

Exhibit to Agenda Item #1

Provide the Board an informational presentation and executive summary on the 2030 Zero Carbon Plan Progress Update.

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

Wednesday, April 19, 2023, scheduled to begin at 6:00 p.m.

SMUD Headquarters Building, Auditorium

2030 Zero Carbon Plan

2022 accomplishments
2023 priorities

April 19, 2023

Powering forward.
Together.

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



Agenda

- **Zero carbon overview** – *Joel Ledesma, Director Power Generation*
- **Utility-scale** – *Joel Ledesma*
 - New Tech & Business Models
 - Proven Clean Technology
- **Customer Programs & Initiatives** – *Ed Hamzawi, Director Advanced Energy Solutions*
 - Program Portfolios
 - Communications, Marketing & Outreach
 - Community Impact Plan

Zero carbon overview

Natural gas generation repurposing

Replace 2 power plants with renewable and storage resources and retool remaining 3 to minimize emissions

Proven clean technology

- Expand SMUD's renewable and battery storage resources by 3.5x
Equivalent to energy needs of more than 600,000 homes
- Support customer resources
Growing rooftop solar and batteries

90% reduction of greenhouse gas emissions

~\$2.5 billion investment

New technology & business models

Pilot & scale new projects and programs

- 2x savings from energy efficiency & building electrification
- Education & demand flexibility
- Virtual power plants & vehicle-to-grid technology
- New grid-scale technologies

Financial

- Pursue grants & partnerships
- Limit rate impacts to rate of inflation

~\$2 billion investment

Maximize community benefits

- Keep affordable rates & reliable power
- Improve local air quality & overall community health
- Reduce regional impacts of carbon – drought, wildfires & extreme weather
- Create regional clean tech jobs
- Strengthen all communities
- Support under-resourced communities
- Involve our customers & community in this transition

Goal:

