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Reach Codes Workshop for Elected Officials

September 29, 2022

2022 Reach Codes

Enabling a faster, lower-cost transition to clean buildings and transportation
September 2022

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Agenda

Five key questions:

1. Why Reach Codes?
2. What have other cities done?
3. What questions are citizens asking?
4. What are the options for 2022?
5. What are the next steps?

Why Reach Codes?

Only local elected officials have the power to ensure that development is pollution-free, efficient, and future-ready.

Most emissions in our region come from buildings and transportation.

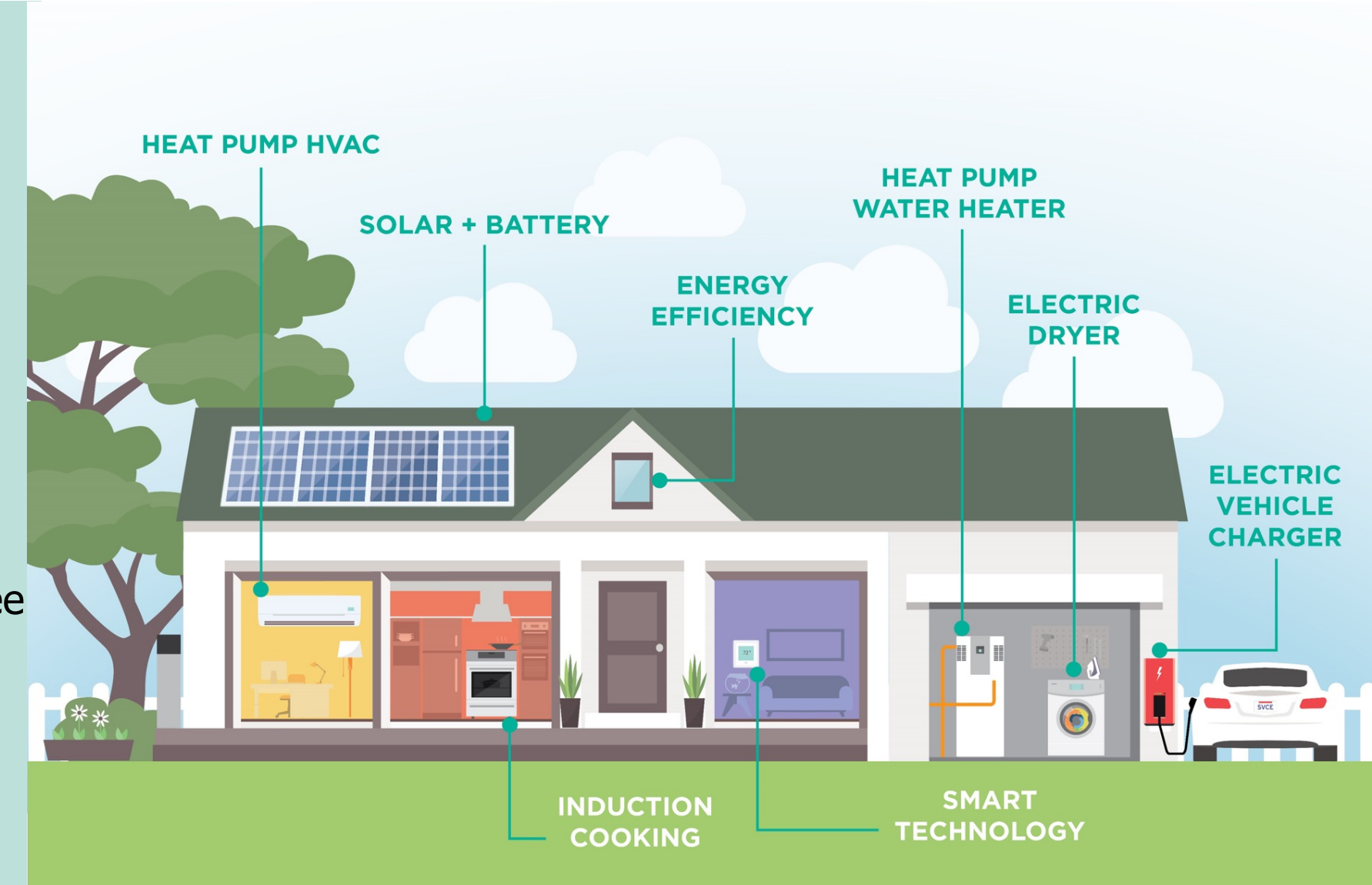
~30%

~50%

Approximated emission proportions based on internal SVCE/PCE analysis

Reach codes help the development of today meet the needs of tomorrow.

- What we build now will last 50-70 years.
- Building all-electric protects communities from rising gas prices as the system shrinks.
- Reach codes ensure these buildings will be pollution-free and future-ready.



Reach codes enable a faster, lower-cost transition to clean energy.

2022 State code	vs	With all-electric reach codes
~50k homes with gas water heating		~50k homes with heat pump water heating
~$25M locked-in replacement cost from gas to electric		$0 replacement cost
$0 savings at the time of construction		~$85M savings at the time of construction
~50,000 annual MT carbon pollution from new water heaters		0 MT carbon pollution from new water heaters
~20,000 families without access to home EV charging		~20,000 more families with reliable home EV charging

*Illustrative example for the next five years. Assumes housing construction happens according to RHNA mandates and is built evenly across years.

What have other cities done?

More than 50 jurisdictions across California have adopted electrification reach codes.

Most Californians now live in communities with a reach code.

Reach codes are not one size fits all.

29 Member Agencies Adopted Reach Codes in 2019

SVCE & PCE 2019 Member Agency Accomplishments

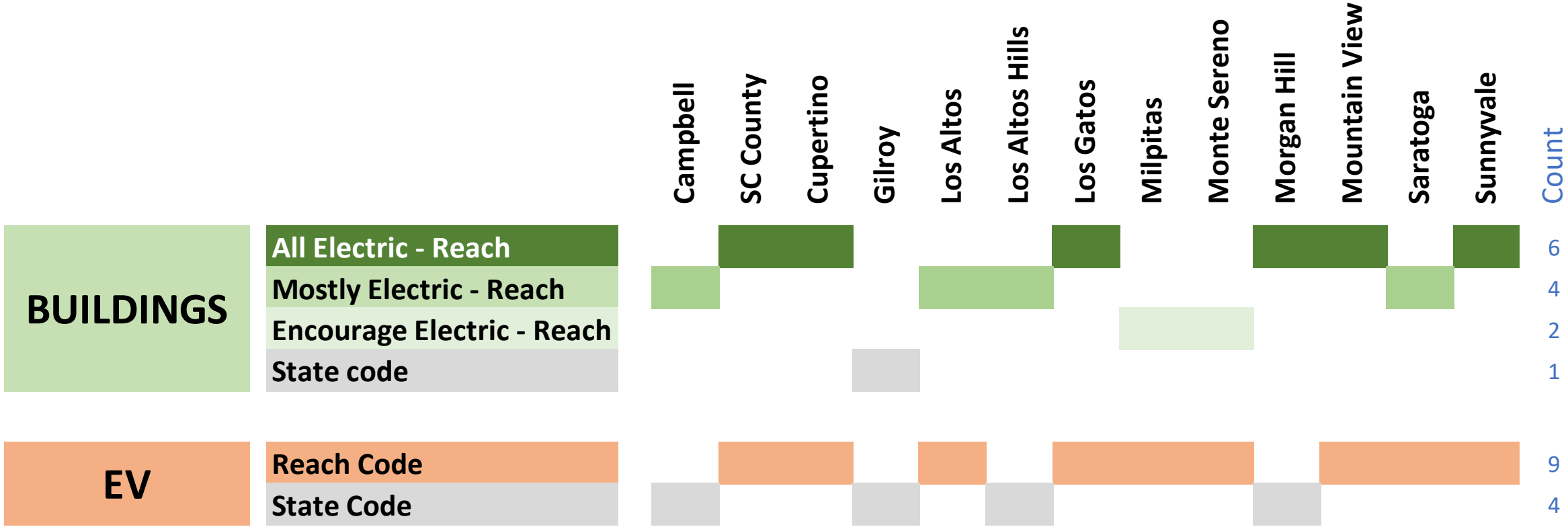
25 adopted an electric vehicle reach code — EV

