

# California Hydrogen Market Development Strategy

## *Objectives & Public Engagement*

### **Background**

California has an unprecedented opportunity to accelerate the production, distribution, and use of clean, renewable hydrogen, which can play a critical role in meeting California's climate and air quality goals while also creating jobs and stimulating the economy. The California Air Resources Board's 2022 Scoping Plan Update calls for scaling the production and use of clean, renewable hydrogen to fully decarbonize our economy by 2045. This carbon-free energy carrier complements electrification efforts by helping the state to fully address difficult-to-decarbonize sectors of our state economy, including, but not limited to transportation, power generation and storage, shipping, ports, aviation, fertilizer production, and heavy industry.

A year ago, to help accelerate California's clean, renewable hydrogen market, the Governor's Office of Business and Economic Development (GO-Biz), the University of California, State Building and Construction Trades, and Renewables 100 formally launched the Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES). ARCHES is a private-public consortium that was created to organize a multi-stakeholder statewide effort to pursue federal funding for the development of a clean, renewable hydrogen hub in California.

The United States Department of Energy process of applying for the federal funding produced several insights. Some were intuitive—a comprehensive and balanced cross sector system can drive down cost and emissions for everyone. Others were eye opening—we have well over \$50 billion worth of proposed clean, renewable hydrogen projects in California—solely based on what was submitted to ARCHES last year. While this interest is significant, more opportunities exist, especially if California fosters an environment where clean, renewable hydrogen projects become part of a larger “ecosystem” that creates tens of thousands of family-supporting jobs building, operating, and maintaining this system.

California's clean, renewable hydrogen journey became much clearer on October 13, 2023, when President Biden announced that the California Regional Hydrogen Hub, led by ARCHES, was selected as the largest of seven hydrogen hubs to receive federal funding. This up to \$1.2 billion federal investment is expected to leverage ten times this amount in state, local, and private sector funding for projects aimed at achieving the goal of cost parity with diesel fuel by 2030. Participating projects will be developed and implemented in close collaboration with Justice 40 ensuring that at least 40 percent of the hydrogen hub investments benefit our most disadvantaged communities.

To organize our collective efforts to ensure all agencies and partners are moving in a shared, market-enabling direction, Governor Newsom directed GO-Biz to collaborate with state agencies and stakeholders to develop an all-of-government Hydrogen

Market Development Strategy (H2 Strategy). The H2 Strategy will be organized around a shared North Star: **leverage clean, renewable hydrogen to decarbonize the state's transportation, energy, and industrial sectors.**

California has a unique and emerging opportunity to demonstrate that a large-scale clean, renewable hydrogen market can help enable full statewide decarbonization, be economically sustainable, clean up the air, curb climate change, maintain energy system resilience and reliability, and directly benefit local communities. What follows is an outline of the core objectives and opportunities for stakeholders to engage in the development of the H2 Strategy.

## **Objectives**

*System:*

1. **Support the state's climate, air quality, clean energy, and environmental goals while driving affordability, reliability, and safety.** Accelerate progress, balance tradeoffs, and measure outcomes.
2. **Foster a resilient and competitive market.** Create opportunities for multiple market players to displace fossil fuels based on clear and consistent market signals, regulatory frameworks, and a worldclass workforce.
3. **Iteratively assess barriers to cost effective use of clean, renewable hydrogen and identify strategies to capture opportunities and overcome challenges.** Identify obstacles and risks early and track progress on competing technologies to minimize the potential for stranded assets.
4. **Articulate the role state agencies play regarding clean, renewable hydrogen.** Clearly identify the roles and responsibilities of lead and supporting agencies, including helping stakeholders understand the roles of federal and local agencies, while achieving social, economic, and environmental benefits cost-effectively.
5. **Enable investment in clean, renewable hydrogen projects in California** by building policies that provide long-term signals, transparency and affordability, help meet climate, air quality, energy reliability, and commodity cost objectives, and promote consistency and a level playing field for technologies across all sectors.
6. **Establish clear systems to facilitate learning and adaptation,** including periodic updates to the H2 Strategy and leveraging California's worldclass educational institutions to create opportunities, solve problems and educate energy leaders and the public at large.