Eliminate CO₂ from SMUD's power supply

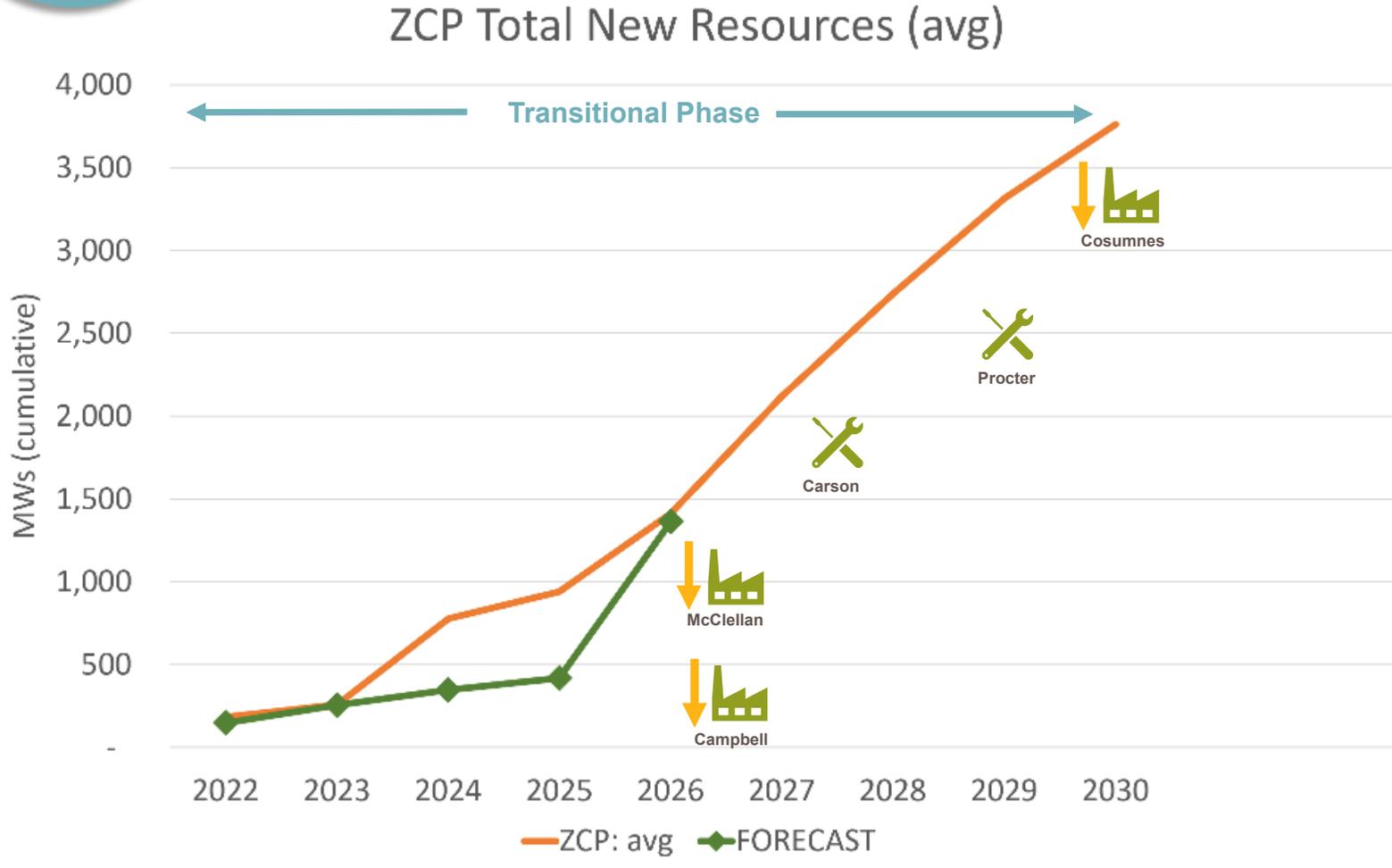
100% Zero carbon by 2030

Thousands of new regional clean tech jobs



Total new renewable resources (MWs) including storage & Distributed Energy Resources

Work in progress vs 2030 Zero Carbon Plan



- Transitional Phase now – 2030.
- Steep climb to achieve goals.
- Uncertain economy continues to create challenges.
- Developing pipeline of projects for future years.

