

Exhibit to Agenda Item #1

Brief the Board on the mid-year progress update for the **2030 Zero Carbon Plan**.

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

Wednesday, September 20, 2023, scheduled to begin at 6:00 p.m.

Auditorium, SMUD Headquarters Building

2030 Zero Carbon Plan

Mid-Year Update

September 20, 2023

Powering forward.
Together.

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



Agenda

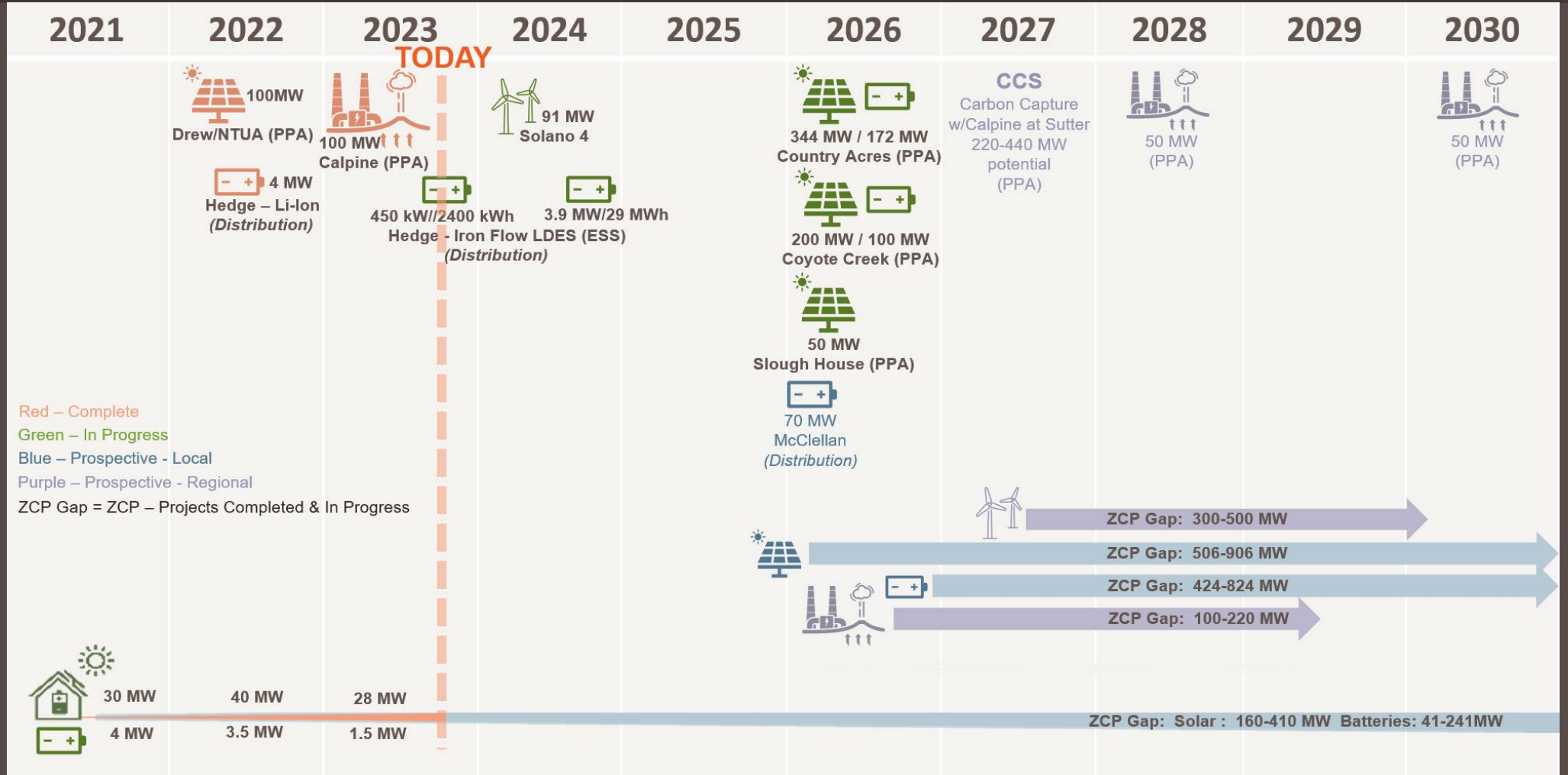
- **Utility-Scale** – *Joel Ledesma*
 - New tech
 - Proven clean technology
- **Customer Programs & Initiatives** – *Ed Hamzawi, Director Advanced Energy Solutions*
 - Program portfolios
 - Program highlights, marketing & outreach
 - Key metrics & milestones
 - Looking ahead

Utility-Scale



Pipeline progress

Proven clean tech





Solano 4 wind project

Proven clean tech



Turbine Foundation



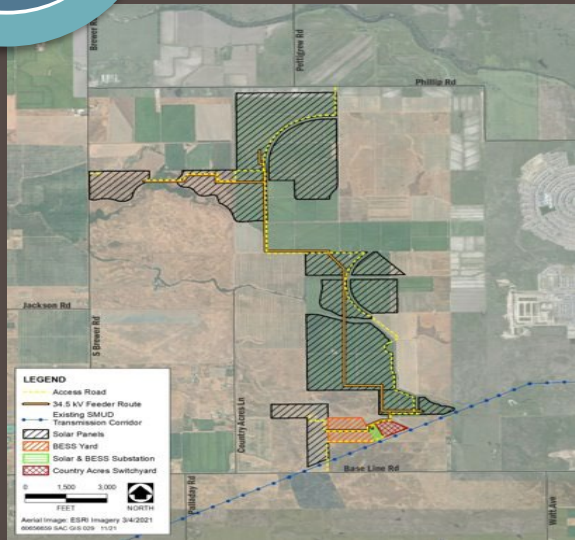
Finish Grading – East Laydown Yard

- **Decommissioning Phase: Solano 1**
(Completed May 2023)
 - Removed 23 wind turbines, 15 MW total
- **Construction Phase: Solano 4**
(Began April 2023)
 - Installing 19 wind turbines, 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.



