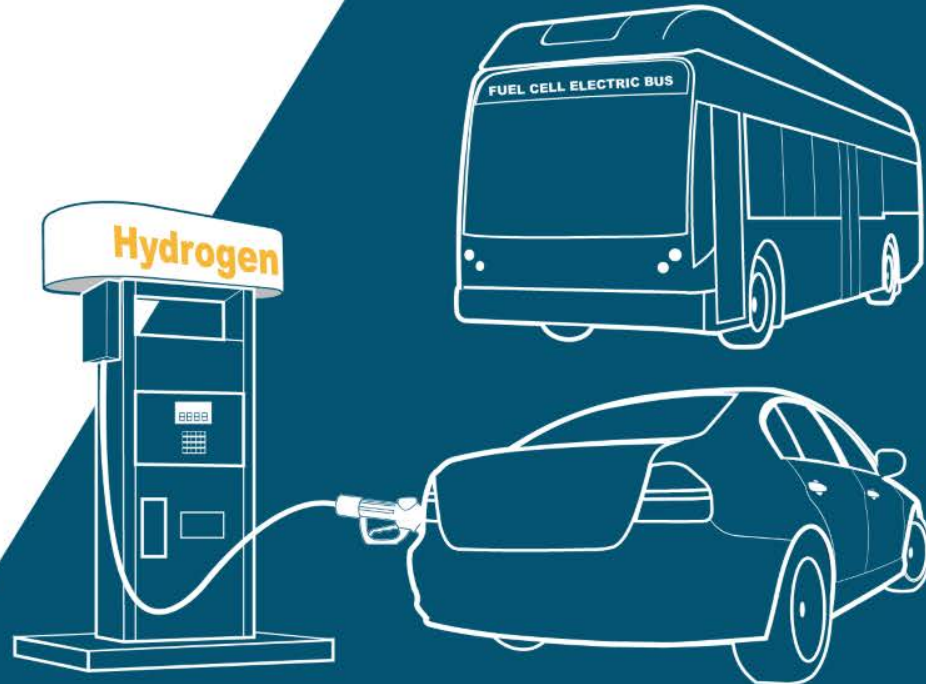


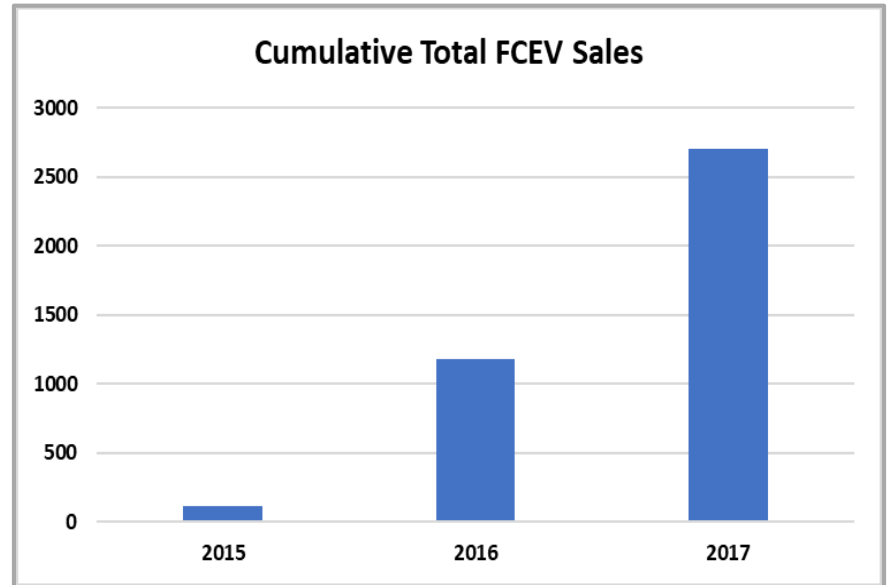
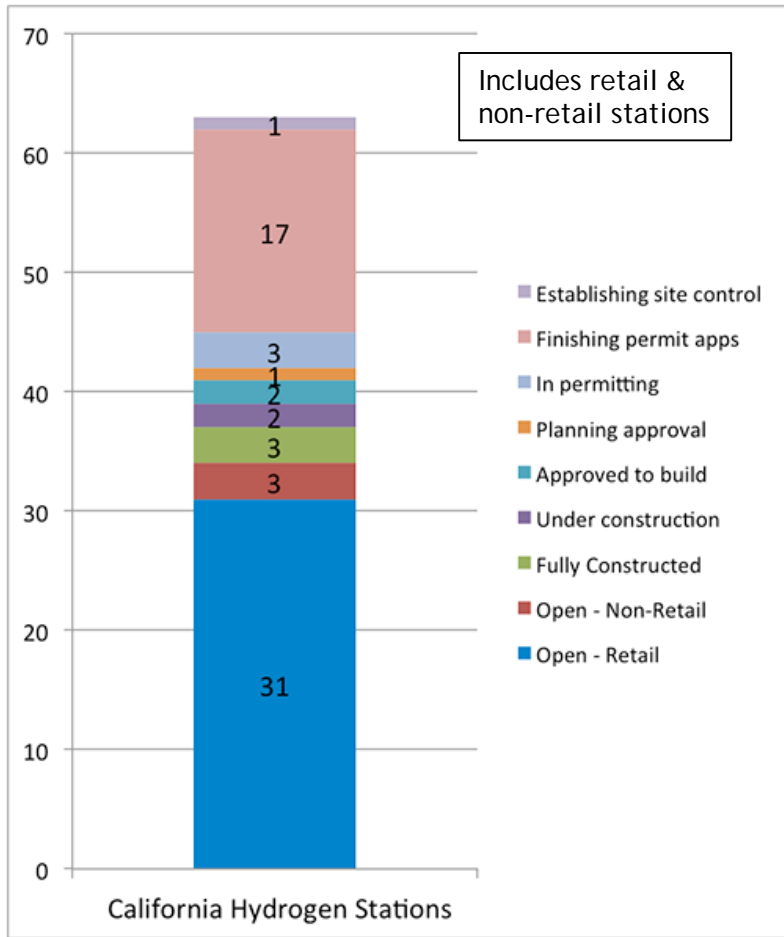
Retail Hydrogen Fueling Station Network Update

Joe Gagliano & Ben Xiong

October 24, 2017



California H2 Station Network & FCEV Totals



Source: HybridCars.com & Carsalesbase.com

Retail Openings 2016: 25 stations
 Forecast estimate 2017: up to ~33
 Forecast estimate 2018: ~47
 Forecast estimate 2019: ~63

Source: Go-Biz



CAFCP By The Numbers

By The Numbers

FCEV Sales, FCEB, & Hydrogen Station Data

The table shows how many fuel cell cars have been sold and leased, how many fuel cell buses are on the road in California, and how many hydrogen stations are open in California.

	Numbers as of October 1, 2017	Total
FCEVs—Fuel cell cars sold and leased		2,699
FCEBs—Fuel cell buses in operation in California		20
Retail hydrogen stations open in California		31
Fuel cell buses in development in California		33
Fuel cell shuttles in development in California		4
**Retail hydrogen stations in development in California		30

*Number of total FCEV sales data from HybridCars.com and Carsalesbase.com

FCEB Source: AC Transit, Orange County Transportation Authority (OCTA), SunLine Transit, UC Irvine

Hydrogen station source: Air Liquide, Air Products, GO-Biz, ITM Power, Linde, True Zero



Retail Station Openings 2017-2018



South Pasadena



Riverside

Forecast Next Stations

- Ontario
- Woodside
- Mountain View
- LAX
- Thousand Oaks
- Palo Alto



Lawndale



Fremont



San Ramon



Torrance



H2 Station Network

September 2017

Northern CA Hydrogen Stations

● Retail: Open

- Campbell - Winchester Blvd
- Fremont
- Hayward
- Mill Valley
- San Jose
- San Ramon
- Saratoga
- South San Francisco
- Lake Tahoe-Truckee
- West Sacramento

