SB 350 Transportation Electrification Filing

David Sawaya, Principal, EV Program Design
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Outline

• Background

• PG&E’s transportation electrification (TE) portfolio

• FleetReady program

• Fast Charge program

• Priority review projects

• Metrics, data tracking, and evaluation
Guiding Principles for Transportation Electrification

- Ensure public, employee and contractor safety
- Increase access to electricity as a transportation fuel
- Enable TE market and support grid management using core utility capabilities
- Support California climate, air quality and equity policies
- Target commercially ready sectors that will spur technology diffusion
- Leverage state, federal and private funding
Transportation sectors offer varied emissions reduction benefits

2030 emissions reduction potential
By vehicle type

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Particulate Matter Emissions Reductions (Tons/day)</th>
<th>GHG Emissions Reductions (Millions Tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Duty</td>
<td>0.50</td>
<td>20</td>
</tr>
<tr>
<td>MD/HD &amp; Non-road</td>
<td>0.25</td>
<td>10</td>
</tr>
<tr>
<td>Ports</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Rail</td>
<td>0.25</td>
<td>5</td>
</tr>
</tbody>
</table>

1Bubble size indicates annual electricity consumption (kWh)

Addressing TE barriers with utility tools

General Barriers to Widespread Transportation Electrification:

• Vehicle availability, selection, and range

• Upfront vehicle costs

• Upfront costs of charging infrastructure

• Vehicle operating costs

• Access to charging

• Lack of awareness or understanding

Sources: ICF International (2014), California Transportation Electrification Assessment – Phase 1: Final Report
CALSTART (2015), Electric Truck & Bus Grid Integration: Opportunities, Challenges &
### PG&E’s transportation electrification portfolio

Initiatives in black will be included in PG&E’s January SB350 Transportation Electrification (TE) application. Initiatives in blue are part of PG&E’s portfolio that are complete, underway, or expected to occur in the future.

<table>
<thead>
<tr>
<th>Light-duty</th>
<th>Medium-/heavy-duty</th>
<th>Off-road</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMW i ChargeForward EV submetering&lt;br&gt;DC fast charger siting tool&lt;br&gt;Open vehicle-grid integration platform</td>
<td>A-1 transit bus rate pilot</td>
<td>Vehicle on-site grid support system</td>
</tr>
<tr>
<td>Residential charger information resource</td>
<td>Medium-duty customer demonstration&lt;br&gt;School bus overgen. demonstration</td>
<td>Idle-reduction customer demonstration</td>
</tr>
</tbody>
</table>

Additional 1-year electrification projects via open RFP

### EV Infrastructure and Education Program:
- Phase 1 (approved)
- Phase 2 (planned)

“Fast Charge” DCFC make-ready program

- Public transit
- School buses
- Delivery fleets
- Private shuttles
- Other

“FleetReady” (non-light-duty make-ready) program
- Idle-reduction (truck-stops, truck refrigeration units)
- Class 1 forklifts
- Port, rail and airport equipment

### Residential EV rates

Clean Fuel Rebate (LCFS)

PG&E 2017 GRC Phase II rate proposals

### Priority review projects

### Standard review

### R&D

### Infrastructure

### Product & Rate Design
SB 350 TE Application forecast budget

SB 350 Transportation Electrification application requests $253M over five years for three initiatives: FleetReady, Fast Charge and Priority Review projects

- Program costs to be recovered through EV Program Balancing Account
- Proposal requests that programs be subject to overall cost cap; infrastructure deployment and costs will be dependent on customer demand and unspent funds returned to customers

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**Total application budget request**  
Capital vs. expense

<table>
<thead>
<tr>
<th>Capital vs. Expense ($M)</th>
<th>Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>$211M</td>
</tr>
<tr>
<td></td>
<td>$184</td>
</tr>
<tr>
<td></td>
<td>$20</td>
</tr>
<tr>
<td></td>
<td>$7</td>
</tr>
<tr>
<td>Expense ($M)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$42M</td>
</tr>
<tr>
<td></td>
<td>$13</td>
</tr>
<tr>
<td></td>
<td>$26</td>
</tr>
<tr>
<td></td>
<td>$2</td>
</tr>
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</table>

