

Presentation starts at 12:00 PM



# City of Palo Alto Utilities Facility Manager's Meeting

April 23, 2024

# Welcome

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We extend our heartfelt thanks to our gracious host, B.B. Patel, and the entire team at the Palo Alto Cabana Hotel.



We deeply appreciate everyone's participation in learning, networking, and experiencing a site tour of the hotel's innovative Heat Pump HVAC system.





# Introductions & Agenda

Hiromi Kelty  
Manager, Utility Program Services

## 6 Utilities, more than 120 years of history

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Water (1896)



Wastewater (1898)



Electric (1900)



Gas (1917)



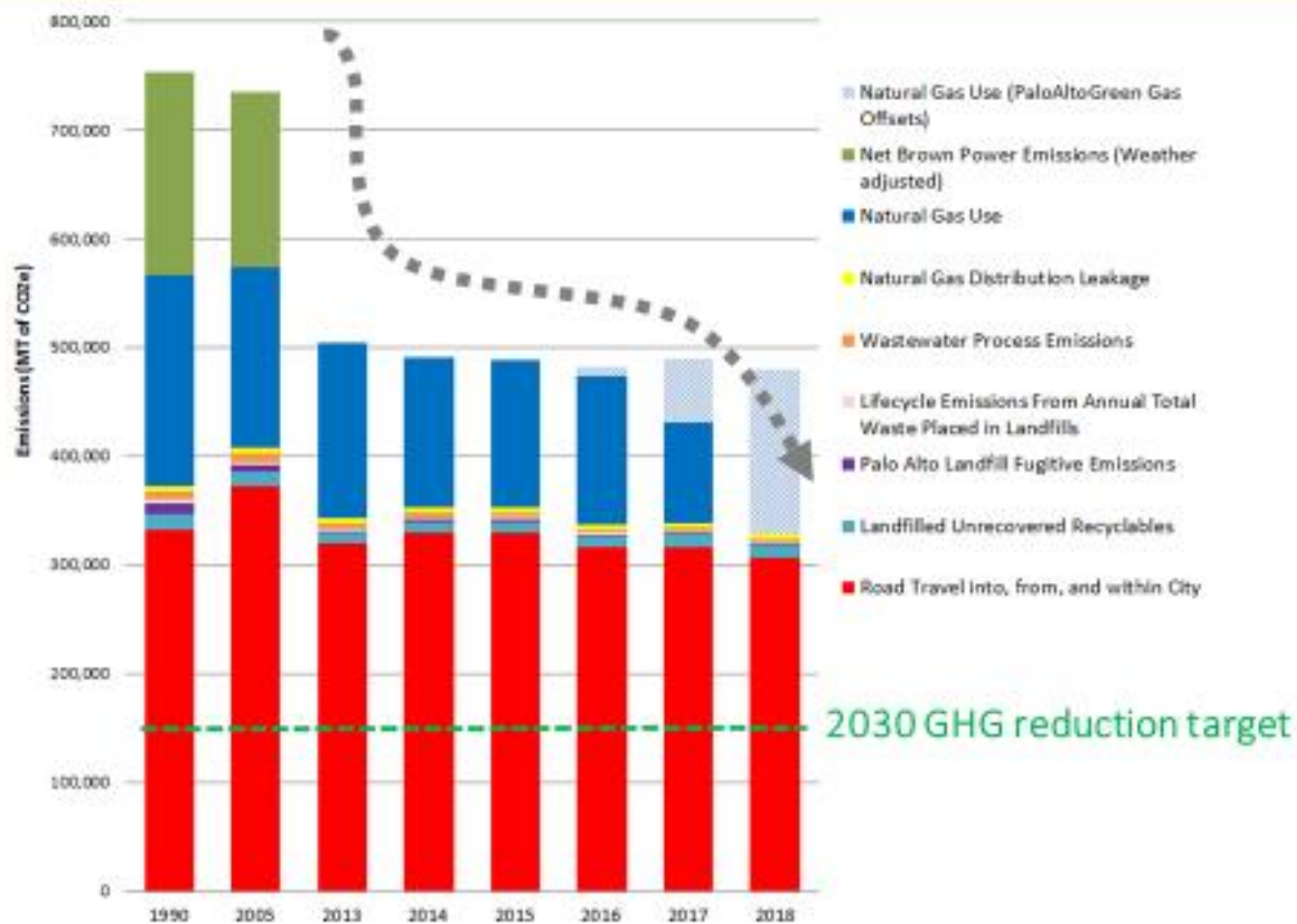
Storm Drain (1898\*)