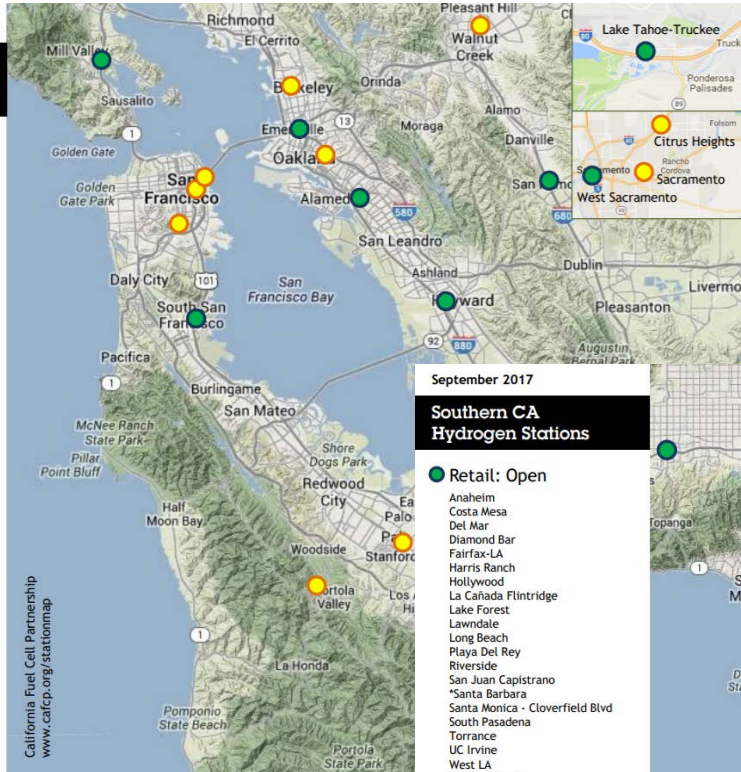
● Other: Open

- Emeryville - AC Transit
- Oakland - AC Transit

● Retail: In Development

- Berkeley
- Campbell - East Hamilton Ave
- Citrus Heights
- Mountain View
- Oakland - Grand Ave
- Palo Alto
- Sacramento
- San Francisco - Third St
- San Francisco - Harrison St
- San Francisco - Mission St
- Santa Nella
- Sunnyvale
- Walnut Creek
- Woodside

*Not shown on map



September 2017

Southern CA Hydrogen Stations

● Retail: Open

- Anaheim
- Costa Mesa
- Del Mar
- Diamond Bar
- Fairfax-LA
- Harris Ranch
- Hollywood
- La Cañada Flintridge
- Lake Forest
- Lawndale
- Long Beach
- Playa Del Rey
- Riverside
- San Juan Capistrano
- *Santa Barbara
- Santa Monica - Cloverfield Blvd
- South Pasadena
- Torrance
- UC Irvine
- West LA
- Woodland Hills