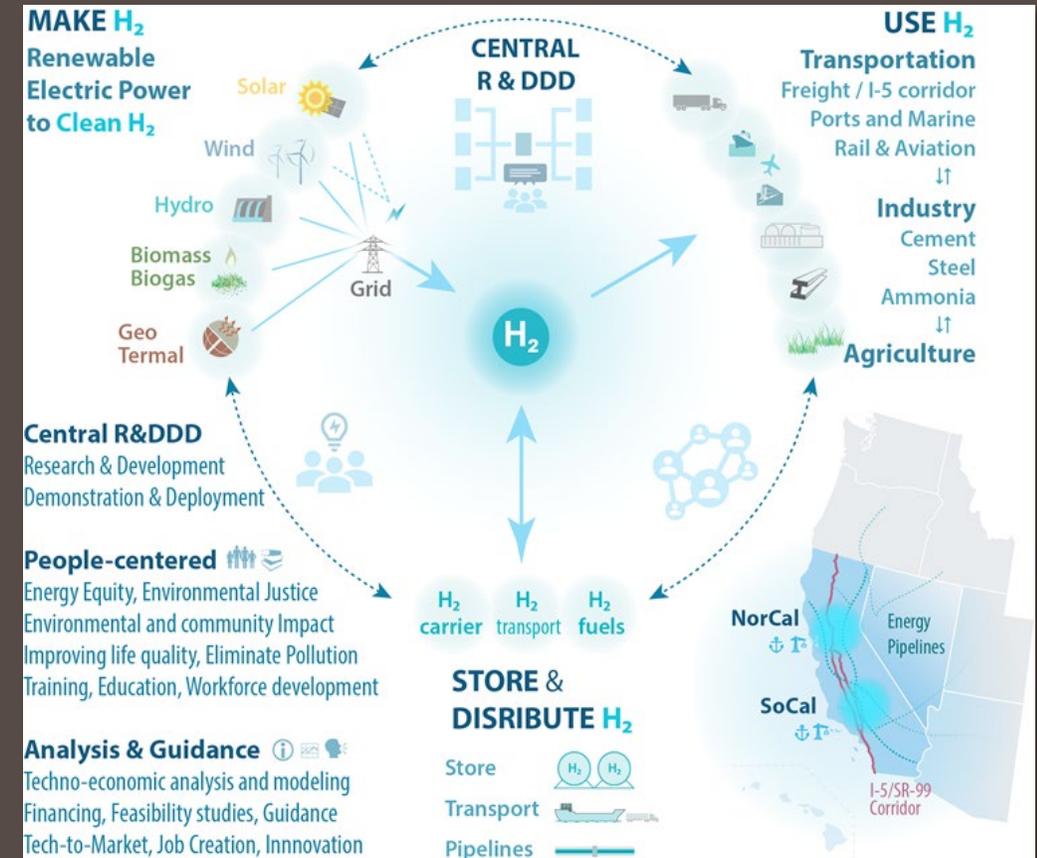
Utility-Scale



Hydrogen – ARCHES – State hub concept

New Tech & Business Models

- Department of Energy (DOE) regional Clean Hydrogen Hubs (H2Hubs) program.
- **\$7 billion** to establish **8 -10** H2Hubs across U.S.
- Selection of regional hubs expected in fall 2023.
- ARCHES encouraged by DOE to submit full-length proposal.
- SMUD concepts are “alternatives” in the ARCHES proposal.
 - **Concept 1:** Electrolytic hydrogen production to support power, transportation & industrial applications.
 - **Concept 2:** Thermochemical conversion of biomass to hydrogen to support power, transportation and industrial applications.





Long-duration energy storage & carbon capture & storage

New Tech & Business Models



Long-duration energy storage

- ESS partnership – Phase 1
 - Demonstration (4 MW/24 MWH).
 - Construction began April 2023.
 - Expected COD Fall 2023.
- Pursuing another technology to pilot.



Carbon capture & storage

- Exploring potential PPA for carbon capture with Calpine at Sutter Energy Center.



Calpine Sutter – 100 MW geothermal

Proven Clean Tech

- SMUD Board approval on March 16, 2022.
- Contract took effect on Jan. 1, 2023.
- 10-year power purchase agreement.
- 100 MWs of energy from Calpine’s operations at The Geysers.
- Adds 100 MWs of geothermal energy to SMUD’s portfolio, enough to power about 100,000 homes for a year. The addition of this renewable energy source is equivalent to removing 342,000 metric tons of greenhouse gas emissions.



Located north of San Francisco, [The Geysers](#) is the single largest geothermal electrical operation in the world.



Solano 4 Wind project

Proven Clean Tech

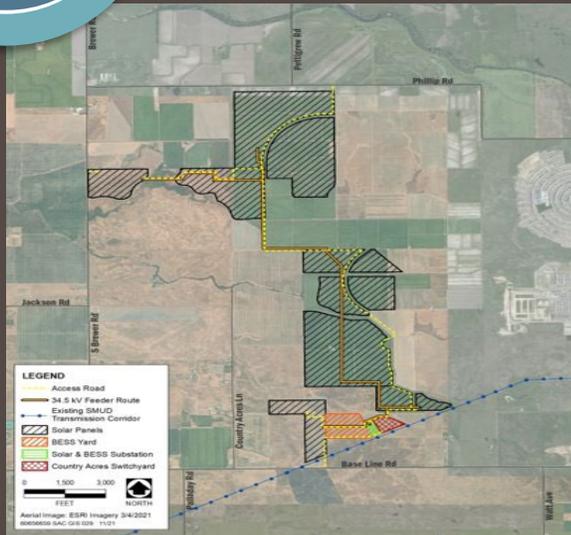


- **Decommissioning Phase: Solano 1**
(Completion May 2023)
 - Removing 23 wind turbines.
 - 0.66 MW each, 15 MW total.
- **Construction Phase: Solano 4**
(Begins April 2023)
 - Installing 19 wind turbines:
9 Solano 4 East, 10 Solano 4 West.
 - 4.5 MW each, 85.5 MW total.
 - Commercial Operation Date expected May 2024.
- **SMUD Solano assets**
(May 2024)
 - Solano 2, 3, & 4 will have a total installed capacity of 300 MW.



