Fuel Cell Vehicles in California: On the Road to Commercial

Jan van Dokkum

CaFCP Steering Team Chair

California Fuel Cell Partnership

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

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.

California FUEL CELL PARTNERSHIP

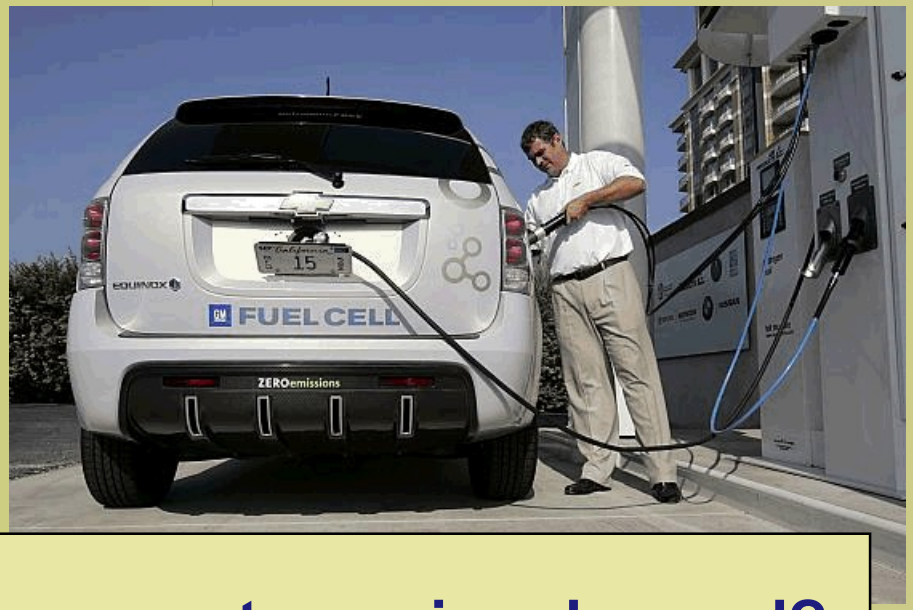
Air quality

Global warming

Petroleum dependency

California
FUEL CELL
PARTNERSHIP

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 = H_2FCV or BEV, Silver+ = PHEV or H_2ICE

CARB "Gold" ZEV requirements[1]

	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:

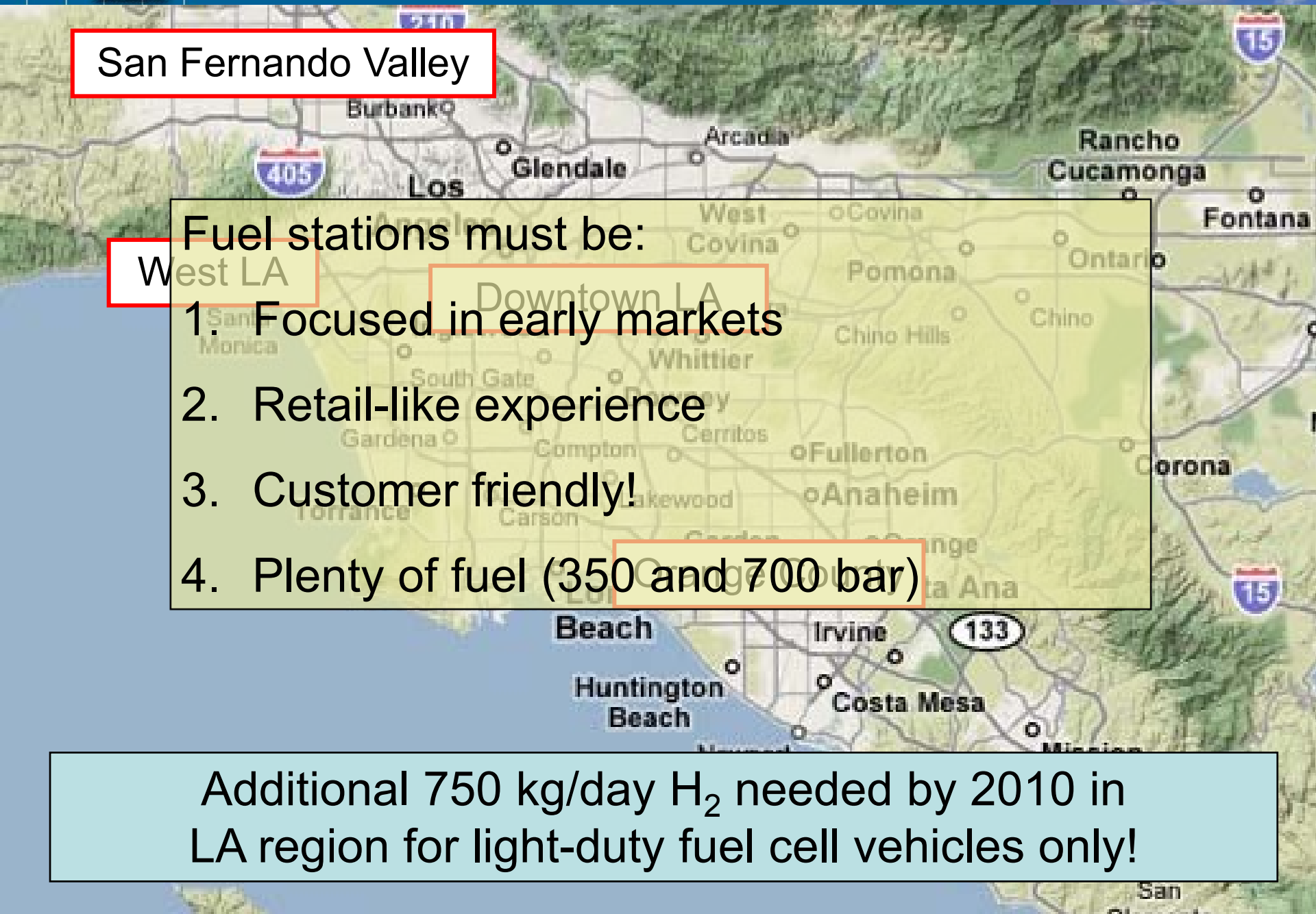
ZEV Vehicle Type	Vehicles Required 2012-2014 :
Type V – Long-Range (300+ mi) FCV	**5,357**
Type IV – Mid-Range (200+ mi) FCV	**7,500**
Type III – Short-Range (100+ mi) FCV or Longer-Range (200+ mi) BEV	**9,375**
Type II – Long-Range (100+ mi) BEV	12,500
Type I.5 – Mid-Range (75+ mi) BEV	15,000
Type I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

They can make up the difference with their market share of approx. 58,000 "Silver+" vehicles (PHEVs, H_2ICEs)

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 H_2 stations be located?



Fuel stations must be:

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

Additional 750 kg/day H_2 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)

California
FUEL CELL
PARTNERSHIP