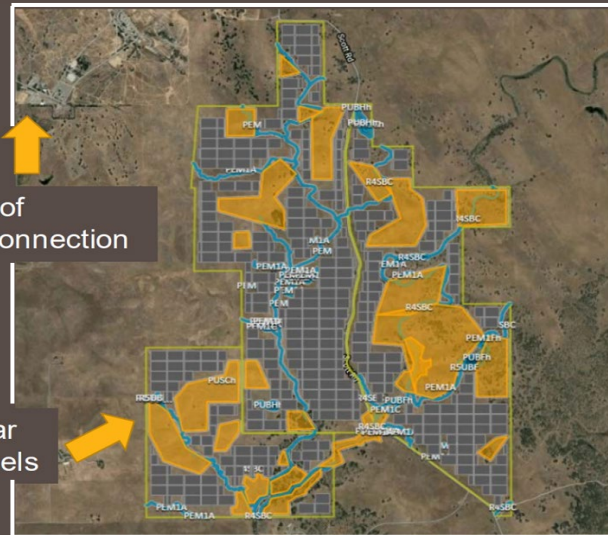
Solar & storage

Proven clean tech



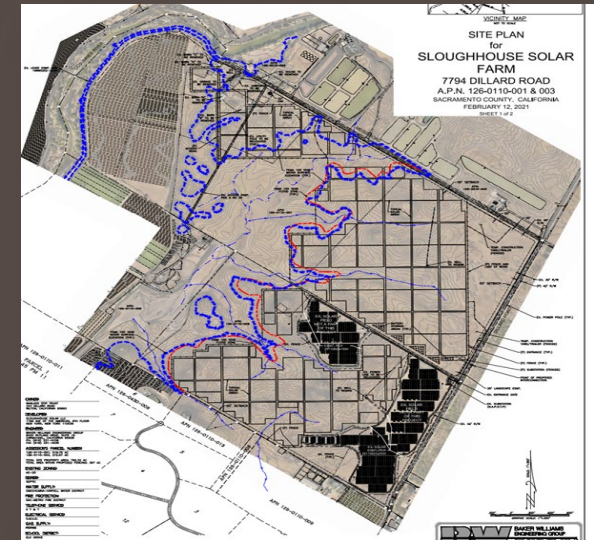
344 MW / 172 MW

Country Acres (PPA)



200 MW / 100 MW

Coyote Creek (PPA)



50 MW

Sloughhouse (PPA)

PPA = Power Purchase Agreement



Infill project: McClellan Battery Energy Storage System

Proven clean tech

Project Details: 70 MW Battery Energy Storage System (BESS)
Target COD 2026

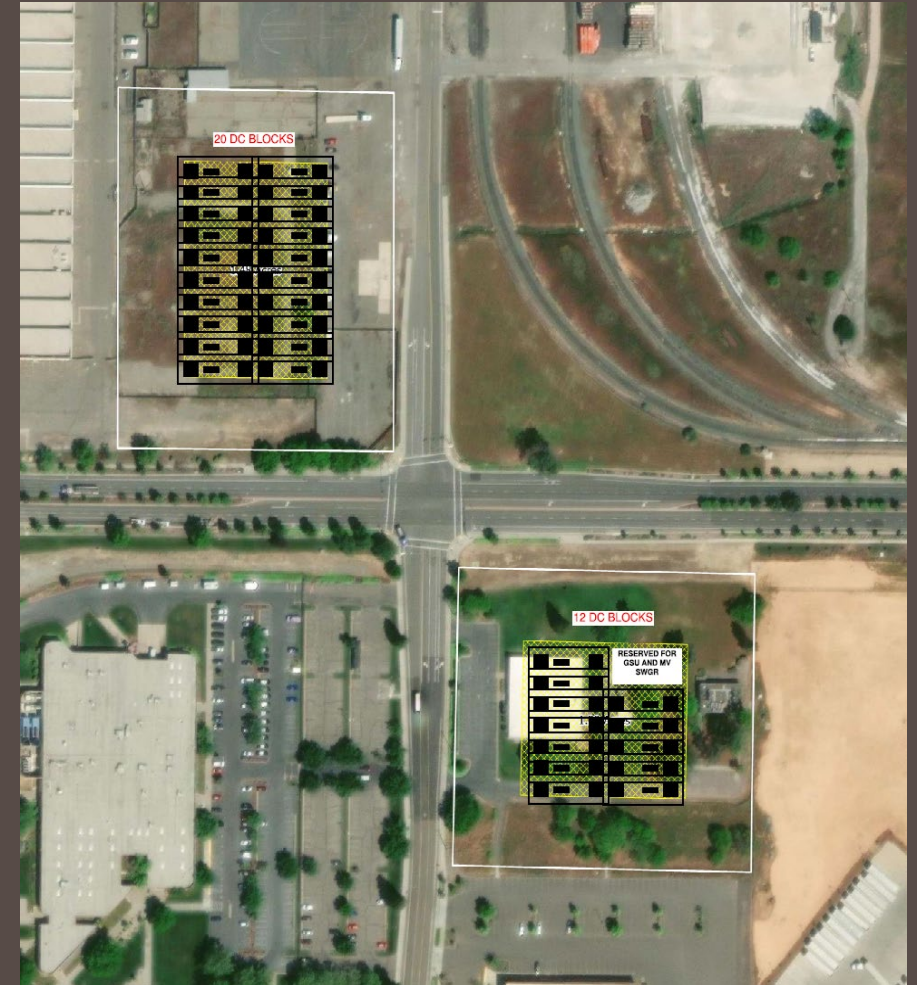
Interconnection: Connection to 69 kV distribution line

Land: Completed purchase option

Permitting: AECOM completing environmental studies to confirm
Categorical Exemption qualification

Next Steps:

- Obtain Net Present Value (NPV) & Levelized Cost of Energy (LCOE) analysis
- Continue Interconnection process
- Complete permitting studies
- Begin high level engineering





Hydrogen – ARCHES update

New tech

DEPLOYMENT

Average delivered H₂ cost to end use kg

\$7.65 w/o any PTC	\$5.04 with PTC & LCFS
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165 Miles of new H₂ pipeline (30 existing)

