Transportation Electrification: Reducing Emissions, Driving Innovation

July 2017
California is Raising the Bar in Environmental Policy and Action

- Senate Bill 32 requires California to reduce emissions to at least 40 percent below 1990 levels by 2030.
- Governor Brown’s Exec Order B-16-2012 Calls for 1.5 million ZEVs by 2025, infrastructure to support 1 million ZEVs by 2020.
Meeting California’s Environmental Goals

• In California, transportation electrification represents the largest near term opportunity to reduce greenhouse gas emissions and drive down air pollution.

• By fueling a variety of vehicles with clean electric power instead of fossil fuels, we can help meet California's ambitious greenhouse gas (GHG) and clean air goals.

Transportation is a BIG Greenhouse Gas Problem

Did you know that 40% of the goods entering the nation are being moved through Southern California’s ports and highways?

While the goods movement industry is crucially important to the state and local economy, the transportation sector is responsible for 36% of California’s GHG emissions.
Benefits of Transportation Electrification

• Based on 2008 State Alternative Fuels Plan (CEC and CARB), EVs compared to gasoline counterparts:
  ✓ **Emit approximately 70 percent fewer greenhouse gases**
  ✓ **Emit over 85% fewer ozone-forming air pollutants**

• EV charging load is uniquely flexible and may provide significant grid benefits with effective load management.

• Improved system utilization may provide potential downward pressure on rates.
SCE is Leading the Way in Transforming the Energy Sector

• In line with the state’s efforts, SCE filed a wide-ranging plan with the California Public Utilities Commission (CPUC) for expanding electric transportation within its service area.

• SCE’s Transportation Electrification (TE) filing demonstrates the company’s commitment to supporting California’s environmental goals.

The TE filing lays out SCE’s broader vision for TE and proposes a portfolio of projects and programs that expand the use of electricity as fuel.

Greenhouse Gas Goals for California

California’s goals to reduce the state’s total GHG emissions by 40% from 1990 levels by 2030 and 80% by 2050 are some of the most ambitious environmental goals in the world. To help meet these goals, transportation electrification would account for 19 million metric tons of emissions abatement in California.
Trends supporting growth potential:

- More models in more classes
- Increased electric range at a lower price
- Faster charging
- Ride-sharing/taxis and autonomous operations

### Electric Vehicles – By the Numbers

<table>
<thead>
<tr>
<th>$1.3/gallon (EV gasoline equivalent)</th>
<th>20+ models available</th>
<th>12,000 chargers in California today</th>
<th>260,000+ EVs in California today</th>
<th>4,000,000+ zero emission vehicles in California by 2030</th>
</tr>
</thead>
</table>
Medium-Duty, Heavy-Duty and Non-Road Vehicles Contribute Significantly to Emissions¹

1 EPA National Emissions Inventory 2014 for counties in SCE area Los Angeles County. US DOT 2016 Non-Road & Ports category includes forklifts, yard tractors, cranes, and transport refrigeration units
Focus on Disadvantaged Communities - SCE has 45% of CA’s DACs

Communities are considered DACs if they are in the worst quartile of environmental & economic burden, as evaluated by the California EPA using CES 3.0. Freight corridors are consistent with those identified by the Southern California Association of Governments in its 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy. A map of freight corridors, warehouses, and rail lines is available in the RTP/SCS Goods Movement appendix, available at http://scagrtpscs.net/Documents/2016/final/2016RTPSCS_GoodsMovement.pdf.
Current & Proposed Transportation Electrification Programs
# SCE’s TE Vision

<table>
<thead>
<tr>
<th>SCE Role</th>
<th>Availability: Infrastructure necessary to fuel EVs</th>
<th>Affordability: Low cost in comparison to traditional vehicles</th>
<th>Awareness: Customer understanding of benefits of EVs</th>
</tr>
</thead>
</table>
| Infrastructure | • Charge Ready program to fund passenger vehicle charging infrastructure  
• Funding for medium- and heavy-duty truck charging infrastructure  
• Building vehicle charging infrastructure for electric transit buses  
• Building urban DC Fast Charger (DCFC) Clusters | • Charge Ready rebate for away-from-home charging stations  
• Rebate for purchase or lease of a new or used EV  
• Rebate for at-home “make-ready” for residential customers  
• Rebate for charging stations for medium- & heavy-duty trucks | Market education and outreach program to target potential car buyers in SCE’s service territory to expand awareness about EVs and the benefits of fueling from the electric grid |
| Rate Design    | | Rates designed to encourage EV adoption | |
| Innovative Collaborations | Port electrification projects, such as cargo-handling equipment | | Bonus reward to rideshare and taxi drivers who use EVs |