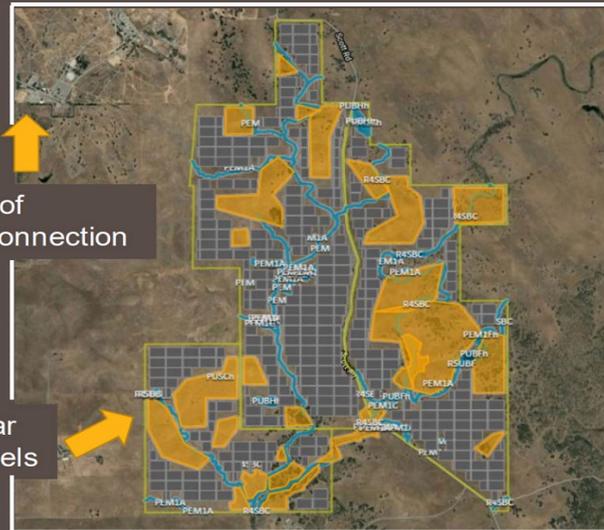
Solar & storage

Proven Clean Tech



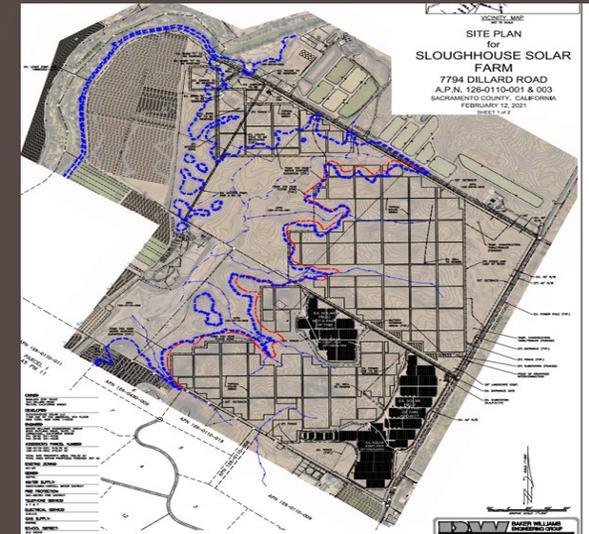
344 MW / 172 MW

Country Acres (PPA)



200 MW / 100 MW

Coyote Creek (PPA)



50 MW

Sloughhouse (PPA)

All 3 projects in Permitting Phase. Commercial Operation Date forecast of early 2026.

