Exhibit to Agenda Item #1

Board Finance & Audit Committee Meeting and Special SMUD
Board of Directors Meeting

Tuesday, December 10, 2019 scheduled to begin at 5:30 p.m.

Customer Service Center, Rubicon Room
SMUD Fleet Electrification
Electric transportation for a cleaner future

Casey Fallon
Director, Purchasing, Warehouse & Fleet
Fleet electrification +100 years ago

1832
First Crude Electric Vehicle Is Developed

Around 1832, Robert Anderson develops the first crude electric vehicle, but it wasn't until the 1870s or later that electric cars become practical. Pictured here is an electric vehicle built by an English inventor in 1884.

1889 — 1891
First Electric Vehicle Debuts in U.S.

William Morrison, from Des Moines, Iowa, creates the first successful electric vehicle in the U.S. His car is little more than an electrified wagon, but it sparks an interest in electric vehicles. This 1896 advertisement shows how many early electric vehicles were not much different than carriages.

1899
Electric Cars Gain Popularity

Compared to the gas- and steam-powered automobiles at the time, electric cars are quiet, easy to drive and didn't emit smelly pollutants -- quickly becoming popular with urban residents, especially women.
Fleet electrification +100 years ago

1900—1912

Electric Cars Reach Their Heyday

By the turn of the century, electric vehicles are all the rage in the U.S., accounting for around a third of all vehicles on the road. Pictured here is Fifth Avenue in New York City around this time, showing the range in vehicle options available.
Fleet electrification +100 years ago

1908—1912
Model T Deals a Blow to Electric Vehicles

The mass-produced Model T makes gas-powered cars widely available and affordable. In 1912, the electric starter is introduced, helping to increase gas-powered vehicle sales even more. Pictured here is Henry Ford with the first Model T and the 1 millionth.
A new beginning for electrification

2006

Silicon Valley Startup Takes on Electric Cars

Tesla Motors, a Silicon Valley startup, announces it will produce a luxury electric sports car with a range of 200+ miles. Other automakers take note, accelerating work on their own electric vehicles.
SMUD’s fleet
SMUD’s fleet
Fleet electrification focus
Clean fleet strategy

- Parts & Recycling
- Fueling Program
- Idle Mitigation Behaviors
- Fleet Electrification
- Auxiliary Power and Non-Drive Equipment
- Vehicle Obsolescence
# Fleet electrification program

<table>
<thead>
<tr>
<th>Light Duty Electrification</th>
<th>Hybrid Medium/Heavy Trucks</th>
<th>Equipment Electrification</th>
<th>Everything Else</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hybrid sedans</td>
<td>• Hybrid bucket trucks</td>
<td>• Forklifts</td>
<td>• Trailers w/ equipment</td>
</tr>
<tr>
<td>• PHEVs</td>
<td>• Idle mitigation</td>
<td>• Cable pullers</td>
<td>• Construction equipment</td>
</tr>
<tr>
<td>• Hybrid SUVs</td>
<td>• Pickups</td>
<td>• NEVs</td>
<td>• Boats</td>
</tr>
<tr>
<td>• BEVs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pickups</td>
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</tbody>
</table>
Roadmap for electrification

Vehicle Class

*Pilot, R&D*
- TBD

*Equipment*
- Electric Equipment Pilots
- Bucket trucks (JEMS)
- ZeroRPM (Idle Mitigation)

*Heavy duty*
- Bucket trucks (JEMS)

*Medium duty*
- BEVs

*Light duty*
- PHEVs
- Electric Pickups

Opportunity to engage with CMC suppliers, innovation, other R&D focused efforts

OEMs prototyping electrified equipment

OEMs beginning to release electrified equipment for pickup truck segment

December 10, 2019
Fleet electrification market & strategy

- 36 Bolts in-service
- Release of all electric pickup
- 50% pickup electrification
- 100% hybrid truck electrification

Graph showing the percentage of electrification over years from 2015 to 2025.
Measuring Success

Fleet Maintenance Cost per Mile

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019 YTD</th>
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<tbody>
<tr>
<td>Cost</td>
<td>$1.10</td>
<td>$0.90</td>
<td>$0.80</td>
<td>$0.70</td>
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</table>

Fuel Economy (Miles per Gallon)

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019 YTD</th>
<th>2020 FC</th>
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</thead>
<tbody>
<tr>
<td>Economy</td>
<td>6.0</td>
<td>7.0</td>
<td>8.0</td>
<td>9.0</td>
<td>12.0</td>
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</table>
EV Workplace Charging Program

WPC Vehicle Growth

Current SMUD EV Charger Landscape

Goal: Demonstrate SMUD’s commitment to a sustainable future and environmental leadership for our community and to model Workplace Electric Vehicle Charging programs.

Since its inception in 2014, the WPC has grown significantly and is forecasted to reach 150 participants by 2020.
Trends & Forecasts – Future Projections

EV Workplace Growth

- Projections
- Actuals
- EVSE
Benchmarking our progress and goals

### State of CA

- **Per CA CPUC:**
  - http://www.cpuc.ca.gov/zev/

### City of Sac

- **Per City of Sacramento Electric Vehicle Strategy December 2017:**
  - http://www.cityofsacramento.org/ev

### SMUD

- **DRAFT Directional Goals**

<table>
<thead>
<tr>
<th>Year</th>
<th>State of CA</th>
<th>City of Sac</th>
<th>SMUD</th>
<th>IRP</th>
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</thead>
<tbody>
<tr>
<td>2018</td>
<td>Min of 50% annual light duty purchases be ZEV</td>
<td>13% Overall Fleet electrified</td>
<td>100% EV Sales in Light Duty</td>
<td>100% EV Sales in Light Duty</td>
</tr>
<tr>
<td>2019</td>
<td>Min of 75% annual light duty purchases be ZEV</td>
<td>18% Overall Fleet electrified</td>
<td>100% Eligible Hybrid Bucket Trucks</td>
<td>100% EV Sales in Light Duty</td>
</tr>
<tr>
<td>2020</td>
<td>50% ZEV’s for all light duty replacement vehicle procurement</td>
<td>50% Pickup Electrification</td>
<td>100% Eligible Hybrid Bucket Trucks</td>
<td>100% EV for Eligible Fleet</td>
</tr>
<tr>
<td>2023</td>
<td>250,000 charging stations</td>
<td>50% ZEV’s for all light duty replacement vehicle procurement</td>
<td>100% EV for Eligible Fleet</td>
<td>100% EV Sales in Light Duty</td>
</tr>
<tr>
<td>2025</td>
<td>5,000,000 ZEV’s in CA</td>
<td>75,000 ZEV’s in Sacramento</td>
<td>100% Eligible Hybrid Bucket Trucks</td>
<td>→ 2040: 100% Truck Sales are electric, hybrid, CNG</td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td>Increase charging infrastructure # from 521 to 4100*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2035</td>
<td></td>
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**Per City of Sacramento Electric Vehicle Strategy December 2017:**

- http://www.cityofsacramento.org/ev

**Integrated Resource Plan; Vehicle Electrification**

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*Note: All values are in thousands.*