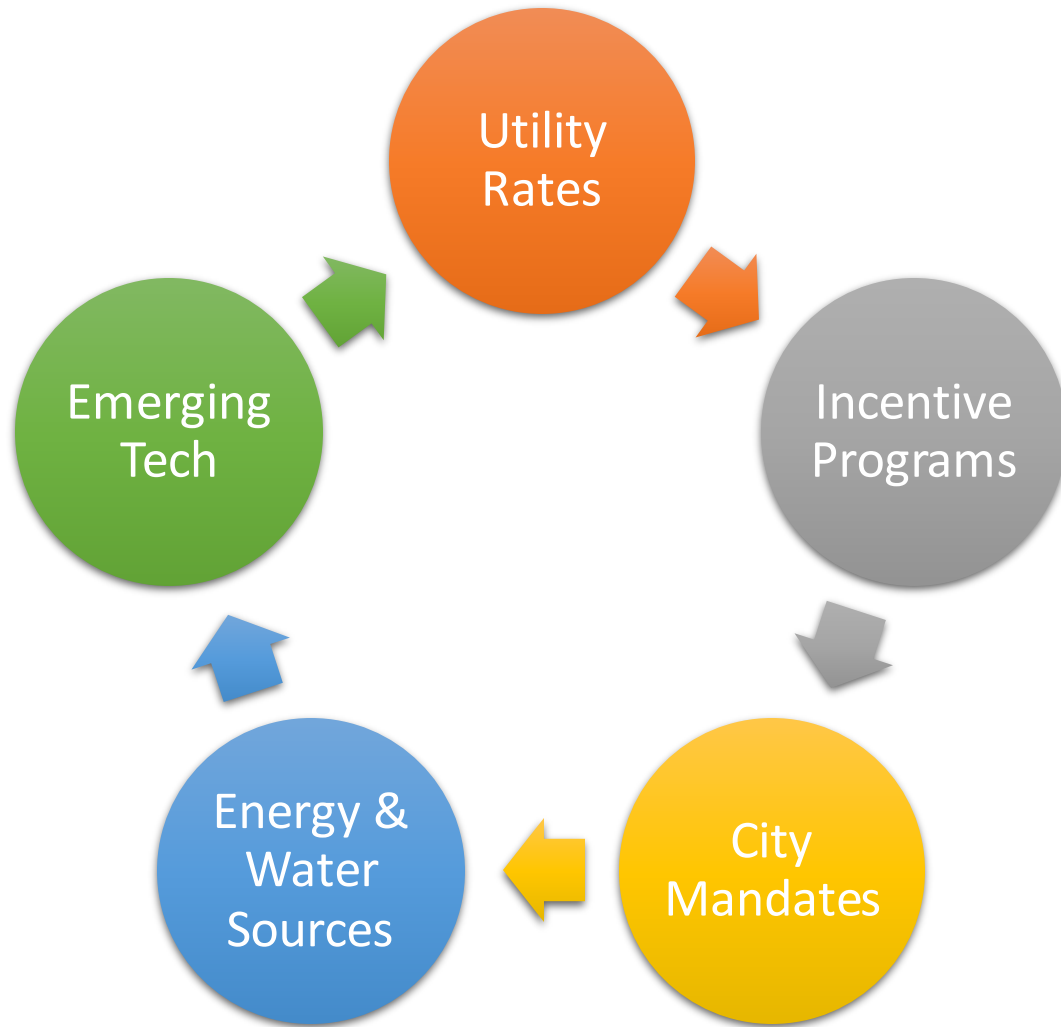
Fiber (1996)



## CO<sub>2</sub> savings mostly from renewable electricity & natural gas offsets – what's next?



# Led by Palo Alto City Council, CPAU has many levers to help lower CO<sub>2</sub>



1. 100% carbon-free electricity portfolio (with lower rates)
2. 100% carbon-neutral natural gas
3. All-electric mandate for new residences
4. Efficiency programs ≈ to removing ≈ energy usage of 800 homes/yr.
5. Highest EV adoption in the nation (30% surveyed)
6. 2.5% of electricity from in-city local solar
7. **Swapping gas space & water heaters for new electric heat-pumps**

# Four Personality Topics

Let's get to know each other better! What traits best describe you?



Logistics, Data Driven, Structure, Lists, Organization

1



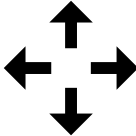
Intuition, Friendly, Social Harmony, Big Vision, Empathetic

2



Strategy, Goals, Deliberate, Rational, Efficiency

3



Tactics, Independent, Fearless, Movement, Spontaneity

4

## “Guardians”

- Detail-oriented
- Organized
- Industrious
- Analytical skills
- Decision maker



## “Idealists”

- Open
- Outgoing/Sociable
- Harmony
- Commitment to justice and peace



## “Rationals”

- Visionary
- Purposeful
- If you are going to do something, do it right
- Relies on facts and logic



## “Artisans”

- Always moving
- Clever
- Can be deceptive but charming
- Thrifty – but can be outrageous




# Agenda

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1. Introduction
2. Heat Pump Water Heater Installment Case Study (Dolphins)
3. Business Electrification Boosted Incentives (Owls)
4. Water Conservation Programs (Beavers)
5. Meterlinks and AMI (Beavers/Owls)
6. Q&A and Survey (Dolphins)
7. Tour of Cabana Hotel's New Heat Pump HVAC System (Foxes)





