



# CA's Clean Hydrogen Market Development

CARB H2 ICE Workshop

November 23, 2023

California Governor's Office of Business &  
Economic Development (GO-Biz)



# California Selected as a National Hydrogen Hub

Published: Oct 13, 2023

SACRAMENTO – California will receive up to \$1.2 billion from the U.S. Department of Energy to accelerate the development and deployment of clean renewable hydrogen, critical to cutting pollution and expanding the clean energy economy statewide.

## **What it means:**

- Up to \$1.2 billion to build or expand hydrogen projects that will power public transportation, heavy-duty trucks, port operations, and more;
- Will leverage the state’s leadership in clean energy technology to produce hydrogen exclusively from renewable energy and biomass.

## **Why it’s important:**

- Cuts up to 2 million metric tons of carbon emissions every year – equivalent to the pollution of 445,000 gasoline-powered cars annually;
- Creates an estimated 220,000 new jobs, including 130,000 in construction and 90,000 permanent jobs;
- Estimated \$2.95 billion per year in economic value from better health and health cost savings;

## Recent News

[California Has Removed 5,679 Encampments, Announces \\$300 Million in New Funding to Move People Out of Encampments](#)

[Acting Governor Eleni Kounalakis Proclaims Thanksgiving Day](#)

[California Increases Law Enforcement Operations Heading Into Holiday Shopping Season To Combat Organized Retail Crime](#)



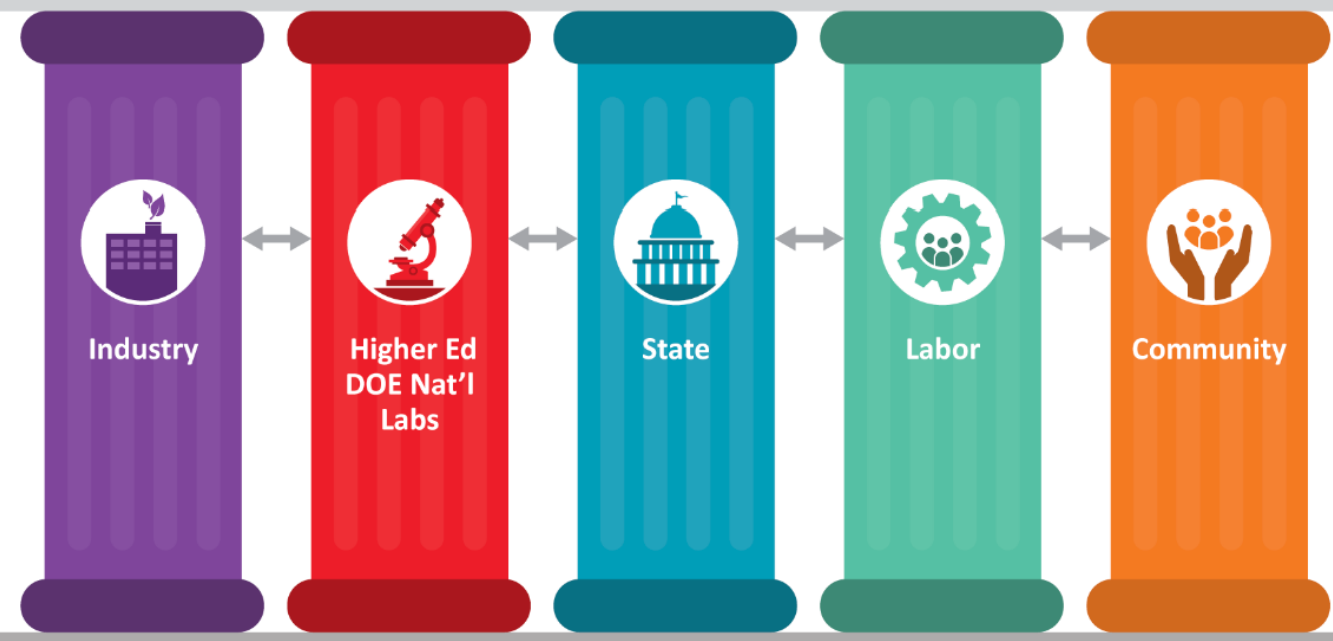
# Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) – California H2Hub