4 adopted a mostly-electric building reach code — Buildings

20 adopted an all-electric building reach code — Buildings

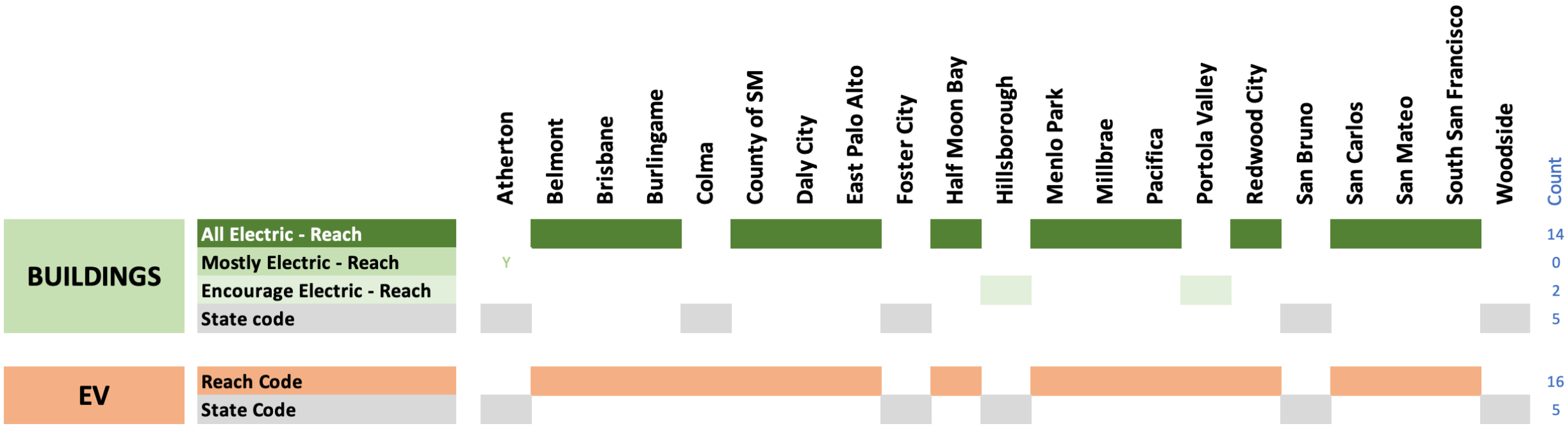
4 adopted an encourage-electric building reach code — Buildings

2019 Reach Codes - SVCE



All Electric Reach	All appliances must be electric, with very limited exemptions.
Mostly Electric Reach	Water and space heating must be electric, exemptions for other appliances. Electrification-ready panel and wiring in mixed-fuel buildings.
Encourage Electric Reach	Allows mixed-fuel buildings with high energy performance. Electrification-ready panel and wiring in mixed-fuel buildings.
EV - Reach Code	More charging infrastructure for a higher percentage of parking spaces.

2019 Reach Codes - PCE



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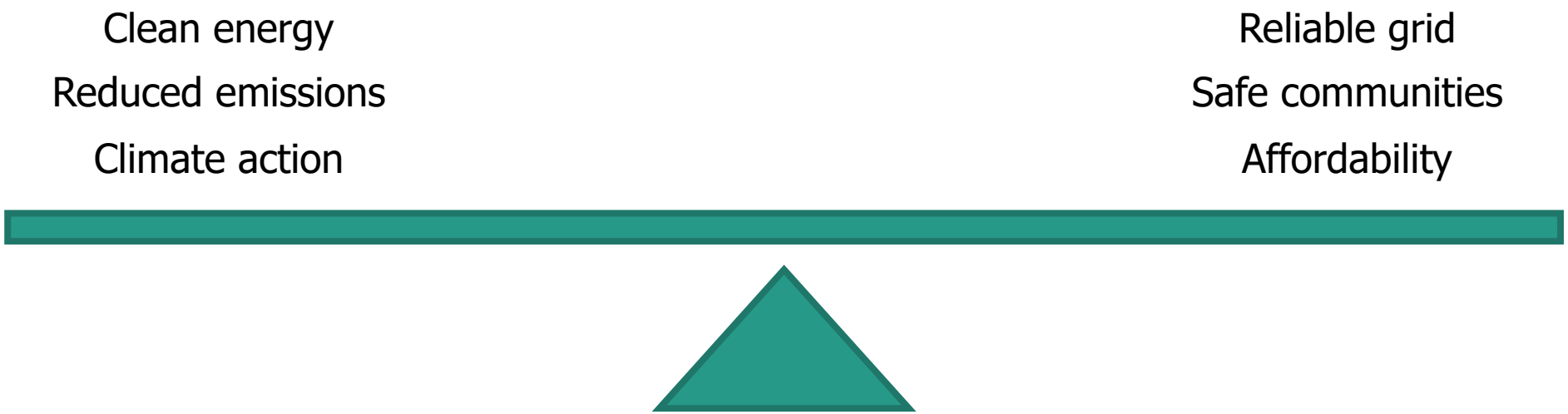
Encourage Electric Reach	Allows mixed-fuel buildings with high energy performance. Electrification-ready panel and wiring in mixed-fuel buildings.
EV - Reach Code	More charging infrastructure for a higher percentage of parking spaces.

What questions are citizens asking?

Climate
Reliability
Cost

Communities are seeking forward-thinking, sensible action.

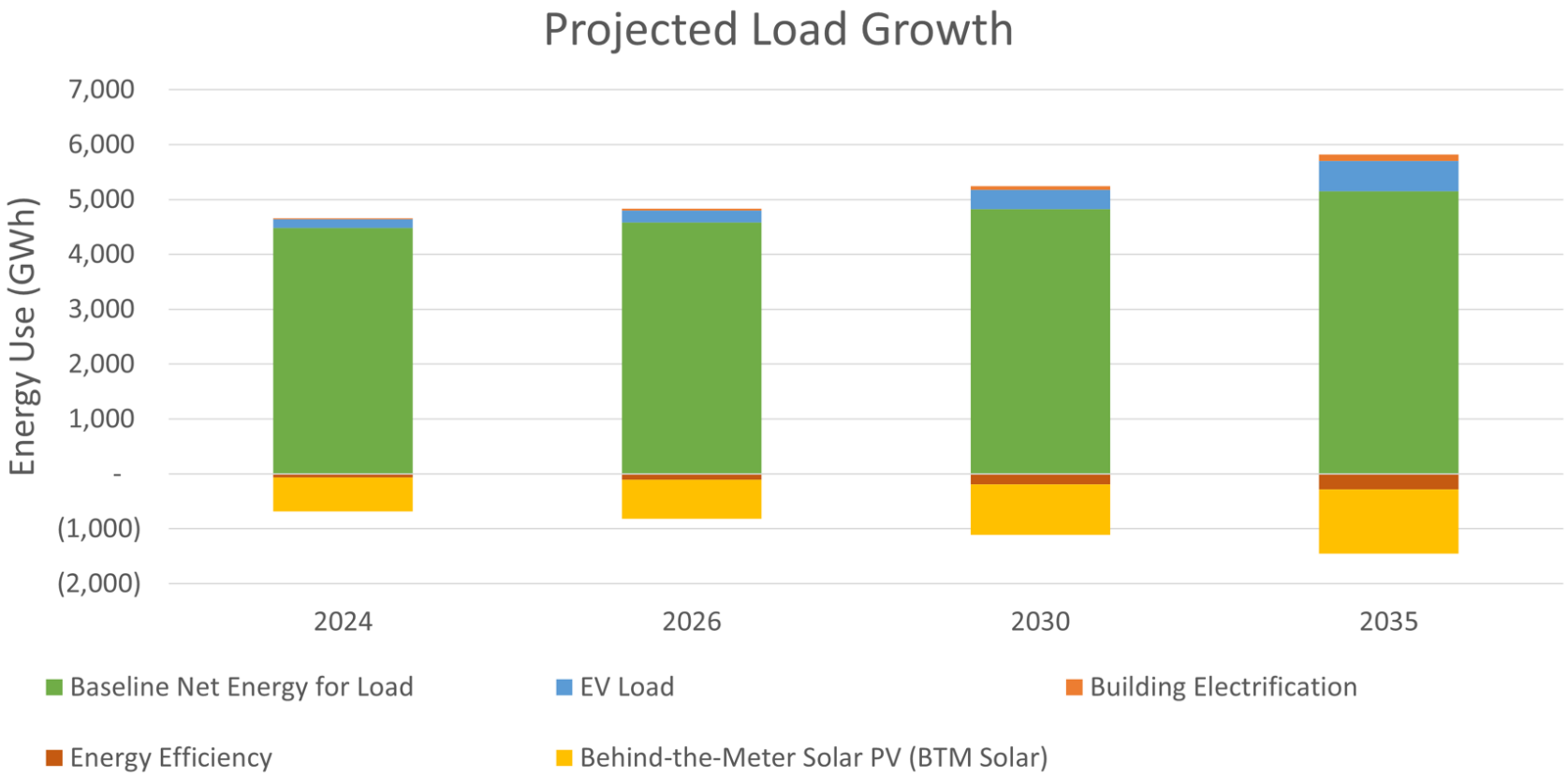
We consistently hear calls for climate action that protects and maintains community well-being.



