

# Exhibit to Agenda Item #3

Accept the monitoring report for **Strategic Direction SD-10, Innovation.**

Board Energy Resources & Customer Services Committee Meeting and Special  
SMUD Board of Directors Meeting

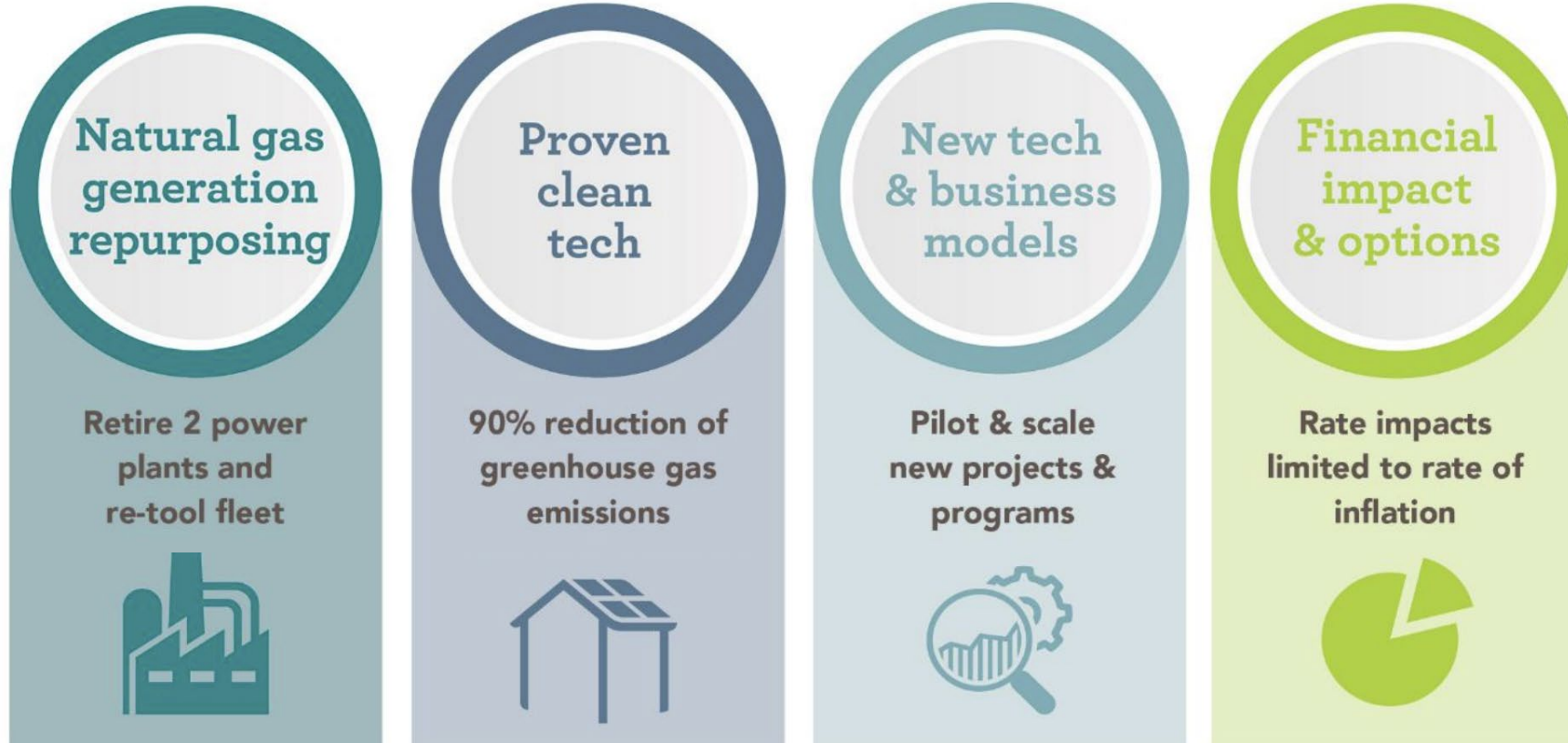
Wednesday, October 18, 2023, Scheduled to begin at 6:00 p.m.