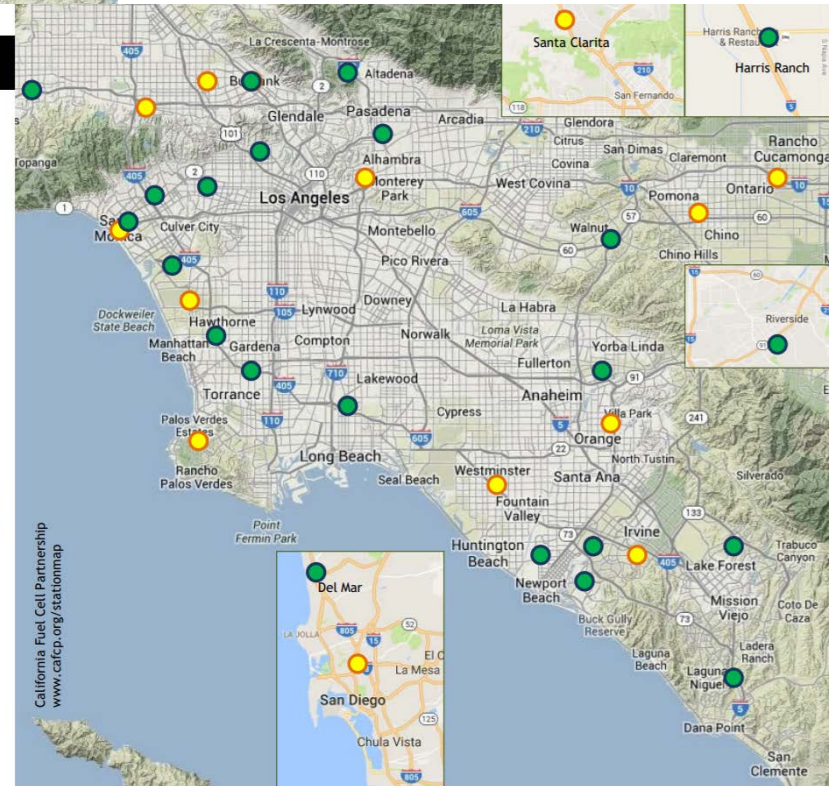
● Other: Open

- Burbank
- Newport Beach
- *Thousand Palms - SunLine Transit

● Retail: In Development

- Burbank (upgrade)
- Cal State LA
- Chino (upgrade)
- Huntington Beach
- Irvine
- LAX (upgrade)
- North Hollywood
- Ontario
- Orange
- Rancho Palos Verdes
- San Diego
- Santa Clarita
- Santa Monica - Lincoln Blvd
- Sherman Oaks
- *Thousand Oaks

*Not shown on map





CAFCP Station Map & SOSS

The screenshot displays the CAFCP Station Map & SOSS website. At the top left is the logo for the California Fuel Cell Partnership, featuring a globe and the text "California FUEL CELL PARTNERSHIP DRIVING FOR THE FUTURE". The navigation menu includes "HOME", "CARS", "STATIONS", "BENEFITS", "BUSES & TRUCKS", and "RESOURCES". A search bar is located in the top right corner with the text "Search by Zip Code or Address" and a "GO" button. Below the search bar are two buttons: "List Stations" and "Filter By". The main content area is a map of California showing fuel cell stations marked with green "H" icons. The map includes labels for major cities like Redding, Sacramento, San Francisco, San Jose, Fresno, Bakersfield, Long Beach, Anaheim, San Diego, Tijuana, Mexicali, Las Vegas, Salt Lake City, Sandy, Provo, St George, Phoenix, Mesa, Tucson, Nogales, Albuquerque, Santa Fe, and El Paso. The map also shows state boundaries for Nevada, Utah, Arizona, New Mexico, and Baja California. The bottom of the page features the Google logo, copyright information "© CALIFORNIA FUEL CELL PARTNERSHIP Powered by the fastest molecule on earth!™", the address "3300 Industrial Blvd. Suite 1000 West Sacramento, CA 95691", and the phone number "SOSS | 916.371.2870".

<http://cafcp.org/stationmap>
<http://m.cafcp.org>



Facebook Users Groups

- Hydrogen Car Owners
- Honda Clarity Owners
- Toyota Mirai Owners
 - Share experience
 - Station information
 - CaFCP participates, does not administer

Hydrogen Car Owners
Public Group

Discussion
Members
Events
Videos
Photos

Search this group

Shortcuts
California Fuel Cell P...

