Retail Hydrogen Fueling Station Network Update

Ben Xiong, Keith Malone, David Park

04/04/2022
CaFCP Members

— 20+ years of collaboration —
New Members

[Logos of various companies]
Hydrogen Village week

Tuesday, April 5,  
9:00am- 4:00pm  
Hydrogen Village Education – Online Briefings

Wednesday, April 6  
9:00am- 4:00pm  
Hydrogen Village  
1315 10th St, Sacramento, CA 95814  
(west steps facing the Tower Bridge)
CaFCP Station Map & SOSS

http://cafcp.org/stationmap  |  http://m.cafcp.org
An Expanding Hydrogen Station Network

CA Light-Duty Hydrogen Stations Progress

*Includes 15 stations in development that are 100% privately funded

Source: Governor’s Office of Business and Economic Development
Retail Hydrogen Stations & Network Health

Latest Stations to Open
- Sherman Oaks
- Costa Mesa – Bristol
- Baldwin Park
- Hawaiian Gardens
- Orange

In Commissioning
- Cupertino
- San Jose – Bernal Road
- San Jose – Snell Ave
- Woodside

Stations Currently Unavailable
- Ontario
- Newport Beach – In Permitting
- Berkeley – Mid 2022
- SF Harrison St – Mid 2022

Station Improvements are Ongoing
- H2 supply mostly resolved;
- H2 retail deliveries vastly improved;
- Station short fill issues are much improved;
- Durability improvements continue
## By the Numbers (cafcp.org)

<table>
<thead>
<tr>
<th>Category</th>
<th>Numbers as of March 1, 2022</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCEVs—Fuel cell cars sold and leased in US*</td>
<td></td>
<td>12,703</td>
</tr>
<tr>
<td>FCEBs—Fuel cell buses in operation in California</td>
<td></td>
<td>76</td>
</tr>
<tr>
<td>Fuel cell buses in development in California</td>
<td></td>
<td>76</td>
</tr>
<tr>
<td>Hydrogen stations available in California**</td>
<td></td>
<td>52</td>
</tr>
<tr>
<td>Retail hydrogen stations in <em>construction</em> in California***</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Retail hydrogen stations in <em>permitting</em> in California***</td>
<td></td>
<td>29</td>
</tr>
<tr>
<td>Retail hydrogen stations <em>proposed</em> in California***</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Retail hydrogen stations <em>funded, but not in development</em> in California***</td>
<td></td>
<td>71</td>
</tr>
<tr>
<td><strong>Total retail hydrogen stations in development in California</strong>*</td>
<td></td>
<td>121</td>
</tr>
<tr>
<td>Truck hydrogen stations in operation in California</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Truck hydrogen stations <em>funded</em> in California****</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>
H2 Supply and Distribution

- [https://m.cafcp.org/](https://m.cafcp.org/) (SOSS) is your friend

**New Hydrogen Supplies**
- Linde 30+ tons/day liquid H2 production facility, La Porte, TX operating today
- Linde 30+ tons/day liquid H2 production facility, Ontario, CA, serving mobility market, today

**Future Hydrogen Supply Announcements**
- Air Liquide Nevada renewable H2 production plant expected- Q2 2022
- Air Products $1.3B H2 production complex in Edmonton, Alberta, expected- 2024
- Air Products 10 tonne/day renewable H2 production in AZ, expected 2023

**Retail Activity**
- More H2 stations-publicly and privately funded
- More H2 delivery trucks, trailers and hubs
- Stations: Higher capacity, multiple fueling positions
- Station Growth: Faster station development time

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**Hydrogen Station Availability**

- Chart showing the availability of hydrogen stations from January 2021 to March 2022.
Hydrogen Fuel Cell Vehicles! (Light-duty)

Honda Clarity  
Hyundai NEXO  
Toyota Mirai  
Toyota Mirai  
BMW  
Riversimple  
Hyperion  
Hopium
Hydrogen Fuel Cell Vehicles (Heavy-duty)

- Cellcentric
- Cummins
- Daimler Truck North America
- Hino
- Hyundai
- Hyzon
- Kenworth
- Nikola
H2 Fuel Cell Bus- The Other Electric Vehicle

California Transit Agencies with fuel cell electric buses on the road and in the pipeline

1. AC Transit (East Bay)
2. Eastern Contra Costa Transit Authority (East Bay)
3. Fresno Area Express
4. Golden Empire Transit (Bakersfield)
5. Montebello Transit*
6. North County Transit (San Diego)
7. OCTA (Orange County)
8. Riverside Transit Agency
9. SunLine Transit (Coachella Valley)
10. UC Irvine

*recently noted in a legislative hearing that they are pursuing fuel buses
Hydrogen & Fuel Cell Activity – California

Likely and Potential Mini-Hubs in California
- Lancaster
- Shasta region
- Fresno and the Central Valley
- Central Sierras
- Coachella
- Victor Valley, Barstow and Mojave
- Redwood Coast (Humboldt)

Heliogen and Woodside Energy Announce Commercial-Scale Demonstration Project and Collaboration Agreement

Sea Change
Fuel Cell Ferry

Japan-California Memorandum of Cooperation
Governor Murphy, Governor Hochul, Governor Baker, and Governor Lamont Announce Multi-State Partnership with Major Hydrogen Ecosystem Partners to Propose a Clean Regional Hydrogen Hub

Fast-moving Bill Seeks to Win Hydrogen Hub for Wash.

The Lone Star State May Host The World’s Next Big Hydrogen Hub

Leading Companies Launch Initiative to Support Low-Carbon and Hydrogen Industrial Hub in Ohio, Pennsylvania and West Virginia

Oklahoma joins neighbor states in quest for dollars to prove hydrogen's worth

Jack Money
Oklahoman
Hydrogen & Fuel Cell Activity – U.S.

Fed Policymakers Unveil Hydrogen Transportation Bill

Hydrogen for Trucks Act

Honda to Install Stationary Fuel Cell Power Station on California Campus as First Step Toward Commercialization of Zero-Emission Backup Power Generation
Hydrogen & Fuel Cell Activity - Global

Will Biden And Scholz Unlock Hydrogen’s Potential?

‘Our switch to renewables and hydrogen will make us truly independent of Russia,’ says European Commission President

REPowerEU: Joint European action for more affordable, secure and sustainable energy
CaFCP Resources

• **KEY DOCUMENTS**
  - Truck Vision – [https://cafcp.org/truckvision](https://cafcp.org/truckvision)
  - Legislative hearing on hydrogen hubs - [https://www.senate.ca.gov/media-archive/default](https://www.senate.ca.gov/media-archive/default)

• **CAFCP PAGES**
  - Station Map – [www.cafcp.org/stationmap](http://www.cafcp.org/stationmap)
  - SOSS – [http://m.cafcp.org](http://m.cafcp.org)
  - Resources – [www.cafcp.org/resources](http://www.cafcp.org/resources)

• **UPCOMING EVENTS**
  - April 23 – CEC Santa Barbara Earth Day Celebration - [https://sbearthday.org/](https://sbearthday.org/)

• **SUMMER EVENTS**
  - June 6 -7 CHBC – California Hydrogen Leadership Summit - [https://www.cahydrogenleadershipsummit.com/](https://www.cahydrogenleadershipsummit.com/)
  - August 15 – August 18 – Green Transportation Summit & Expo - [https://www.gtsummitexpo.com/about-3](https://www.gtsummitexpo.com/about-3)
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