Exhibit to Agenda Item #1e

Zero Carbon Energy Solutions 2022 Proposed Budget.

Board Finance & Audit Committee and Special SMUD Board of Directors Meeting
Tuesday, November 9, 2021, scheduled to begin at 5:30 p.m.
Virtual Meeting (online)
Zero Carbon Energy Solutions

2022 Proposed Budget & Initiatives

Lora Anguay
Chief Zero Carbon Officer
## Business Segments & Functions

<table>
<thead>
<tr>
<th>Power Generation</th>
<th>Advanced Energy Solutions</th>
<th>Commodity, Procurement &amp; Sales</th>
<th>New Business Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro Generation</td>
<td>Research &amp; Development</td>
<td>System Economic Dispatch for Load</td>
<td>New Business Development</td>
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<tr>
<td>License Implementation</td>
<td>Program Planning &amp; Support</td>
<td>Energy Trading</td>
<td>California Mobility Center</td>
</tr>
<tr>
<td>Thermal Generation</td>
<td>Residential Program Implementation</td>
<td>Power / Gas Contracts &amp; Reserves</td>
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<tr>
<td>Renewable Generation</td>
<td>Commercial Program Implementation</td>
<td>Energy Imbalance Market</td>
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<td>Gas Pipeline</td>
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<td>Energy Settlements</td>
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<td>Regulatory Compliance</td>
<td></td>
<td>Optimize Energy Operations Assets</td>
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<tr>
<td>Rancho Seco Fuel Storage</td>
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<tr>
<td>Project Development</td>
<td></td>
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</table>
### 2030 Zero Carbon Plan Summary

<table>
<thead>
<tr>
<th>Year</th>
<th>Reliability Studies</th>
<th>MW</th>
<th>550MW</th>
<th>300-500 MW</th>
<th>450-850 MW</th>
<th>100-220 MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>McClellan</td>
<td>5MW</td>
<td>91MW</td>
<td>550-950 MW</td>
<td>300-500 MW</td>
<td>550-950 MW</td>
</tr>
<tr>
<td>2023</td>
<td>Campbell</td>
<td>100MW</td>
<td>250 MW</td>
<td>550-950 MW</td>
<td>450-850 MW</td>
<td>100-220 MW</td>
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<tr>
<td>2025</td>
<td>Carson</td>
<td>550MW</td>
<td></td>
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<tr>
<td>2027</td>
<td>Procter &amp; Gamble</td>
<td></td>
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<tr>
<td>2030</td>
<td>Cosumnes</td>
<td></td>
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</table>

#### Projects
- **VPP Pilots**
- **V2G Pilots**
- Research game changing tech: Storage, biofuels, sequestration
- Partnerships, grants, joint ventures
- Identify internal savings
- Assess & mitigate financial risks
- Regulatory and legislative advocacy for zero carbon solutions

#### Action Plan
- Re-assess, adjust, prioritize, scale
Safety & Reliability

- Maintenance on Hydro Generation Asset
- Thermal Plant Maintenance & Overhauls
- Fire System Upgrades at Loon Lake
- Control Upgrades at Multiple Hydro Facilities
- Increase grid monitoring and control capabilities
  - Continue co-development of Distributed Energy Resources Management System (DERMS)
  - Complete dynamic transmission line ratings pilot
  - Test smart inverters

SD-4, 9, 10
Affordability

- Pursue new net revenue opportunities
  - Leverage existing partnerships and new opportunities

- Power Generation operational excellence measures
  - Camino Unit 1 generator rehabilitation project
  - Campbell Steam turbine overhaul deferral
Organizational Agility

- Ensure our processes are aligned with Operational Excellence
  - Implementation of 2030 Zero Carbon Project Management Office
  - Restructure Research & Development to align with the Zero Carbon Plan
Environmental Leadership

- Building Energy Efficiency and Electrification
  - Consolidate and optimize energy efficiency and building electrification programs to maximize carbon reduction
  - Expand and launch additional program offerings such as Home Energy/Carbon Reports, All Electric Smart Homes, and Express Heat Pump Water Heater replacement

- Energy Storage
  - Launch new programs and incentives to increase uptake of residential battery energy storage systems
  - Investigate additional distributed and long-term duration storage opportunities
Environmental Leadership

- Load Flexibility
  - Implement and launch new Virtual Power Plant (VPP) customer programs
  - Conduct research to develop estimates of grid and customer infrastructure impacts from electrification and plan for mitigation measures to accelerate growth

- Transportation Electrification
  - Expand programs and incentive offerings to support commercial and residential electric vehicles adoption
  - Expand eMobility hubs to increase access to zero emission transportation options in under-resourced communities

SD-4,7,9,10

SD-7,9,10
Environmental Leadership

- Green Pricing & Carbon Reduction
  - Implement enhanced options for voluntary renewable pricing and carbon free energy programs

- Demonstrate the potential to create habitat to sequester carbon for responsible power generation and land development
Environmental Leadership

- Thermal Transition
  - Investigate and assess alternative clean fuel options
  - Complete technical evaluation of options for Long Duration Energy Storage (LDES), Carbon Capture, as well as retirement determinations for McClellan and Campbell Power Plants

- Renewable Project Development
  - Solano Wind
  - Solar and battery storage projects

SD-7,10

SD-2,4,7,9
Community Vitality

- Upper American River Project (UARP) License Implementation Projects
  - Crystal Basin Recreational Facilities upgrades
2022 Proposed Budget

- O&M
  - 2021 Forecast: $137.6
  - 2021 Budget: $149.4
  - 2022 Proposed: $163.9

- Public Good
  - 2021 Forecast: $35.2
  - 2021 Budget: $53.1
  - 2022 Proposed: $51.8

- Capital
  - 2021 Forecast: $68.1
  - 2021 Budget: $82.7
  - 2022 Proposed: $108.4
# Commodities Budget

## 2022 Commodity Budget

<table>
<thead>
<tr>
<th>Cost ($Million)</th>
<th>2021 Budget</th>
<th>2022 Proposed</th>
<th>$ Change Proposed to Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Cost</td>
<td>$251.2</td>
<td>$215.0</td>
<td>($36.1)</td>
</tr>
<tr>
<td>Transmission Cost</td>
<td>$30.2</td>
<td>$28.8</td>
<td>($1.4)</td>
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<tr>
<td>Gas Cost</td>
<td>$159.6</td>
<td>$196.9</td>
<td>$37.4</td>
</tr>
<tr>
<td>Total Commodity Cost</td>
<td>$440.9</td>
<td>$440.7</td>
<td>($0.2)</td>
</tr>
</tbody>
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- In 2021 SMUD Water Year was about 60% of normal precipitation.
  - Reservoirs are starting in 2022 lower than normal leading to an increase in gas costs and higher percentage of SMUD’s thermals than past years.

## SMUD’s Resource Supply

- SMUD Renewable 9%
- Renewable LT Contracts 24%
- Renewable Hydro 1%
- Carbon Free Hydro (UARP & WAPA) 18%
- SMUD Thermal 49%

2022