FUEL CELL CAR

Hydrogen tank

Join Group

Join this group to post and comment. [+ Join Group](#)

PINNED POST

Adam Bray-Ali
September 26, 2016

Hi folks. I'm starting a publicly accessible and widely open Facebook group to share details and information related to the Hydrogen Fuel Cell cars that are available now in California. While I envision this being mostly California based, we are open to all comers and interested parties without any sponsorships, affiliations or obligations. I currently drive a Toyota Mirai in their fastest available color and I have enjoyed meeting many other drivers of these cars in the past 6 months. Looking forward to meeting you at this virtual water cooler and sharing insights, details and other information. The only thing that I request is that you respect other's opinions. If someone is being a troll, please message me and I can address them directly and potentially bar them. Drive on! Thanks. Adam Bray-Ali

[Like](#) [Share](#) Russ Mobley and 30 others 8 Comments

MEMBERS 384 Members

DESCRIPTION
A forum and Facebook group to share details and information for ... [See More](#)

GROUP TYPE
Support

TAGS
Fuel cell · Hydrogen Economy · Toyota Mirai · [More](#)

LOCATIONS
San Francisco, San Jose, Las Vegas, California

CREATE NEW GROUPS
Groups make it easier than ever to share with friends, family and [Create Group](#)

2017 OEM Priority Location Recommendations

Arvin/Lebec (I-5/Wheeler Ridge Rd.)	Palm Springs/Rancho Mirage
*Barstow/Victorville (I-15)	Rancho Santa Margarita (SR 241)
Baldwin Park/W. Covina (I-10/I-605)	Redondo Beach
Beverly Hills	Redwood City (US 101)
Brea (SR 57)	Sacramento/Downtown (I-5/Bus80)
Calabasas (US 101)	Sacramento/Folsom (US 50)
Cerritos (US 91/I-605)	San Diego /La Jolla–University Town Center
Corona (I-15/US 91)	San Diego/Airport (I-5)
Cupertino	San Diego/Carlsbad-Oceanside (I-5)
Davis (SR 113/I-80)	San Diego/Rancho Bernardo (I-15)
Downey/Norwalk (I-5/I-605)	San Jose/Alamitos (SR 85/SR 87)
Dublin/Pleasanton (I-580/I-680)	San Luis Obispo (US 101)
Garden Grove/Orange (SR 22/I-5)	San Mateo/Foster City
Granada Hills (I-405/SR 118)	San Rafael/Corte Madera (US 101)
Irvine North	Santa Cruz (PCH/SR 17)
Laguna Niguel/Aliso Viejo	Santa Rosa (US 101)
Los Angeles (near Downtown)	Simi Valley (SR 118)
Malibu (PCH)	Temecula (I-15)
Manhattan Beach	Toluca Lake/Burbank (SR 134)
Monterey	Vallejo (I-80/SR 29)
Napa (SR 29/Trancas St.)	Ventura (US 101)
Newport Beach	Walnut Creek (I-680/SR 24)
Pacific Palisades	