Our energy system can handle the 1% per year growth from electrification.

By 2030, the CPUC projects electrification in SVCE territory will increase its demand by ~9%

- 1.4% increase from building electrification.
- 7.3% increase from transportation electrification.
- There is time to procure the additional clean power and make necessary infrastructure upgrades.



What happens when the power goes out?

Heat Pump Space Heating

Gas furnaces require electric fans, but fireplaces still work.

Heat Pump Water Heating

Gas water heaters require electronic ignition or pumps

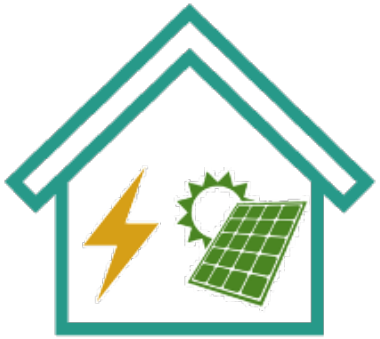
Induction Cooking

Some gas stoves will work without electricity, but it's unsafe

Electric Clothes Dryer

Gas dryers use electric motors to run the tumbler

The Cost Story – Single Family

	Mixed-Fuel Home	**All-Electric Home:** on home electrification rate	**All-Electric Home:** expanded efficiency, optimal Solar
			
Construction Cost:*	-	~$6,000 savings	~Equivalent

Compared to a mixed fuel home

What are the options for my community?

1. No reach codes: adopt State 2022 Code as-is
2. Model 2022 Codes: adopt the pre-designed all-electric building reach code and/or EV reach code
3. Custom reach codes: adopt one or both Model 2022 Codes with modifications

2022 Building Code Options

APPLIANCE	2022 BUILDING CODE OPTIONS		
	State 2022 Code	Model 2022 Code	Custom 2022 Code
Water Heating	Electric Encouraged	Electric	Electric
Space Heating	Electric Encouraged	Electric	Electric
Clothes Dryer	Electric or Gas	Electric	Electric or Gas
Commercial Cooking	Electric or Gas	Electric	Electric or Gas
Residential Cooking	Electric Encouraged	Electric	Electric Encouraged
Outdoor	N/A	Electric	Electric or Gas

*This is an example; jurisdictions can customize by appliance or by exempting certain building types

2022 EV Code Options

Outlet, circuit, charger options	Single Family and Multifamily w/Garage		Multifamily – Shared Parking		Office		Other Non-Res	
	State	Model	State	Model	State	Model	State	Model
L1 EV Outlet		1		60%				
L2 EV Circuit	1		10%		15%	30%	15%	10%
L2 EV Outlet		1	25%					
L2 EV Charger			5%	40%	5%	20%	5%	10%

L1 Outlet

L2 Circuit

L2 Outlet

L2 Charger

Jurisdictions can adopt an EV code for one, some, or all building types

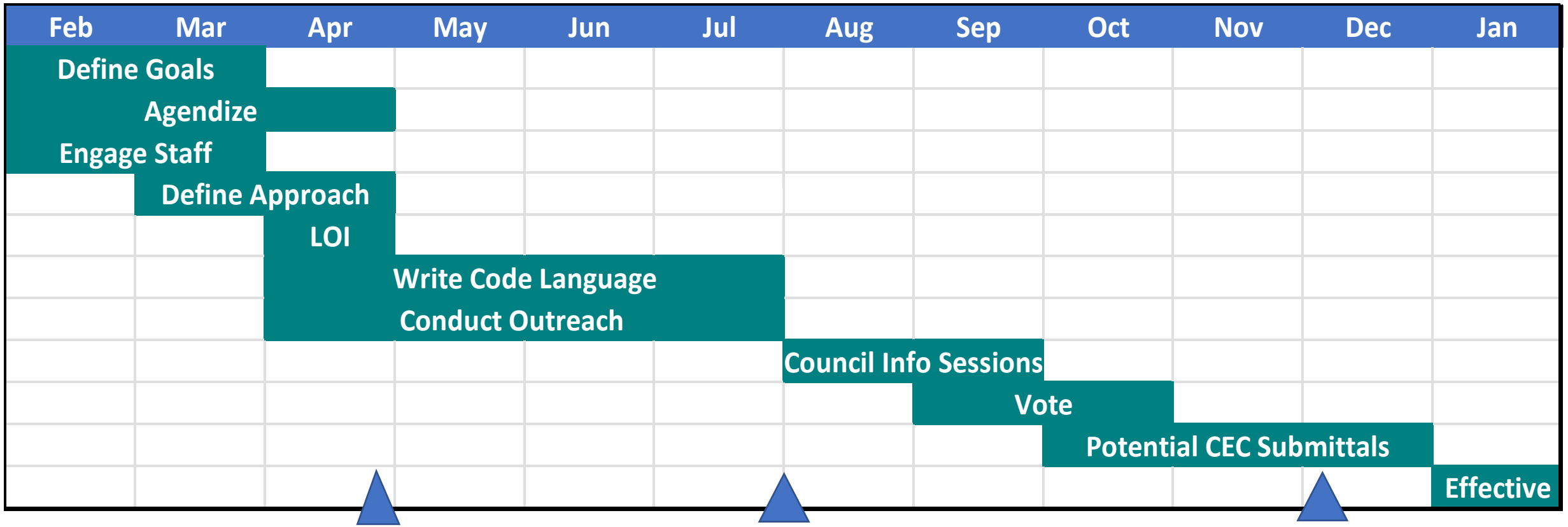
What are the next steps?

Work with CCA staff and your agency staff as needed – we are here to support you!

Vote – The majority of votes are scheduled October – early November.

Appendix

Member Agency Reach Code Tasks and Milestones



Goals and Approach Defined
Reach Codes Agendized
City Manager LOI Signed
Staff Responsibilities Defined

Proposed Code language complete
Outreach conducted
Council informed

Final code language complete
Vote complete, same meeting as state code adoption
Documentation done

Orange text indicates a Boardmember task

Jurisdiction	Council Information Session	First Reading	Second Reading	Link to Staff Report
Campbell	10/4	11/1	TBD	
Cupertino	N/A	10/11	TBD	
Gilroy	8/1	10/17	TBD	Link to Council Info Session
Los Altos	9/6	TBD	TBD	Link to Council Info Session
Los Altos Hills	9/15	10/13	11/17	Link to Council Agenda Packet - Item starts on page 407
Los Gatos	6/7	11/1	11/15	Link to Council Info Session
Milpitas	N/A	10/18	12/6	
Monte Sereno	9/20	10/4	10/18	Link to Council Info Session
Morgan Hill	N/A	11/2	11/16	
Mountain View	N/A	11/1	12/13	
Saratoga	9/21	11/2	11/16	Link to Council Info Session
Sunnyvale	N/A	10/25	TBD	
Santa Clara County	N/A	11/15	TBD	

Reach Code Scenarios Key Assumptions

Slide 6 Reach Code Impact Illustrative Example

- Leverages projected RHNA for the two territories and assumes housing construction is built evenly for five years
- Assumes 70% of new housing is multifamily (~twice the historic rate)
- Assumes all buildings built without a reach code are built with a gas water heater.

