


# Exhibit to Agenda Item #3b

2024 Proposed Zero Carbon Energy Solutions Budget.

Board Finance & Audit Committee and Special SMUD Board of Directors Meeting  
Tuesday, November 7, 2023, scheduled to begin at 6:00 p.m.

SMUD Headquarters Building, Auditorium



# Zero Carbon Energy Solutions 2024 Proposed Budget & Initiatives

**Lora Anguay**

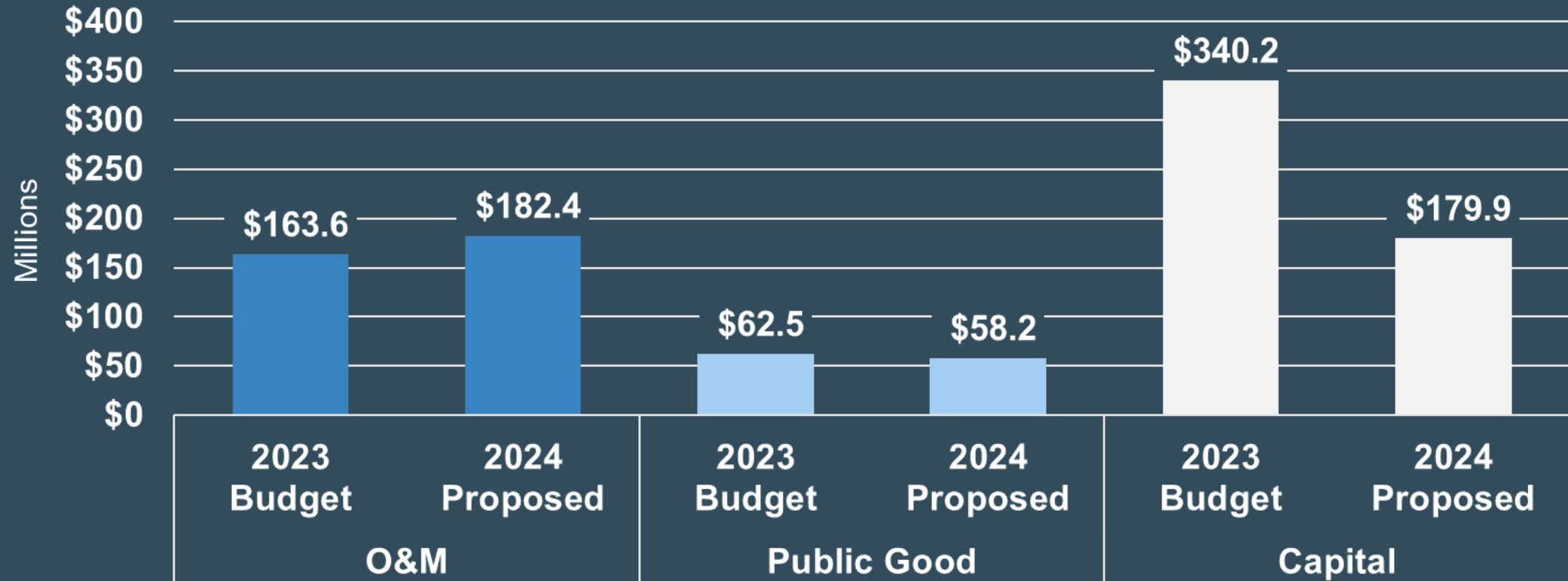
Chief Zero Carbon Officer

# Zero Carbon Energy Solutions

| Corporate / Enterprise                             | Enterprise Strategy       | Zero Carbon Energy Solutions                | Customer & Community Services       | Energy Delivery & Operations                 | Information Technology                                  | Workforce, Diversity & Inclusion |
|--|---------------------------|---|-------------------------------------|--|---|----------------------------------|
| Governance   | Resource Strategy         | Power Generation                            | Customer Experience Delivery        | Transmission Planning & Operations           | Enterprise Systems, Strategy & Governance               | People Services & Strategies     |
| Finance  | Revenue Strategy          | Advanced Energy Solutions                   | Customer Operations                 | Distribution Planning & Operations           | Infrastructure Platform Services                        | Diversity, Equity & Inclusion    |
