

August 1, 2025

The comments below were submitted to the Governor's Office of Business and Economic Development in response to their request for comment on their Draft Hydrogen Market Development Strategy Framework.

1. Full name:

Tim McRae

2. Organization:

California Hydrogen Business Council

3. Please select your role as stakeholder:

NGO

4. Are you developing an H2 project:

No

5. Which sectors are you most involved or most interested in?

Electricity Generation, Emerging Opportunities (Airports, Trains, Maritime, etc.), Hydrogen Supply, Industrial Processes, Ports/Goods Movement, Transportation

6. What suggestions do you have for the strategy?

The California Hydrogen Business Council (CHBC) is the largest and longest established hydrogen trade association in the U.S., with over 100 members that span the hydrogen value chain in California. We appreciate the opportunity to submit input to the Draft Hydrogen Market Development Strategy Framework ("Strategy") proposed by the Governor's Office of Business and Economic Development ("GO-Biz") in June 2025.

Overarching themes

CHBC provides specific comments on the slide presentation which include the following themes:

1. The Hydrogen Market Development Strategy should represent and promote the development of the entire statewide hydrogen industry, including the ARCHES hydrogen hub, but market development should not be controlled by any single entity, including ARCHES.
2. GO-Biz should present a transparent statewide Strategy for development of the hydrogen market that minimizes barriers to entry and promotes transparency to

stimulate rapid scale-up of hydrogen production, delivery, and offtake through California.

3. ARCHES should play a critical role focused on market facilitation, rather than oversight, control, or regulation. There are many hydrogen projects in California both inside and outside ARCHES.

Go-Biz and ARCHES' roles in California

The California hydrogen market began long before the creation of ARCHES, and ARCHES does not represent the entirety of the California hydrogen market. ARCHES was formed as a hydrogen hub to attract federal funding from the 2021 Bipartisan Infrastructure Law. ARCHES is perfectly positioned to fulfill a critical role in promoting market development in California. However, if ARCHES assumes a role that focuses on control rather than facilitation, it could unintentionally stifle market development.

The draft Framework contemplates an expanded role for ARCHES, an LLC that consists of a number of government and nonprofit organizations whose participation and roles are governed by several non-disclosure agreements. These agreements may have been appropriate as ARCHES was preparing its application for federal funding, but are no longer necessary at this stage of market development. These agreements have resulted in an organization whose decisions, strategies and goals are not transparent to the public or the broader hydrogen market that has not signed non-disclosure agreements. CHBC is concerned that this lack of transparency and inability to consider a broad range of stakeholder input could create unintentional burdens on the hydrogen market and result in decisions that unintentionally stifle, rather than promote, market development.

The hydrogen market in California existed for years prior to the formation of ARCHES, and while ARCHES has done a great deal to promote development of hydrogen, a large portion of current projects in the market are being developed outside of ARCHES. The state should leverage all of these projects and all of this expertise to develop a robust hydrogen market in California. The state should rely on openness, transparency and consideration of input from all interested parties to develop a robust market development strategy.

The Strategy should present a transparent plan with clear goals

Recent changes in federal law have increased the need for California to minimize barriers to entry while maximizing opportunities and incentives for innovation in the hydrogen industry. California needs a statewide Hydrogen Market Development Strategy that engenders a transparent market with clear overarching goals designed to ensure that the market can respond and continue to grow, even as federal laws and regulations shift. California should focus on attracting and retaining hydrogen investments in ways that are able to withstand changes in federal policy and should not exclusively rely on one entity. ARCHES should play an important role

in developing and implementing this Strategy with transparent objectives, processes, and plans that focus on fulfilling its original mission of facilitating investments in projects identified by the hub to accelerate the commercial-scale deployment of hydrogen, but its role in market development should not be exclusive. GO-Biz leadership in the coordination of hydrogen policy, programs, and activities across state agencies is important to help minimize barriers to market entry.