# ARCHES

## ARCHES Key Differentiators

- Infrastructure Availability
- Industry Readiness
- Offtake Resilience
- Market Catalyst
- Community Connectivity
- Delivery Certainty

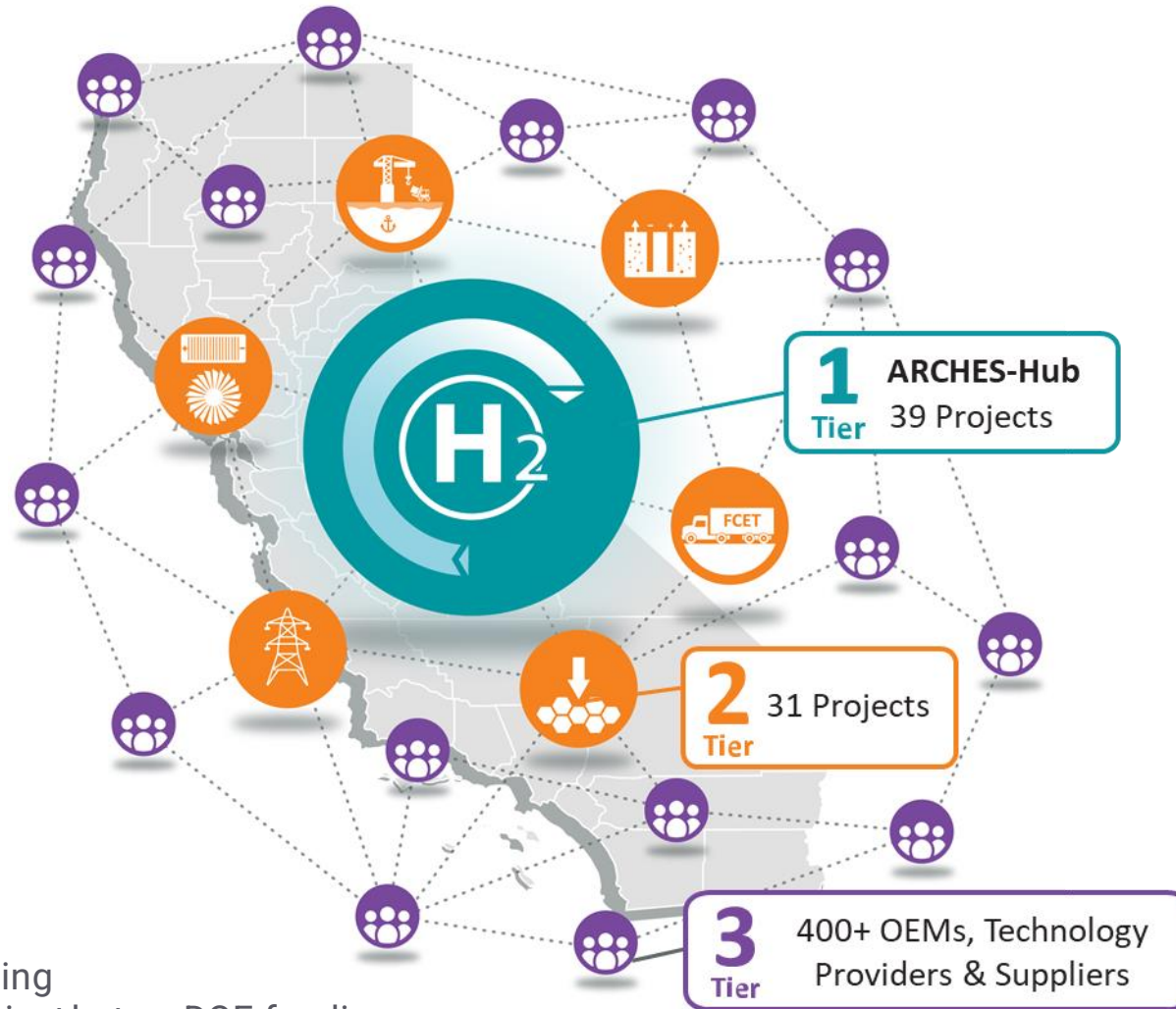


## ARCHES Principles

- Statewide
- Green/Clean
- Stakeholder & Community Engaged
- Equity & Justice Centered
- Aligned with State Interests
- Solution-Oriented
- Objective & Unbiased
- Multi-dimensional
- Connected
- Delivery Certainty