Learn more

svcleanenergy.org

info@svcleanenergy.org

1-844-474-7823

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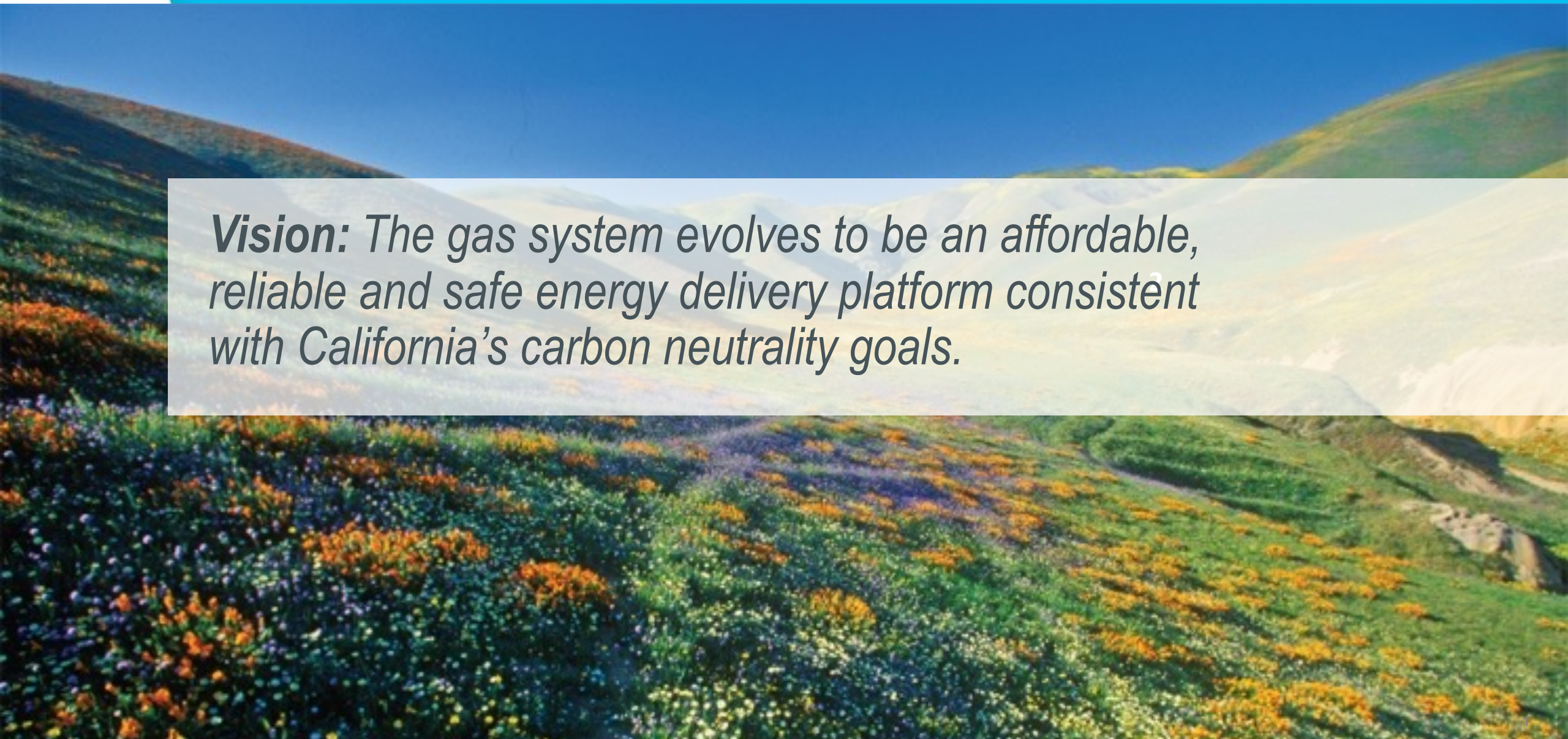
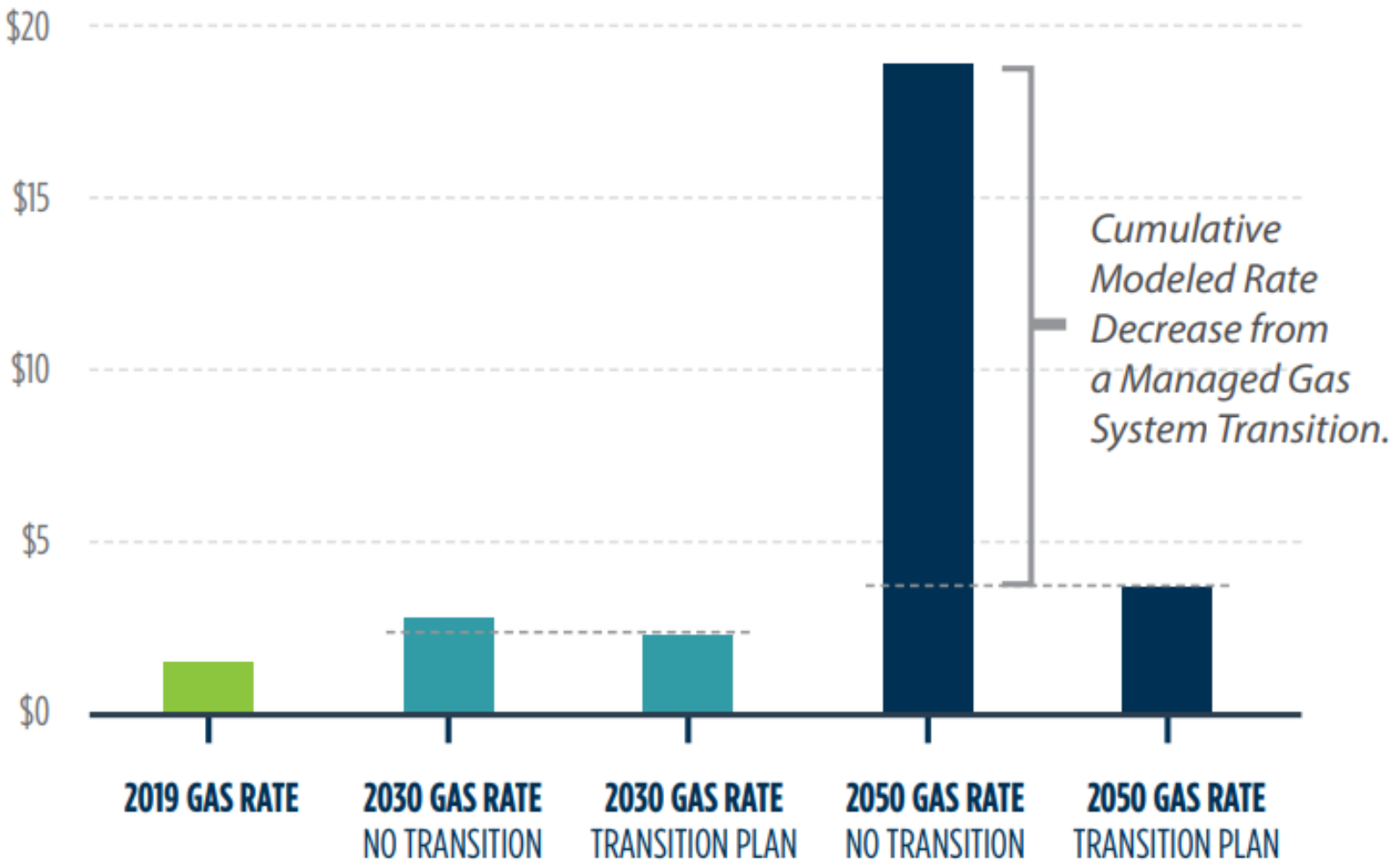
PG&E Gas Strategy