CHBC has members who are both participants and nonparticipants in ARCHES, but each is passionate about development of the hydrogen market, and both are concerned that the proposed Market Development Strategy would exclusively rely on one entity as the coordinator of an entire emerging market. CHBC respectfully submits that ARCHES should play a critical role, and that role should focus on market facilitation. Exclusive reliance on one coordinator with an excessive amount of control over market development could have the unintended consequence of impeding market entry, stifling competition, and limiting innovation in a critical emerging market. This would impede rather than promote market development and impact the affordability of hydrogen as the market is being developed.

Industry Regulation

The suggestion on Slide 11 that ARCHES will work with partners to “vet projects” could imply that ARCHES would act as a regulatory body that determines which hydrogen projects should or should not be pursued in the state. CHBC submits that these determinations should be made by the market, and ARCHES should facilitate development of projects that meet emerging market needs. If it is determined that one entity should vet hydrogen projects, CHBC submits that any entity making these kinds of determinations should be representative of the entire industry, should not be a market player, and should utilize open and transparent decision-making processes. Our understanding is that ARCHES has a defined scope, and California has other agencies that oversee hydrogen – the CPUC overseeing Investor-Owned Utility projects, the CEC overseeing infrastructure investments, and CARB regulating transportation applications and synthesizing how hydrogen helps California meet greenhouse gas goals. Each of these entities makes policy determinations through open and transparent processes that consider the input of all interested parties.

There are several well-established players, including developers, suppliers, off-takers, non-profits, and advocacy organizations who have been developing the hydrogen market in California for many years. There is a role for each to advance the goal of scaling hydrogen production and expanding off-take into existing and new markets. CHBC encourages GO-Biz to view ARCHES as one valuable contributor among the broader organizations advancing this cause. ARCHES’ original remit is to advance the demonstration and scale-up of hydrogen projects that produce, process, deliver, store or use affordable hydrogen from renewable energy resources in California – the

CHBC welcomes the opportunity to work with them to achieve that goal without CPUC-style regulation or CAISO-style management of the California hydrogen market.

Go-Biz should organize around 45V Tax Credit priority

A primary objective of the hydrogen hubs is to increase domestic energy and hydrogen production. The primary federal incentive for that market is the 45V Clean Hydrogen Production Tax Credit, which has been accelerated to require a commence construction date by January 1, 2028, rather than 2033 as originally set in law. The CHBC recommends that the Strategy include a plan, components, and policy priorities to support all proposed and designed hydrogen production facilities in California to reach the required 45V commence construction date by January 1, 2028.

Recommended Project Management Tools

The CHBC recommends several steps to: 1) elevate the Strategy from a planning document to an operational blueprint, 2) strengthen stakeholder confidence in GO-Biz's ability to accelerate California's hydrogen market, and 3) help support projects in meeting the 45V commence construction deadline. To further improve the feasibility and achievability of the Strategy, CHBC recommends that GO-Biz enhance the Strategy by making it more specific and actionable through:

- Defining measurable and achievable success metrics to track progress and impact
- Adding a risk and mitigation section to strengthen preparedness and confidence
- Incorporating a cost-benefit and funding analysis to demonstrate financial viability
- Creating phase-specific project management plans focused on task-level execution
- Including an overall implementation timeline
- Providing an overview of a transparent governance and decision-making structure

GO-Biz articulates a compelling vision and clear strategic objectives for ARCHES (Slides 3–5). To build on this strong foundation, CHBC recommends the statewide Strategy become more specific and measurable, with overarching goals such as increasing hydrogen utilization or expanding the number of market participants. The current framework is effective for high-level planning; the next step is to translate that vision into an actionable roadmap.

Incorporating these refinements would elevate the Strategy from a planning document to an operational blueprint and strengthen stakeholder confidence.

1. Define Measurable and Achievable Success Metrics

Metrics are foundational to any strategic plan to ensure that progress is trackable, adaptable, and aligned with broader objectives. While Slide 5 outlines an intent to define

“metrics/targets,” strengthening this with clear, specific, and time-bound metrics will make the Strategy more actionable and persuasive. For example, in the “Establish Market Integrator” section, the Strategy could clarify:

- What does certainty mean (e.g., X% of hydrogen supply undersigned purchase agreements by 2027)?
- What specific challenges will the Strategy address? How will success be measured—for example cost savings, emissions reductions, faster permitting?
- What is the benchmark for system-wide cost competitiveness?