Auditorium, SMUD Headquarters Building

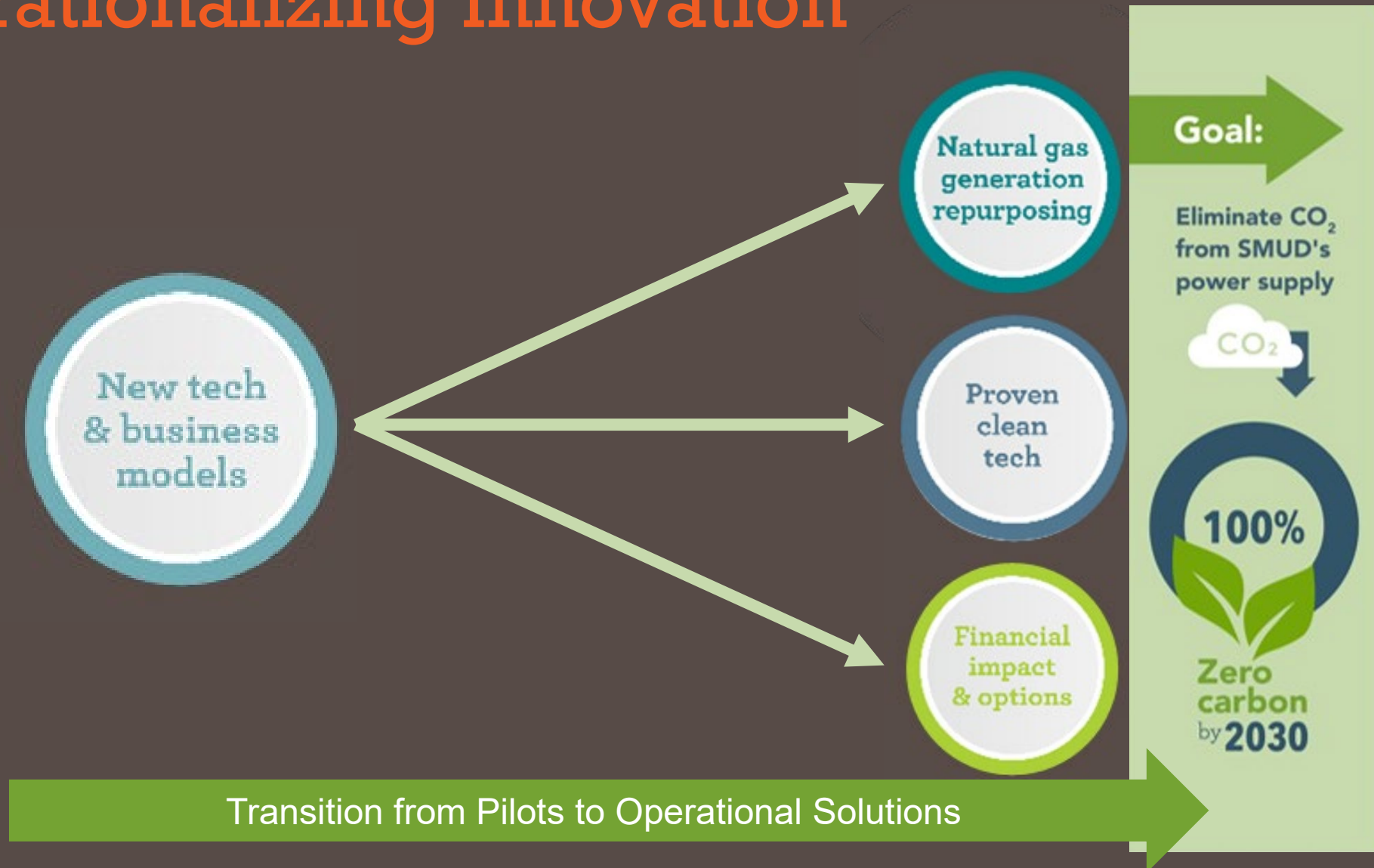
## SD-10 Innovation

Delivering innovative solutions, products and services to our customers is a core value. To assure our long-term competitiveness, SMUD shall invest in research and development projects that support its core and key values, and integrate emerging technologies and new business models into SMUD's customer offerings in a way that balances risk and opportunity and benefits our customers and community.

