<table>
<thead>
<tr>
<th><strong>DOCKETED</strong></th>
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<tbody>
<tr>
<td><strong>Docket Number:</strong> 16-TRAN-01</td>
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<tr>
<td><strong>Project Title:</strong> SB 350 Transportation Electrification (Publicly Owned Utilities)</td>
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<tr>
<td><strong>TN #:</strong> 213884</td>
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<tr>
<td><strong>Document Title:</strong> Presentation - SMUD Plug-in Electric Vehicles Integrated Resource Plan Inclusion by Bill Boyce</td>
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<tr>
<td><strong>Description:</strong> October 5, 2016 Workshop</td>
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<td><strong>Filer:</strong> Patty Paul</td>
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<td><strong>Organization:</strong> SMUD</td>
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<td><strong>Submitter Role:</strong> Public Agency</td>
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<td><strong>Submission Date:</strong> 10/4/2016 8:28:27 AM</td>
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<td><strong>Docketed Date:</strong> 10/4/2016</td>
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SMUD Transportation Electrification IRP Approach

- SMUD has incorporated transportation electrification load into its demand forecast for resource planning since 2012

- Input is based on expected market adoption and SMUD specific load curves

- Market adoption curves are adapted from CalETC Transportation Electrification Assessment Assessment Phase 1 Study
  - SMUD’s market is 4% of the State’s based on population density of Sacramento County
SMUD Market Adoption / Load Planning

- High Case: 240,000 Vehicles in 2030 (Slope needed for 2050 State Goals)
- Low Case: 48,000 Vehicles
- Mid Case: 93,000 Vehicles
SMUD Adoption Trends

Light duty adoption

Total vehicle registrations

Historic hybrids

Plug-in hybrid electric vehicles

Battery electric vehicles

SMUD EV Load profile

KW

EV Loadshape in Forecast

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

- 0.50 1.00 1.50 2.00 2.50

Summer Weekend Summer Weekday Winter Weekend Winter Weekday

SMUD™
SMUD EV Load profile assumptions

• Light Duty residential charging only
  – Updated annually

• Load shape based off 220 customers on our submeter TOU rate and 341 customers on our whole-house TOU EV discount rate
  – Large discount for charging after midnight

• SMUD is strategically migrating toward TOU rates for all residential customers

• Average energy usage is 8.8kWh a day
Current SMUD PEV Activities

• Creating or adjusting PEV electricity rates

• Launched a new “free fuel for a year” residential incentive program in April ($300/vehicle)
  – LCFS based funding

• Developing new outreach and education activities (Awareness)
  – Expanded ride-n-drive program to get more customer exposure

• Deploying 6 Public DC Fast Chargers (Awareness)
  – 4 SMUD Funded (Original two funded with SMUD AB32 Allowance Credit Auction funding)
  – 2 CEC/SMUD/SMAQMD Funded

• Piloting workplace and multi-family incentive program (Awareness)

• Supporting Regional efforts on Electric Bus Deployment

• Truck Emission Reduction Pilot Efforts
  – Truck idle reduction at the 49er Travel Plaza
  – Truck refrigeration unit deployment at Penske Trucking
New 2017 Initiatives will try to drive adoption from the low-case toward the mid-case line

- Enhanced residential program (≈$599/year incentive)
- Doubling advertising and outreach awareness campaign
- Full Workplace/Multi-family dwelling EVSE incentive program
  - 200 incentive per year for L2 Charging, $1500 / each
- DC Fast Charger Incentive Pilot Program
  - 6 DC Fast Chargers per year (incentive level under development)
- Community Partners School Bus electrification support ($438K)
- Fleet / Workplace Charging / Assessment Tool research
- Managed charging research
- Medium and Heavy Duty Fuel Switching research
## SMUD EV Fleet and EVSE Expansion Plans