2. Add a Risk and Mitigation Section to Demonstrate Strategic Foresight

The current Strategy presents promising ideas for market development. To further strengthen it and bolster confidence, CHBC recommends adding a Risk and Mitigation section to anticipate and prepare for potential obstacles. This could take the form of:

- A short paragraph or table at the end of each section (detailed, but time-intensive), or
- A standalone section summarizing cross-cutting risks and mitigation strategies (more concise).

Key risks to consider include:

- Low stakeholder engagement: How will ARCHES increase participation if uptake is limited?
- Policy or funding shifts: What is the contingency plan if state priorities or federal funding levels change?
- Substitute competition: How will the Strategy position hydrogen against or alongside established renewables like solar and electrification?

3. Add a Cost-Benefit and Funding Analysis

ARCHES’ phased approach outlines meaningful strategic actions. To strengthen financial credibility of the statewide Strategy, CHBC recommends adding a clear financial picture through a cost-benefit and funding analysis. This section would show how (or where) resources will be used wisely and transparently. Questions to address include:

- What is the total estimated budget for the Strategy?
- What are the projected costs of each phase (e.g., developing infrastructure, market integration tools, etc.)?
- How will funds be distributed and tracked?
- How will accountability in execution be assured?

4. Build a Project Management Plan per Phase

While the Strategy lays out strong overarching goals, implementation would be significantly strengthened by developing project management plans for each phase. These plans should detail how outcomes will be delivered, with defined timelines, partners, and resources. CHBC recommends including:

- Measurable, timebound objectives
- Defined roles and responsibilities (e.g., permitting, infrastructure, engagement)
- Communication and coordination checkpoints
- Collaboration plans with other accelerators or market actors

This added structure would demonstrate that ARCHES has both the vision and tools in place to drive execution effectively and to meet key deadlines such as the January 1, 2028 commence construction date required for the Section 45V tax credit.

5. Provide an Implementation Timeline to Add Structure and Urgency

The inclusion of “next steps” throughout the report is a strong starting point that reflects thoughtful planning. To build on this, CHBC recommends adding a clear visual or tabular implementation timeline that outlines when each phase and action will take place, whether linearly or concurrently.

A well-defined timeline would clarify sequencing, support stakeholder coordination, and introduce accountability tied to performance milestones. It would also help beneficiaries, investors, and partners track progress and outcomes over time, reinforcing public trust and signaling strategic momentum.

6. Create Transparency and Clarify the Governance Structure

ARCHES’ ability to bring together a broad coalition of partners is a major strength. To support coordination and accountability, each phase of the Strategy should include a preliminary transparent governance structure that outlines:

- How input from all stakeholders will be solicited and considered
- How transparency will be ensured
- How stakeholder feedback will inform decisions
- Who will hold decision-making authority and whether a process will exist to challenge those decisions
- Regulatory authority
- Roles around permitting and implementation (ARCHES vs. public entities)
- Board structure and inclusion processes.

Policy and Funding Alignment

An additional example of where we think ARCHES can be helpful in bringing hydrogen to scale is the efforts described in Slide 33, which proposes to streamline and unify funding in incentive programs for ease of implementation and to facilitate cross-sector alignment in the future, per Slide 36. Core to the success of these efforts is alignment across California state agencies, and because ARCHES leadership includes state agencies, industry would welcome such alignment. Ideally, policy alignment across agencies would facilitate project development, from financing to production to end use, by giving long-term certainty to incentive plans and policy support. Projects need years for successful implementation, and policies that support these projects, whether or not they are part of the ARCHES first tier portfolio. This would make it easier for projects to succeed, both financially and in terms of time to reach completion. CHBC would be happy to partner with ARCHES in policy streamlining.

