Progress report: SCAG PEV Readiness Plan

June 5, 2012
Early in Project but on Target

• Notice to proceed April 19

• Data collection underway

• Model development underway

• Early reports underway

• Half team in place, half starting
  • Brett Williams (newly arrived EV & Alt. Fuels Program Director) and Norman Wong (GIS and spatial data) working
  • Ayala Ben Yehuda (Project Manager) and Jon Overman (Researcher) start June 15
Progress to date (1)

• Demand analysis
  – Draft survey instrument
  – Draft contract Knowledge networks
  – Next steps--scheduling focus groups

• Vehicle supply analysis
  – Current sales data BEV and PHEV; supply-constraint discussion
  – Next steps drafting report
  – Also collecting existing market PEV forecasts
Progress to Date (2)

- Charging Station Economic Viability Analysis
  - Economic models developed
    - Variable installation costs
    - O&M cost
    - Alternative cost recovery strategies
    - Estimated low levels of ROI
    - Next steps – estimate high market penetration and costs to drivers
  - On track to have Vehicle Supply Constraint analysis and Draft Data Report soon.
Technical Approach – Regional

Core Research Activities

- Household Demand Analysis
- Zonal Travel Demand Analysis
- Spatial Demand for Public & Workplace Charging
- Charging Station Parcel Suitability Analysis
- Charging Station Economic Viability Analysis
- Vehicle Supply Analysis

Deliverables

- Document Market Penetration Assumptions
- Data Needs Report for PEV Readiness
- Deployment Plan Analysis

- Projected Memo Penetration Memo
- Regional Map of Station locations
- GHG Memo
- PEV Readiness

Report Quantifying PEVs delivered to SC
<table>
<thead>
<tr>
<th>Project Cost</th>
<th>$</th>
<th>$</th>
<th>$</th>
<th>$</th>
<th>$</th>
<th>$</th>
<th>$</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 1,000.00</td>
<td>$ -</td>
<td>$ (195.72)</td>
<td>$ 2,038.45</td>
<td>$ 3,155.54</td>
<td>$ 4,272.63</td>
<td>$ 5,389.71</td>
<td>$ 6,506.80</td>
<td></td>
</tr>
<tr>
<td>$ 3,000.00</td>
<td>$ (2,603.77)</td>
<td>$ (369.59)</td>
<td>$ 747.49</td>
<td>$ 1,864.58</td>
<td>$ 2,981.67</td>
<td>$ 4,098.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 5,000.00</td>
<td>$ (5,011.81)</td>
<td>$ (2,777.64)</td>
<td>$ (1,660.55)</td>
<td>$ (543.46)</td>
<td>$ 573.62</td>
<td>$ 1,690.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 7,000.00</td>
<td>$ (7,419.86)</td>
<td>$ (5,185.68)</td>
<td>$ (4,068.60)</td>
<td>$ (2,951.51)</td>
<td>$ (1,834.42)</td>
<td>$ (717.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 9,000.00</td>
<td>$ (9,827.90)</td>
<td>$ (7,593.73)</td>
<td>$ (6,476.64)</td>
<td>$ (5,359.55)</td>
<td>$ (4,242.47)</td>
<td>$ (3,125.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 11,000.00</td>
<td>$ (12,235.95)</td>
<td>$ (10,001.77)</td>
<td>$ (8,884.68)</td>
<td>$ (7,767.60)</td>
<td>$ (6,650.51)</td>
<td>$ (5,533.42)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 13,000.00</td>
<td>$ (14,643.99)</td>
<td>$ (12,409.82)</td>
<td>$ (11,292.73)</td>
<td>$ (10,175.64)</td>
<td>$ (9,058.56)</td>
<td>$ (7,941.47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 15,000.00</td>
<td>$ (17,052.04)</td>
<td>$ (14,817.86)</td>
<td>$ (13,700.77)</td>
<td>$ (12,583.69)</td>
<td>$ (11,466.60)</td>
<td>$ (10,349.51)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 17,000.00</td>
<td>$ (19,460.08)</td>
<td>$ (17,225.91)</td>
<td>$ (16,108.82)</td>
<td>$ (14,991.73)</td>
<td>$ (13,874.65)</td>
<td>$ (12,757.56)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 19,000.00</td>
<td>$ (21,868.13)</td>
<td>$ (19,633.95)</td>
<td>$ (18,516.86)</td>
<td>$ (17,399.78)</td>
<td>$ (16,282.69)</td>
<td>$ (15,165.60)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Charger Level | Daily Utilization | 10.8 kWh (7.5 hours) | Fee Structure | Variable | Discount Rate | 10% | Monthly Fee | $ 30.00 | Revenue Share | 5% Variable, 10% Monthly | Electricity Markup | Installed Project Cost
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---