# The Resilient H<sub>2</sub> Ecosystem for California



Tier 1 = DOE funding

Tier 2 = viable project but no DOE funding

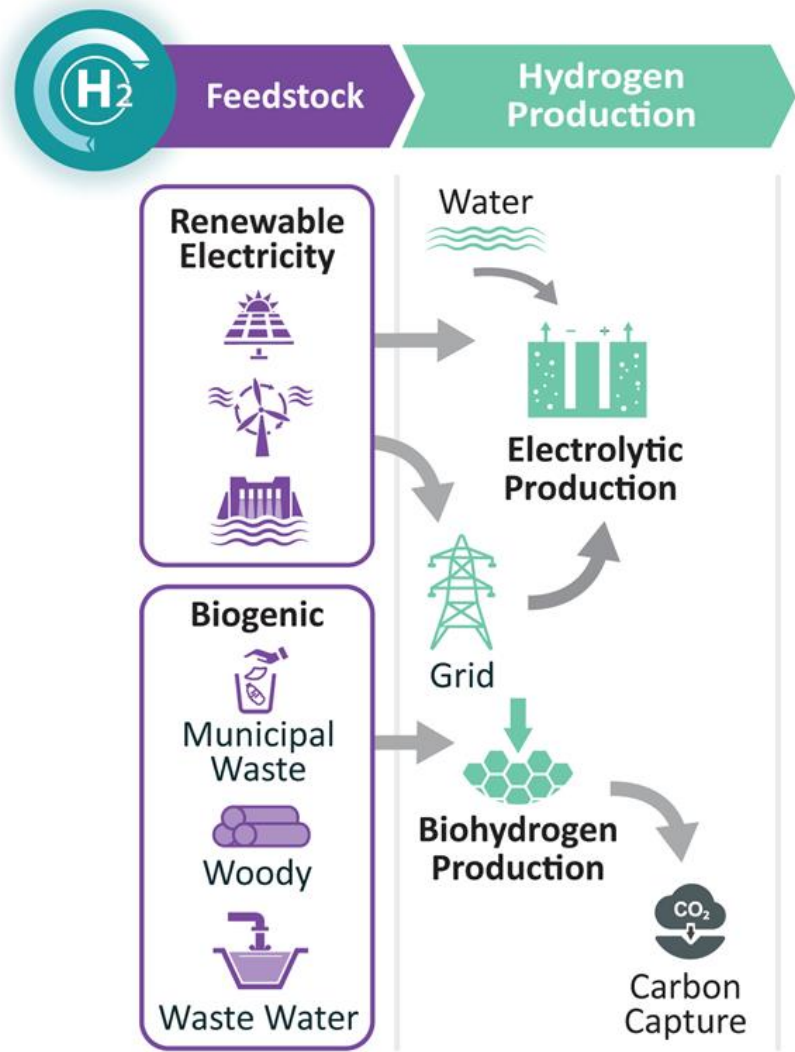


# ARCHES Hydrogen Flow



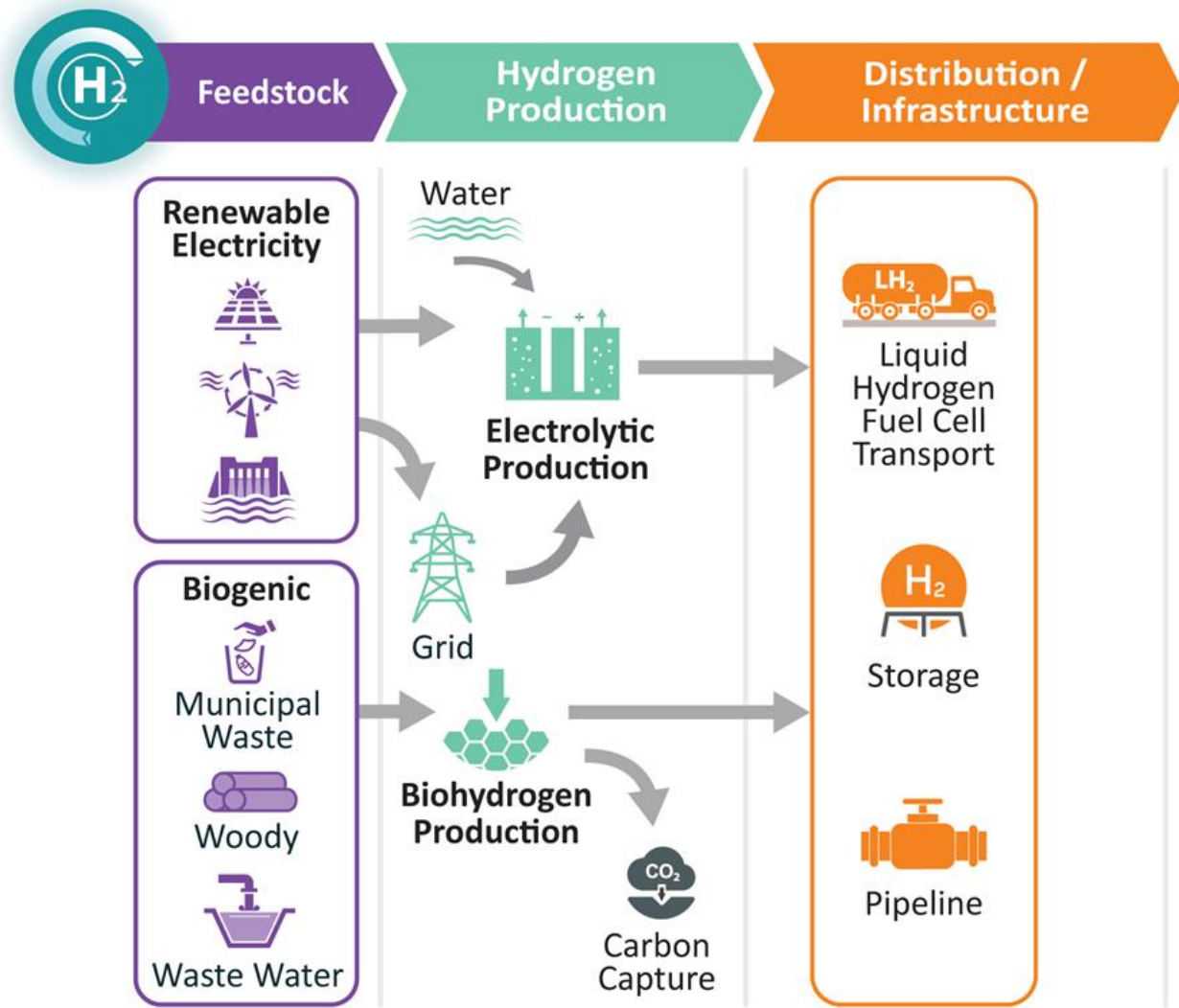


# ARCHES Hydrogen Flow





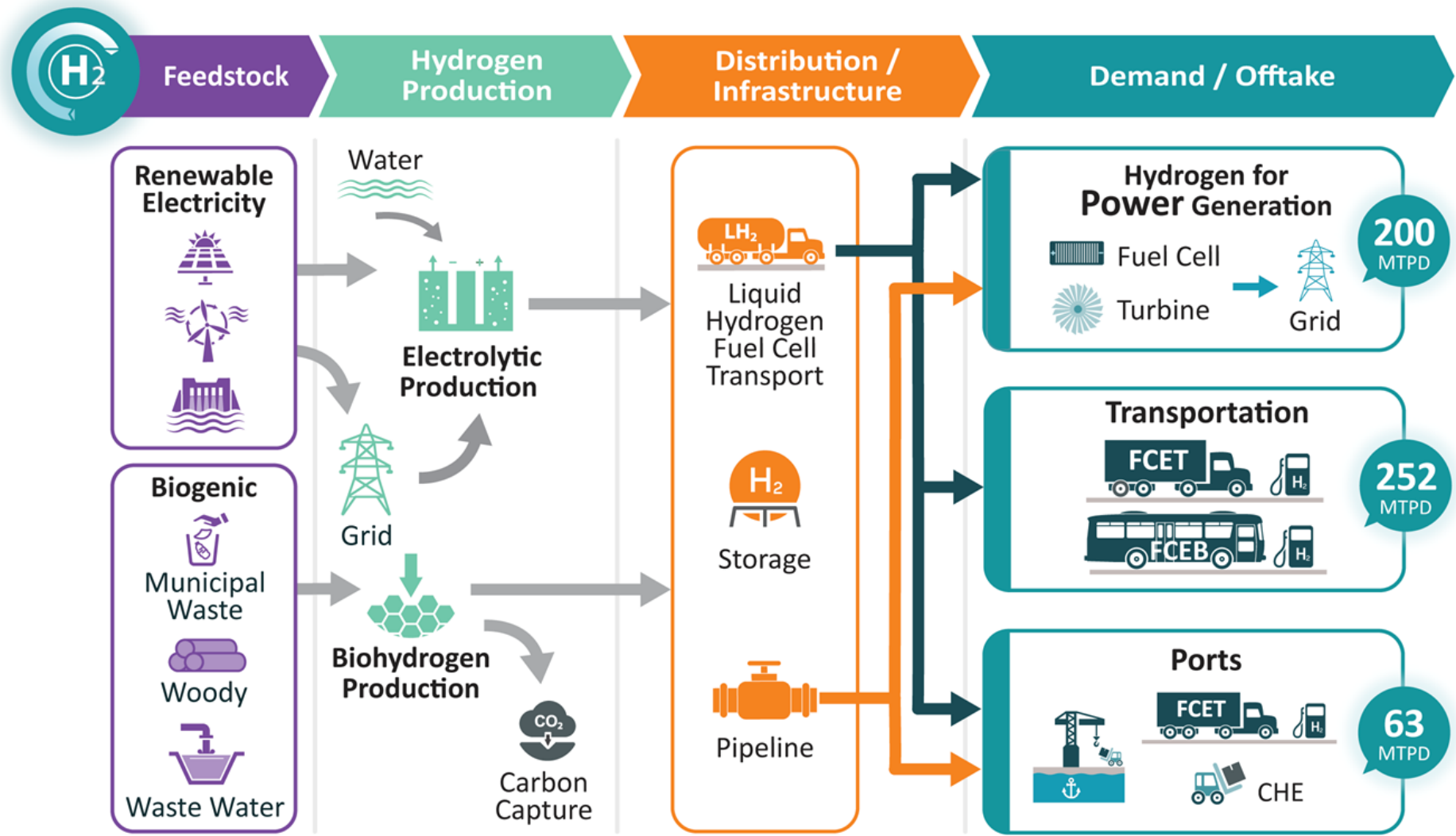
# ARCHES Hydrogen Flow





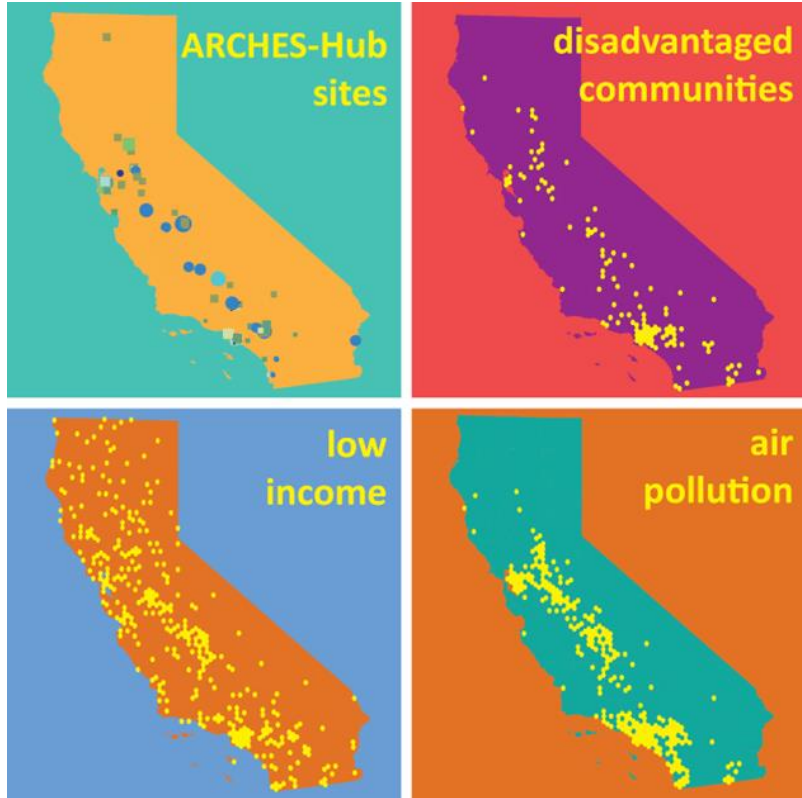


# ARCHES Hydrogen Flow





# Communities Will Benefit



\*EJ40 database and CalEnviroScreen

**COMMUNITY**

- ▲ **\$2.95 billion** Economic value of increased health\* and associated health costs savings per year