Customer Programs & Initiatives



2022 accomplishments / 2023 priorities

Customer Zero Carbon Program Portfolios

All-Electric Equivalent Homes Ahead of Plan

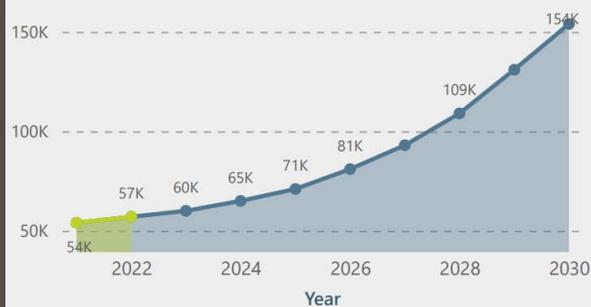
2023 All-Electric Equivalent Homes

● 2023 Program Plan ● YTD AEH Program Actual



All-Electric Equivalent Homes by 2030

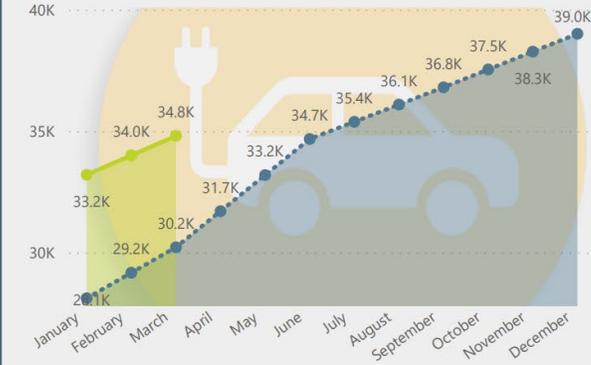
● Plan ● Actual



Electric Vehicles Ahead of Plan

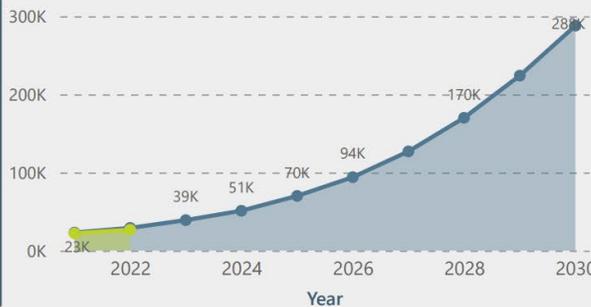
2023 Electric Vehicles

● Program Plan ● YTD Program Actual



Electric Vehicles by 2030

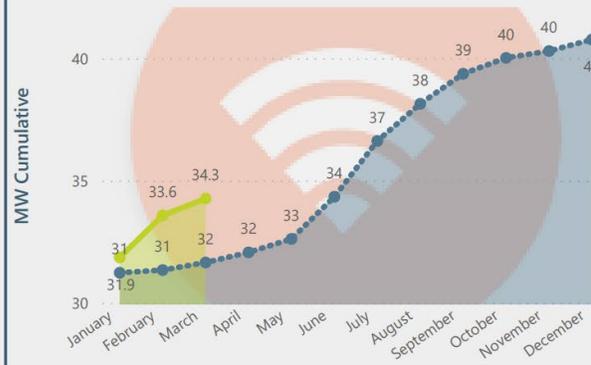
● Plan ● Actual



Distributed Energy Resources Ahead of Plan

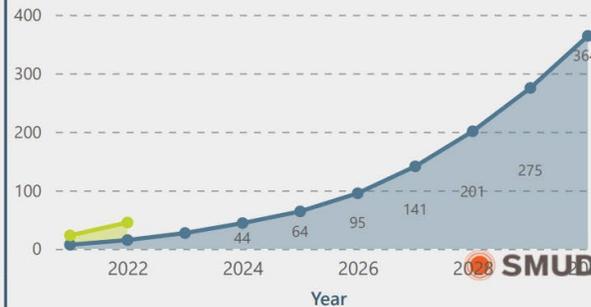
2023 Distributed Energy Resources (DER)

● Program Plan ● YTD Program Actual



DER Cumulative MW by 2030

● Plan ● Actual





Key metrics & milestones

Building Electrification and Energy Efficiency

	2022 Final	2023 March Actual	2023 Goal
Heat Pump HVAC Conversions	2,109	510	2,180
Heat Pump Water Heater Conversions	897	191	1,000
Induction Cooktop Conversions	256	84	300
All Electric New Homes & Multifamily Units Constructed	1,299	158	750
Multifamily Units Retrofitted	954	0	500
Commercial Retrofit Projects	311	44	500
All Electric Equivalent Homes (Cumulative)	57,000	57,925	61,287

In progress:

- Relaunch of Home Electricity Reports
- Community Impact Plan offerings
- HPWH SMUD Energy Store turnkey solution
- Carbon free loans



SMUD
Feb 25

SMUD's proud to be your partner in creating cleaner, safer, healthier homes!

SMUD Board President, Heidi Sanborn, and SMUD Energy Specialists visited with our community in North Highlands to share valuable information on how to qualify for free home upgrades and improve indoor air quality. We can help income-eligible customers switch from gas to electric appliances through our Neighborhood Electrification Program, and there are options for both homeowners and renters.