*Implementation:*

7. **Set up processes to ensure local-project affected communities have a clear voice in decision-making and the future of the clean, renewable hydrogen market.** Establish clear pathways and venues for information exchange, feedback, workforce and project development opportunities, and incorporation

of local project adjacent perspectives, building on the ARCHES [Community Benefits Pathways Strategy](#).

8. **Focus job creation efforts on communities most in need.** Work with labor partners to create work opportunities for local-project communities, especially those living in low-income and disadvantaged areas, and workers whose jobs are being impacted by the energy transition away from fossil fuels.
9. **Align training at all levels of education,** including high school, community college, Cal State Universities, University of California, apprenticeships, private and public partner training and certification programs, etc.
10. **Facilitate project development.** Leverage the Governor's Infrastructure Strike Team to enable projects to seamlessly move from concept to completion by focusing on project implementation through every project phase, including planning, any necessary permitting and streamlining reforms and removing project construction obstacles.

*Production:*

11. **Support in-state clean, renewable hydrogen production from biogenic feedstocks and electrolysis using renewable and zero-carbon produced electricity.**
  - a. Enable low, zero and negative carbon biogenic and electrolytic hydrogen production by sending clear policy signals and addressing barriers.
  - b. Plan for increased electric load from clean, renewable hydrogen production and incorporate the growth in this sector into statewide clean energy resource planning and procurement and electric distribution and transmission infrastructure planning and development.
  - c. Encourage electrolytic hydrogen production facilities to serve as 'good electric grid citizens' by operating as flexible loads that maximize the utilization of renewable and zero-carbon produced electricity and minimize or avoid grid electricity consumption during peak and net-peak electric demand and grid reliability events while reducing grid and operating costs.
  - d. Track hydrogen production to monitor the transition away from hydrogen produced from fossil fuels as we scale clean, renewable hydrogen production.

*Distribution:*

12. **Enable safe, reliable, and cost-effective storage and distribution of clean, renewable hydrogen while minimizing leakage and ensuring operational safety.**
  - a. Leverage the ARCHES ecosystem of participating projects and stakeholders to coordinate clean, renewable hydrogen supply and demand and share storage, distribution, and refueling infrastructure to accelerate and drive down costs.

- b. Collaborate with stakeholders to standardize and implement codes, standards, certifications, and state-of-the-science monitoring to ensure safety and minimize leakage.

*End Use:*

**13. Prioritize the use of clean, renewable hydrogen in difficult-to-decarbonize applications while driving scale, reducing costs, and creating opportunities for quality jobs and multi-sector growth.** Build from the ARCHES ecosystem to create cross sector synergies.

**14. Leverage state assets to increase access to hydrogen fueling by transit and public users.** Identify opportunities for the state to use clean, renewable hydrogen that simultaneously increase access for the public.

The H2 Strategy document will focus on delivering on the above objectives—leveraging various tools and building systems to ensure learning and iteration. In delivering these objectives, GO-Biz and partner agencies will consider the various existing efforts to accelerate clean energy deployment and decarbonize our transportation and industrial sectors and may incorporate or build on these efforts where feasible.

Opportunities to engage.

To gather input and to help encourage participation, GO-Biz is creating multiple avenues to engage in the development of the H2 Strategy. This includes regular updates and notifications by signing up to GO-Biz's [H2 on the Move email list](#), providing early feedback on our H2 Market Development Strategy [Feedback Form](#), and/or sending feedback directly to [hydrogen@gobiz.ca.gov](mailto:hydrogen@gobiz.ca.gov). Stakeholder involvement and engagement in all of the processes is welcome and highly encouraged.

As the state moves forward with developing California's clean, renewable hydrogen market, we collectively affirm our commitment to leveraging California's robust policy environment to build an economically and environmentally sustainable and safe clean, renewable hydrogen market that creates family supporting jobs, cleans the air we breathe, and maintains economic leadership while increasing our state's resilience in the face of climate change.

We are committed to creating systems that enable these projects to be built in California, by Californians, in ways that directly benefit our communities, and we look forward to working with all stakeholders to build a prosperous, carbon-free future.



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