| Legal, Government Affairs & Reliability Compliance | Customer & Grid Strategy  | Grants, Research & New Business Development | Community Energy Services           | Line Assets                                  | Enterprise Solutions, Engineering & Emerging Technology | Sustainable Communities          |
| Facilities, Security & Emergency Operations        | Enterprise Prioritization | Commodity Procurement & Sales               | Commercial Dev. & Solutions         | Substation, Telecom, Network & Metering      | Customer & Grid Operations Technology Center            |                                  |
| Procurement, Warehouse & Fleet                     |                           | Commodity & Operations Settlements          | Business Performance & Optimization | Strategic Services & Operations PMO          | Cybersecurity   |                                  |
| Communications Marketing & Community Relations     |                           |   |                                     | Environmental, Safety & Real Estate Services |   |                                  |
| Enterprise Affairs                                 |                           |   |                                     | Operational Excellence                       |   |                                  |

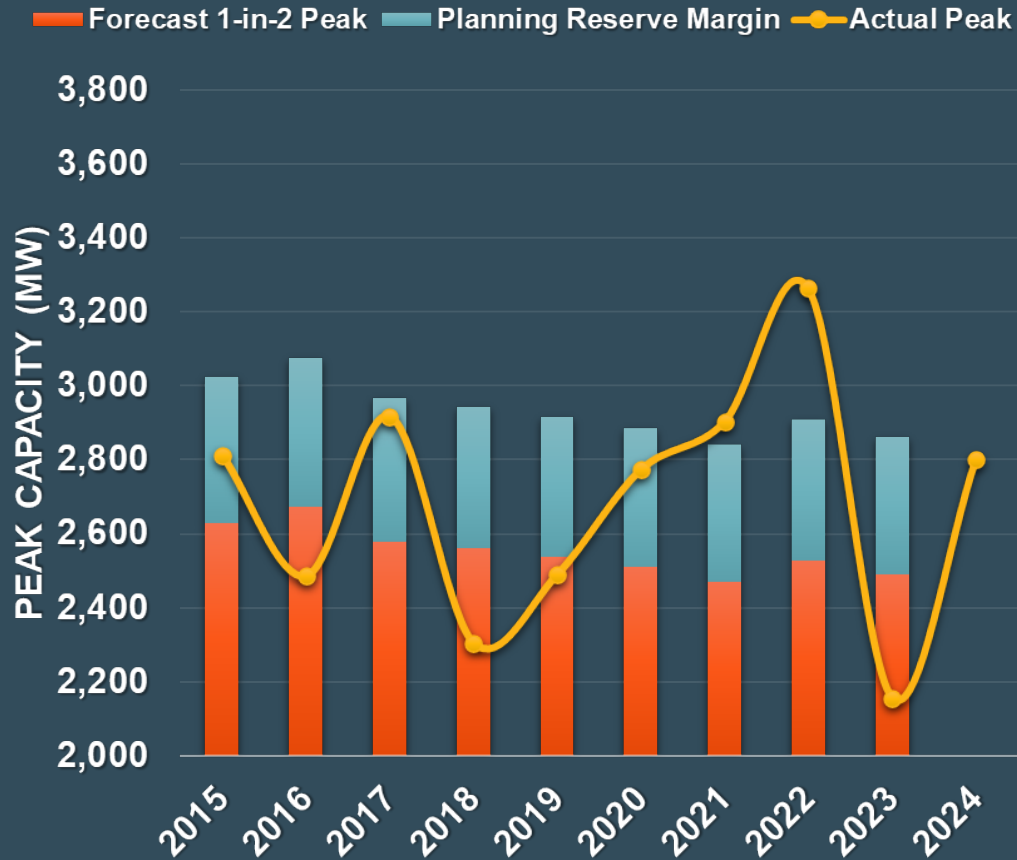
# Zero Carbon Energy Solutions

## 2024 Proposed Budget



# Commodity Budget

## SEPTEMBER PEAK COMPARISON



- Budget component with the largest increase in dollars; by \$87 million, or 18%
- Increasing costs and cost volatility
- Overall load has decreased by 1%, yet peak has increased by 6%
- Continuing progress on carbon goals