- ▲ **222,400** Number of jobs created per year
- ▼ **2,097** Fewer hospitalizations for respiratory & cardiac illness per year
- ▼ **13,292** Fewer work loss days per year
- ▼ **6,900** Nitrogen oxide net emissions avoided MTPY
- ▼ **239** Sulfur dioxide net emissions avoided MTPY
- ▼ **326** Particulate matter net emissions avoided MTPY
- ▼ **48** Fewer premature deaths per year
- ▲ **\$380 million** Invested in community benefits & workforce development

\*Reduced premature death, asthma, cancer risk, missed work days



# ARCHES Achieves Market Liftoff

## DEPLOYMENT

Average delivered H<sub>2</sub> cost to end use kg

**\$7.65**  
w/o any  
PTC



**\$5.04**  
with PTC  
& LCFS

**165** Miles of  
new H<sub>2</sub>  
pipeline  
(30 existing)



**~5,500** Class  
6 & 8  
trucks



**-0.15** Average  
life-cycle  
carbon  
intensity

kgCO<sub>2</sub>/KgH<sub>2</sub>



**1,080** Transit  
buses



Heavy-duty HRS

**66**  
Public



**24**  
Private/  
Transit

**232** Port cargo  
handling  
equipment





**H2 Market  
Development  
Strategy**



# Governor Newsom Announces New Strategy to Develop a Hydrogen Economy of the Future

Published: Aug 08, 2023

SACRAMENTO – Governor Gavin Newsom has [directed](#) the Governor’s Office of Business and Economic Development (GO-Biz) to develop California’s Hydrogen Market Development Strategy, employing an all-of-government approach to building up California’s clean, renewable hydrogen market. It will closely resemble the [Zero-Emission Vehicle Market Development Strategy](#) to help California collectively move forward and deliver zero-emission benefits to all Californians.