<table>
<thead>
<tr>
<th>Installed Project Cost</th>
<th>$</th>
<th>-</th>
<th>$</th>
<th>0.10</th>
<th>$</th>
<th>0.15</th>
<th>$</th>
<th>0.20</th>
<th>$</th>
<th>0.25</th>
<th>$</th>
<th>0.30</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 1,000.00</td>
<td>$ 137.50</td>
<td>$ 1,813.13</td>
<td>$ 2,650.94</td>
<td>$ 3,488.76</td>
<td>$ 4,326.57</td>
<td>$ 5,164.39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 2,000.00</td>
<td>(1,066.53)</td>
<td>$ 609.10</td>
<td>$ 1,446.92</td>
<td>$ 2,284.74</td>
<td>$ 3,122.55</td>
<td>$ 3,960.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 3,000.00</td>
<td>(2,270.55)</td>
<td>(594.92)</td>
<td>$ 242.90</td>
<td>$ 1,080.71</td>
<td>$ 1,918.53</td>
<td>$ 2,756.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 4,000.00</td>
<td>(3,474.57)</td>
<td>(1,798.94)</td>
<td>(961.12)</td>
<td>(123.31)</td>
<td>$ 714.51</td>
<td>$ 1,552.32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 5,000.00</td>
<td>(4,678.59)</td>
<td>(3,002.96)</td>
<td>(2,165.15)</td>
<td>(1,327.33)</td>
<td>(489.52)</td>
<td>(348.30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 6,000.00</td>
<td>(5,882.62)</td>
<td>(4,206.98)</td>
<td>(3,369.17)</td>
<td>(2,531.35)</td>
<td>(1,693.54)</td>
<td>(855.72)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 7,000.00</td>
<td>(7,086.64)</td>
<td>(5,411.01)</td>
<td>(4,573.19)</td>
<td>(3,735.38)</td>
<td>(2,897.56)</td>
<td>(2,059.75)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 8,000.00</td>
<td>(8,290.66)</td>
<td>(6,615.03)</td>
<td>(5,777.21)</td>
<td>(4,939.40)</td>
<td>(4,101.58)</td>
<td>(3,263.77)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 9,000.00</td>
<td>(9,494.68)</td>
<td>(7,819.05)</td>
<td>(6,981.24)</td>
<td>(6,143.42)</td>
<td>(5,305.61)</td>
<td>(4,467.79)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ 10,000.00</td>
<td>(10,698.70)</td>
<td>(9,023.07)</td>
<td>(8,185.26)</td>
<td>(7,347.44)</td>
<td>(6,509.63)</td>
<td>(5,671.81)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Calendar-year sales by PEV model

- Prius Plug-In
- Focus Electric
- Active E
- i
- smart fortwo ed
- Chevy Volt
- LEAF

Year sales by PEV model:
Cumulative U.S. sales by PEV model

- LEAF
- Chevy Volt
- smart fortwo ed
- i
- Active E
- Focus Electric
- Prius Plug-In

Dec-06 | Apr-07 | Aug-07 | Jan-08 | May-08

0

2,000

4,000

6,000

8,000

10,000

12,000

14,000

16,000
Monthly U.S. sales by PEV type

(previously listed models only)
Cumulative U.S. sales by PEV type

(Previously listed models only)

- **BEVs**
- **PHEVs**
- **PEVs**

Dec-06  Apr-07  Aug-07  Jan-08  May-08
**EV demand: steps for each travel analysis zone**

1. **Household Characteristics**
   - Census data

2. **EV purchase model**
   - Analysis of survey data

3. **Potential EV purchases**
   - Forecast using model

4. **Adjusted EV purchases**
   - Housing types & vehicle supply

5. **Predicted EV purchases**
   - 1-2 years

6. **Out years Forecasts**
   - bass diffusions
   - Econ. forecasts
EV demand estimation steps for each travel analysis zone

1. Household Characteristics
   - Census data

2. EV purchase model
   - Analysis of survey data

3. Potential EV purchases
   - Forecast using model

4. Adjusted EV purchases
   - Housing types & vehicle supply

5. Predicted EV purchases
   - 1-2 years

6. Out years Forecasts
   - Bass diffusions
   - Economic forecasts
Technical Approach - Subregional

Core Research Activities

- Sub-Regional Vehicle Supply Analysis
- Charging Station Economic Viability Analysis
- Household Demand Analysis
- Zonal Travel Demand Analysis
- Spatial Demand for Public & Workplace Charging
- Charging Station Parcel Suitability Analysis
- Sub-Regional Surveys of:
  - Prime Destinations
  - Housing Readiness
  - Institutional Readiness

Deliverables

- Sub-regional data availability memo
- Draft Supply & Demand Forecast
- Final Supply & Demand Forecast
- 32-35. Draft & Final Charge Port Infrastructure Deployment Plan
- 29/31. Memo documenting Prime Destination Surveys
- Survey of Prime Destinations
- Housing PEV Readiness Survey & Findings