

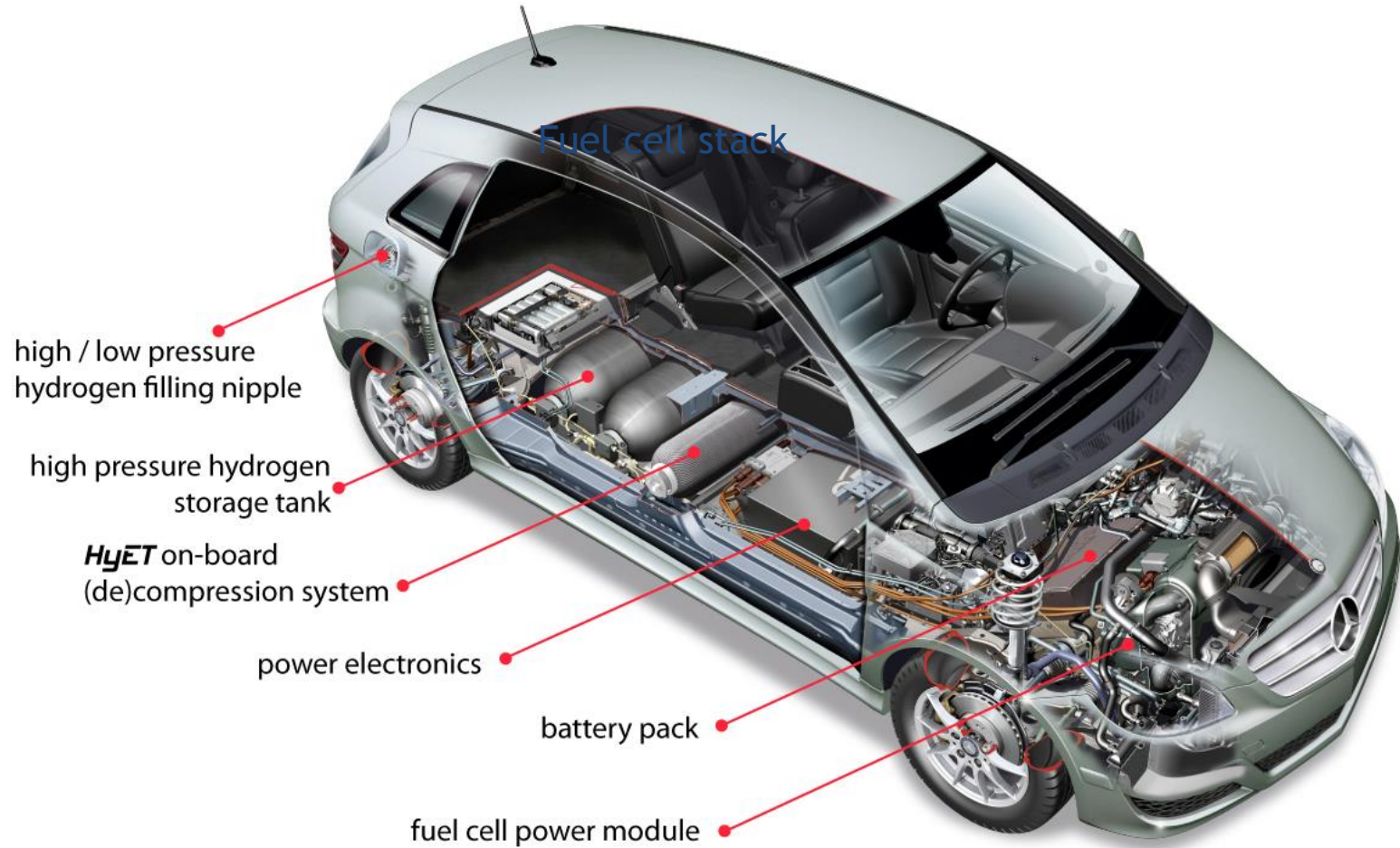
The Emerging Fuel Cell Electric Vehicle Market

Bill Elrick

Technical Program Director



FCEVs are electric vehicles



The cars are coming



and fuel cell buses, forklifts,
medium/heavy duty, stationary...



Hydrogen; where and why?