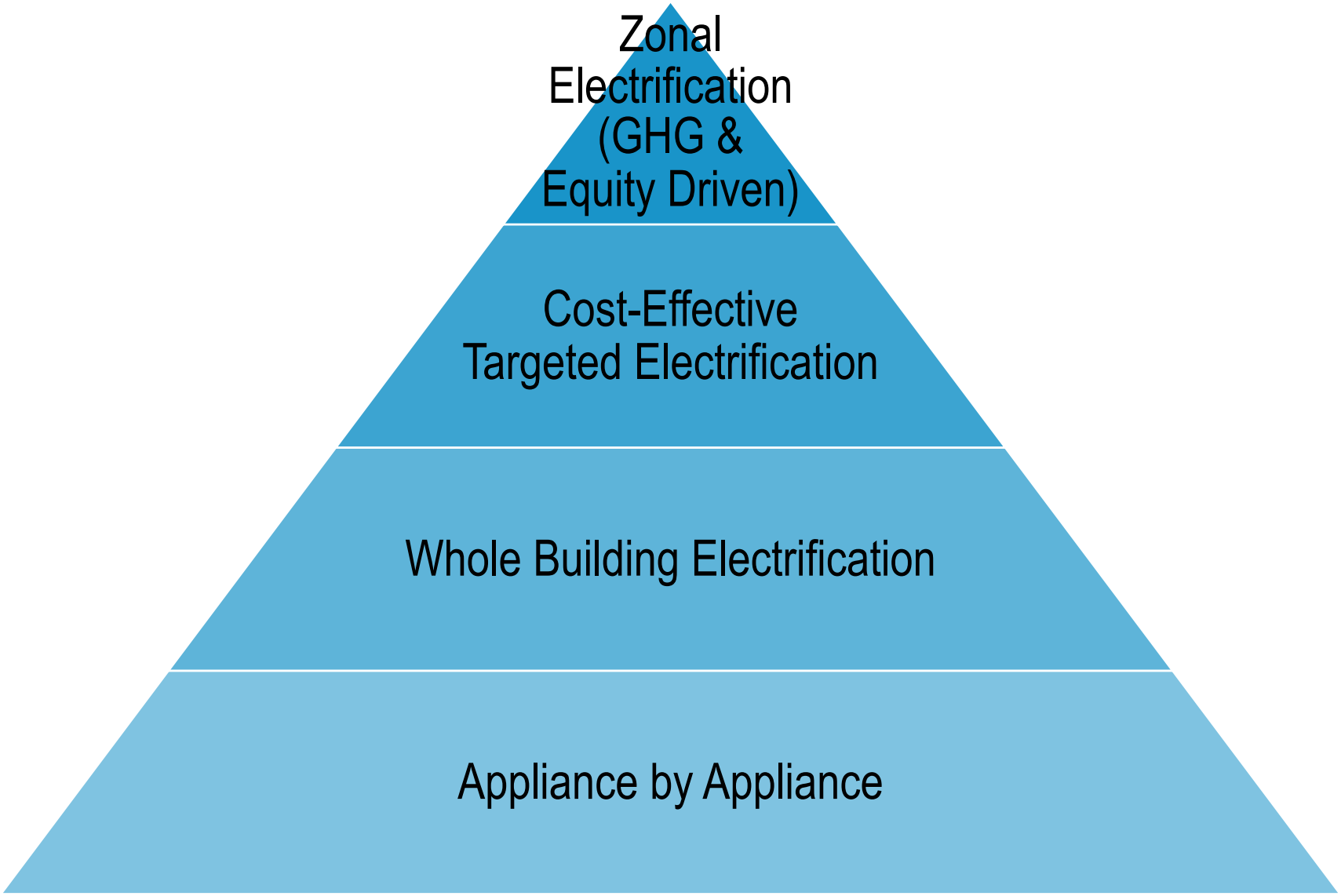
Vision: *The gas system evolves to be an affordable, reliable and safe energy delivery platform consistent with California's carbon neutrality goals.*

Building Electrification Impact on Long-Term Gas Rates

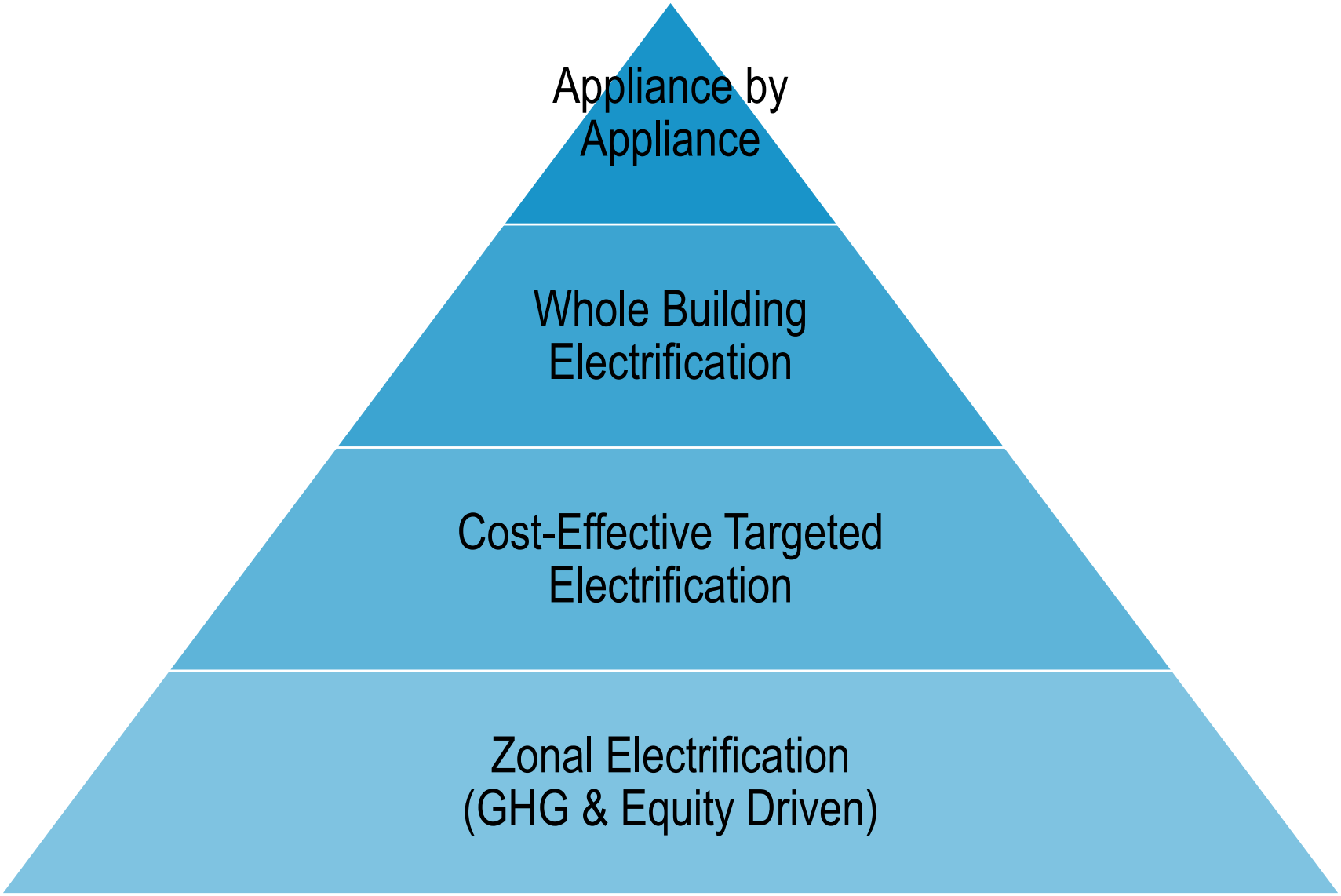


Source: California's_Gas_System_in_Transition.pdf (gridworks.org)