Building The Station Network

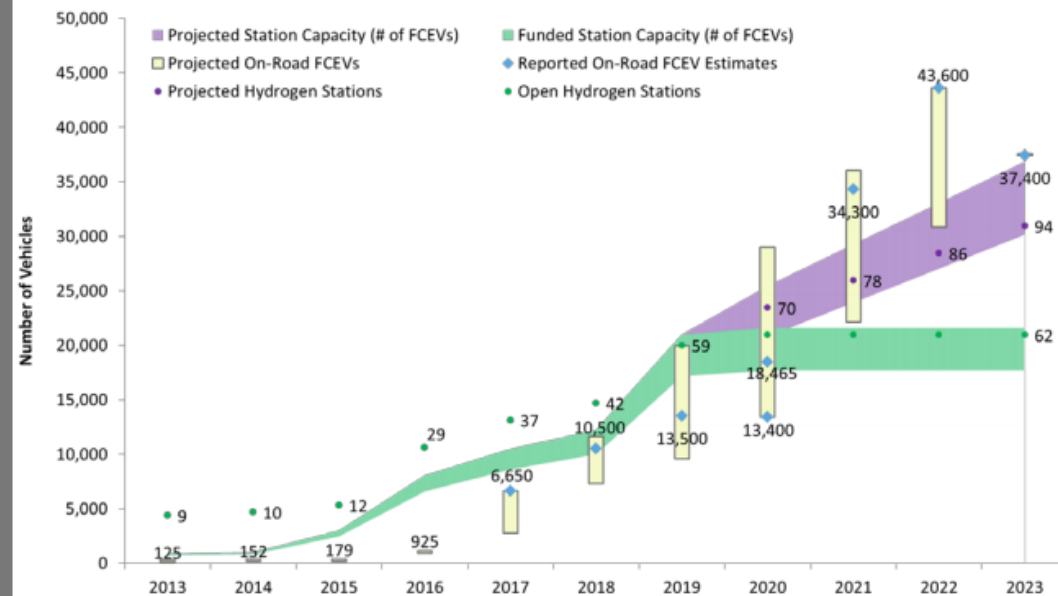
- Coverage - network of stations to serve key markets
 - Cluster, destination and connector stations (2012 Roadmap)
 - Improves customer experience & confidence to fill up where they travel
 - Increases vehicle utility
 - Enables broad market participation
 - 1st 100 stations are primarily to address market coverage
- Capacity - hydrogen supply
 - At a single station
 - In network of stations
 - Produced to serve the market
- Challenge: Balancing coverage/capacity as market grows
- End Goal: Market coverage/capacity decisions by private-sector
 - CaFCP Vision 2030 will help map out this transition



Capacity Must Increase

Finding 6

Long-term FCEV deployment plans continue to indicate a need for dispensing capacity beyond business-as-usual development.

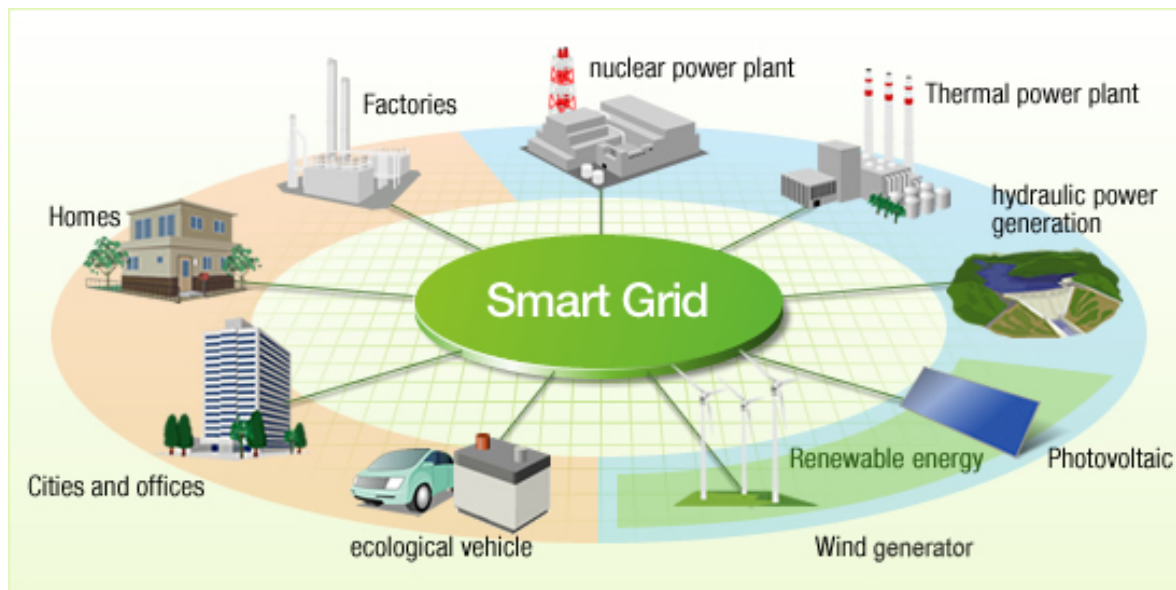


(ARB 2017 Annual Evaluation of FCEV and H2 Fuel Station Network Development)