**Existing Programs | Proposed Programs**
Charge Ready Pilot Program

- First site completed February 2017
- 1,087 Charge Ports in Customer Committed Agreements, with 50% in Disadvantaged Communities
- High response from Workplaces & Destination Centers; lower from Fleets & Multi-Unit Dwellings
- Goal of 750 Charge Ports installed by end of 2017

Upon pilot completion, SCE will file for a larger Phase 2 program
## Transportation Electrification (TE) Advisory Services

**“One-Stop Shop”** for specialized education, awareness, and support on TE issues.

<table>
<thead>
<tr>
<th><strong>Education &amp; Outreach</strong></th>
<th>TE Technologies and Benefits Awareness Development</th>
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<tbody>
<tr>
<td></td>
<td>Vehicle-Grid Integration Awareness</td>
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<tr>
<td><strong>Assessment</strong></td>
<td>Fleet Conversion, incl. Solar and Storage Integration</td>
</tr>
<tr>
<td></td>
<td>Charging Infrastructure Planning (non-Charge Ready)</td>
</tr>
<tr>
<td><strong>Costs</strong></td>
<td>Rate Analysis/Bill Impact</td>
</tr>
<tr>
<td></td>
<td>Financial Incentive Support</td>
</tr>
<tr>
<td><strong>Beyond TE</strong></td>
<td>GHG Audit/Compliance</td>
</tr>
</tbody>
</table>

Full services launching in Q3 2017
Proposed programs in SCE’s January TE filing

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
<th>Duration</th>
<th>Key Partners</th>
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<tbody>
<tr>
<td>Light Duty</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Customer rebate for residential charging station installation</td>
<td>$4M</td>
<td>1 Yr</td>
<td>Electricians, Homeowners, MUDs</td>
</tr>
<tr>
<td>Building urban DC Fast Charger clusters</td>
<td>$4M</td>
<td>1 Yr</td>
<td>Community Leaders, MUDs, Rideshare &amp; Taxi Companies</td>
</tr>
<tr>
<td>Bonus reward to rideshare/taxi drivers who use EVs</td>
<td>$4M</td>
<td>1 Yr</td>
<td>Rideshare &amp; Taxi Companies</td>
</tr>
<tr>
<td>Rates designed to incentivize EV adoption</td>
<td>N/A</td>
<td>10 Yr</td>
<td>Commercial &amp; Industrial Customers, Transit agencies, AQMD</td>
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<tr>
<td>Medium-Heavy Duty</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Funding for medium- and heavy-duty vehicle charging infrastructure</td>
<td>$553M</td>
<td>5 Yr</td>
<td>Commercial &amp; Industrial Customers, Transit agencies, AQMD</td>
</tr>
<tr>
<td>Building vehicle charging infrastructure for electric transit buses</td>
<td>$4M</td>
<td>1 Yr</td>
<td></td>
</tr>
<tr>
<td>Two Port of Long Beach electrification projects</td>
<td>$3.5M</td>
<td>1 Yr</td>
<td>POLB, Terminal Operators</td>
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</table>

1 Program also supports public funding programs: IRS (tax credits), ARB (CVRP, LCT, HVIP), SCAQMD (Carl Moyer)
2 New rate design proposal contains new tariffs for three customer classes based upon demand size
3 Rebates will only be available in sectors with technology that meets applicable standards
How SCE Can Assist Today...

• While we await the launch of TE Advisory Services, as well as future pilots and programs, please reach out to us for assistance with:
  – Rate analysis support & review of rate structure
    • When is separate metering beneficial?
    • How will EV charging impact my bill?
  – Electrical infrastructure capacity checks to assess need for infrastructure upgrades
  – Load management and other considerations

Visit SCE.com or contact your Account Manager for assistance
Questions?

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