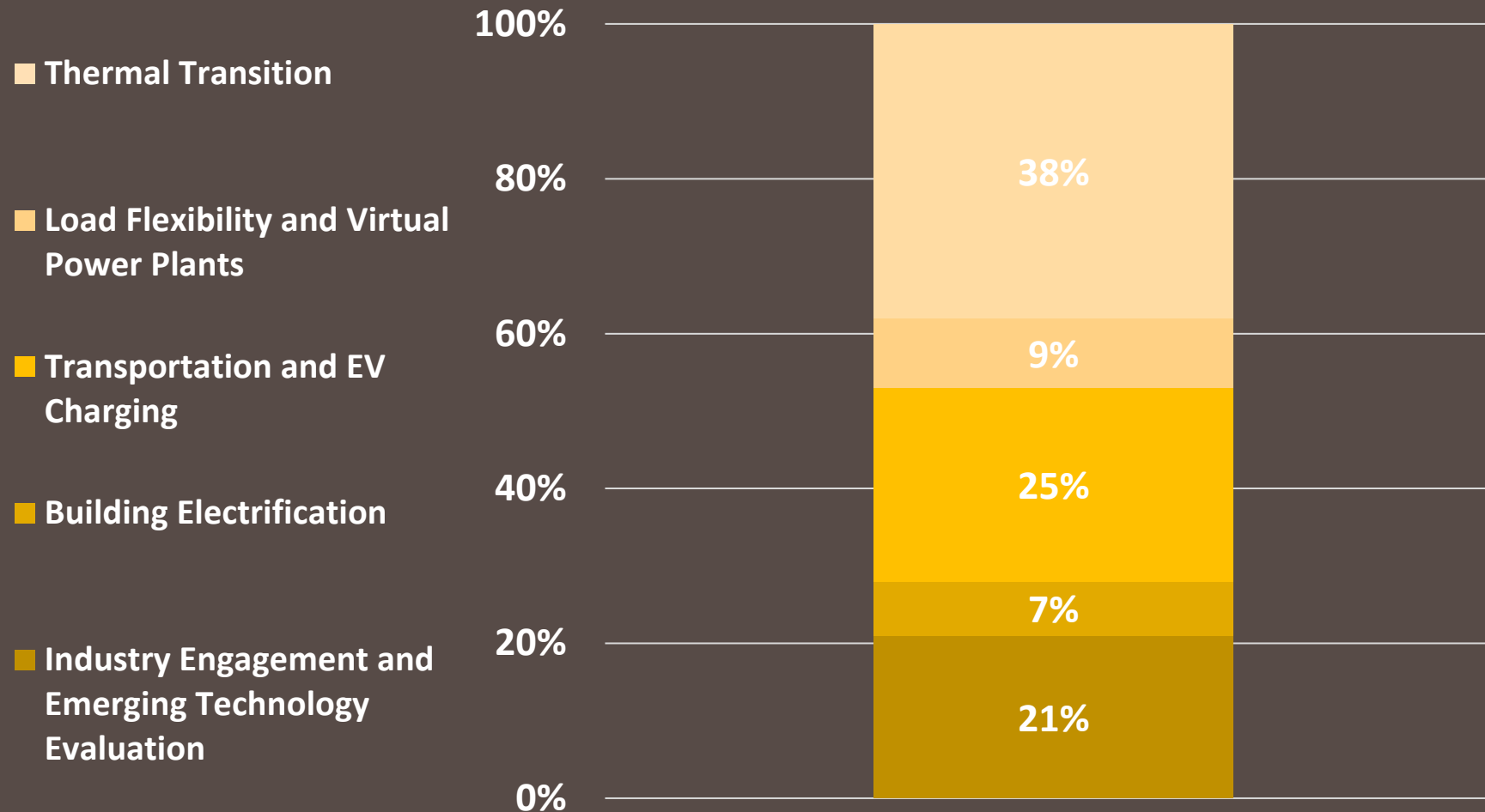
# Zero Carbon by 2030



# Operationalizing Innovation



# Innovation Portfolio Breakdown by Budget



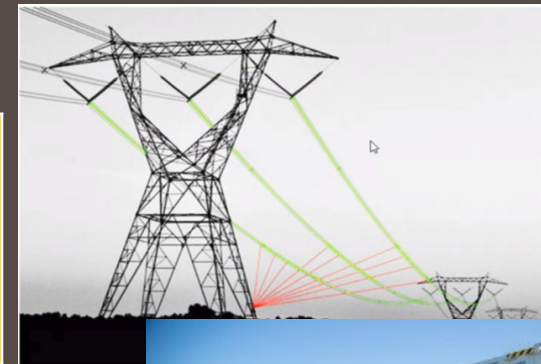
# Thermal Transition

## Operationalize energy storage

## Evaluation of long duration energy storage

## Infrastructure utilization

- On-going operation of 4MW Lithium battery at Hedge
- Installed ~0.5 MW of Energy Warehouse iron flow long duration batteries in partnership with ESS (Site Acceptance Testing 2023)
  - Planning SMUD's 4MW long duration storage system at Hedge underway
- Completed initial data collection and analysis for dynamic line rating sensors and software on one of the UARP transmissions lines



# Thermal Transition

Hydrogen ecosystem	Biomass management and utilization	Carbon sequestration
<ul style="list-style-type: none"><li>• Partnered with UCLA for Hydrogen blending study (grant award by CEC to UCLA)</li><li>• Established strategic partnerships through ARCHES for state led hydrogen grant pursuit</li><li>• Preliminary concept engineering &amp; design for biomass to hydrogen conversion in collaboration with Mote and CA Department of Conservation (Grant Funded)</li><li>• Reseeding for Rancho Seco site habitat after native plants &amp; pollinators introduced last fall sustained damage from storms</li></ul>		



# Load Flexibility and Virtual Power Plants

Virtual Power Plant  
performance  
evaluation

Development of  
control strategies

Plan for technology  
advancement

- My Energy Optimizer
  - The program is part of our efforts to reduce peak demand, avoid building new power plants and reduce the need to buy electricity from more expensive, less environmentally-friendly sources.
- Advanced Distribution Management System (ADMS) and Distributed Energy Resource Management System (DERMS)
  - Enhanced grid visibility, data utilization and capability to control large scale distributed energy resources
  - ADMS development complete and DERMS phase 1 complete.