Don't miss out on our energy assistance rates, home energy assessments and special programs! Learn more at smud.org/EnergySaverBundles and let's work together to make your home more efficient!

[Read less](#)

[Boost post](#)



2022 accomplishments / 2023 priorities

Community Impact Plan: Ensuring no community left behind

2022 accomplishments:

- **Residential Neighborhood Electrification** – Gardenland (150+ measures).
- **Commercial Business District Electrification** – Partnership with Sacramento Hispanic Chamber of Commerce (ARPA funds) in Gardenland.
- **Regional Workforce Development** – 90 people received workforce education, 105 people received training & skills development, & 16 people in job placement.
- **Inclusive Economic Development** – expanded partnerships with 14 Property Business Improvement Districts.

2023 priorities:

- **Carbon Free Loan program** – Financing options for median-income customers.
- **Residential & Commercial Electrification** – North Highlands, Meadowview, Gardenland.
- **Shine Awards** – Increased investment to ensure reach.
- **Community Ambassadors** – Targeted outreach and education.

Our audience

Residential

- Low- & median-income populations who can't afford necessities
- Renter with higher energy burdens
- Under-served populations with cultural or language barriers

Commercial

- Small businesses
- Nonprofits

Our focus

- Affordability**
- Equitable access**
- Community engagement**

We're doubling the current investment towards under-resourced communities!

Our approach

- **Diversifying** clean energy programs to make them accessible to more residential customers.
- **Leading** inclusive economic development with new job trainings and job placement programs for clean energy jobs.
- **Focusing** on investing in the business community through meaningful and impactful partnerships.
- **Creating** capacity building opportunities for nonprofits to support our 2030 zero carbon plan engagement.
- **Showing up** in culturally relevant ways with community education and outreach through our community ambassador teams.



Key metrics & milestones

Transportation Electrification

	2022 Actual	2023 March Actual	2023 Goal
Residential EV Chargers Installed	577	300	500
Commercial EV Chargers	349	42	355
Residential EV Rate Participants (Cumulative)	17,229	19,027	22,620
E-Fuel Solutions Projects	-	0	4
Managed Charging Pilot Participants (Cumulative)	297	330	1000
# of Light Duty EV's in Service Territory (Cumulative)	32,396	34,796	39,000



Ready to drive electric?
We can help.

smud.org/DriveElectric

In progress:

- Expanding home charger contractor network
- ChargeReady Community (REACH) project
- SMUD Energy Store home charger installation offering
- Vehicle-To-Grid (V2G) research and pilot projects



Vehicle to Grid (V2G) Research & Pilots

Electric school bus V2G

- 24 Chargers & buses deployed at Twin Rivers Unified School District.
- Awaiting charger commissioning then testing.
- Seeking additional candidate school bus fleets.



Light-duty V2G

- Initial testing completed - fleet Nissan Leaf with Fermata bidirectional charger.
- Federal grant applications partnered with GM, Nissan and Ford.
- Customer pilots in planning.





Key metrics & milestones

Load Flexibility and Battery Storage

	2022 Actual	2023 March Actual	2023 Goal
My Energy Optimizer Smart Thermostats (Cumulative)	12,503	16,119	16,000
My Energy Optimizer Starter Batteries (Cumulative)	144	218	306
My Energy Optimizer Partner+ Batteries	-	0	400
Peak Conserve (NextGen ACLM) enrollments	-	0	2,000
PowerDirect Commercial Customers (Cumulative)	36	42	82
Total MW (Cumulative)	30	34	41

In progress:

- My Energy Optimizer Partner+ Battery launch
- My Energy Optimizer Thermostat Critical Peak Pricing expansion
- Peak Conserve (Next Gen ACLM) launch
- PowerDirect small-medium businesses expansion

Advanced Thermostat Management
Complete Energy Solutions - Automated Demand Response

The electricity we deliver is now cleaner than ever and by 2030, 100% of our power will come from carbon-free sources. As your community-owned, not-for-profit electric service, we're proud to lead the way in delivering carbon-free energy solutions for your business, including our Advanced Thermostat Management offer.