Renewable sources

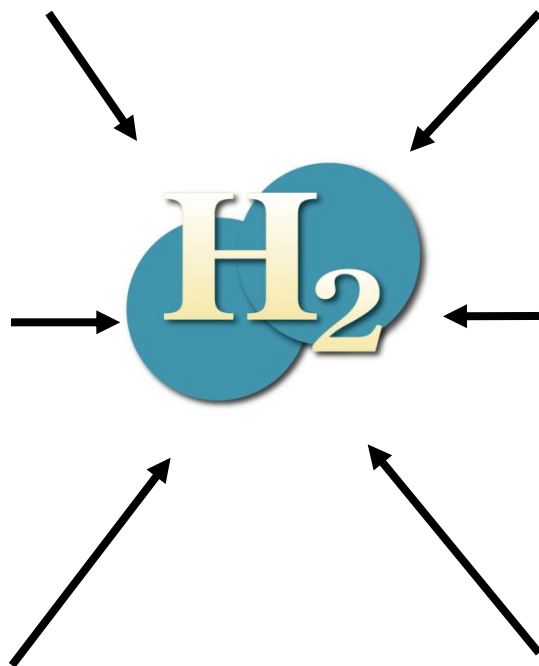


*Solar, wind, geothermal,
hydro, biomass, algae*

Traditional sources



*Natural gas, methane,
gasoline, nuclear, coal*



Excellent energy carrier, reduced GHGs, economically competitive, as safe as gasoline, regionally sourced

Benefits of hydrogen and FCEVs

**Local,
renewable fuel.**

**2-3 times
more
efficient.**

**200-400
miles on a
tank.**

**Zero
tailpipe
emissions.**

**60-90%
GHG reduction.**

**Fill hundreds
of vehicles per
station.**

**Full-size
SUVs & sedans.**

**5-7 minutes
to refill.**

Hundreds of zero-emission fuel cell electric vehicles are on the road today and tens of thousands are coming beginning in 2015. With about 100 stations statewide, customers will have sufficient access to hydrogen fuel to replace a conventional vehicle with an FCEV.

What is infrastructure?



Production

Delivery

Stations



Hydrogen stations



Emeryville: H₂ from solar electrolysis and liquid delivery



Fountain Valley: H₂ from wastewater



Newport Beach: H₂ reformation



Harbor City: H₂ gaseous delivery

What is CaFCP? We do we do?



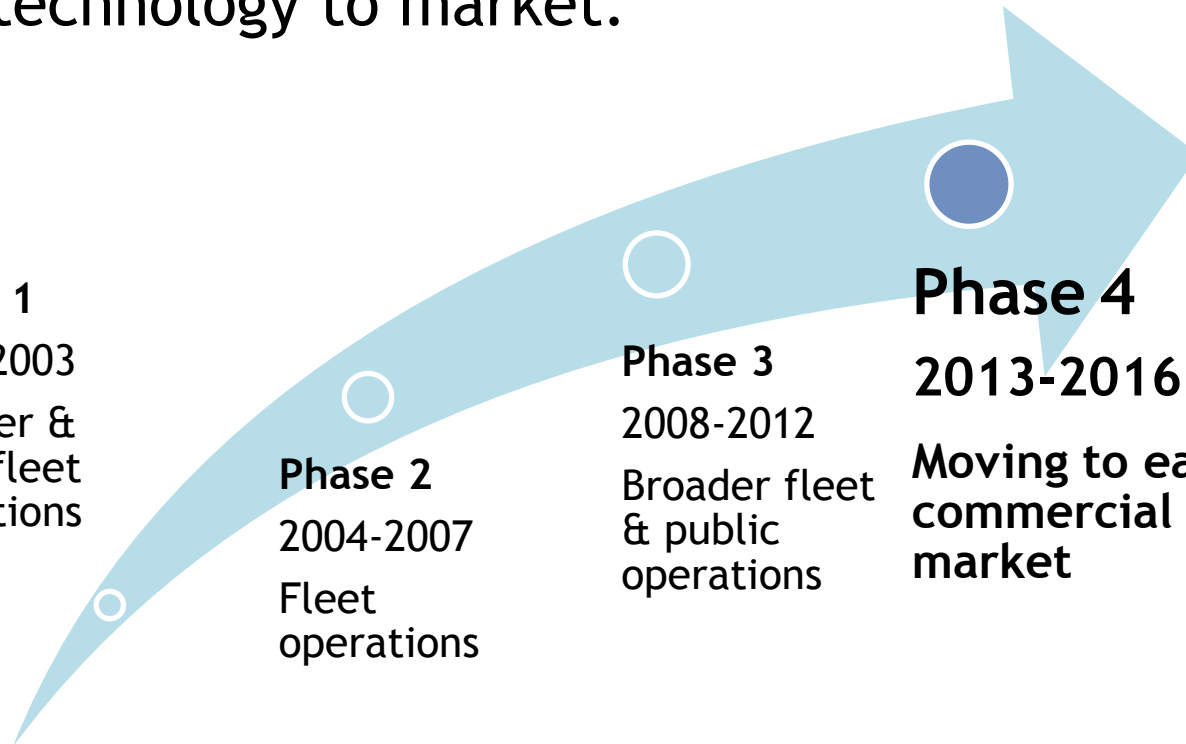
- Public-private collaboration with common goal
 - » Not an “association”
 - » Must bring knowledge and experience
- Work on joint activities that benefit all members and move technology to market.