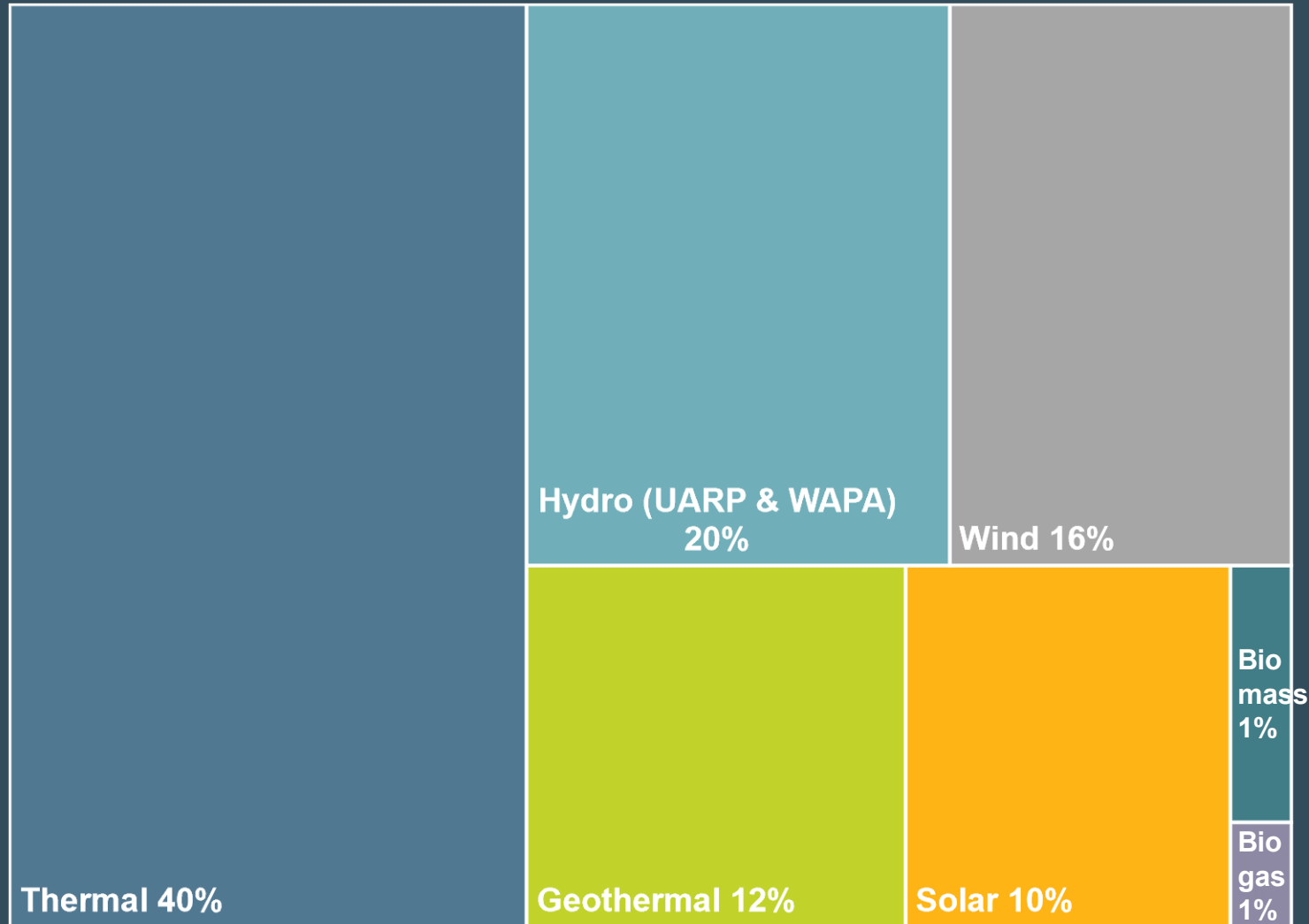
# Commodity Budget cont.