# Heat Pump Water Heater at City Hall – Case Study

Jesus Prado

Key Account Manager

# Heat Pump Water Heater at Palo Alto City Hall

 Project Description

 Unit and System

 Economics

 Lessons Learned

 How to get started

## CASE STUDY

### NEW HEAT PUMP WATER HEATER AT PALO ALTO CITY HALL



<b>Building Year Built</b>	1967
<b>Building Size</b>	86,496 sq. ft.
<b>Project Details</b>	Replaced commercial gas-powered water heater with a Electric Heat Pump Water Heater (HPWH)
<b>Project Date</b>	December 2023
<b>CPAU Rebate</b>	\$3,500
<b>Manufacturer</b>	State Water Heater—Model CSHP120



#### Project Description

The Palo Alto City Hall building, located at 250 Hamilton Ave, serves as a central hub for various city services, including the Police Department, Human Resources, IT, Legal, divisions of Utilities, Planning & Development, Public Works, and the City Manager's Office. The city plays a vital role in leading by example and prioritizing building electrification across its range of structures. Through the alignment of facility repairs and upgrades, Palo Alto aims to set a precedence for other commercial customers, becoming a pioneer in sustainable urban development.

In December 2023, the city replaced its aging gas-powered water heater at 250 Hamilton Ave, which supplied hot water to washrooms and kitchens. The 14-year-old AO Smith Model BTN 250A 108 (100-gallon) unit had reached the end of its useful life and was showing signs of minor leaking.

Facility management enhanced the water heating system by replacing the gas-powered water heater unit with a 119-gallon electric heat pump water heater (HPWH)—State Water Heater—Model CSHP120, while preserving the 300-gallon reserve tank as a fundamental element of the system. A dedicated 60-amp service was added for the new electric load.

#### Unit & System Benefits

CPAU chose a unit with energy-saving features, specifically designed for commercial use. It utilizes industry-leading heat pump technology, proving a more efficient way to heat water with electricity. By pulling heat from the surrounding air and transferring it into the tank, it operates at an industry leading 4.2 coefficient of performance (COP). The integrated 119-gallon storage tank maximizes performance and energy savings.

# Project Stats

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Emergency Heat Pump  
Water Heater Project in  
December 2023



Building built in 1967



8 floors and +86K  
square feet of office  
space



Replaced a 14-year-old  
AO Smith 100-gallon  
water heater



Replace with a State  
Water Heater 119-  
gallon electric HPWH



A dedicated 60-amp  
service was added for  
the new electric load

# Economics

Project Item	Cost	-	Rebates	=	Total
Heat Pump Water Heater	\$8,060				
Electrical Upgrades	\$6,000				
Installation Costs	\$4,860				
Removal and Pickup	\$1,000				
Permits	\$520				
Structural Calculation	TBD				
Electrical Panel Load Schedule	TBD				
Title 24 Compliance	TBD				
CPAU Electrification Rebate			(\$3,500)		
<b>Net Project Cost</b>					<b>\$16,940</b>

# Lessons Learned

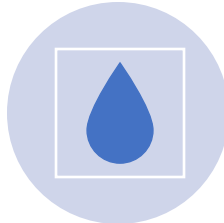
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GET MULTIPLE  
QUOTES



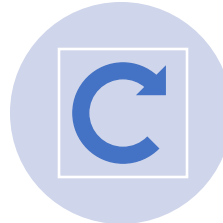
BE SPECIFIC ABOUT  
THE MINIMAL  
REQUIREMENTS,  
RATINGS, AND  
PERMIT  
APPLICATION AS  
PART OF THE BID



COMPARE UNIT  
ENERGY-EFFICIENCY  
OPTIONS



EVALUATE THE  
PLACEMENT OF A  
NEW HPWH TO  
ENSURE THERE IS  
SUFFICIENT SPACING  
AND CIRCULATING  
AIR SOURCES



MODIFICATION MAY  
BE NEEDED  
ACCOMMODATE TO  
PLUMBING AND  
ANCHORAGE  
SYSTEM



EVALUATE THE  
CURRENT  
ELECTRICAL SERVICE  
PANEL



Business Energy Advisor

Business Electrification Technical  
Assistance Program

Shelby Sinkler

Sustainability Programs Manager

# Boosted Business Rebates

Available until May 31<sup>st</sup>, 2024

- Businesses that participate in the Business Electrification Technical Assistance program receive DOUBLE rebates for projects completed by 5/31/24.
- Customers must receive an assessment to prequalify.
- Contact me if you are interested:  
Shelby.Sinkler@cityofpaloalto.org



## ELECTRIFICATION REBATES HAVE DOUBLED!

Electrification Measure	Rebate per Unit	
	Before	NOW!
Packaged Heat Pump	\$650/ton	\$1,300/ton
Heat Pump Water Heater	<55 gal \$2,500	<55 gal \$5,000
	55.1-75 gal \$3,000	55.1-75 gal \$6,000
	>75.1 gal \$3,500	>75.1 gal \$7,000
Convection Oven	Half size \$1,200	Half size \$2,400
	Full size \$2,500	Full size \$5,000

For more information, go to [cityofpaloalto.org/businesseselectrification](https://www.cityofpaloalto.org/businesseselectrification)

Electrification incentives are capped at 50% of the project cost, or \$100,000, whichever is less.