Phase 1
1999-2003
Member &
early fleet
operations

Phase 2
2004-2007
Fleet
operations

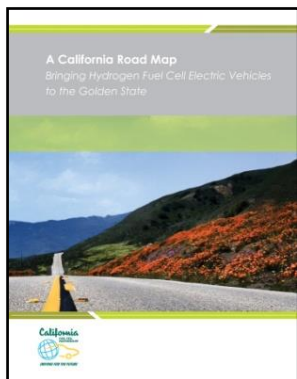
Phase 3
2008-2012
Broader fleet
& public
operations

Phase 4
2013-2016
Moving to early
commercial
market



A California Road Map (2012)

- Develop initial station network
 - » 68 stations to launch
 - » 100 stations towards sustainable market
- Station implementation
 - » Timeliness, performance, path to profitability
- Promote hydrogen readiness
 - » Communities, businesses, consumers

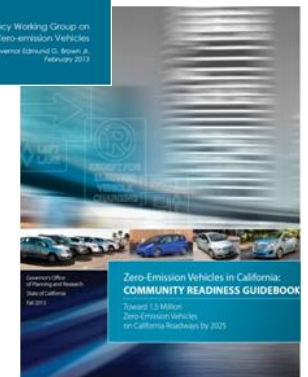
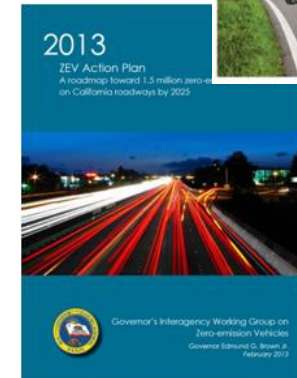
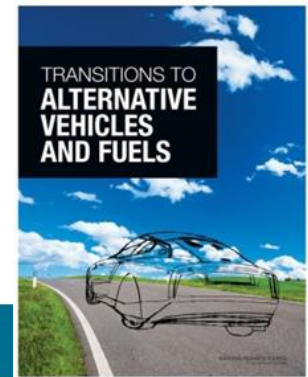


www.cafcp.org/roadmap



Government leadership

- Governor's ZEV Executive Order
 - » Action Plan: 100+ actions & strategies
 - » Guidebook
 - » Infrastructure Proj Manager
- Formation of H₂USA
- 8 State MOU
- AB8 passed into law
 - » Funds at least 100 hydrogen stations