- **Power costs** – increased complexity and risk
  - Resource Adequacy has increased in price 2-3 times over 2023
  - Replacing with firm energy possible, but also costly
  - Includes \$18 million in premiums to purchase low/zero cost power (“ACS”) from the Northwest and \$10 million in Renewable Energy Credits (RECs)
- **Transmission costs** consistent with previous year
- **Gas costs** – increased thermal generation from Consumnes Power Plant (CPP), which has been online for a full year (10 months for 2023).

|                              | 2023<br>Budget | 2024<br>Proposed | \$ Change     |
|------------------------------|----------------|------------------|---------------|
| Power Cost                   | \$264.9        | \$284.3          | \$13.2        |
| Transmission Cost            | \$35.1         | \$36.2           | \$1.1         |
| Gas Cost                     | \$185.0        | \$251.5          | \$66.6        |
| <b>Total Commodity Costs</b> | <b>\$485.0</b> | <b>\$572.0</b>   | <b>\$87.0</b> |

\$Millions

# Commodity Resource Mix



## 60% Renewable and Carbon Free Resources

- Western Area Power Administration (WAPA) to provide 511 MWhs (same as 2023 budget)
- Upper American River Project (UARP) to provide 1,580 MWhs
- Replacement power purchase if low hydrogeneration
  - Hydro Rate Stabilization Fund (HRSF) balance of \$96 million
  - WAPA Rate Stabilization Fund (WRSF) balance of \$3.5 million

## 40% Thermal

- Northwest power prices have increased from the Washington State cap-and-trade program and with lower-than-normal precipitation – therefore it's forecasted to be more economical for SMUD to generate power than buy from the market
- Consumnes Power Plant, SMUD's most efficient plant was added back to dispatch for a full twelve months

# 2024 Potential Commodity Greenhouse Gas (GHG) Reductions

| Opportunities for reduction from 2024 Budget        |              |                              |
|---|--------------|------------------------------|
| Description   | MWh          | Potential GHG Reduction (MT) |
| Additional Budget for Carbon Free Resources (\$18M) | 1,200,000    | 492,240                      |
| RPS - Short-term PCC1/PCC2 RECs                     | 561,400      | 141,473                      |
|   | <b>Total</b> | <b>633,713</b>               |
| Improvements over 2023                              |              |                              |
| Solano 4  | 212,000      | 53,424                       |
| Rancho Seco 2 – Return to full ops                  | 110,000      | 43,230                       |
|   | <b>Total</b> | <b>96,654</b>                |
|   | <b>Total</b> | <b>730,367</b>               |





# Infrastructure Investment

Alignment to Strategic Direction: SD-4 SD-6 SD-8 SD-11 SD-14 SD-16 SD-17

## Maintaining Existing Assets

### Protecting reliability and maintaining compliance of SMUD's existing Power Generation Facilities

- **Dam Safety and Compliance**
  - FERC Part 12D Comprehensive Assessment of Union Valley
- **Improvements and Upgrades**
  - Unit Breaker & Switchgear Upgrade at Loon Lake, Robbs Peak & Union Vally
  - Camino Unit 1 Generator Rehabilitation
  - Transformer Replacements at Camino and Loon Lake
  - UARP Crane Controls Upgrade
  - Major overhauls at Campbell, Carson and Procter
- **800C Gas Pipeline Comprehensive Assessment**