# Free Commercial Energy Efficiency Webinar

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**Webinar this Thursday, April 25<sup>th</sup>, 11-11:50 am**

- Hosted by CPAU and CLEAResult
- A discussion with industry experts to learn ways to save on your utility bills, best energy efficiency practices and strategies for commercial buildings.
- Session focused on HVAC and Lighting.
- Learn more about the Business Energy Advisor and Business Electrification Technical Assistance programs.

**Scan the QR code  
to register**



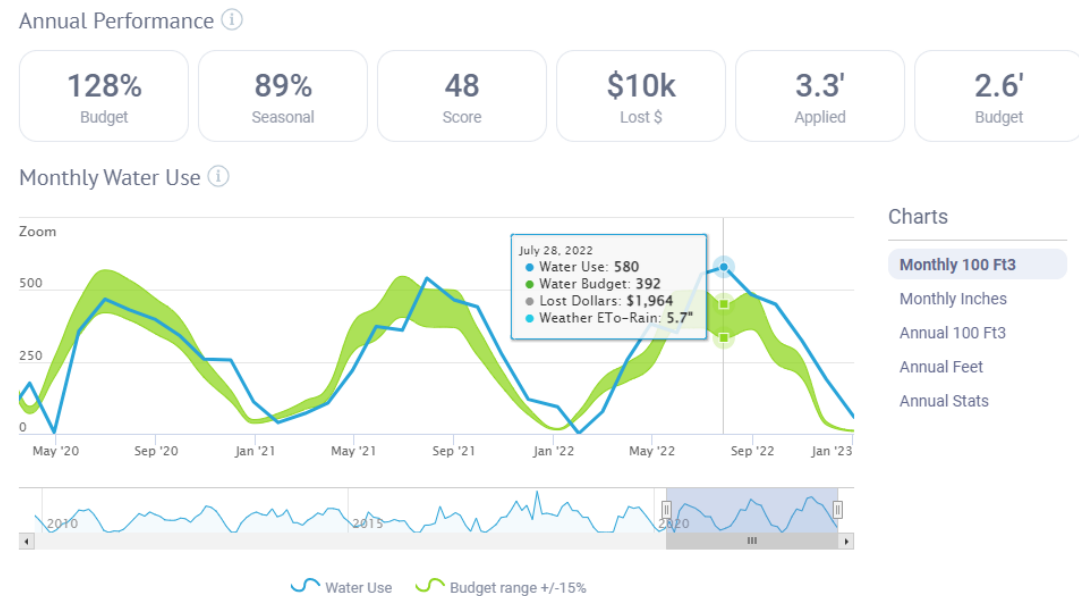


# Water Conservation Programs

Linda Grand  
Water Programs Manager

# Waterfluence – Irrigation Budget Program

- Free tool to help you save water and money
- Improve the efficiency of your large landscape
- Real-time weather and site-specific monitoring
- Detection for possible problems, like water use spikes
- Field surveys



[www.waterfluence.com](http://www.waterfluence.com)



# Water Conservation Rebates & Resources

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- Rebates to help offset costs of water efficiency projects
- Lawn to Mulch Rebate – \$2 per sq. ft., rebate cap of \$110,000
- Landscape Conversion Rebate – \$4 per sq. ft., rebate cap of \$120,000
- Irrigation Upgrade Rebates



Scan for office hours:



Meet with a water expert from CPAU to learn more about your water usage.



# Meterlinks & Advance Metering Infrastructure

Brian Ward

Key Account Manager

# Meterlinks Program Update



Meterlinks program will end operations 6/30/2024



Meterlinks is a software program implemented in 2000



Designed to provide commercial customers the ability to view their electric meter consumption data. kWh, KW KVar



Meter data can be viewed in 15-minute, daily, and monthly intervals

Enabled facility managers to gain insights into energy consumption, track reductions, and minimize waste