What is Advanced Thermostat Management?
In the summer months, energy demand is at its greatest and we need the help of our community to maintain a reliable power grid. This is where our Advanced Thermostat Management partners come in. In the event of a power emergency, we call on the support of our Advanced Thermostat Management participants to reduce energy consumption. By integrating automated response capabilities into your HVAC system, your energy use will automatically scale back when demand for electricity is at its peak.

Benefits of Advanced Thermostat Management:

- Reduces carbon emissions
- Cleaner air quality
- Increases energy reliability
- Supports renewable energy
- Supports California's clean energy goals

Powering forward. Together. **SMUD**

SMUD
Feb 18

It's National Battery Day! Did you know SMUD offers generous incentives of up to \$2,500 on battery storage for your home? If you're wondering if battery storage is right for you, we have the answers at smud.org/StorageRes.

[Read less](#)

Boost post

Is battery storage right for you?

Try our Solar System Estimator with battery storage to help you make the best decision.

[Start your estimate](#)



Key metrics & milestones

Green Pricing

	2022 Actual	2023 March Actual	2023 Goal
Residential Greenergy customers	65,257	66,296	69,000
Commercial Greenergy customers	1,621	1,582	1,600
Neighborhood SolarShares homes (Cumulative)	489	489	796
Commercial SolarShares Customers / Accounts	30 / 436	30 / 437	30 / 436
Total Qualifying GWh Sales	762	160	770
# of trees planted	9,525	2,302	10,000