# Infrastructure Investment

Alignment to Strategic Direction: SD-4 SD-6 SD-8 SD-11 SD-14 SD-16 SD-17

## Grid Integration of Distributed Energy Resources

- **Construction and Testing of Energy Storage at Hedge Battery Facility**
  - 4MW // 8MWh Lithium battery performance benchmarking and use case testing
  - Flow battery construction. (4MW installed by end of 2025)
- **Virtual Power Plant (VPP) research and integration roadmap**
  - Standardize interface between programs and grid services
  - Define grid services provided by virtual power plants
  - Integrate with Distributed Energy Resource Management System (DERMS)
- **Load Impact Analysis from EVs and building electrification**





# Zero Carbon Plan

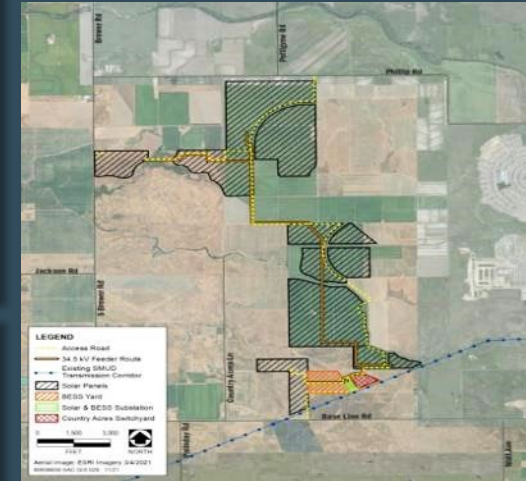
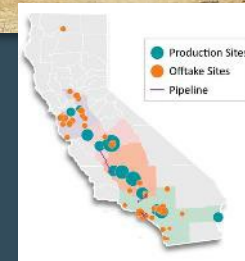
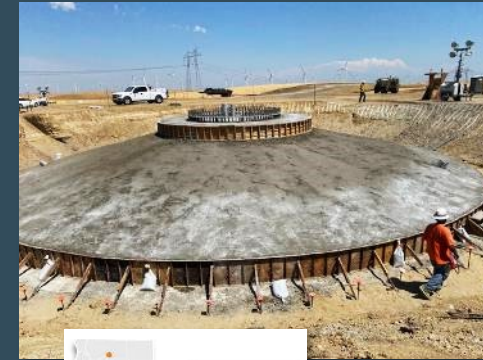
Alignment to Strategic Direction: SD-2 SD-3 SD-7 SD-9 SD-10 SD-19

## Natural Gas Repurposing

- Support partnership for carbon capture technologies
- Pursue partnerships to further technology and access to the Renewable Natural Gas (RNG) and renewable hydrogen value chains
  - ARCHES selected as DOE Hydrogen hub

## Proven Clean Technologies

- Solano 4 Wind Project (85.5 MW)
- Country Acres Project (344 MW Solar + 172 MW Storage)
- Coyote Creek (200 MW Solar + 100 MW Storage)
- Sloughhouse Solar (50 MW)
- Planning, evaluation and deployment of additional proven clean technology resources
  - McClellan BESS, Solano 5, other renewables







# Zero Carbon Plan

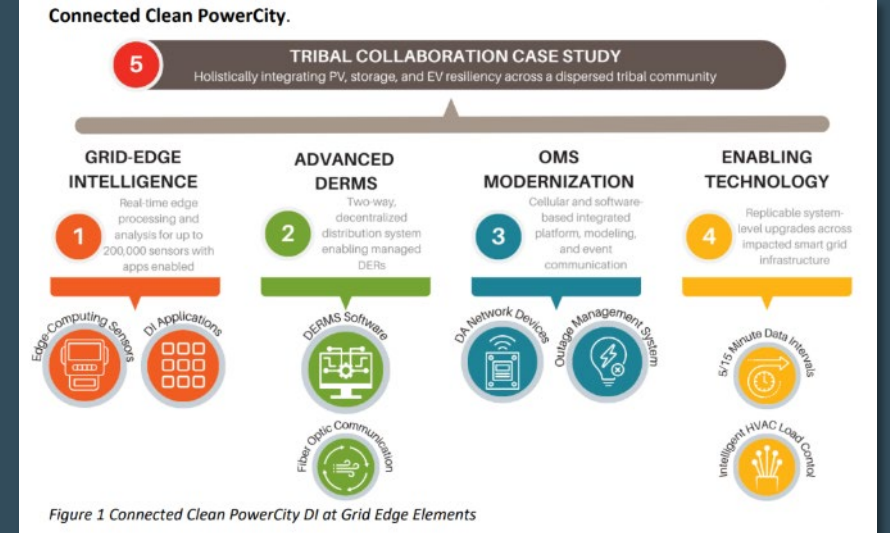
Alignment to Strategic Direction: SD-2 SD-3 SD-7 SD-9 SD-10 SD-19