# EV Charging

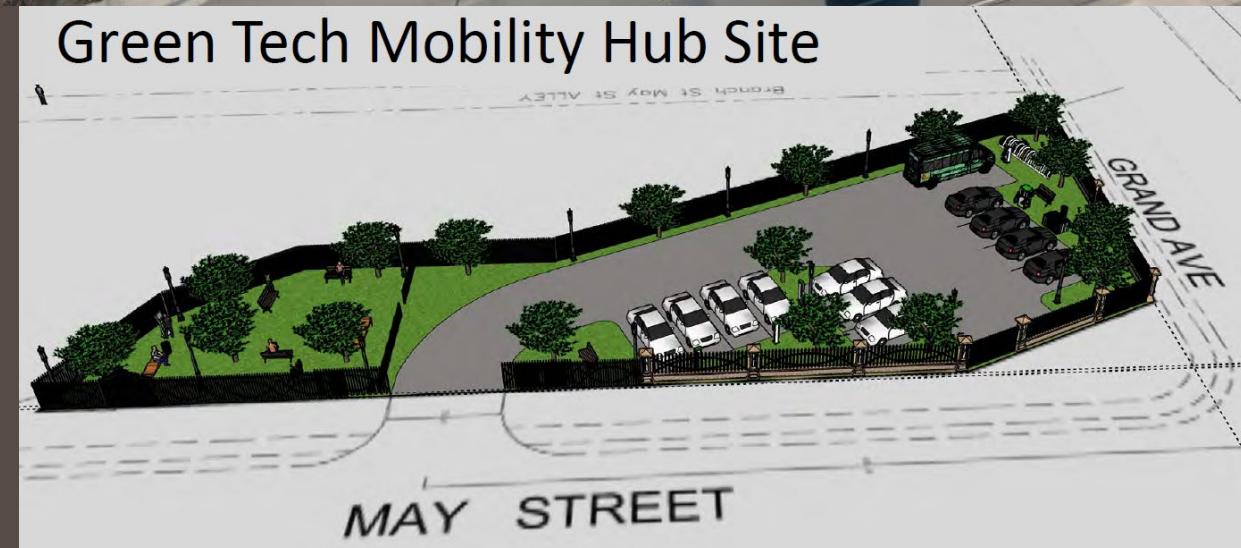
Support  
transportation  
electrification

Expand access to  
EV charging

- Project launch to deploy at least 108 EV chargers at up to 11 underserved multifamily properties selected by Mutual Housing California (Grant Funded, installations begin ~Q3:2023)
- Supported the development of the Green Tech (Del Paso) Mobility Hub
- PepsiCo Beverages North America's Sacramento facility became the first location worldwide to receive 21 new Tesla semi-trucks for its fleet.



Green Tech Mobility Hub Site



# Vehicle Grid Integration

Manage grid impacts from EVs	Enable EVs as a grid resource	Plan for technology advancement
<ul style="list-style-type: none"><li>• Twin Rivers Unified School District V1G/V2G project planning and demonstration</li><li>• Light-duty vehicle to grid pilot demonstration. Tested the Fermata FE-15 bidirectional charger with the Nissan Leaf</li><li>• Launched managed EV charging pilot program (2022).<ul style="list-style-type: none"><li>• Tesla, Ford, GM, and BMW are all currently eligible (2023)</li></ul></li></ul>		



# Building Electrification

Minimizing Grid Impact	Customer engagement	DERs for load flexibility
<ul style="list-style-type: none"><li>• Examining solutions for heat pump water heater technology and segment gaps<ul style="list-style-type: none"><li>• Statewide, 32 installations of 120V Heat Pump Water Heaters (HPWH) were found to save money and time compared to standard 240V HPWH installations on average, primarily due to reduced electrical interventions.</li></ul></li><li>• Home Infrastructure Planning phase 2 kicking off<ul style="list-style-type: none"><li>• to develop tools and forecasts to help distribution planners and customers make optimal decisions regarding utility service upgrades supporting residential electrification</li></ul></li></ul>		



# Recommendation

- SMUD is in compliance with SD-10
- Recommend Board accept 2022 SD-10 Monitoring Report