“California is all in on clean, renewable hydrogen – an essential aspect of how we’ll power our future and cut pollution,” **said Governor Newsom**. “This strategy will lay out the pathway for building a robust hydrogen market to help us fully embrace this source of clean energy.”

## WHY IT’S NEEDED:

- Expanding the market for clean, renewable hydrogen is key to achieving California’s climate goals – especially for a clean electric grid, net-zero carbon emissions, and drastically cutting air pollution.
- California is currently competing to become a federally funded [Hydrogen Hub](#), a program that will leverage \$8 billion from the Bipartisan Infrastructure Law to establish at least four Hydrogen Hubs across the United States.

## Recent News

### [GETTING LOCAL:](#)

[Protecting People from Wildfires & Disasters](#)

### [WHAT THEY ARE SAYING:](#)

[Kids Groups, Counties & More Respond Positively to Progress on Governor Newsom’s Proposed Mental Health Reform](#)

[Governor Newsom Triples CHP Support to Assist Los Angeles in Organized Retail Theft Crack Down](#)

[More Trees, Less Asphalt at School](#)

[Governor Newsom](#)

## **H2 Strategy North Star:**

Leverage hydrogen to accelerate clean energy deployment and decarbonize our transportation and industrial sectors

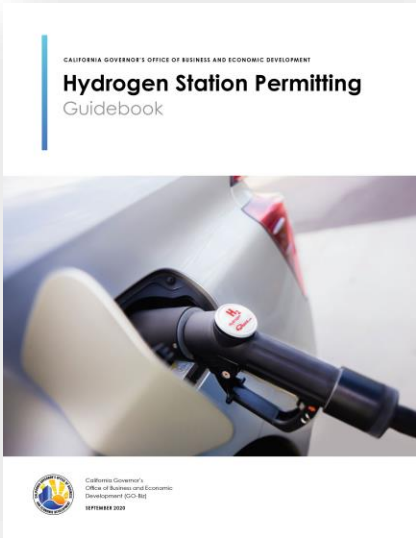


# Hydrogen Fueling Station Readiness

Hydrogen fueling stations are becoming increasingly common in California, serving both passenger and commercial vehicles. They operate under robust codes and standards, with approval from local building, planning and fire officials.

Please refer to our Hydrogen Station Permitting Guidebook for information and best practices for hydrogen station development. The Hydrogen Fuel Cell Partnership also has a Hydrogen Refueling Station Buyer's Guide.

The Hydrogen Fueling Station Permit Streamlining Map is a living companion to the Hydrogen Fueling Station Permitting Guidebook. Its purpose is to create a shared understanding of Hydrogen Fueling Station permit streamlining across the state, and track compliance with California law SB-1291 Hydrogen-fueling stations. We hope communities use this tool, and the others linked below, to easily replicate success, leverage lessons learned, and save time as we all work to aggressively build out California's zero-emission vehicle infrastructure network.



Hydrogen Permitting Guidebook

Hydrogen Permitting Scorecard



Join California's H2 Hub Effort Through ARCHES

- Best Practices and Resources
- Hydrogen Permitting Fact Sheets

Fact sheets



**Permitting Hydrogen Stations Scorecard:**  
All cities and counties, including charter cities, in California are required to comply with SB 1291.