## Grant and External Funding Opportunities

- Identify and pursue new opportunities aligned with the Zero Carbon Plan
- Existing opportunities
  - Calpine carbon capture and sequestration
  - ARCHES hydrogen hub partnerships and projects
  - FEMA disaster recovery, readiness and prevention funding
  - Apprenticeship and workforce development incentives (AIF)
- Deliver on grants won
  - Connected Clean Power City (GRIP grant)
  - SMUD Neighborhood Electrification Project (Congressional Allocation)
  - Charge Ready Community (CEC Reach grant)
  - Forrest Biomass to Carbon-Negative Biofuels Site Evaluation (DOC grant)
  - SMUD DC FAST Charger Updates (FAST Grant)

## New Technologies and Business Models

- ESS Long Duration Energy Storage Demonstration Project – install the 3.6 MW/29 MWh (8-hr duration) Energy Centers at Hedge
- Market scan for emerging technologies and establish key partnerships
- Participate in planning for expanded energy market participation





# Zero Carbon Plan

Alignment to Strategic Direction: SD-2 SD-3 SD-7 SD-9 SD-10 SD-19

## Zero Carbon Customer Programs

### Building Electrification and Energy Efficiency: \$46 million

Key programs:

- Advanced Home and Commercial Solutions
- SmartHomes-Residential new construction
- Multi-Family Retrofit

Key Goal for 2024:

- 5,000 Equivalent All Electric Homes added

### Distributed Energy Resources/Load Flexibility: \$8.9 million

Key programs:

- My Energy Optimizer Partner (Smart Thermostats)
- My Energy Optimizer Partner+ (Solar and Battery Storage)
- Peak Conserve (2-way communicating AC Load Controls)
- PowerDirect (Commercial Demand Response)

Key Goal for 2024:

- 17 MW added to our Virtual Power Plant
- 15,000 Smart Thermostats added
- 6,500 AC Load controllers installed
- 475 Battery systems enrolled







# Zero Carbon Plan

Alignment to Strategic Direction: SD-2 SD-3 SD-7 SD-9 SD-10 SD-19

## Zero Carbon Customer Programs

### Transportation Electrification: \$13.2 million

#### Key programs:

- Residential Drive Electric (outreach and education)
- Residential Charge@Home
- Multi-Family charging solutions
- Commercial EV solutions (vehicle and charging incentives)

#### Key Goals for 2024:

- 12,000 Equivalent Light Duty Vehicles added
- 5,000 residential and commercial chargers/handles installed



