Innovation and Coordination at the California Fuel Cell Partnership

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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.
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 H$_2$ happen
- Focus on customer experience
- Match H$_2$ 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

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

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

<table>
<thead>
<tr>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>&lt; 2.5</td>
<td>Poor</td>
</tr>
<tr>
<td>&lt; 3.5</td>
<td>Moderate</td>
</tr>
<tr>
<td>&lt; 4.25</td>
<td>Good</td>
</tr>
<tr>
<td>≤ 5</td>
<td>Excellent</td>
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</tbody>
</table>
Learning: Probability – how likely is a station to be developed?

<table>
<thead>
<tr>
<th>Score</th>
<th>Probability</th>
<th>Information provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Currently operating</td>
<td>Station operational</td>
</tr>
<tr>
<td>4</td>
<td>Very likely</td>
<td>All dates indicated, funding allocated</td>
</tr>
<tr>
<td>3</td>
<td>Somewhat likely</td>
<td>Dates indicated, no funding allocated, proven company</td>
</tr>
<tr>
<td>2</td>
<td>Not likely</td>
<td>Dates indicated, no funding allocated, new company</td>
</tr>
<tr>
<td>1</td>
<td>No information</td>
<td>No information</td>
</tr>
</tbody>
</table>
By 2010 we need additional

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