Required as part of our Demand Response



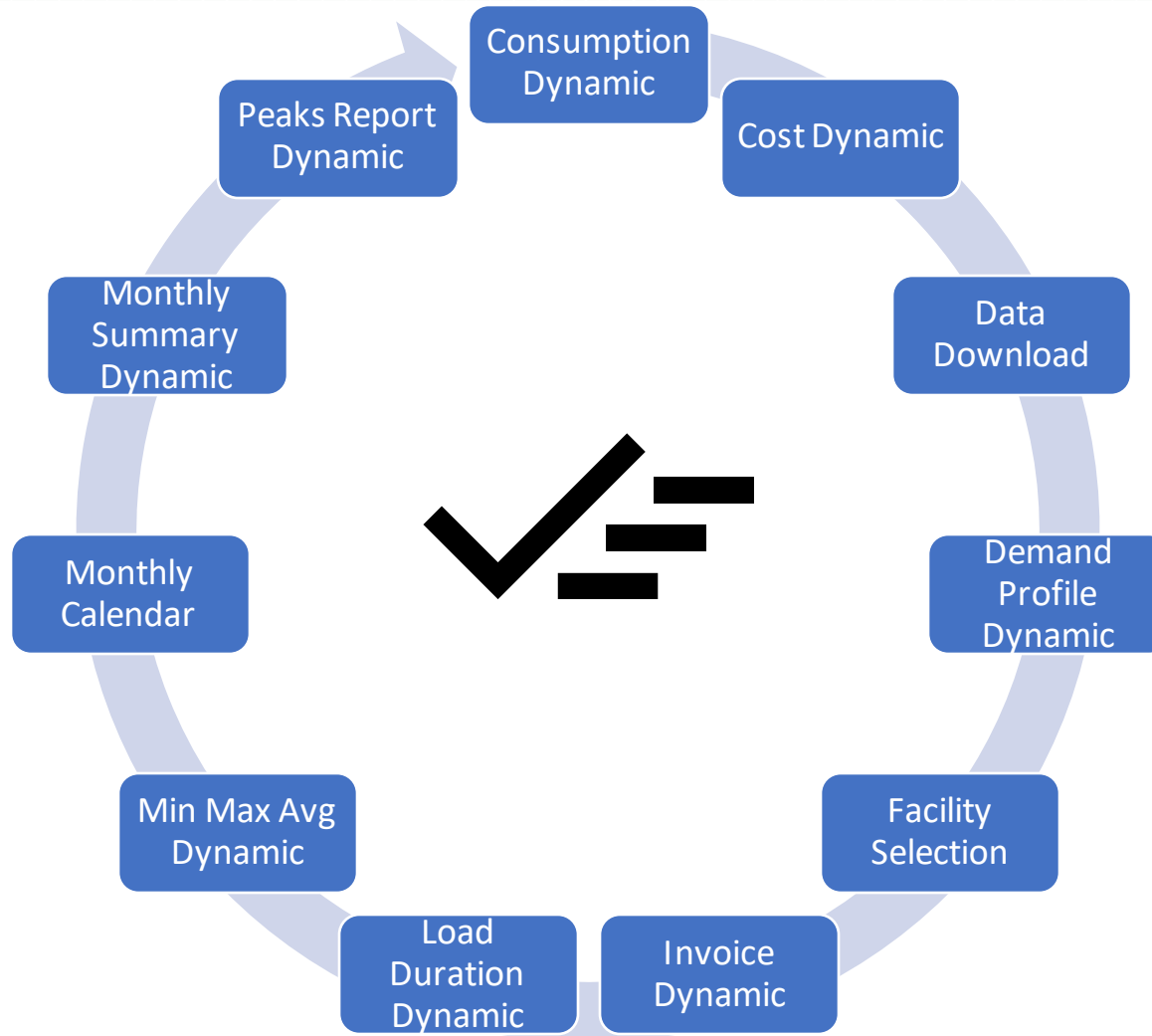
+ 24 hours (next day) not real time



Requires phone line to meter then digital and cellular

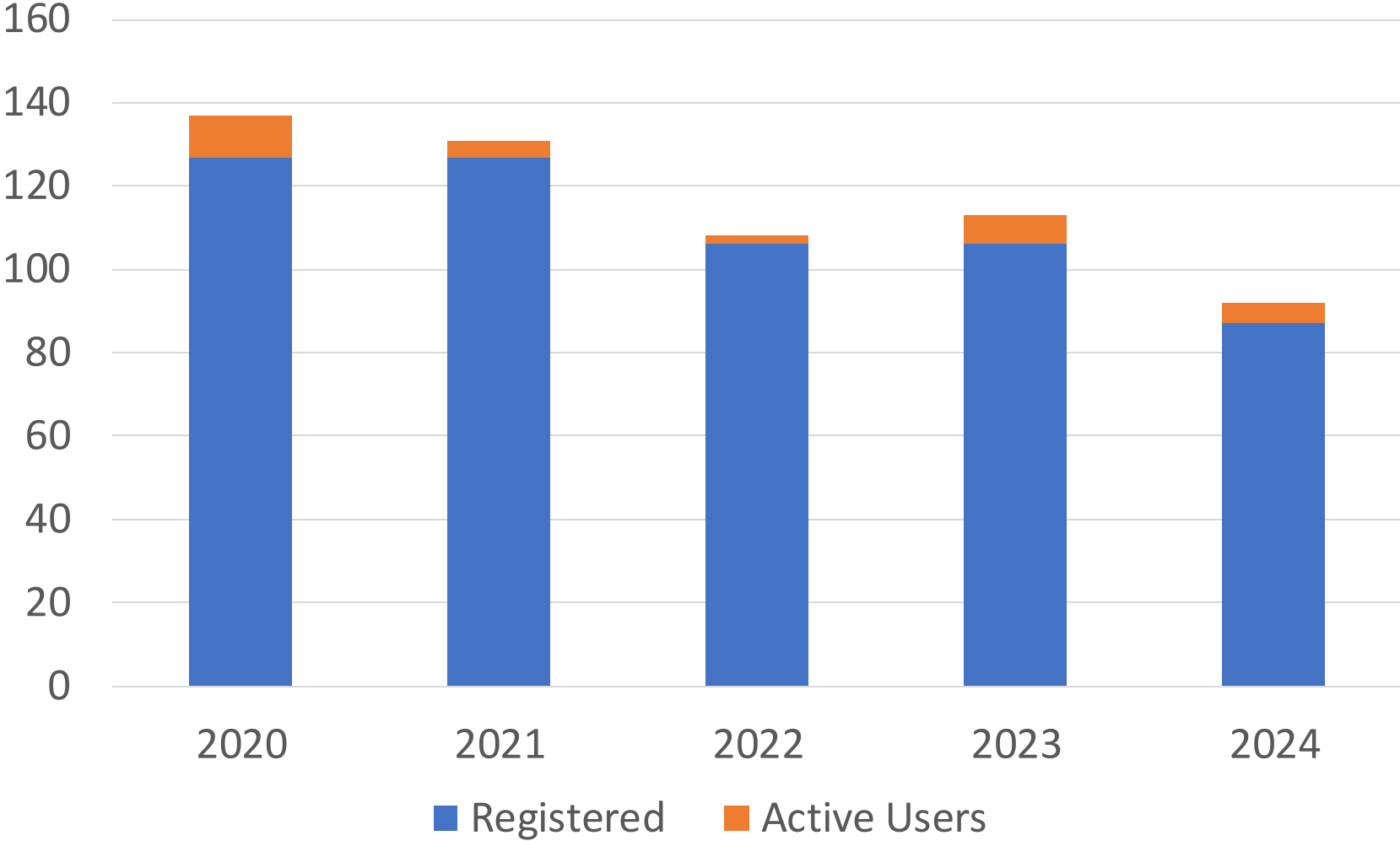


# Meterlink Program Success



# By the Numbers

Meterlinks Participation

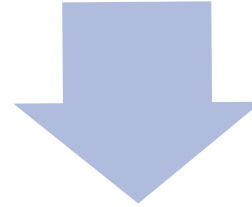