~5,500 Class 6 & 8 trucks

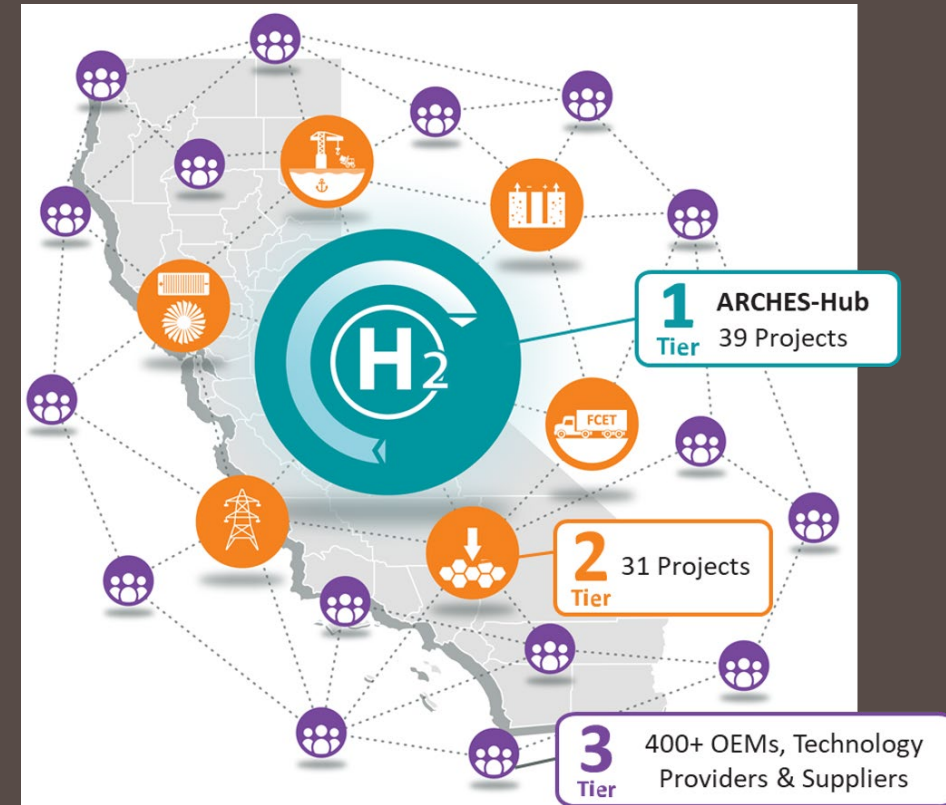
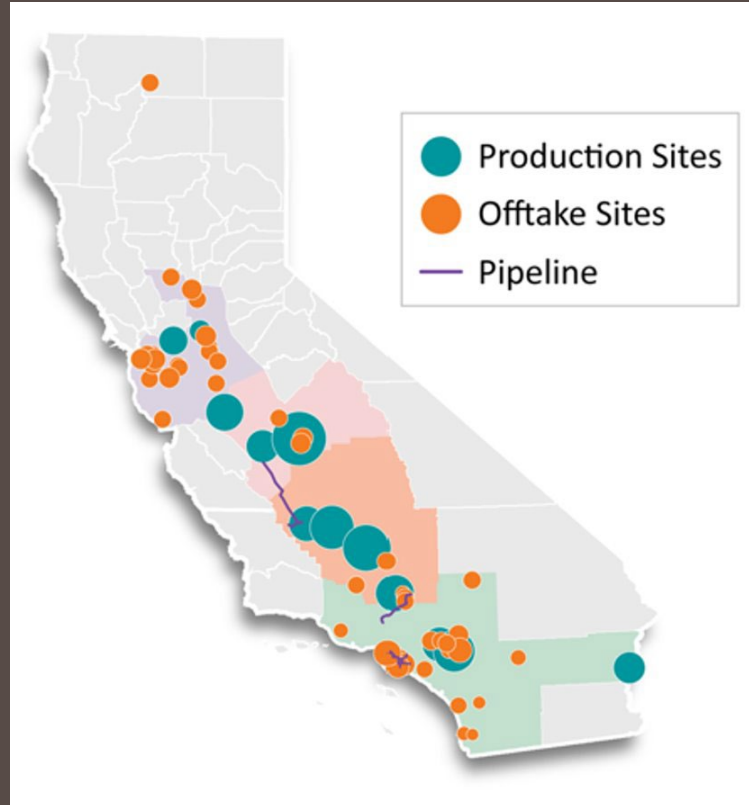
-0.15 kgCO₂/KgH₂ Average life-cycle carbon intensity

1,080 Transit buses

66 Public Heavy-duty HRS

24 Private/Transit Heavy-duty HRS

232 Port cargo handling equipment



Tier 1 = w/ DOE funding
Tier 2 = w/o DOE funding



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All partner projects will be subrecipients and have a signed partnership with ARCHES H2 LLC, except for FCET procurements.





ARCHES: SMUD submitted concept papers

Concept 1:

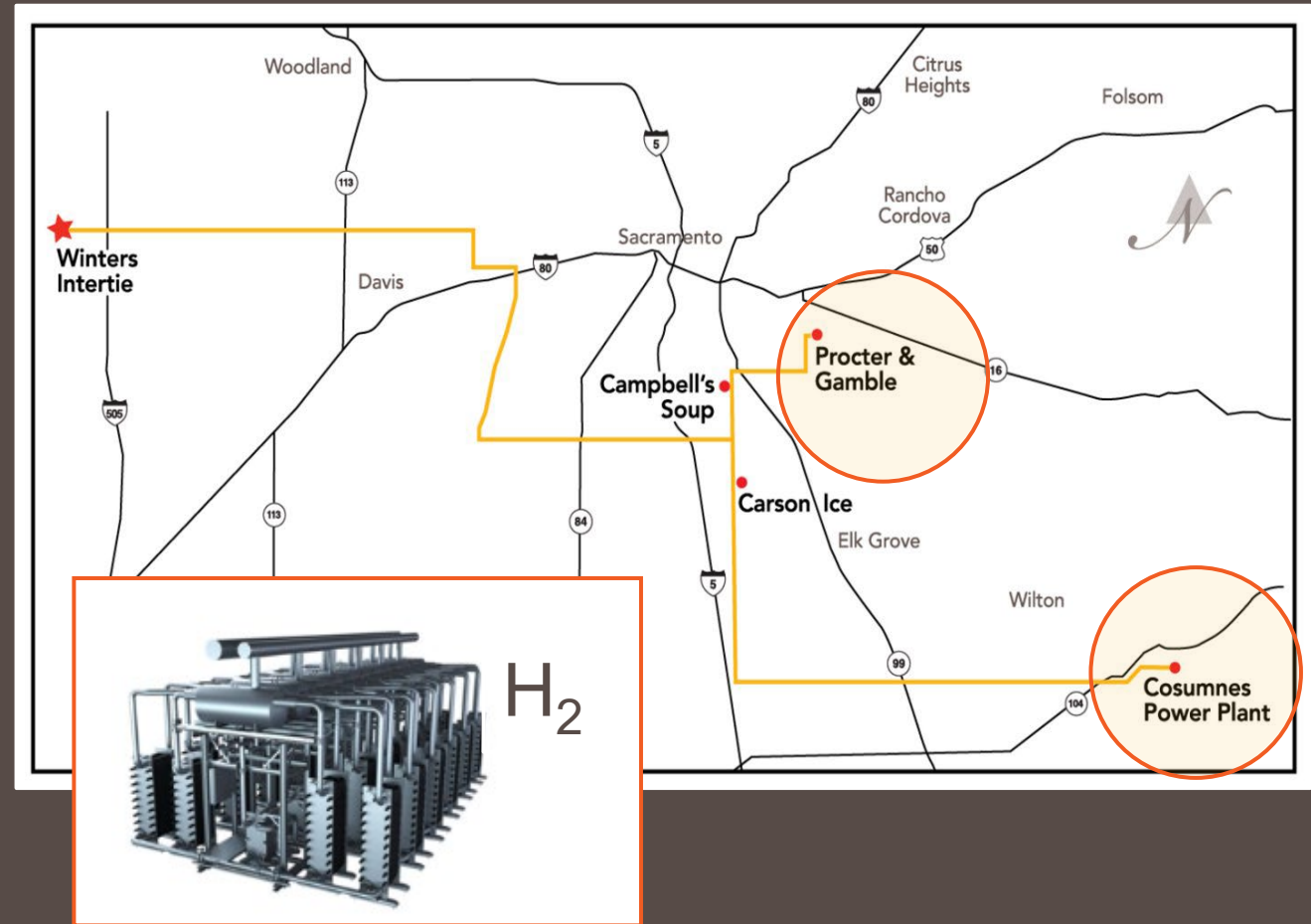
Electrolytic Hydrogen Production for Power, Transportation, and Industrial Applications