An example of such streamlining is how GO-Biz and ARCHES could orient themselves in meeting the CARB 2022 Scoping Plan objectives for increasing 1700-fold the production of hydrogen in California. Helping align government policies across agencies, and engaging with the CHBC to ensure execution, would be an excellent use of GO-Biz's efforts, rather than recreating a Scoping Plan for hydrogen that puts ARCHES as the market overseer attempting to achieve all of the goals for said plan on their own.

7. What concerns do you have about the development or implementation of the Strategy?

The strategy proposes to put ARCHES in charge of Aggregating Demand (Slide 21) and matching Supply with Demand (described in Slides 22-24, including ARCHES as a central piece between MOUs/Term Sheets and Contracts in Slide 23). The state should look to the market to match supply with demand and negotiate agreements at arm's length. Only if the market demonstrates an inability to conduct this function should another party step in, and if that does occur, the party that steps in should not have any interest in which market players prevail. There is no demonstrated need for ARCHES to expand into this realm.

The proposal to make ARCHES the supplier and distributor of hydrogen for purchase (see Slides 25-26) is redundant to the existing marketplace. There already are multiple private businesses who do this, who can provide hydrogen at least cost through competition in the marketplace. While ARCHES could serve as the conduit for federally funded supply and distribution, it should not assume a role in competitive markets that could displace other market participants. This could stifle potential investment, impose an unnecessary barrier to entry, increase project risk, and slow the development of existing projects. ARCHES should facilitate

market development, for example, by aiding projects in commencing construction by January 1, 2028 to take advantage of the 45V Clean Hydrogen Production Tax Credit.

There are additional areas of hydrogen development that the Strategy should include, and they are being advanced outside ARCHES. This includes:

- Accelerating pipeline blending
- Funding pilots in the long-term gas planning OIR at the CPUC
- Procurement mandates
- Adopting the federal definition of clean hydrogen as eligible for credit resources in the Integrated Resource Planning proceeding
- Promoting and incentivizing Hydrogen Internal Combustion Engines (H2ICE).

All of these are initially the jurisdiction of the CPUC (save H2ICE, which is the province of CARB) and are brought up as illustrations that there are more tools available to develop the California hydrogen market than what is possible for GO-Biz to facilitate.

8. Other comments regarding development of the hydrogen strategy?

CHBC does not have a position on ARCHES conducting educational outreach (Slide 42) or workforce development (Slides 43-45). There are other organizations working in this area, and the CHBC recommends the Strategy illustrate synergies in working with existing organizations in these realms if open communication, collaboration, and alignment is ensured.

CHBC is also encouraged to see the emphasis on low carbon intensity hydrogen (see Slides 3-4), in addition to renewable hydrogen, which will help the industry scale while offering multiple low-carbon pathways to decarbonization.

Using ARCHES' website as a venue for collecting market-based policy ideas to help market players access them, as suggested in Slide 30, could help drive regulators toward the most successful policy mechanisms and replicate success in new markets.

As this comment period is a public process conducted through GO-Biz, the CHBC requests that GO-Biz:

1. Review all of the comments received in this process and issue a revised document that integrates this feedback for further public review and comment. It is critical to have industry aligned with government on the direction of this statewide Strategy, and the CHBC stands ready to collaborate with GO-Biz in this process.
2. Eliminate the word limit of comments and include a method to electronically upload and submit PDF/A comment documents, like the system used by CARB and the CEC. This will maximize public participation and input to inform the statewide Strategy.

Enhancing the statewide Hydrogen Market Development Strategy beyond ARCHES, with clear actions, measurable metrics, risk mitigation, financial analysis, and a clear timeline as

suggested above, will both support stronger internal alignment and improve external communication and transparency. These additions will offer partners, investors, and the broader public greater confidence in GO-Biz support of the greater hydrogen industry in California, as well as ARCHES' ability to deliver results. With these refinements, the Strategy will be well-positioned to build momentum, attract broader support, and accelerate California's leadership in clean hydrogen development.

9. Please provide your name and email if you would be open to follow-up discussion regarding your comments

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