

California
FUEL CELL
PARTNERSHIP



DRIVING FOR THE FUTURE



Innovation and Coordination at the California Fuel Cell Partnership

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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

Over 200 FCVs in California



Daimler



Nissan



GM



Ford



Honda



VTA



Volkswagen



Toyota



Hyundai



Audi



NAC/GM



UTC/AC Transit



Key Learnings

- People in communities make H₂ happen
- Focus on customer experience
- Match H₂ supply to demand
- To start, we need a few good stations

Fire community outreach and education



Fire community outreach and education

1. Understand and build confidence
2. Establish communication
3. Provide a resource



Fire community outreach and education

- ✓ Over 1400 fire officials reached
- ✓ CaFCP program adopted by NASFM-HELP
- ✓ CaOSFM to adopt program



Station Accessibility = Good Customer Experience

- Evaluated 20 of 23 stations in 2006
 - Liability
 - Physical access
 - Technology/Interface
 - Safety
 - Training
 - Payment
 - Station information
- Worked to improve accessibility in 2007
 - Common fuel training materials
 - www.fleet.cafcp.org
 - www.er.cafcp.org

Fueling Training

Goals

- Create champions out of FCV drivers
- Simplify amount of training required
- Fill the gap (limited trainings provided)
- Voluntary program (for OEMs and station operators)

Deliverables

- Consensus training materials
- System to track instructed users
- Method to prove users have been instructed

Fueling Training

Online database

- Instructed users tracked in database on www.fleet.cafc.org
- 400 instructed users registered to date

The screenshot shows a web form titled "REGISTER A TRAINED FLEET CUSTOMER". On the left is a navigation menu with links for Home, About us, Stations, Registration, and Contact us. Below the menu is a "FLEET CUSTOMER LOGIN" section with fields for USERNAME (containing "rvare@cafc.org") and PASSWORD (masked with asterisks), and a "SUBMIT" button. A note below the login fields says "If you have problems logging in, please [contact us](#)." The main form area has a heading "REGISTER A TRAINED FLEET CUSTOMER" and "Instructions" that read: "Please enter all trainer information for the first section and trainee information for the second section." The form is divided into two sections: "Trainer Information" and "Trainee Information". The "Trainer Information" section includes fields for Trainer First Name, Trainer Last Name, Trainer Organization (a dropdown menu currently showing "AC Transit"), Trainer Phone, and Trainer Email. The "Trainee Information" section includes fields for Trainee First Name, Trainee Last Name, Trainee Organization, Trainee Phone, and Trainee Email. At the bottom of the form, there is a "Date of Training" field with a date picker set to "Aug 20 07" and a checkbox labeled "This individual has received instruction regarding the safe use and refueling of hydrogen." At the very bottom right are "Reset" and "Submit" buttons.

Will hydrogen supply match demand?



Goal for deep dive supply survey

Accurately forecast station deployment in
California between 2008 and 2010

- Amount of hydrogen (kg/day)
- Location
- Accessibility
- Status of plans through 2010

Learning: Usable hydrogen supply – kg/day

- No common definition
 - Different assumptions and approaches
- Survey collected each entity's answers and details
 - Pressure
 - Production
 - Buffer supply
 - Compression
 - Supply (kg/day)
 - Supply definition

