

California
FUEL CELL
PARTNERSHIP



DRIVING FOR THE FUTURE



Fuel Cell Vehicles in California: On the Road to Commercial

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California Fuel Cell Partnership



Promoting fuel cell vehicle commercialization as a means of moving towards a sustainable energy future, increasing energy efficiency and reducing or eliminating air pollution and greenhouse gas emissions.

AUTOMOTIVE

- Chrysler
- Daimler
- General Motors
- Ford
- Honda
- Hyundai
- Nissan
- Toyota
- Volkswagen

ENERGY

- BP
- Chevron
- Shell Hydrogen

TECHNOLOGY

- UTC Power

GOVERNMENT

- CA Energy Commission
- CA Air Resources Board
- National Automotive Center
- South Coast AQMD
- US EPA
- US DOE
- US DOT

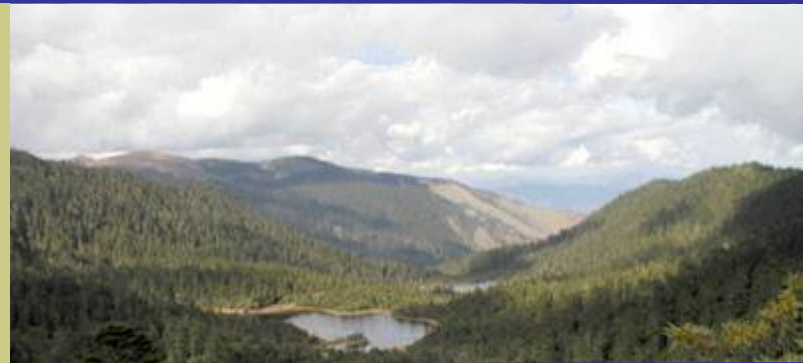
ASSOCIATE

- AC Transit
- Santa Clara VTA
- SunLine Transit
- Air Products
- Distributed Energy
- Powertech Labs
- ISE Corporation
- Praxair
- PG&E
- Ztek
- ITS – UC Davis
- NFCRC – UC Irvine

Air quality



Global warming



Petroleum dependency





Moving forward to real customers!



Will hydrogen fuel stations meet growing demand?



CARB Zero Emission Vehicle Regulation (March 27, 2008)

Requires each major auto to sell market share:

- 2009-2011 – 2,500 “Gold” ZEVs
- 2012-2014 – 25,000 “Gold” ZEVs
 - or fewer, with “Silver+”
- 2015-2017 – 50,000 “Gold” ZEVs
 - or fewer with “Silver+”
 - to be considered further in 2009

Gold = H₂FCV or BEV, Silver+ = PHEV or H₂ICE

CARB “Gold” ZEV requirements¹

	2008 – 2011	2012 – 2014	2015 – 2017
Previous ²	2500	25,000	50,000
New ³	NA	25,000 OR 5357 – 9375 PLUS 58,000 silver+	50,000 OR at least 25,000 ⁴

¹ large-volume automakers required to build their market share

² prior to March 27, 2008 CARB meeting

³ changes based on March 27, 2008 CARB meeting

⁴ 2015 – 2017 requirements to be considered in 2009

CARB Zero Emission Vehicle Regulation

In 2012-2014, if autos make their market share of the following “Gold” ZEVs:

Choose any combination of:

ZEV Vehicle Type	Vehicles Required 2012-2014 :
Type V – Long-Range (300+ mi) FCV	5,357
Type IV – Mid-Range (200+ mi) FCV	7,500
Type III – Short-Range (100+ mi) FCV or Longer-Range (200+ mi) BEV	9,375
Type II – Long-Range (100+ mi) BEV	12,500
Type I.5 – Mid-Range (75+ mi) BEV	15,000
Type I – Short-Range (50+ mi) BEV	18,750

They can make up the difference with their market share of approx. 58,000 “Silver+” vehicles (PHEVs, H₂ICEs)

CARB Zero-Emission Bus Regulation

- Beginning in 2011-2012, transit agencies operating more than 200 buses are required make 15% of new bus purchases zero-emission buses
 - 9 FCBs placed, 7 operating today
 - 8 new FCBs for AC Transit in 2009-2010
- Possibly 200+ FCBs in California by 2015

Where should H₂ stations be located?



San Fernando Valley

Fuel stations must be:

West LA

1. Focused in early markets
2. Retail-like experience
3. Customer friendly!
4. Plenty of fuel (350 and 700 bar)

Additional 750 kg/day H₂ needed by 2010 in LA region for light-duty fuel cell vehicles only!

Building the Hydrogen Highway Network

- \$19 million allocated by California Legislature (2005 through 2008)
- Current RFP for \$7.7 million
 - 3 Retail-like stations, 2 upgraded stations
 - Targeted locations, 350 and 700 bar fuel
 - Use 33% renewable, reduce GHGs 30%, reduce criteria pollutants (SB 1505)