May 2014

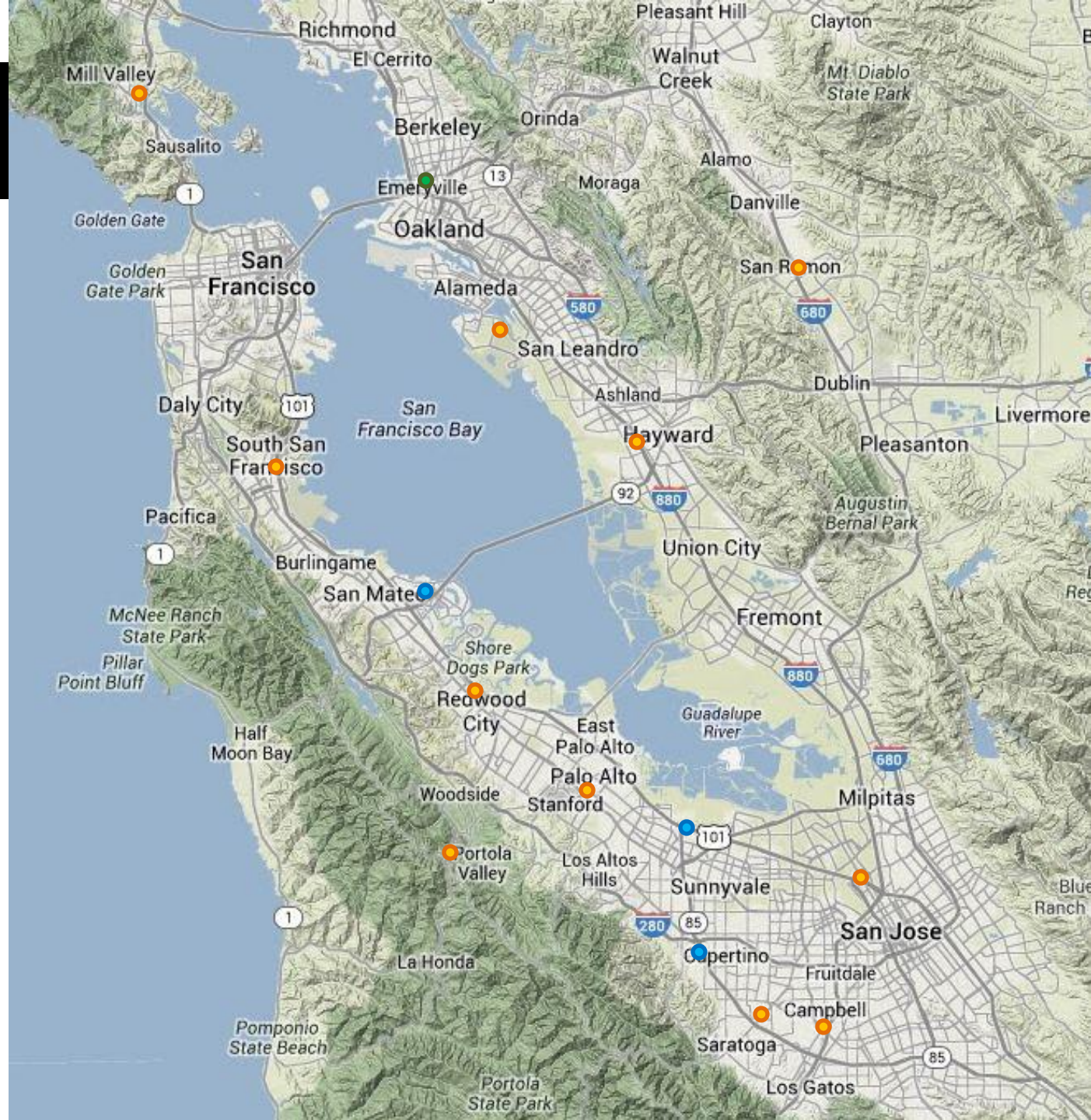
Northern CA Hydrogen Stations

● Open
Emeryville - AC Transit

● In Development
Cupertino
Foster City
Mountain View
***West Sacramento**

● Announced
Campbell
Hayward
Mill Valley
Oakland
Palo Alto
Redwood City
***Rohnert Park**
San Jose
San Ramon
Saratoga
South San Francisco
***Truckee**
Woodside

**Not shown on map*



Southern CA Hydrogen Stations

● Open

Burbank
Fountain Valley - OCSO
Irvine - UC Irvine
Los Angeles - Harbor City
Los Angeles - West LA 1
Newport Beach - Shell
*Thousand Palms - SunLine Transit
Torrance - Shell