**Application budget request**  
Annual cost estimates

<table>
<thead>
<tr>
<th>Year</th>
<th>FleetReady</th>
<th>Fast Charge</th>
<th>Priority Review</th>
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</thead>
<tbody>
<tr>
<td>2018</td>
<td>$45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>$42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>$47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>$53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td>$67</td>
<td></td>
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</tr>
</tbody>
</table>

- FleetReady
- Fast Charge
- Priority Review
FleetReady Program Overview

- Make-ready infrastructure for non-light-duty fleets
- $211 million; 5 years
- Program sized to meet forecasted adoption
- Installations occur following customer acquisition of EVs and chargers
- Additional incentives for disadvantaged communities, school and transit buses
Fast Charge Program Overview

- Make-ready infrastructure for public DC fast charging
- $22 million; 5 years
- Program sized to fill potential gap, both corridor and urban charging locations
- Installations occur following customer acquisition of chargers; modeled with a variety of power levels
- Additional incentives for disadvantaged communities

**Known significant DCFC deployments expected in PG&E service area**
Compared to expected 2025 need

<table>
<thead>
<tr>
<th>DCFC Category</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016 PG&amp;E Service Area DCFCs</td>
<td>293</td>
</tr>
<tr>
<td>CEC Funded DCFCs</td>
<td>124</td>
</tr>
<tr>
<td>NRG Settlement Remaining DCFCs</td>
<td>14</td>
</tr>
<tr>
<td>VW Estimated DCFCs</td>
<td>318</td>
</tr>
<tr>
<td>Gap DCFCs</td>
<td>289</td>
</tr>
<tr>
<td>DCFC Need in 2025</td>
<td>1,038</td>
</tr>
</tbody>
</table>

**Fast Charge Program Budget**
By cost type ($’s Millions)

- ME&O: $16
- Rebates: $4
- PMO & IT: $2
- Make Ready: $1
Priority review projects and demonstrations

**Project 1: MD/HD Fleet Customer Demonstration**

**Goal**: demonstrate lower total cost of ownership for customer fleet electrification with utility assistance

**Description**: Deploy make-ready infrastructure and charging management tools to minimize operating costs

**Project 2: Idle Reduction Customer Demonstration**

**Goal**: demonstrate economic viability for technology deployment with utility assistance

**Description**: Deploy make-ready infrastructure and charging management tools to minimize operating costs

**Project 3: School Bus Over-generation pilot**

**Goal**: test rate and incentive structures to target EV charging during periods of over-generation

**Description**: Leverage unique duty cycle of school bus fleet to charge vehicle mid-day for grid benefit

**Project 4: Home Charger Information Resource**

**Goal**: simplify home charger purchase and installation process to lower barriers for new EV owners

**Description**: Develop online tool for homeowners to understand home charging needs and identify electrical contractors for charger installation

**Project 5: Open RFP**

**Goal**: Identify additional projects for utility investment and encourage innovation and competition among 3rd parties

**Description**: Open, external request for proposals for 3rd party projects to fund
# Metrics, data tracking, and evaluation

PG&E will issue an annual report for the FleetReady and Fast Charge programs and a summary report for each priority review project.

## FleetReady and Fast Charge

### Deployment
- Site enrollments and characteristics (e.g. number of vehicles and chargers)
- Deployment time
- Installation cost
- Disadvantaged community deployments

### Operational
- Utilization, usage data and estimated emissions reductions
- Customer kW profile and kWh usage by price
- Load management approaches, where applicable

### Descriptive
- Outreach efforts
- Key barriers to deployment of EV charging infrastructure
- Insights on effect of the program on the EVSE and EV market

## Priority Review Projects

### Technology demonstrations
- Evaluation of total cost of ownership
- Cost and savings of demand mitigation strategies
- Customer success and willingness to expand electric fleet
- GHG and criteria pollutant savings compared to the existing fossil-fuel fleet
- Comprehensive list of lessons learned which can inform future strategies for working with additional customers to electrify their vehicle fleets

### Home Charger Information Resource
- Website usage statistics
- Participation by installers

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**Note:** Metrics of the FleetReady and Fast Charge programs will differ due to program characteristics. For FleetReady, see Chapter 3 section C.3.j. of PG&E’s SB 350 Transportation Electrification prepared testimony. For Fast Charge see Appendix B http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M159/K711/159711579.PDF