# AMI – Advance Metering Infrastructure “Smart Meters”

## Benefits

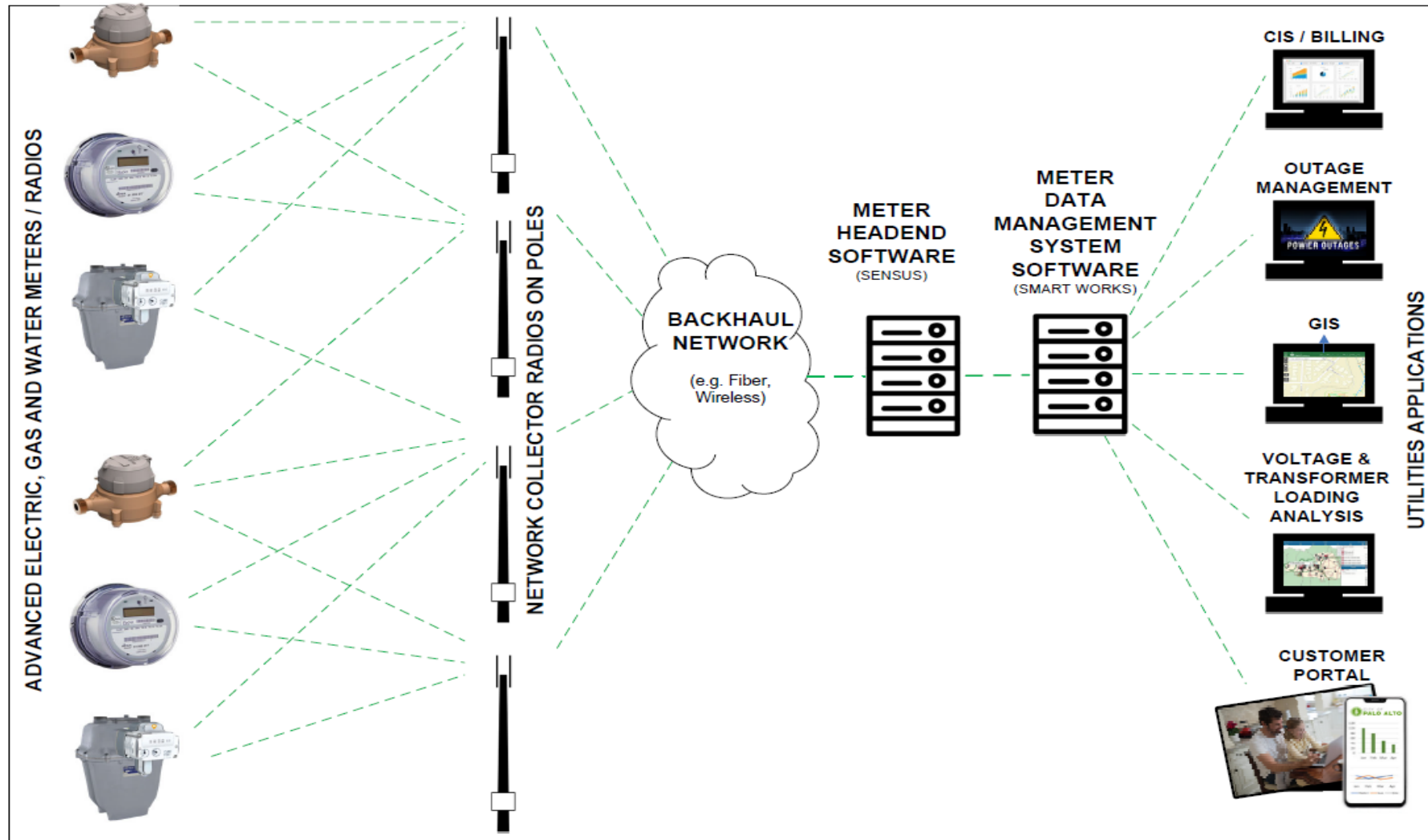
- Improved Meter Reading Accuracy and Reduction High Bill Complaints
- Reduction in Meter Reading Cost & Meter Reader Injuries
- Ensure accurate billing and help customers better understand usage behavior.
- Maintain and Improve reliability
- Improved Water Resource Management
- AMI Data will be available on the MyCPAU utility portal.