Increasing capacity and lowering costs

- Regulatory incentives
- Medium & Heavy-duty vehicles
 - 2-4 in operational demonstrations
- Grid integration





Hydrogen Is On A Renewable Pathway

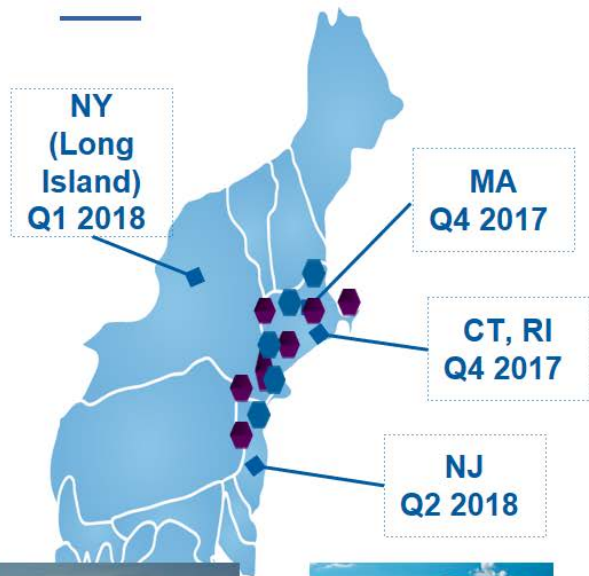
Like electricity

- California requires 33% of hydrogen fuel to be renewable
- Renewable H₂ road map is in development
- California Energy Commission considering demonstration project for renewable H₂ transportation fuel
- Stakeholders educating policy makers about renewable H₂ and energy storage



Northeast Retail H2 Stations

H2 Stations Covering the Northeast



Network of 12 Stations

Start-up over Q4 2017-Q1 2018

Dedicated H₂ supply chain by



Project in collaboration with



New York

Bronx
Hempstead
Brooklyn
Site Location TBA



Connecticut

Hartford



Massachusetts

Braintree
Mansfield
Two others TBA



New Jersey

Lodi
Whippany



Rhode Island

Providence





In Closing

- Network of 31 retail hydrogen stations open in CA
- All stations use minimum 33% renewable H2
- Over 2,700 light-duty FCEVs on California roadways
- In Northeast, 4 retail hydrogen stations coming online
- 20 fuel cell buses in operation in CA
- Fuel cell drayage truck in operation at Port of LA
- CVRP - \$5,000 rebate for FCEVs
- CaFCP Members developing a Vision 2030 document to accelerate market expansion beyond 500+ retail stations



CaFCP Members

Air Liquide

Alameda-Contra Costa Transit District (*AC Transit*)

Automotive Fuel Cell Cooperation

BAE Systems

Ballard Power Systems

Bay Area Air Quality Management District

California Air Resources Board

California Department of Food and Agriculture

California Energy Commission

California State University - Los Angeles

CALSTART

The Center for Energy Efficiency and Renewable
Technologies (*CEERT*)

Center for Transportation and the Environment (*CTE*)

Comdata

Energy Independence Now

FASTECH

FirstElement Fuel, Inc.

General Motors

Honda

Hydrogenics

Hydrogen-XT, Inc.

HyGen

Hyundai

ITM Power

Institute of Transportation Studies, UC Davis

Ivys Energy Solutions

Kobelco

KPA

Linde North America, Inc.

Mercedes-Benz

National Fuel Cell Research Center, UC Irvine

National Renewable Energy Laboratory (*NREL*)

Nel Hydrogen

Nissan

Office of Governor Edmund G. Brown Jr.

Sandia National Laboratories

South Coast Air Quality Management District

Southern California Gas Company

SunLine Transit Agency

Toyota

U.S. Department of Energy

U.S. Environmental Protection Agency

University of California, Berkeley

Volkswagen



CaFCP Members





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Twitter and LinkedIn

#fuelcell #driveH2