Overview:

SMUD is partnering with Air Products and Chemicals, Inc. (APCI), Sacramento Metropolitan Air Quality Management District (SMAQMD), and others to demonstrate and deploy hydrogen production and utilization for power, transportation, and industrial applications in the greater Sacramento Region.

Power Consumption of 363 MW

Green Hydrogen production of 100 Tons Per Day (TPD)





ARCHES: SMUD submitted concept papers

Concept 2:

Thermochemical Conversion of Biomass to Hydrogen for Power, Transportation, and Industrial Applications

Overview:

SMUD is partnering with Mote, Inc. in developing a first-of-a-kind (FOAK) biomass gasification facility in California to produce carbon-negative hydrogen. Mote's technology will generate hydrogen by gasifying wood waste-based biomass with integrated carbon capture and geological sequestration. The project will process approximately 1,150 metric tons per day (MTPD) of biomass to produce 60 tons per day or greater than 21,000 tons of hydrogen annually, and geologically sequester 1,130 MTPD or more than 400,000 tons of carbon dioxide annually. Due to the facility's carbon sequestration component and minimal emissions, the team expects the hydrogen to have a carbon intensity score of $-150\text{gCO}_2/\text{MJ}$.

Collaboration: Mote, SacAQMD, El Dorado Forest Working Group

Costs: Estimate costs is \$500 million
Green Hydrogen production of 60 TPD



Long Duration Energy Storage

New tech

ESS Partnership – Phase 1 at Hedge

- Demonstration (4 MW/24 MWh).
 - Energy warehouse
 - 450 kW/2400 kWh storage system
 - Construction began April 2023
 - Expected COD Fall 2023.
 - Energy center
 - 3.6 MW / 29 MWh (8-hr duration) storage system
 - Design underway
 - Installation planned for 2024





Carbon Capture & Storage

New tech

Calpine at Sutter Energy Center

- Exploring potential PPA
- Calpine submitted DOE grant application in May
 - SMUD letter of support included
- Calpine working to get Front End Engineering Design (FEED) study cost information



Zero Carbon Customer Programs & Initiatives

Zero Carbon Customer Program Portfolios



Building Electrification & Energy Efficiency

Helping customers decarbonize their homes and workplaces by optimizing and managing their electricity use and converting from gas to efficient electric equipment.



Distributed Energy Resources/Load Flexibility

Programs and options to participate in building our Virtual Power Plant to help shift and manage loads during times when energy is needed or when excess energy is available.



Transportation Electrification

Incentives, information and special rates to help customers purchase and charge EVs for homes and businesses.



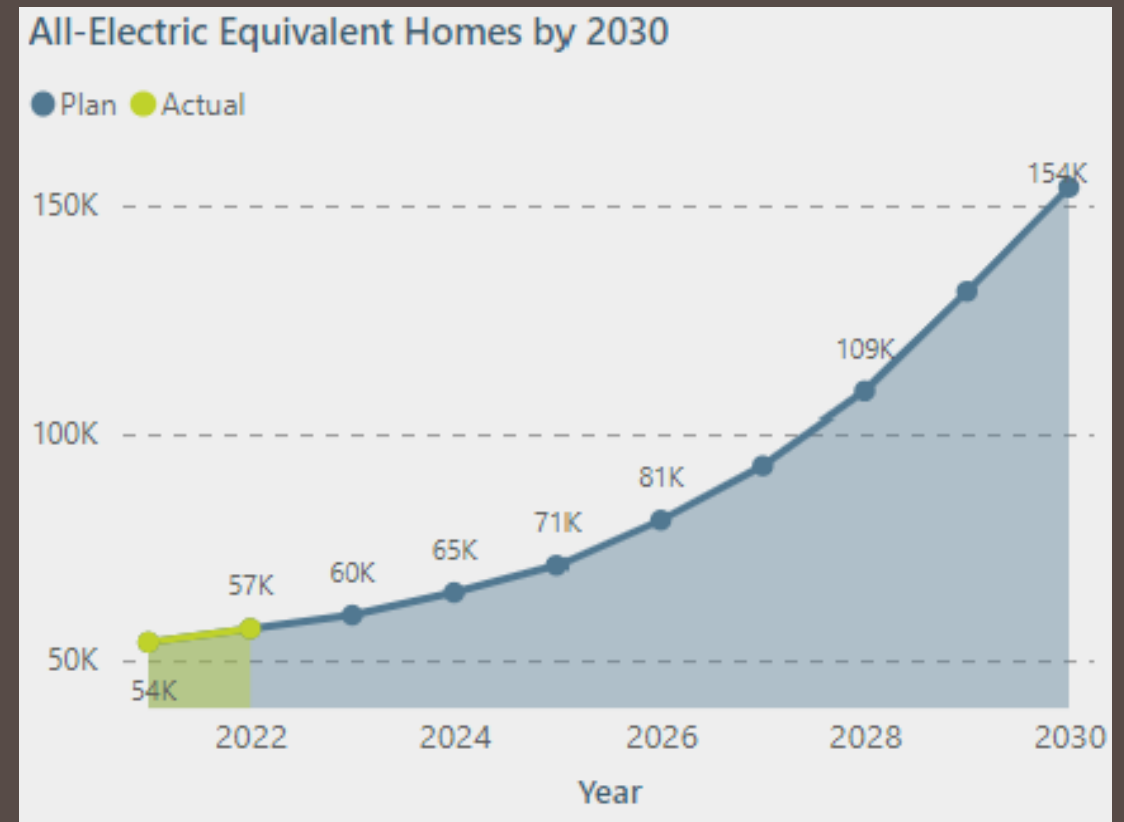
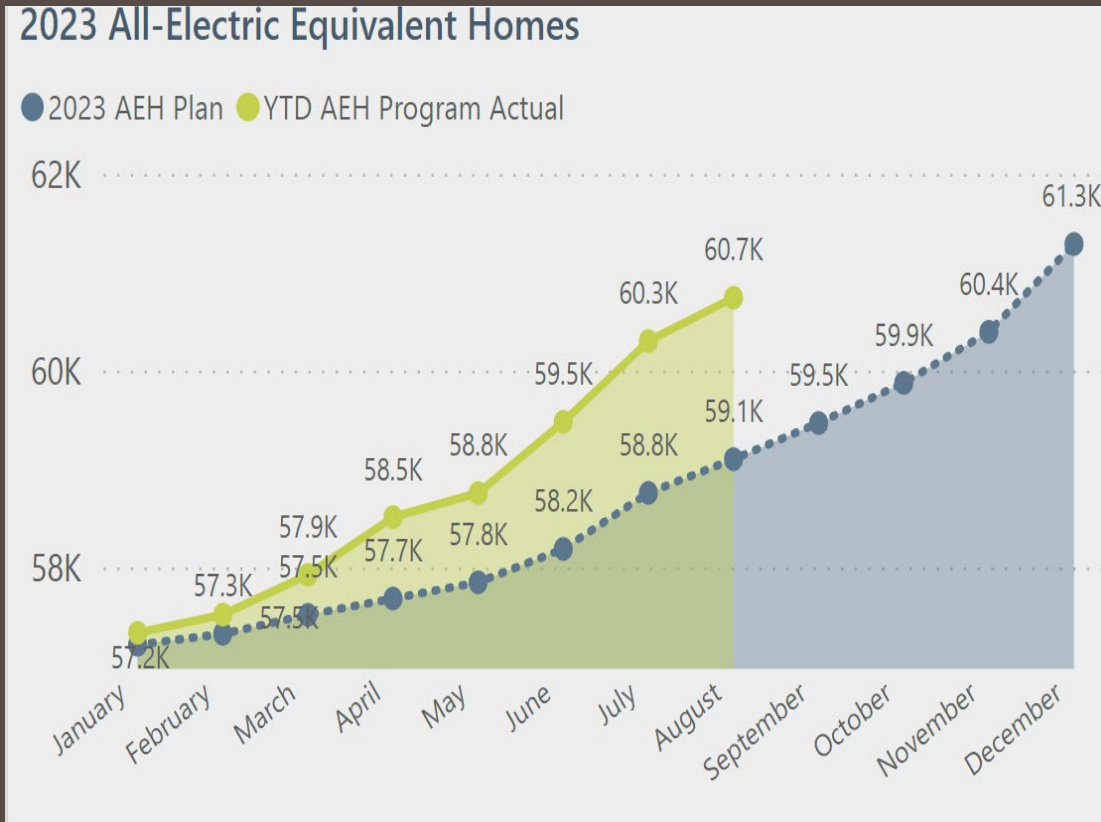
Green pricing