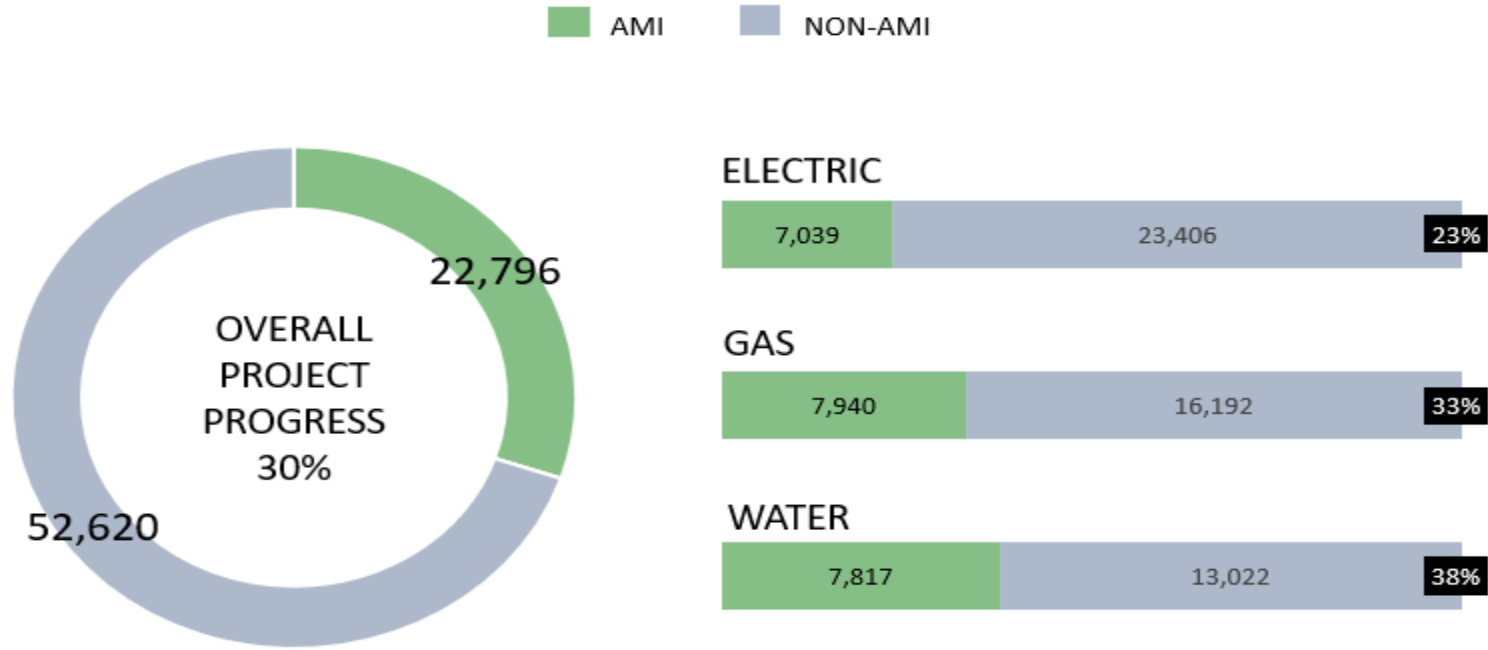
<https://youtu.be/TnAwmQG4Emg>



# AMI Smart Meters



# AMI Smart Meter Status



Full deployment of all meters by Q4 2024

# Contact Information

Brian Ward

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Linda Grand

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Hiromi Kelty

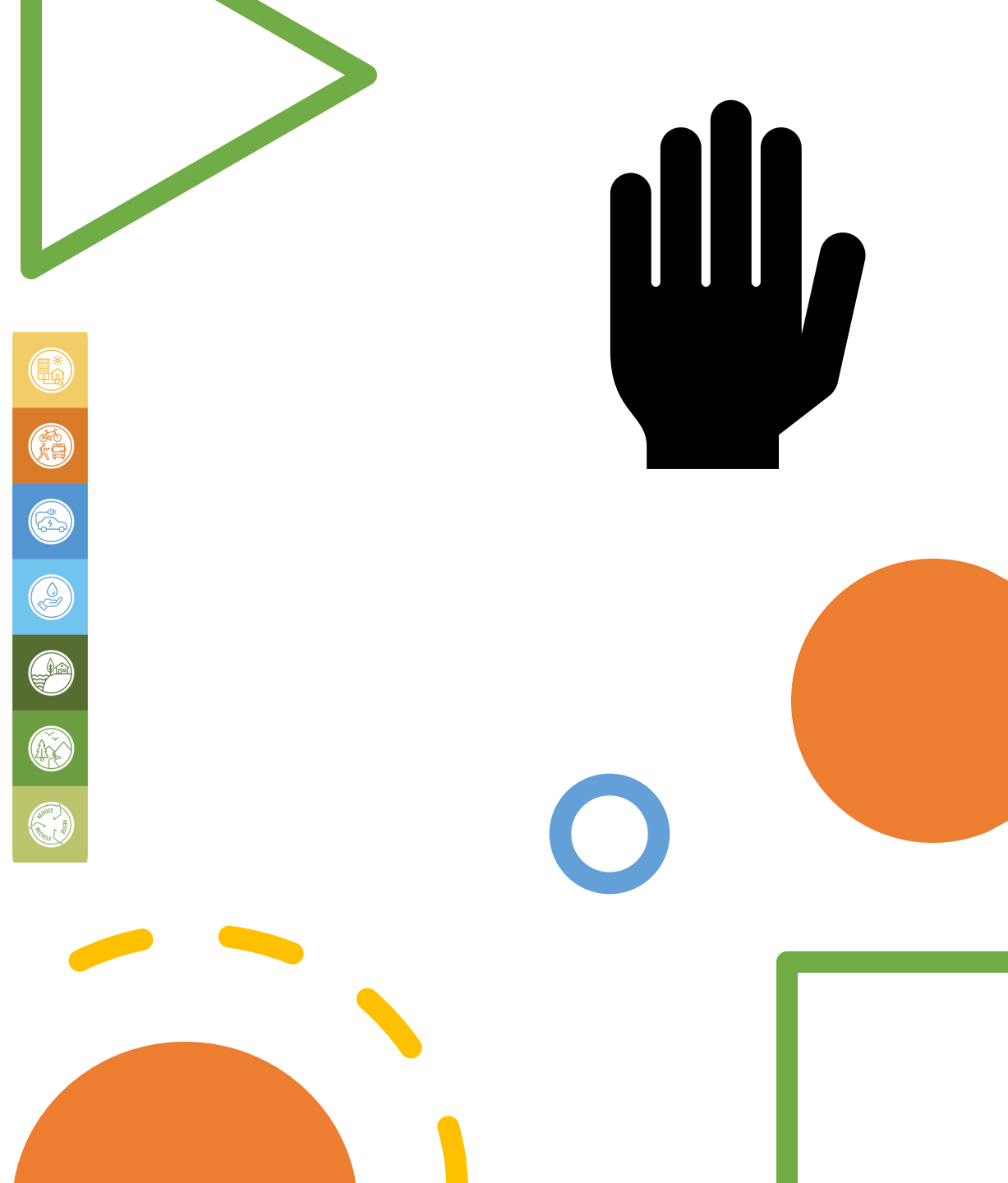
[hiromi.kelty@cityofpaloalto.org](mailto:hiromi.kelty@cityofpaloalto.org)

Alexandra Harris – (Dark Fiber Services)

[alexandra.harris@cityofpaloalto.org](mailto:alexandra.harris@cityofpaloalto.org)



# Question and Answers



# Presentation Survey



**What size category does your business fall under?**

- Small to Medium (under 50K sq. ft.)
- Large (over 50K sq. ft.)

**I found value in this meeting.**

- Strongly Agree
- Agree
- Disagree