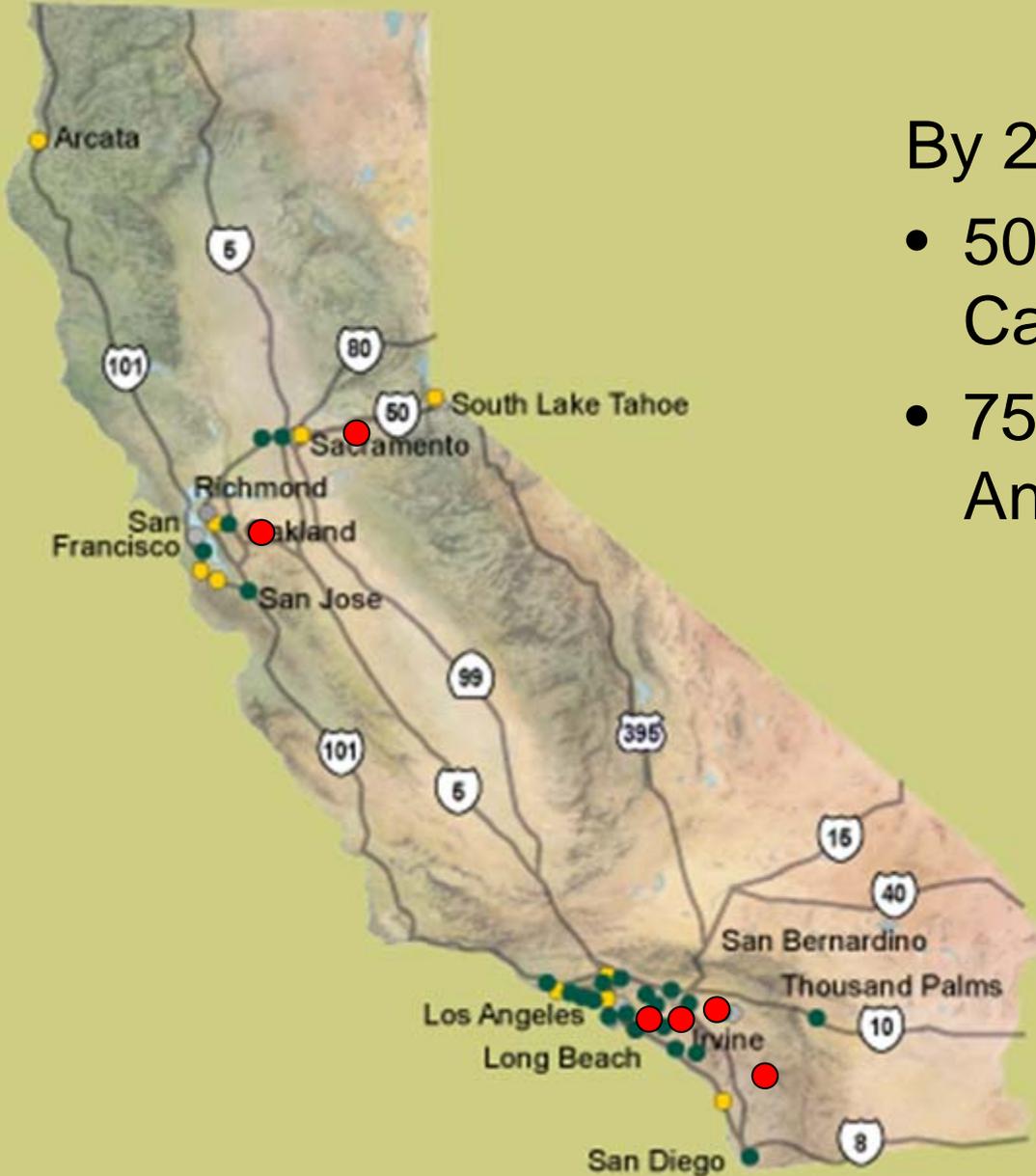
Learning: Accessibility – *how easy is it to fuel?*

Factor	Value	Attribute
Contracts	5	No agreement required for fueling
	4	No contract, but check-in still required; e.g. “vehicle safety check list”
	3	One-time agreement required*
	2	One-time agreement required plus additional agreements (e.g. for each user)
	1	Agreement required for each fueling
Fueling Access	5	Credit card access
	4	PIN access with movement towards credit card access
	3	PIN access
	2	Attendant only
	1	Private (open only to one entity)
Hours of Operation	5	24/7
	4	Extended business hours
	3	Business hours
	2	Limited hours or access
	1	Private (open only to one entity)

Score	
< 2.5	Poor
< 3.5	Moderate
< 4.25	Good
≤ 5	Excellent

Learning: Probability – *how likely is a station to be developed?*

Score	Probability	Information provided
5	Currently operating	Station operational
4	Very likely	All dates indicated, funding allocated
3	Somewhat likely	Dates indicated, no funding allocated, proven company
2	Not likely	Dates indicated, no funding allocated, new company
1	No information	No information



By 2010 we need additional

- 500 kg/day in Northern California
- 750 kg/day in greater Los Angeles region

San Fernando Valley

West LA

Downtown LA

Orange County



Key Learnings

- Grass roots relationships very important
 - Consistent codes and standards are vital, but local application is key to success
- Focus on customer experience
 - Must be excellent!
- Need common definition of hydrogen supply
 - Different calculations lead to uncertainty
 - Real-time information will be an important tool
- Need a few good stations
 - Retail-like, customer-friendly stations in early markets