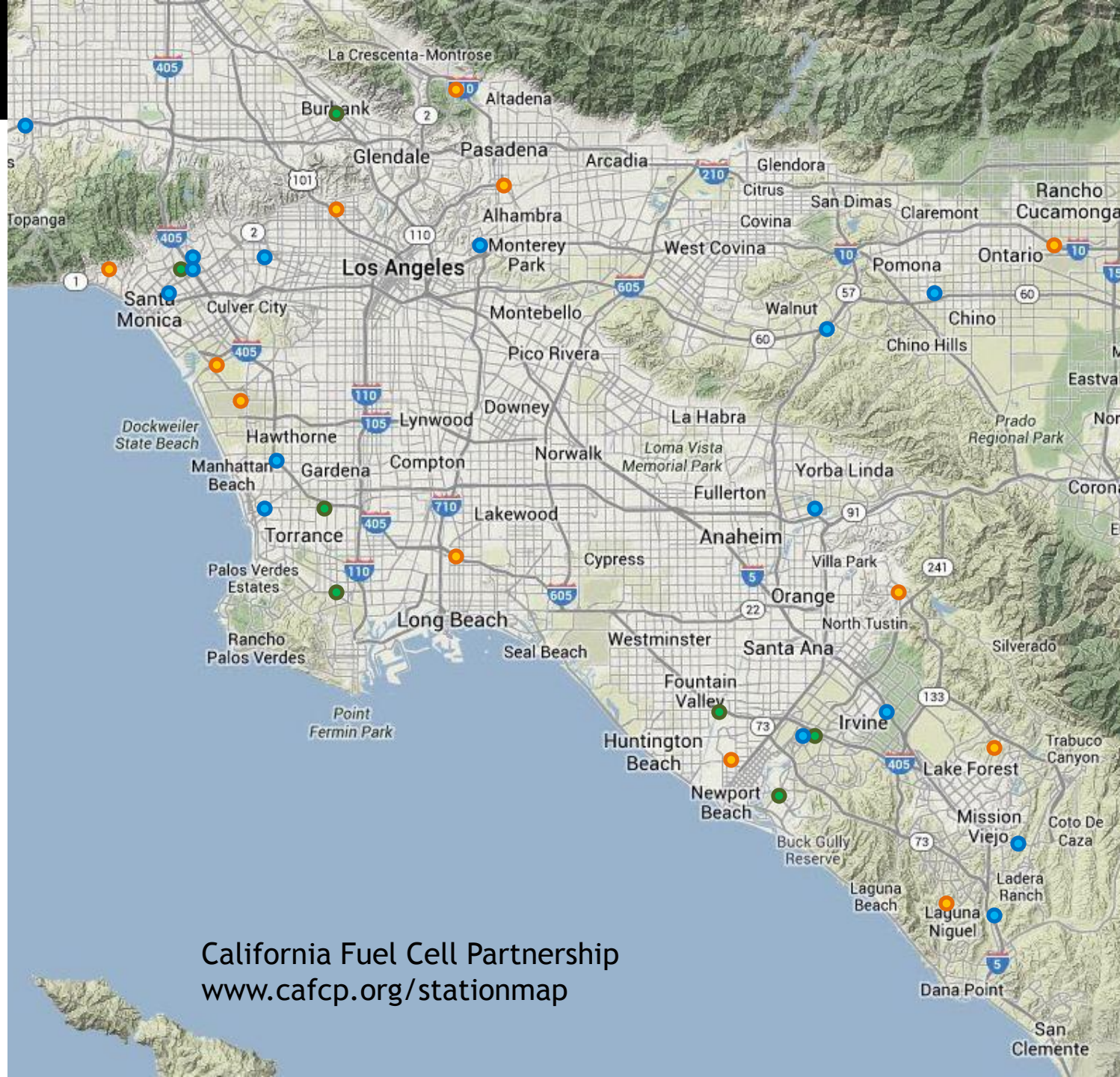
● In Development

Anaheim
Chino (upgrade)
Diamond Bar (upgrade)
Irvine - UC Irvine (upgrade)
Irvine - Walnut Ave.
Lawndale
Los Angeles - Cal State LA
Los Angeles - West LA 2
Los Angeles - Westwood
Los Angeles - Woodland Hills
Los Angeles - Beverly Blvd.
Mission Viejo
Redondo Beach
San Juan Capistrano
Santa Monica 1

● Announced

*Coalinga
Costa Mesa
La Canada Flintridge
Laguna Niguel
Lake Forest
Long Beach
Los Angeles - LAX
Los Angeles - 9
Los Angeles - 10
Ontario
Orange
Pacific Palisades
*Riverside
*San Diego
*Santa Barbara
South Pasadena

*Not shown on map



California Fuel Cell Partnership
www.ca-fcp.org/stationmap

In summary

- FCEVs starting the commercial launch
 - » Establishing initial infrastructure network
- California commitment
 - » Collaboration and leadership
- Retail focused infrastructure
- Preparing the communities
- Resources and materials exist
 - » CaFCP and others here to help

FCEVs - the next step in the evolution of electric drive!



Questions or comments?

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