Gives customers the ability to opt in and select a level of renewable and/or carbon-free electricity that meets individual or corporate objectives above and beyond our standard retail rates.



Building Electrification & Energy Efficiency

Customer program portfolio status





Building Electrification and Energy Efficiency Highlights



Sac City VRF - DHW



Sonrisa affordable housing project



Capitol Park multi-family electrification



Sacramento Manor affordable housing electrification project



Mack Road Partnership business walk



Induction cooking demonstration at the CA State Fair



Capital Christian Center - HVAC



Clean Power Savings campaign



¡Estamos aquí para ayudar!
Encuentre los programas que se ajusten a sus necesidades.

Paquetes de ahorro de energía
Beneficios disponibles para inquilinos y propietarios de viviendas. Escanee para obtener más información o visite smud.org/PaquetesDeAhorroDeEnergia.

Programa de Asistencia de Energía (EAPR)
Proporciona un descuento mensual en la factura de energía. Escanee para obtener más información o solicite en línea en smud.org/DeBajosIngresos.

Programa de Porcentaje de Descuento en Equipos Médicos (MED Rate)
Se le ofrece un descuento de \$15 mensuales en su cuenta mensual para clientes con equipo médico que califique. Escanee para obtener más información o solicite en línea en smud.org/DescuentoEnEquiposMedicos.

EnergyHELP
Regístrese para ayudar a las familias en crisis financiera por tan solo unos pocos dólares al mes. Escanee para obtener más información o visite smud.org/AsudaDeEnergia.

Recursos comunitarios
Compartimos recursos para que usted explore y contacte si necesita ayuda, visite smud.org/RecursosDeLaComunidad.

Notas: _____

Para más información llamo al: 1-888-742-7483

Powering forward. Together.

©2023 SMUD. We acknowledge our staff's commitment to building a better future for all.

Multilingual door hangers



Building Electrification and Energy Efficiency

Key metrics & milestones

	2023 Goal	YTD (Aug.)	2023 Forecast
Heat Pump HVAC Conversions	2,180	1748	2,488
Heat Pump Water Heater Conversions	1,020	483	823
Induction Cooktop Conversions	300	271	370
Smart Homes			
• Single-Family Homes	350	364	600
• Multi-Family Units	650	599	973
Multifamily Units Retrofitted	500	841	1,113
Low Income Home Electrification Retrofits	400	526	600
Commercial Electrification GWh-equivalent	3.0	.36	1.63
All Electric Equivalent Homes (Cumulative)	61,287	60,742	62,236

Program milestones:

- Relaunch of Home Electricity Reports with Rate Coach component
- Contractor Network expansion
- Community Impact Plan offerings

Looking ahead:

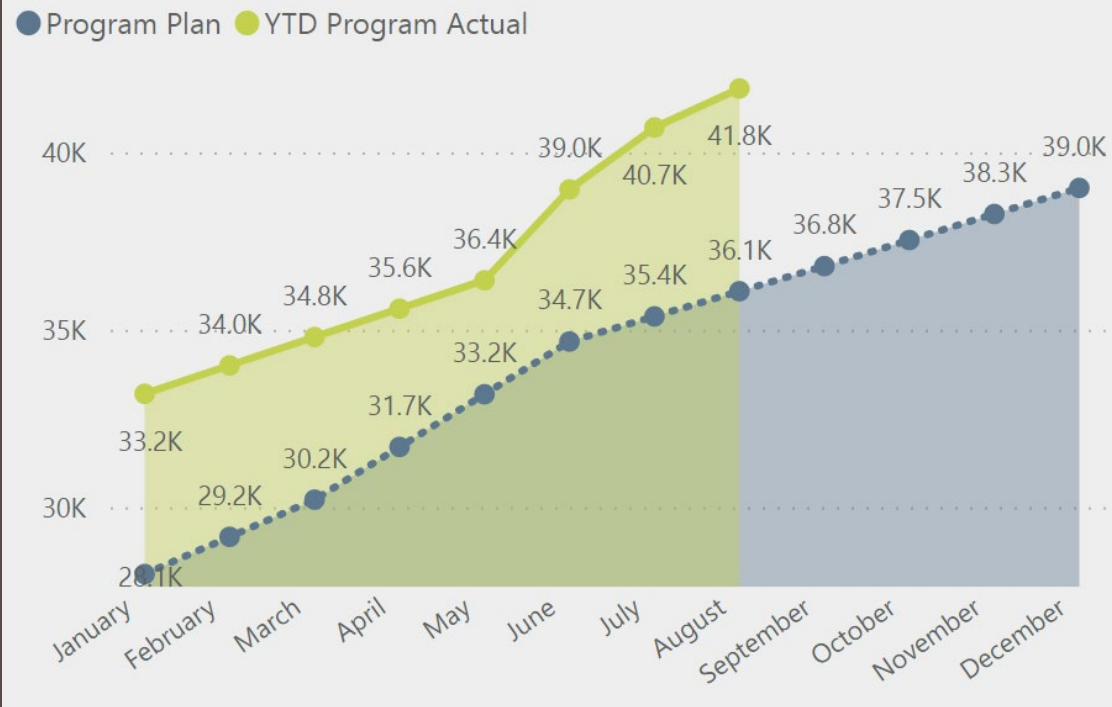
- Carbon Free Loans/Financing
- Coordination with State/DOE IRA programs
- Commercial building electrification offerings
- HPWH Energy Store turnkey offering



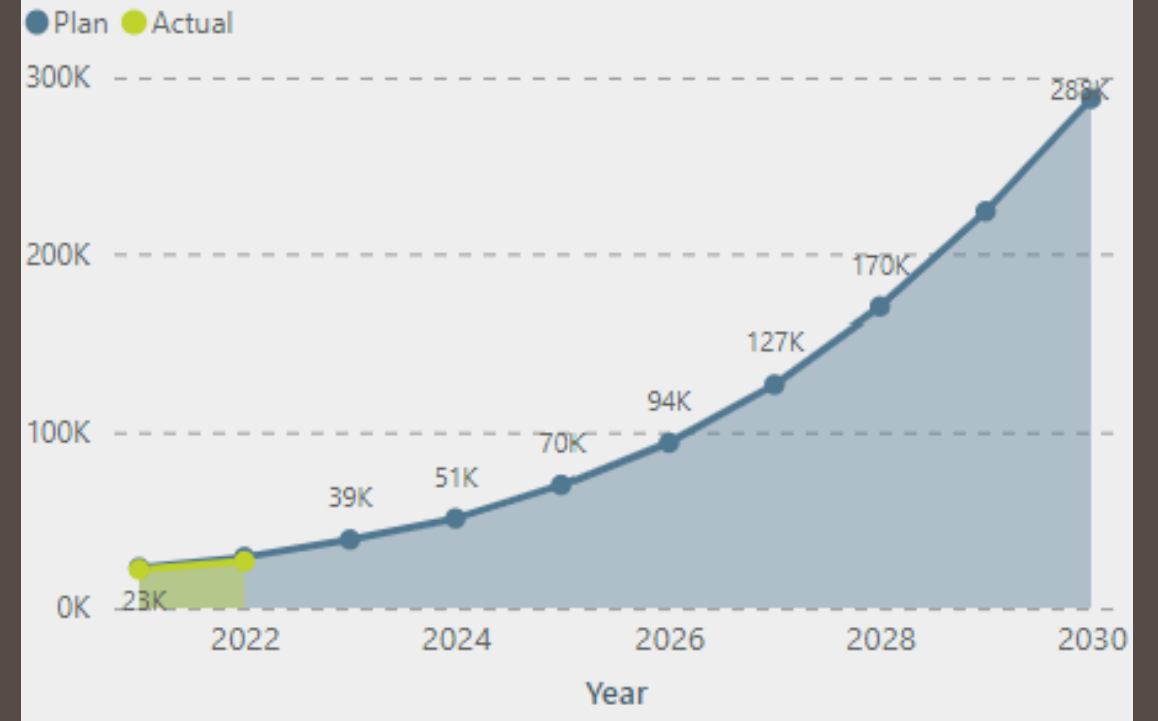
Transportation Electrification

Customer program portfolio status

2023 Electric Vehicles



Electric Vehicles by 2030





Transportation Electrification Highlights



Sac RT Power Inn charging hub



CEO and GM Paul Lau speaking at EVS36



Phoenix Apartments EVSE installation



Mutual Housing – “On The Boulevard” multi-family project

Considering an EV?
Contact SMUD first.
smud.org/DriveElectric

New “Contact SMUD first” marketing campaign



Luciano's Scoop EV truck



Celebrate Oak Park Ride-and-Drive



Charge@Home installation



Transportation Electrification

Key metrics & milestones

	2023 Goal	YTD (Aug.)	2023 Forecast
Charge@Home			
• Charger Rebates	500	1,701	2,250
• Circuit Installations	400	689	1,000
Commercial EV Chargers			
• L1/L2 Charges	210	222	300
• DCFC	25	17	30
Residential EV Rate Participants (Cum.)	22,620	21,352	23,352
Low Income EVSE Installations			
• Chargers Installed	200	75	100
• Circuits Installed	150	251	275
eFuel Commercial Program			
• Assessments	15	13	20
• Projects	4	0	2
Managed Charging Pilot Participants (Cum.)	1,000	901	1,400
# of Light Duty EV's in Service Territory (Cum.)	39,000	41,803	46,000

Program milestones:

- Energy Store home charger installation partnership with QMerit
- ChargeReady Community (REACH 1.0) projects
- Multi-Family charging solutions
- Centralized EV support

Looking ahead:

