogen PTC and identified factors enabling clean hydrogen projects to maximize their utilization of the 45V.
- **Policy Brief on Reliability**: Produced Clean Hydrogen and Grid Reliability: Overview of Potential Use Cases and Considerations for States, a brief on the role of clean hydrogen in providing firm and flexible capacity to maintain the reliability of the electric system in a decarbonized power grid where clean, dispatchable resources are needed over multiday periods.

- **Consumer Education**: In late 2023, the GHC launched a consumer-facing website to provide objective information about renewable hydrogen and its role in our energy transition. The GHC continues to add needed educational content, optimize search engine visibility, dispel myths, raise public awareness, and foster community and policy champions for green hydrogen. In 2024, the GHC generated new and exciting content, such as covering the latest developments in clean and renewable hydrogen as well as educational resources on green hydrogen, pipeline infrastructure, and hydrogen safety.

GHC LAUNCHES THREE NEW INITIATIVES IN 2024

1

RENEWABLE HYDROGEN PRODUCTION 'ELECTRICITY ACCESS' WORKING GROUP

- Electrolytic hydrogen and biomass-to-hydrogen production pathways are key to economy-wide decarbonization, given both production pathways' ability to scale and leverage abundant, renewable resources. In California, both electrolytic and biomass-to-hydrogen are important production pathways for the state's hydrogen hub, driven by the Alliance for Renewable Clean Hydrogen Energy Systems, and both pathways utilize large amounts of electricity.

- This Working Group engages and aligns developers and electric utilities on a legal and regulatory pathway forward to access large, behind-the-meter renewable electricity and 45V-compliant grid-supplied electricity. The goal of this effort is to ensure that the resulting legal and regulatory framework supports bankable project deployment and an efficient, clean, affordable, and reliable power sector.

2

BIOMASS-TO-HYDROGEN IN CALIFORNIA

- Today, municipalities spend millions of taxpayer dollars dealing with waste that cannot be recycled or easily composted, expanding landfills and associated environmental impacts on air and water quality. As a technology-neutral educational nonprofit, the GHC supports leveraging diverse feedstocks to produce renewable hydrogen, including biogas and biomass.

- Municipal biomass that cannot be recycled or composted is an abundant renewable feedstock for the production of renewable hydrogen. Diverting this recurring waste stream from landfills toward the production of renewable hydrogen is one way of mitigating its impact on society.

The Biomass-to-Hydrogen study aims to:

- Identify and quantify the opportunity to convert municipal biomass waste that cannot be recycled or composted into renewable hydrogen statewide.
- Deep dive into the specific opportunities for Biomass-to-Hydrogen in Los Angeles (LA) County, demonstrating the opportunity, savings, and benefits of converting a portion of LA's annual approximately $700 million solid waste disposal costs into useful, near-term renewable hydrogen, including forecasted hydrogen production cost per kilogram.

3

CALIFORNIA GREEN AMMONIA INITIATIVE (CGAI) | TO OFFICIALLY LAUNCH IN Q1, 2025

- In early 2024, the GHC published California's Blueprint to Leverage Green Ammonia Production as a Key Decarbonization Tool, a policy brief that highlights, at a high level, the value proposition, production pathways, technology trends, barriers, and market potential of renewable ammonia.
- Green ammonia can provide a one-for-one replacement for fossil-fuel-based ammonia use in the agricultural sector, serve as an energy carrier for LDES, including the international export of clean hydrogen, and operate as a carbon-free fuel alternative for maritime shipping.
- CGAI will evaluate the costs and benefits of producing and using renewable ammonia in California at a much higher resolution than the aforementioned blueprint. It will also seek to proactively align all stakeholders around a shared vision and roadmap. The scope of this effort will include ensuring its safe use and handling, accelerating deep decarbonization in agriculture, maritime shipping, and industrial refrigeration, as well as exploring potential applications in the power sector for LDES.

The GHC will embark on a three-phase initiative alongside strategic partners and interested GHC supporters:

- **Phase 1 | Establish Initiative Platform, Vision, and Roadmap**: Establish an understanding of the existing ammonia industry and develop a vision and enabling actions to promote the growth of a clean ammonia ecosystem in California.
- **Phase 2 | Innovative Project Development**: Develop on-the-ground lessons learned based on the deployment of ammonia production and use demonstration projects in conjunction with a robust community engagement plan.
- **Phase 3 | Roadmap Roadshow**: Create a policy, regulatory, and strategic communications strategy to build momentum and realize the objectives outlined in the roadmap.

To get involved in these exciting new initiatives, **please contact us at info@ghcoalition.org.**

CONCLUSION

The urgency to combat climate change has never been greater. **As we rely on green hydrogen champions like you to support the cause, please consider making an individual donation to the GHC through Give Lively**. Every dollar donated to the GHC makes a difference and helps fuel our efforts—whether through education, coalition building, or market development—to accelerate a sustainable and equitable future for all.

We extend our heartfelt gratitude for your steadfast belief in our mission. Your support propels us toward meaningful change, and we are honored to have you alongside us on this journey.

GREEN HYDROGEN COALITION

The Green Hydrogen Coalition, a 501(c)(3) educational nonprofit organization, is dedicated to facilitating practices and policies to advance the production and use of green hydrogen in all sectors where it will accelerate a carbon-free energy future.

The GHC has spearheaded multiple game-changing initiatives focused on policy and commercialization efforts that will together accelerate the North American green hydrogen market.

For more information on the GHC, visit ghcoalition.org.