California Hydrogen Highway Network

April 3, 2008

California Air Resources Board
California Blueprint Plan

- Phased approach to infrastructure implementation
- Environmental goals
- Shared risk
CaH2Net Background

• Governor’s Executive Order, S-7-04 formed the CaH2Net in April 2004
• A Blueprint Plan, May 2005
• Legislative Authority
  – SB76, $6.5 Million, stations, vehicles, support
  – Budget Act 2006, $6.5 Million, ZBuses, stations
  – Budget Act 2007, $6 Million, stations, support
The State’s Contribution

- Vehicles
- Stations
- CaH2Net Membership
- Hydrogen Fuel Quality Standard
- Environmental Standards for Hydrogen
- Public outreach and education
Over 90% of Californians Breathe Unhealthy Air at Times

Days Over State 24-Hour PM10 Standard
Days Over State 8-Hour Ozone Standard

Source: ADAM September 2006 (tfn)
Source: MRedgrave May 2006 (mln)
Zero Emission Vehicle Regulation (March 27, 2008)

- Requires market share of FCV totals:
- 2009 – 2011, 2500 fuel cell vehicles

<table>
<thead>
<tr>
<th>ZEV Vehicle Type</th>
<th>Vehicles Required 2012-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 300 miles-fast refuel (Type IV)</td>
<td>5,357</td>
</tr>
<tr>
<td>Shorter-range FCV-fast refuel or &gt;200 mile BEV (Type III)</td>
<td>9,375</td>
</tr>
<tr>
<td>&gt; 100 mile BEV (Type II)</td>
<td>12,500</td>
</tr>
<tr>
<td>75-99 mile BEV (Type 1.5)</td>
<td>15,000</td>
</tr>
<tr>
<td>50-75 mile BEV (Type I)</td>
<td>18,750</td>
</tr>
</tbody>
</table>
Zero Emission Bus Regulation

• Part of Fleet Rule for Transit Agencies
• Transit Agencies > 200 urban buses
• Demonstration and purchase requirements
  – Diesel Path Transit Agencies
  – 12 Bus demonstration starting in 2009
• Purchase Requirement starts in 2011
CaH2Net Efforts

• Fund public hydrogen stations
  – 3 awarded in 2006 (2 awards rescinded)

• Fund hydrogen vehicles
  – 1-GM Fuel Cell Equinox,
  – 4-Quantum Hydrogen internal combustion engine Toyota Prius,
  – 2-Ford HICE Shuttle Buses
Station Network Challenges

• CaH2Net Funding
  – Contract and indemnification
  – California State budget priorities
  – Environmental requirements

• Closure of existing stations
  – DOE partnerships
  – Energy Companies profit outlook
  – Alt Fuels compete with each other
What Happened?

• CSU Los Angeles
  – Contracting issues
  – Alignment of agreements

• San Diego Schools
  – Site changes

• Was there a core business case for these entities to provide hydrogen?
H2 Highway Station RFP

- www.cscr.dgs.ca.gov/cscr
- $7.7 M made available (Year 1, 2, and 3 Funds)
- Includes SB 1505 requirements
- Clustered in LA, SF, Sacramento, San Diego
- Retail-like stations
- Technical Specifications
- Proposals Due: June 13th
Lessons Learned

• More focused geographic approach
  – Focuses demand and vehicle deployment
  – Assists with community preparation
• Solid partnerships needed
• Target the right providers
  – Business case to provide fuel long term
Summary

- Hydrogen Highway is moving forward
- Cars are coming soon
- Dire need for infrastructure
- Looking for partners, private and public