### Green Pricing and Community Solar Offerings: \$7.2 million

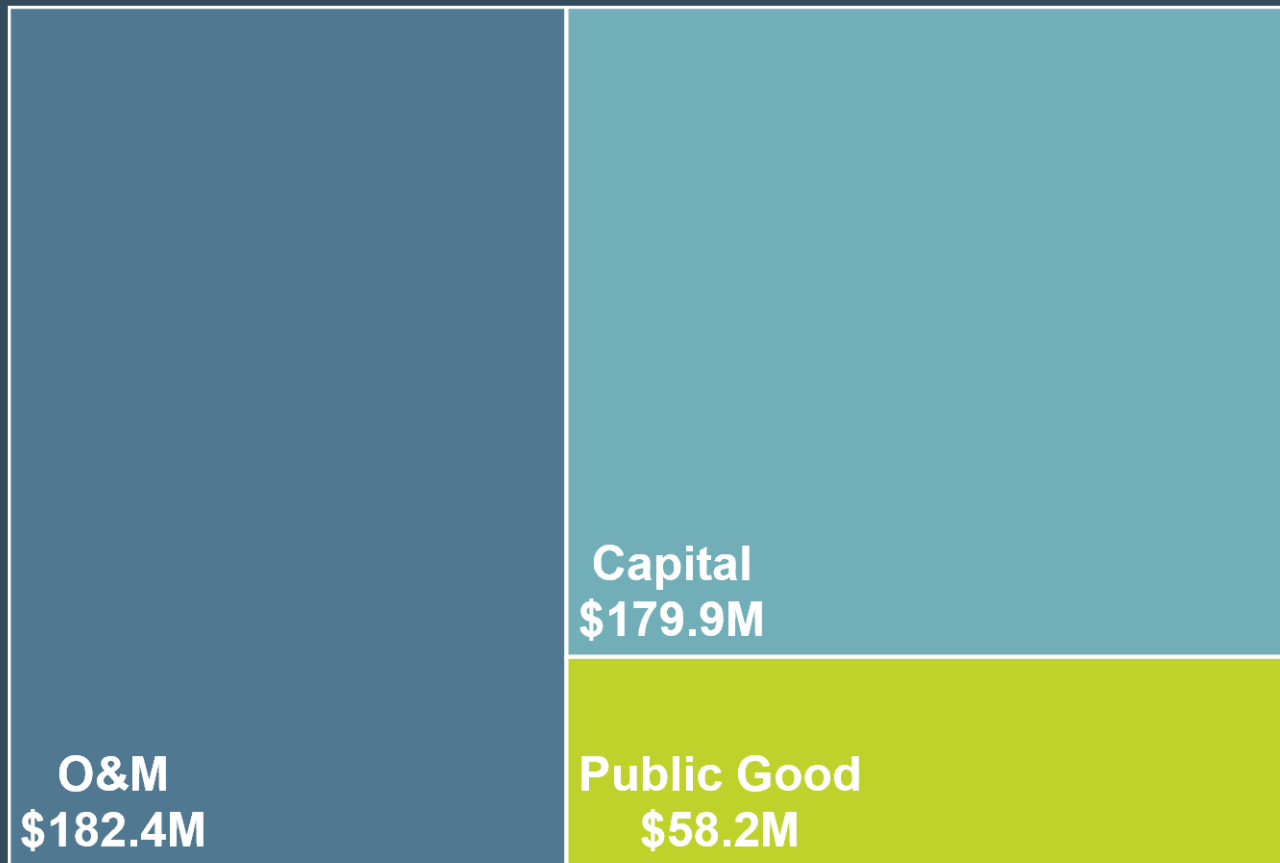
#### Key programs:

- Residential and Commercial Greenergy
- Neighborhood SolarShares (residential new construction)
- SolarShares for low- and median-income customers
- Solar for schools and non-profits



# Zero Carbon Energy Solutions

## 2024 Proposed budget details



### Major Budget Items

- **Power Gen Asset Management and Compliance: \$162.4 million**
- **Utility scale Renewable Projects: \$109.6 million**
  - Solano 4 Wind Project
  - Country Acres Solar and Storage Project
  - ESS Iron Flow Long Duration Energy Storage Demonstration
- **Customer Programs: \$77.8 million**
  - Community Impact Plan: \$7.6 million
- **Grants, Research and New Business Development: \$13.5 million**
  - Connected Clean Power City (GRIP Grant) admin and contract
  - EV Charging
    - Managed EV Charging Pilots
    - SMUD EV Charging App
    - SMUD DC FAST Charger Updates (FAST Grant)
    - ChargeReady Community