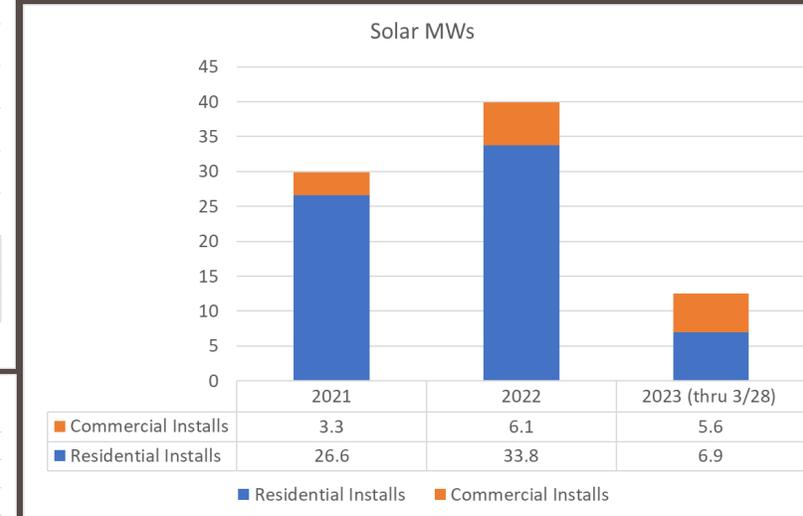
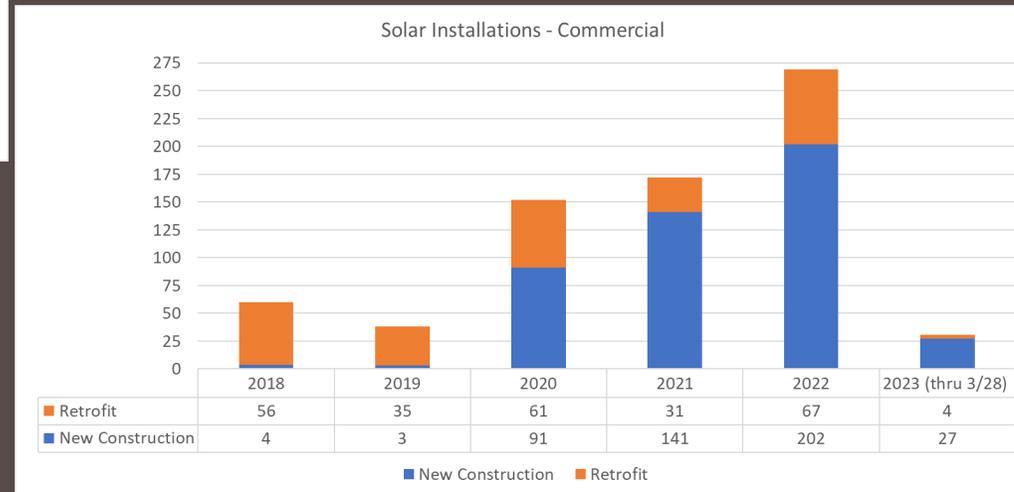
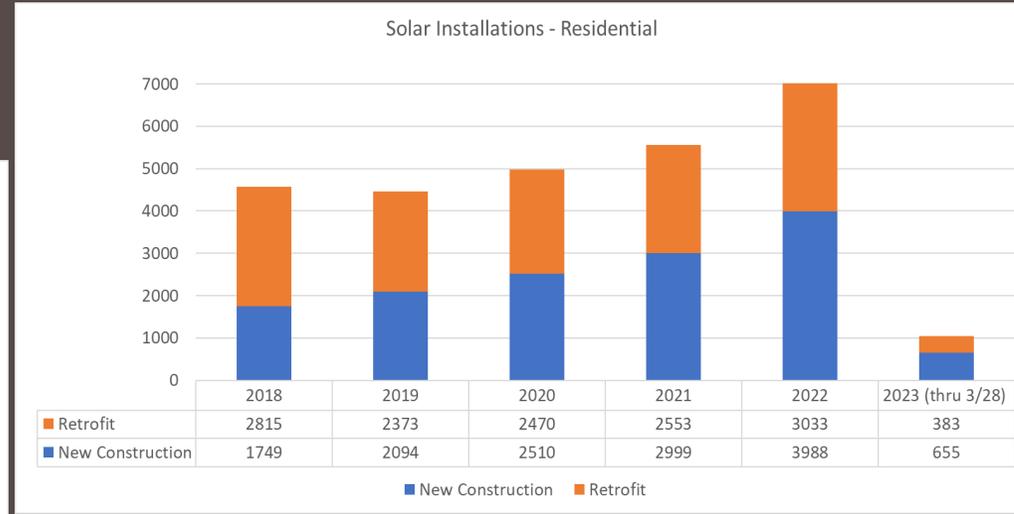
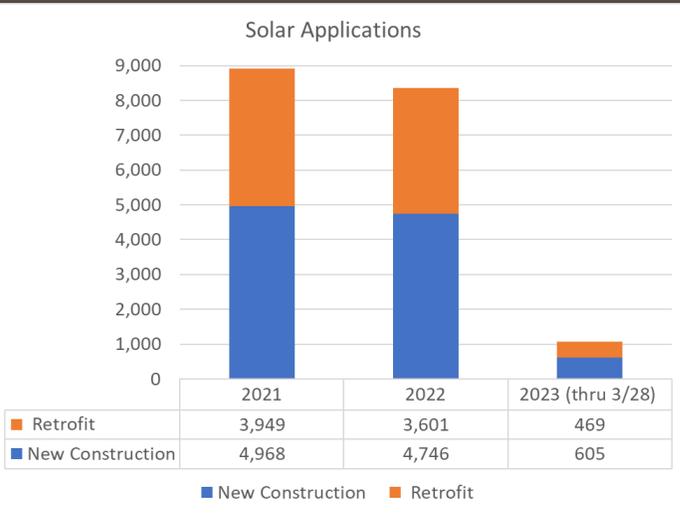
In progress:

- Development of Existing Home SolarShares program
- Planning for Commercial Renewable Shares offerings
- Planning for Community Solar for schools & nonprofits
- Expanding community tree plantings



2022 accomplishments / 2023 priorities

Solar: Behind the Meter



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