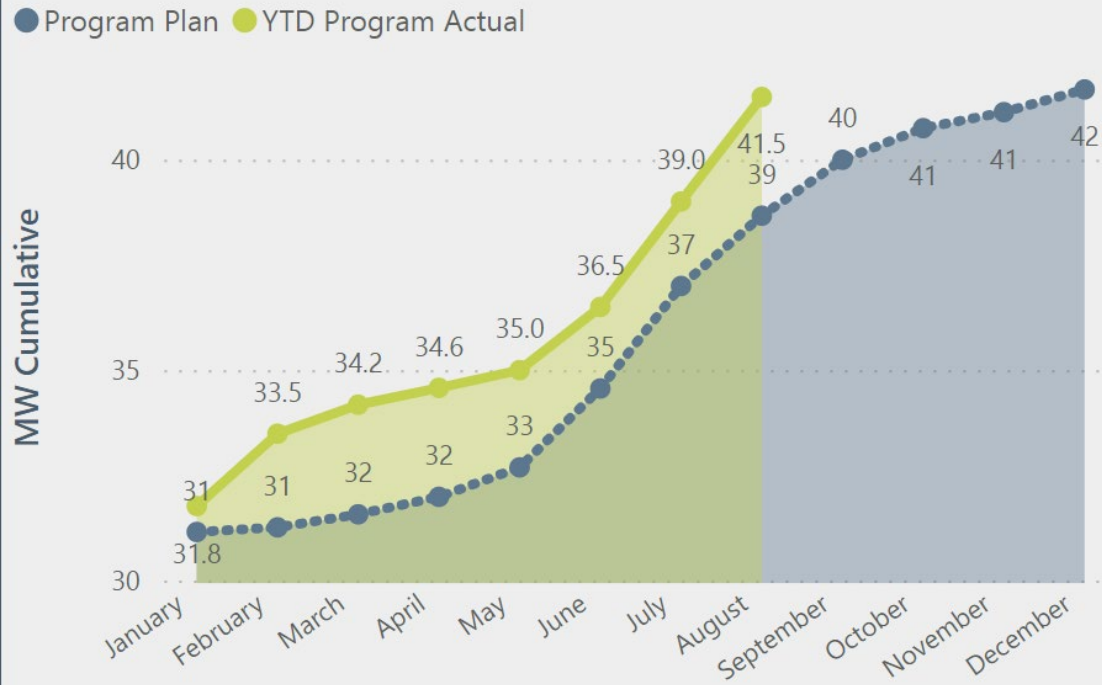
- Resumption of Clean Fuel Rewards statewide program
- Managed Charging program development
- EV data repository
- Multi-Family REACH 2.0 Grant



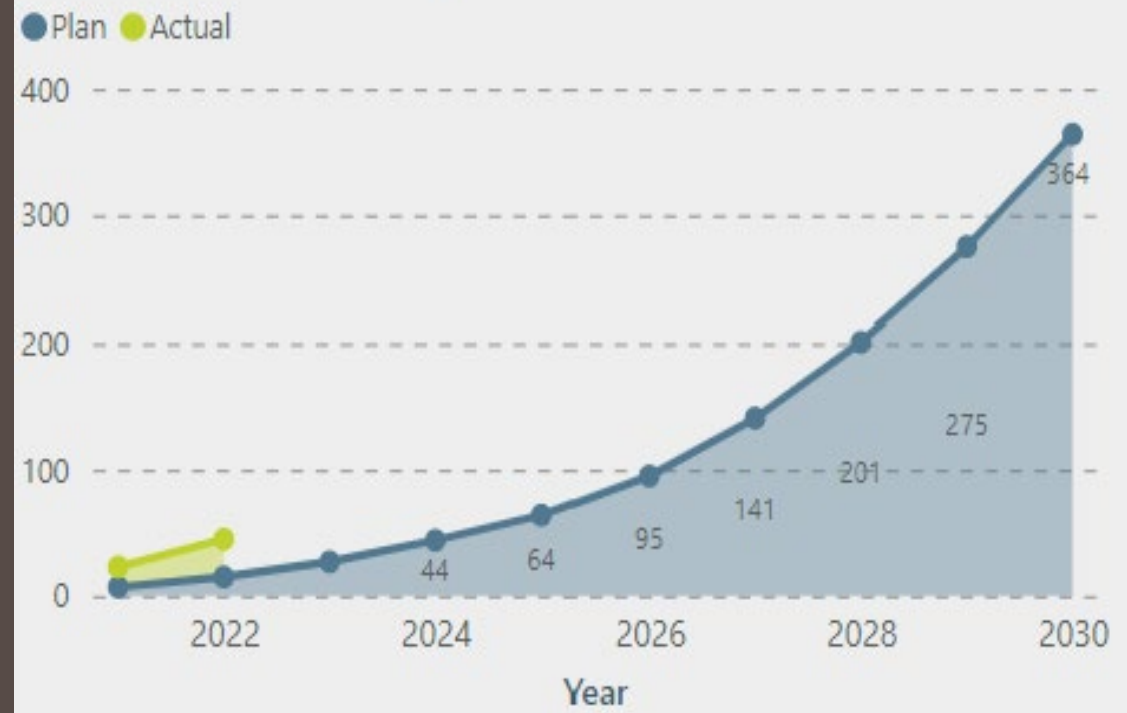
Distributed Energy Resources/Load Flexibility

Customer program portfolio status

2023 Distributed Energy Resources (DER)



DER Cumulative MW by 2030





Distributed Energy Resources/Load Flexibility Highlights



My Energy Optimizer (MEO) smart thermostats



MEO Partner+ Tesla Battery installation



Marketing campaign for battery storage incentives



Peak Conserve switch installation



PowerDirect - Carmichael Water Treatment Plant



Distributed Energy Resources/Load Flexibility

Key metrics & milestones

	2023 Goal	YTD (Aug.)	2023 Forecast
My Energy Optimizer • Smart Thermostats enrolled (Cum.)	16,000	20,817	22,000
My Energy Optimizer Batteries enrolled (Cum.) • Starter • Partner+	306 400	288 13	306 100
Peak Conserve (NextGen ACLM) enrollments	2,000	673	1,300
Commercial PowerDirect MW enrolled (Cum.)	20.2	20.5	20.5
Total MW (Cumulative)	42.0	41.5	44.1

Program milestones:

- My Energy Optimizer Partner+ Battery Storage program launch
- My Energy Optimizer Thermostat Critical Peak Pricing expansion
- Peak Conserve program launch
- PowerDirect expansion

Looking ahead:

- Expansion and scaling
- Coordination with state programs
- My Energy Optimizer multi-DER platform



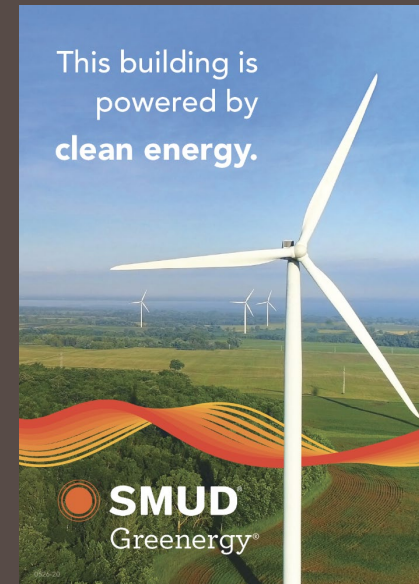
Green Pricing Programs Highlights



Potrero Homes – Neighborhood SolarShares



Wildflower PV Array – North Sacramento



Greenergy commercial and residential marketing campaigns:

- Business window cling
- Sac Business Journal
- Customer bill insert
- Social media