Current State of Electrification in California



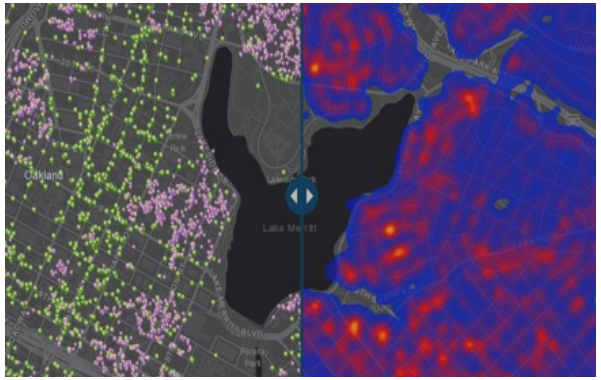
Desired End State of Electrification in California



Zonal Electrification:
An Equity-Based Approach to Electrification

Progress to Date

- Developed an internal ***Gas Asset Analysis Tool*** to evaluate potential areas for zonal electrification. The tool includes data such as customer income, prevalence of renters, geographic risks, and electric capacity
- Submitted a zonal electrification program, targeting low-income neighborhoods, in PG&E's 2023-2027 energy efficiency portfolio



Scaling Early Success

- Similar to targeted electrification "scale is dependent on changes to 'obligation to serve', [significant] external funding, and ability to capitalize behind-the-meter electrification costs"
- Building networks of local, trusted partners is needed to support customer acceptance for community-led electrification

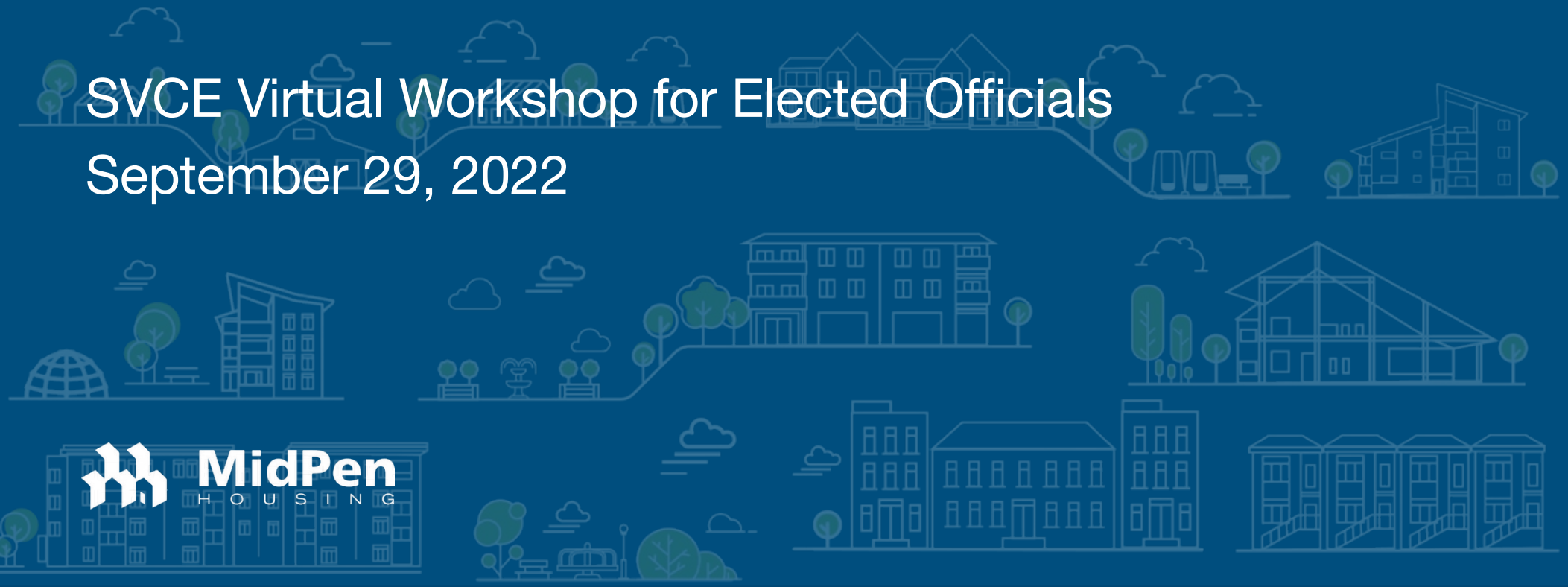
Questions?

electrification@pge.com
Kelly.Cunningham@pge.com
Rachel.Kuykendall@pge.com

Multi-Family Affordable Housing and REACH Codes

SVCE Virtual Workshop for Elected Officials

September 29, 2022



MidPen HOUSING

MidPen Housing

Our mission is to provide safe, affordable housing of high quality to those in need and to establish stability and opportunity in the lives of our residents.

Managing 127 properties

- 8,400+ homes
- 21,000+ residents
- 11 counties: Santa Rosa to Monterey

Pipeline

- 16 properties under construction
- 3,700+ homes in predevelopment

MidPen HOUSING

MidPen Housing

In PCE and SVCE territory

64 existing properties

- 4,074 homes
- 10,000+ residents

Pipeline

- 6 residences/688 units under construction
- 12 projects/2,211 units in predevelopment

MidPen HOUSING

All-Electric at MidPen – What Changes?

- Fireplace: N/A ✔
- Stove: electric ✔
- Space heating: electric ✔
- Space cooling: electric ✔
- BBQ (where applicable): electric since 2020 ✔
- Dryers
  - In unit: electric ✔
  - Laundry room: electric since 2020 ✔
- Water heating: historically gas ✖

MidPen HOUSING

Domestic Hot Water System – Cost Comparison

	Gas + Solar Preheating	Electric HPWH	Cost Difference per Unit
	Gas boilers Storage tanks Solar thermal preheating All gas infrastructures and connection	Heat pumps Storage tanks Some PV (to be Opex neutral) Transformer upsize/additional transformer	
Central system (2016)	$3,000	$3,200	+$200
Central system (2021)	$3,200	$2,200	-$1,000
Individual system (2021)	$4,800	$2,500	-$1,300

Transformer placement can change economy/technical feasibility of the project

Some (Other) Benefits of All-Electric

- Carbon neutral in operation (buy carbon-free electricity)
- $0 utility bills (if enough PV)
- Resiliency during power outages (requires batteries)
- Future-proofing our projects
  - Construction Code converging towards all electric
  - All building with gas will need to be converted to all electric in their useful lifetime