### Current EV Fleet

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<th>Type</th>
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<tr>
<td>Lt. Duty Sedan</td>
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<tr>
<td>SUV’s</td>
<td>0</td>
</tr>
<tr>
<td>Lt Duty Pickups</td>
<td>0</td>
</tr>
<tr>
<td>Med/Hvy Pickups</td>
<td>0</td>
</tr>
<tr>
<td>Class 5 JEMS</td>
<td>4</td>
</tr>
<tr>
<td>Class 7 JEMS</td>
<td>3</td>
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<tr>
<td>Class 5 JEMS</td>
<td>4</td>
</tr>
<tr>
<td>Class 7 JEMS</td>
<td>3</td>
</tr>
</tbody>
</table>

### Planned Expansion (over 5 years)

- 44 PEV’s
- 7 PEV’s
- 30 PEV’s
- 16 (Zero RPM Technology)
- 41 Vehicles
- 8 Vehicles

### Current EVSE

<table>
<thead>
<tr>
<th>Type</th>
<th>Current Count</th>
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<tbody>
<tr>
<td>HQ Fleet</td>
<td>22</td>
</tr>
<tr>
<td>HQ Employee</td>
<td>19</td>
</tr>
<tr>
<td>ECOC Fleet</td>
<td>3 EVSE, 7 120V</td>
</tr>
<tr>
<td>ECOC Employee</td>
<td>0</td>
</tr>
</tbody>
</table>

### Planned Expansion (over 5 years)

- 69
- 65
- 42 EVSE, 52 120V Plugs, 2 DCFC’ers
- 30
SMUD EV Support in Disadvantaged Communities

- SMAQMD / SHRA Share Car Project Support
  - SMUD is installing of a 2nd DC Fast Charger at Sac Valley Station
  - CARB Grant Supported
  - SMUD Providing cost overmatch ($250,310)

- SMAQMD / Twin Rivers/Elk Grove/Sacramento Unified School Districts (SMUD support $438K)
  - SMUD supporting charging infrastructure scope
  - CARB Grant Supported

- SMUD Fleet Expansion is located in a disadvantaged community
01  Changed to Communities
obartho, 9/30/2016
SMUD support for Electric Vehicle Service Providers

- GFO 15-601 West Coast Electric Highway Proposal Support

- PON 14-310 Clean Alternative Fuels Proposal Support

- Sale for Resale policy allows outside entities to retail electricity sales for electric vehicle applications

- Commercial EV Rate development
State funding has supported SMUD efforts to-date

• CEC AB118/ARRA Funding
  – General Motors Volt Deployment and Regional Readiness
    • $2.11M Overall Scope, $454,853 of CEC funding
  – Chrysler PHEV Pickup Truck Demonstration Effort
    • $400,000 of Overall Scope, $100,000 of CEC Funding

• CEC AB8 Funding
  – DC Fast Charging Deployment
    – $895,351 Overall Projected Scope; $467,612 of CEC Funding

• LCFS Projected Value to-date (based on market conditions)
  – ≈$900,000
  – Being used to support SMUD EV incentive efforts.

• SMUD standalone funding for other DCFC efforts are +$1.2M
maybe ‘helped expand’? I am a little worried it will imply that we are only being funded by state?

obartho, 9/30/2016
Issues regarding SB350 Transportation Electrification Objectives

• TE market growth is highly dependent on vehicle manufacturers

• Low price of oil hurts adoption

• LCFS Certainty
  – Vital in supporting POU infrastructure investment going forward

• Inadequate infrastructure and vehicles funding for current policy goals

• Cross sector shift of emissions between transportation and utility sectors should be accounted for properly
Summary

• SMUD has a long track record and expertise in electric transportation

• Transportation Electrification Load already in SMUD resource planning since 2012

• Currently focused on increasing market adoption
  • Developed new EV rates for residential and commercial customers
  • Launching new incentive and awareness programs in 2017
  • Deployment of DCFC to address range anxiety
    • Currently 3 operating and 3 more on-line by year end
    • Going to and incentive model in 2017

• Significantly more funding will be needed to meet state policy goals

• SMUD is investing to support the market (beyond Federal or State Gov't grants)

• LCFS funding is vital for supporting future infrastructure investment

• Accounting for carbon reduction shifts between the utility and the transportation sector will be important for meeting long term goals