**How likely would you recommend the next meeting to a colleague?**

- Very Likely
- Likely
- Not Likely

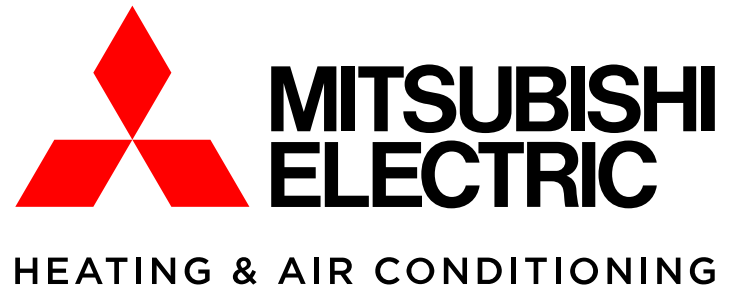
**What topics did you find most valuable? (Select all that apply)**

- Heat Pump Water Heater Case Study
- Business Electrification Boosted Incentives
- Water Conservation Programs
- Meter Links and AMI

**What topics would you like to hear about at future meetings?**

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## System benefits

- Easy retrofit especially in older facilities
- Modular turndown is good
- System will self-diagnose (sensors or codes)
- Easy to repair
- Repair cost tend to be lower
- \$3500 per ton cost to install
- Lower operating cost no need to run the whole building



# Heat Pump HVAC System Tour

- Tour – 15 minutes
- You can leave your belongings here
- The tour concludes the presentation. Thank You!