Scoring Criteria:	Complete if:
<input type="checkbox"/> 1. Streamlining Ordinance Ordinance creating an expedited, streamlined permitting process for hydrogen vehicle refueling stations.	Streamlining ordinance has been adopted.
<input type="checkbox"/> 2. Permitting checklists posted on Website Checklist of all requirements needed for expedited review posted on city or county website.	Permitting checklist is available and easily found on city or county website.
<input type="checkbox"/> 3. Administrative approval of Hydrogen Station Hydrogen station projects that meet expedited checklist are administratively approved through building or similar non-discretionary permit (or similar).	The streamlining ordinance states that permit applications that meet checklist requirements will be approved through non-discretionary permit (or similar).
<input type="checkbox"/> 4. Approval limited to health and safety review Hydrogen station project review limited to health and safety requirements found under local, state, and federal law.	The streamlining ordinance states that no discretionary use permit is required and permit approval will be limited to health and safety review.
<input type="checkbox"/> 5. Electronic signatures accepted AHJ accepts electronic signatures on permit applications.	Electronic signatures accepted on City or County website (usually specified in the ordinance).
<input type="checkbox"/> 6. Hydrogen Station not subject to association approval Hydrogen station permit approval not subject to approval of an association (as defined in Section 4080 of the Civil Code).	The streamlining ordinance states that hydrogen permits do not require association approval.
<input type="checkbox"/> 7. One complete deficiency notice AHJ commits to issuing one complete written correction notice detailing all deficiencies in an incomplete application and any additional information needed to be eligible for expedited permit issuance.	The streamlining ordinance dictates that a written correction notices must detail all deficiencies.

\*If a city or county determines it is unable to accept electronic signatures on all forms, the permit streamlining ordinance shall state the reasons.

Streamlining Map



Hydrogen Readiness - California Governor's Office of Business and Economic Development

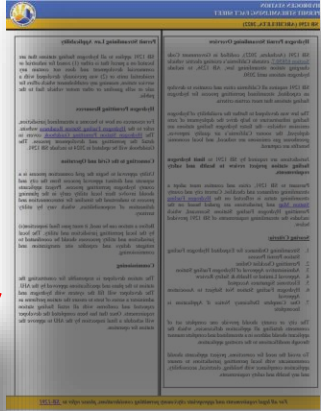
**Hydrogen Fueling Station Streamlined Permitting Process**

**Hydrogen Fueling Station Streamlined Permitting Process**

- Checklist
- Permit Application
- Review
- Permit Issuance

\*The deficiency notice should include one complete set of comments.

Learn More About Zero Emission Vehicles, Download! Contact Us Here:  
HYDROGEN STREAMLINING | INCIDENT RESPONSE | AIR QUALITY RESOURCE

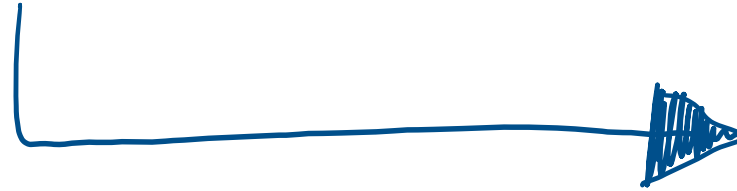


# H<sub>2</sub> Market Development Strategy:

Why? When?	C-Neutral by 2045 (AB 1279)
What?	2022 Scoping Plan
How? Who?	H <sub>2</sub> Market Development Strategy — SB 1075 — SB 643 — — IEPR — SB 671 — — ARCHES White Papers etc.
Model	ZEU Market Development Strategy



# H2 Market Development Survey



For more information:

<https://business.ca.gov/industries/hydrogen/>



[GO-Biz Hydrogen Market Development Strategy Input Form \(smartsheet.com\)](https://business.ca.gov/industries/hydrogen/)

**We need partnership to succeed...**



The background features a light green gradient with several large, glossy green spheres. A prominent glass stem connects two of these spheres, one positioned higher and to the left, and another lower and to the right. The lighting creates bright highlights on the spheres, giving them a three-dimensional appearance.

# Thank You!

Tyson Eckerle

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