MidPen HOUSING

EV at MidPen

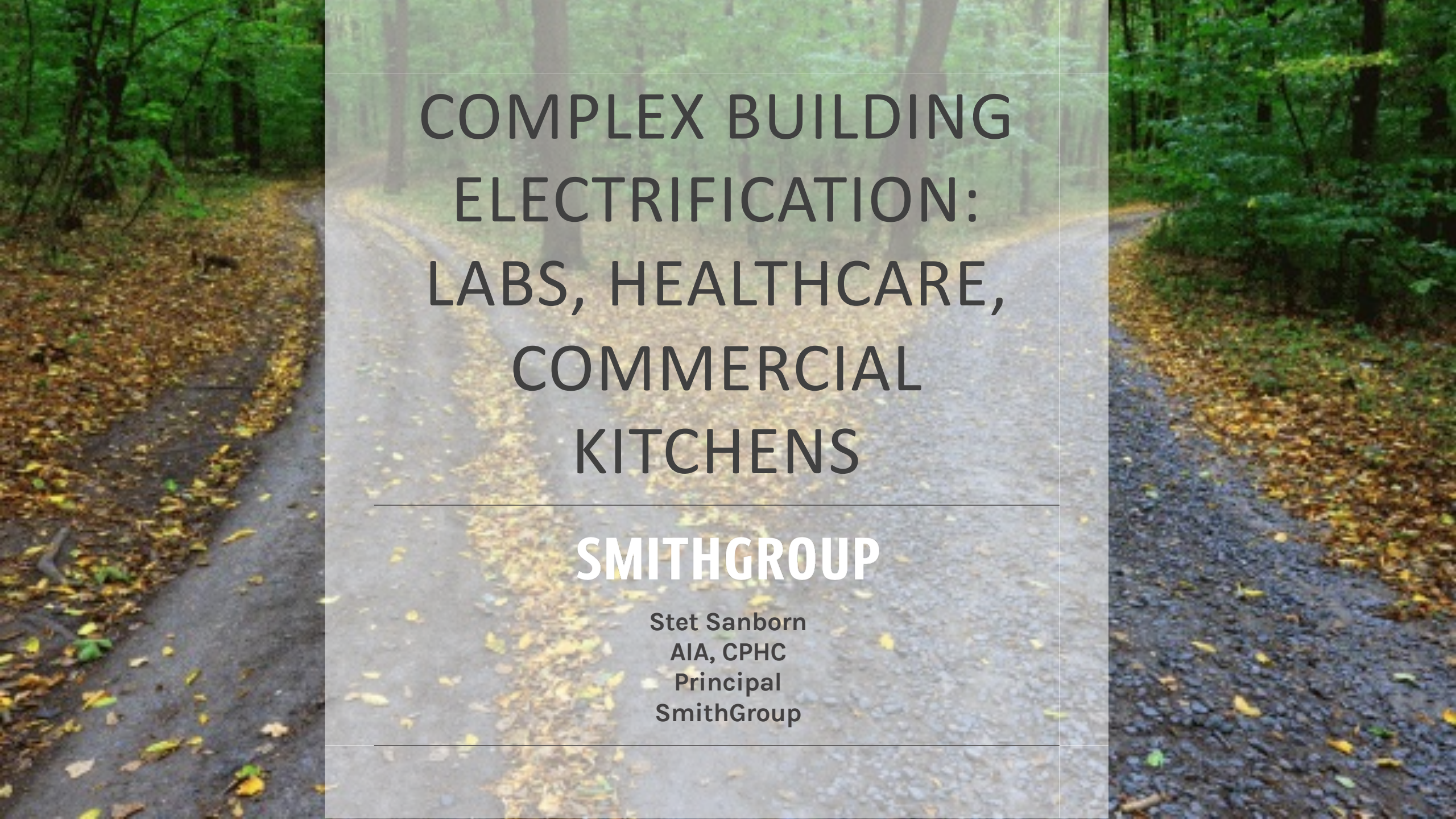
- 5 locations with EV chargers
  - 4 properties
  - 1 central office (Foster City)
  - Looking at adding more
- Very low usage
  - Mostly staff
  - About 1-2% adoption rate among residents

MidPen HOUSING

Thank you

Amélie Besson – albesson@midpen-housing.org

MidPen HOUSING



COMPLEX BUILDING ELECTRIFICATION: LABS, HEALTHCARE, COMMERCIAL KITCHENS

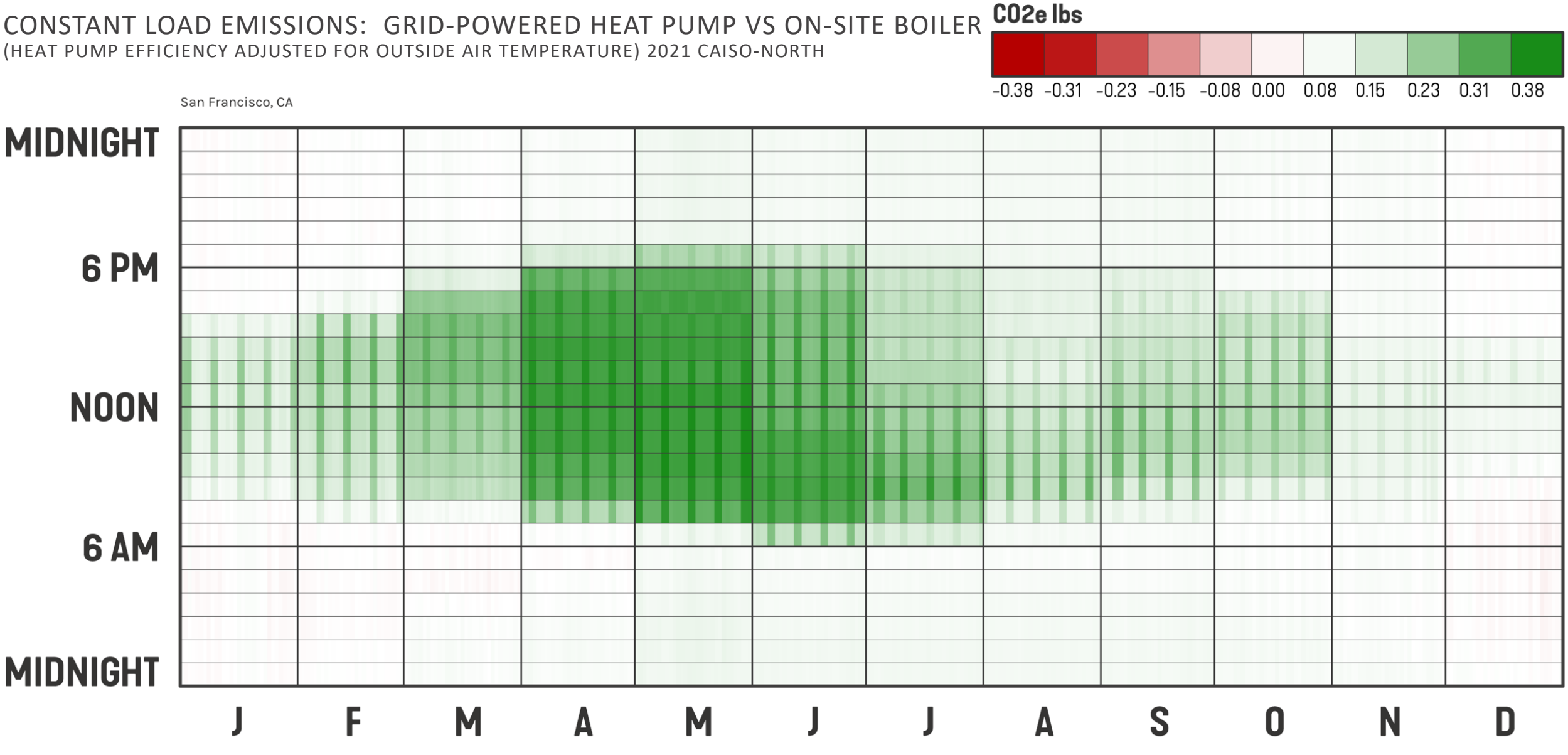
SMITHGROUP

Stet Sanborn
AIA, CPHC
Principal
SmithGroup

IS IT BENEFICIAL?