Green Pricing Programs

Key metrics & milestones

	2023 Goal	YTD (Aug.)	2023 Forecast
Residential Greenergy customers	69,000	65,005	62,446
Commercial Greenergy customers	2,244	1,542	1,550
Neighborhood SolarShares <ul style="list-style-type: none"> • Enrolled premises (Cum.) • Premises reserved 	405 3,900	967 3,686	1,168 3,900
Commercial SolarShares <ul style="list-style-type: none"> • Customers • Accounts 	30 436	30 436	30 437
Total Qualifying GWh Sales	770	513	645

Program milestones:

- Development of SolarShares program for Low & Median Income (LMI) customers
- Planning for Community Solar for schools & non-profits

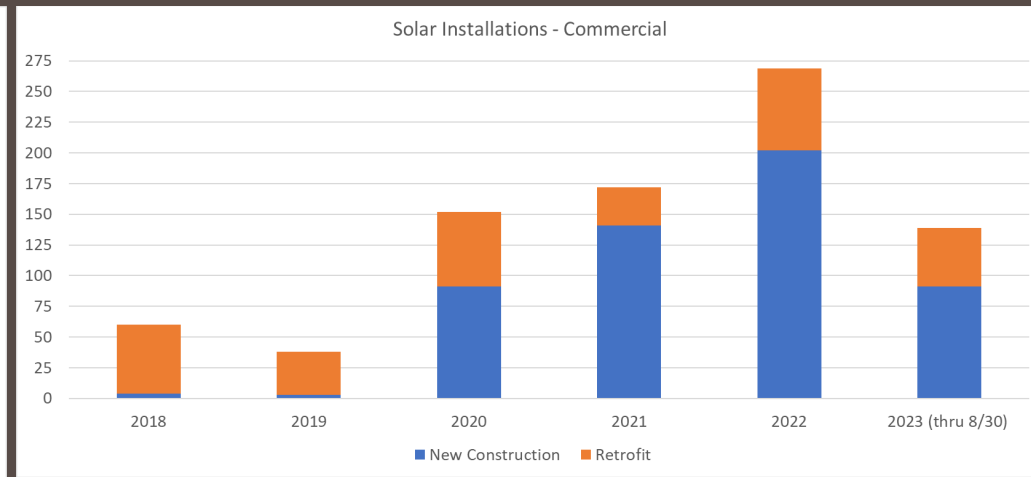
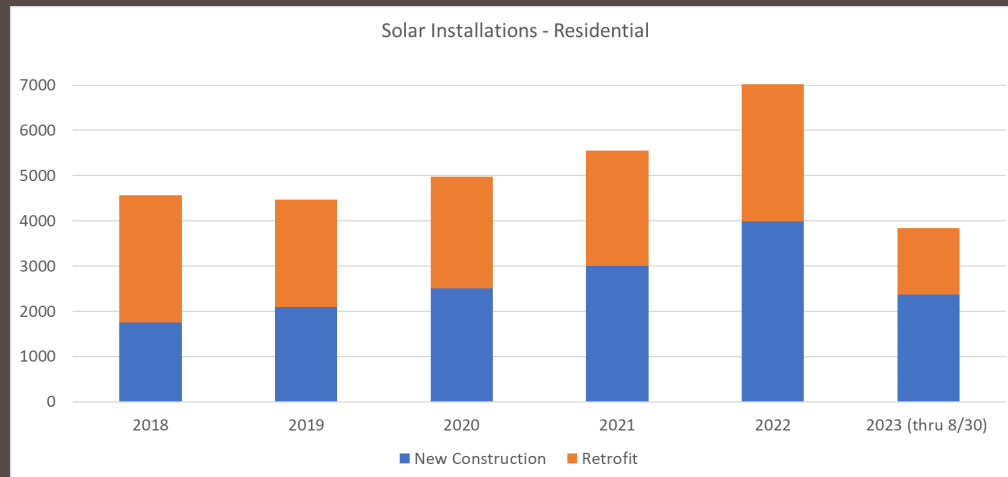
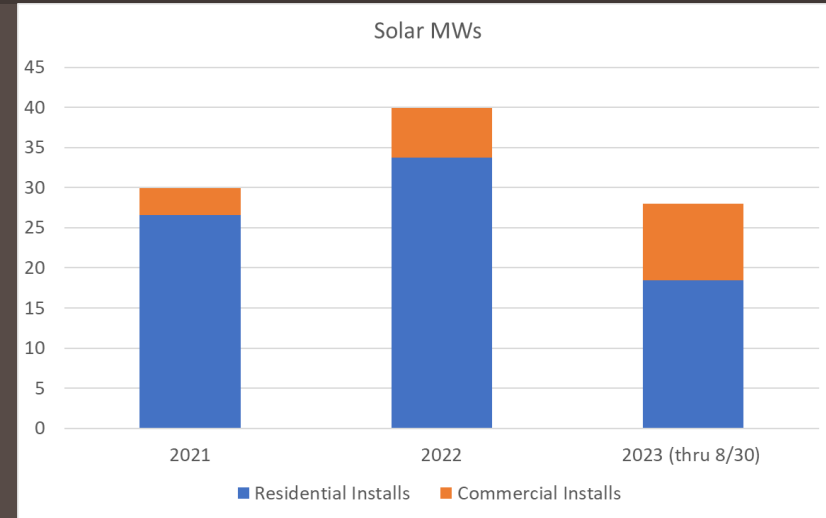
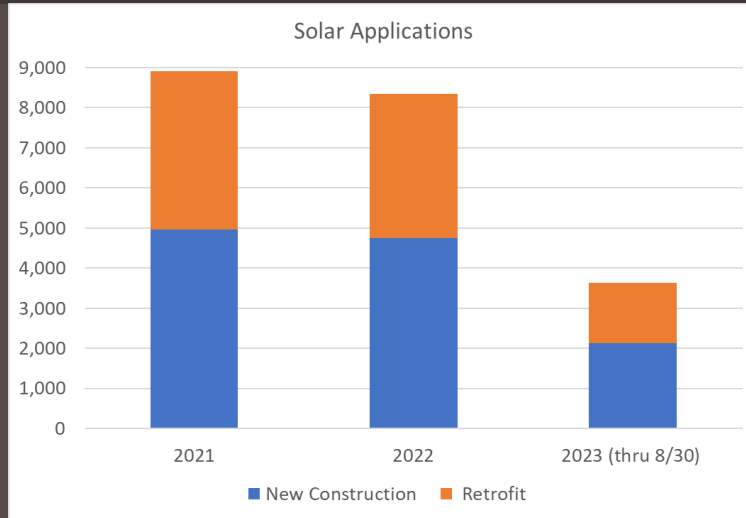
Looking ahead:

- Community Solar resource planning and development
- Planning for Commercial Renewable Shares offerings



2023 Progress

Solar: Behind the Meter



END