CONSTANT LOAD EMISSIONS: GRID-POWERED HEAT PUMP VS ON-SITE BOILER

(HEAT PUMP EFFICIENCY ADJUSTED FOR OUTSIDE AIR TEMPERATURE) 2021 CAISO-NORTH



ALL-ELECTRIC SYSTEMS

SPACE HEATING & COOLING VIA EXHAUST HEAT RECOVERY: SF STATE SCIENCE REPLACEMENT BUILDING

LABORATORIES

LBNL BIOEPIC RESEARCH LAB BY SMITHGROUP

LABORATORIES

LBNL INTEGRATED GENOMICS LAB

SMITHGROUP, INTEGRAL GROUP, GUTTMANN & BLAEVOET

HEALTHCARE

ALL-ELECTRIC SAN MATEO COUNTY WELLNESS CENTER – OSHPD 3

HISTORIC DECARB RETROFIT

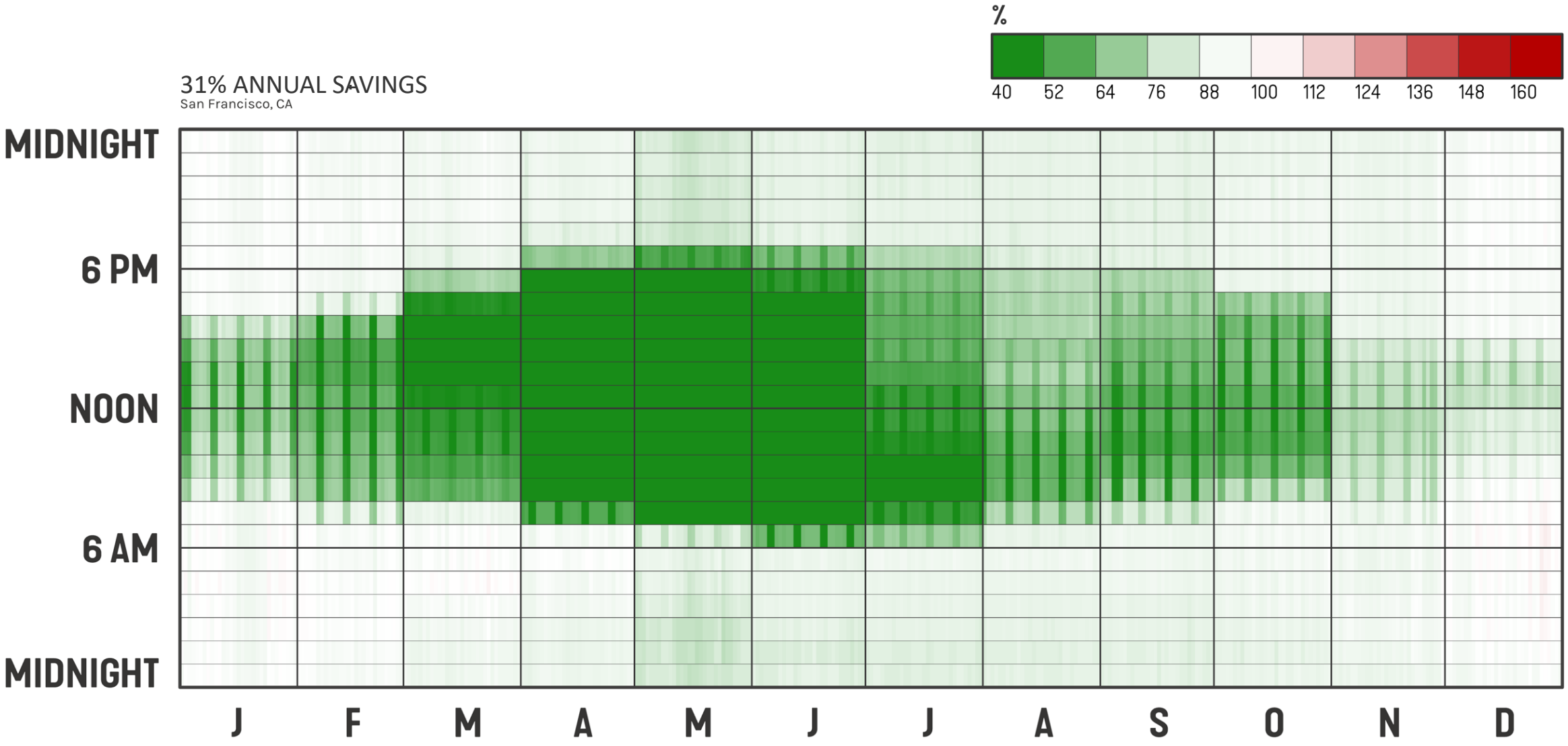
UNDERSTANDING UNIQUE CHALLENGES

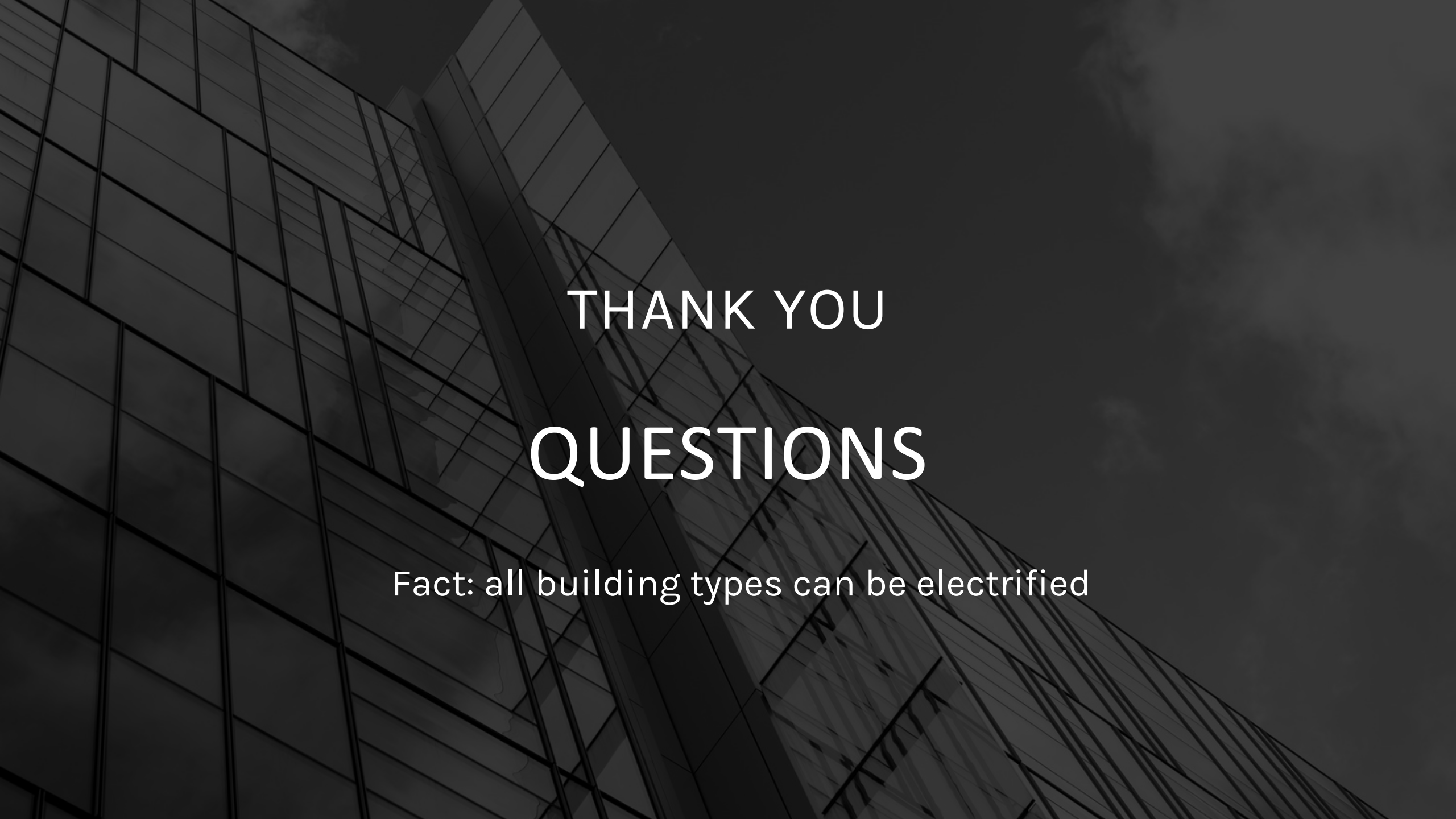
- Historic Religious Facility in San Francisco
- 1890's Sanctuary
- 1960's Brutalist Modern Expansion

- Existing Boiler, 180F LWT
- No Air Conditioning
- Full Time Day Care

HISTORIC DECARB RETROFIT

HEAT PUMP GRID EMISSIONS VS ON-SITE BOILER





THANK YOU

QUESTIONS

Fact: all building types can be electrified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