CPAreachcodes.org

CPA CLEAN POWER ALLIANCE

CPA Reach Codes Program

Advancing safer, healthier and more affordable buildings and vehicles

Slide Deck Library
CPA Reach Code

Program for Building and Transportation Electrification

Advancing safer, healthier and more affordable buildings and vehicles

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CPAreachcodes.org

Slide Deck Topics

- Clean Power Alliance Overview
- Program Overview
- California Energy Code
- Reach Codes 101
- Reach Code Examples
  - New Construction
  - Existing Building Retrofits
  - Electric Vehicle Infrastructure
- Building Electrification
- Appliances and Technology
- Electric Vehicle Infrastructure (EVI)
- Common Concerns and FAQ

Clean Power Alliance

We work together to bring you access to the most sustainable energy available

Source

Clean Power Alliance

CPA acquires green energy supply (solar, wind, water) sourced locally and regionally

Delivery

SCE

SCE delivers the power, maintains the lines, and reads your meter

Customer

You

You benefit from more clean power options

- CPA purchases clean power and Southern California Edison (SCE) delivers it
- SCE sends the monthly bill, which includes SCE charges for electricity delivery and Clean Power Alliance charges for electricity supply/generation
- CPA charges are NOT an added fee; they simply replace the SCE supply/generation charges
- Revenues, after costs for power and operations plus financial reserve contribution, are pooled and invested into local programs

Clean Power Alliance Basics

CPA is a not-for-profit electricity supplier, offering clean, renewable energy at competitive rates.

- Public entity formed through a Joint Powers Authority (JPA)
- Comprised of 32 public agencies across Ventura and Los Angeles Counties (three additional in March 2024)
- Board members are locally elected officials who represent and serve our communities
- Approximately 1 million customer accounts, representing over 3 million residents and businesses
- 4th largest electricity provider in California
- More customers receiving 100% renewable energy than any utility in the country

Reach Codes Program Overview

- What is the purpose of the CPA Reach Codes Program?
- What is the program's service offering?
- What are the incentive requirements?

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Program Purpose

Increase Reach Codes	Support Member Agencies	Collaboration
Equitably decarbonize Los Angeles and Ventura regions	**Develop tools and templates**, leveraging what has been successfully used in other regions	**Collaborate with regional partners** (utilities, RENs, CCAs, building industry, advocates)
Improve community, **economic and environmental indicators**	Share **lessons learned** from other local governments	Streamline support and resources to member agencies
Support regional and State electrification goals	Offer financial assistance to offset municipal staff time	
	On-Call technical support	
	Outreach assistance	

Key Offerings

Templates and Tools

- Model ordinances and adoption resources developed through years of municipal support and stakeholder engagement
- Resource library, tools, templates, and presentations
- Streamlined delivery models based on lessons learned

Customization

- Diverse needs ≠ one size fits all
- Provide local research and specific tools to support municipal staff
- Interpret statewide CA code cost-effectiveness studies related to climate zones and goals
- Integrate feedback regarding unique building stock and community feedback

Adoption Support

- Technical assistance
- Present at City Council meetings
- Facilitate public workshops
- Provide financial support for members agencies

New Construction

Reach Code Development Support

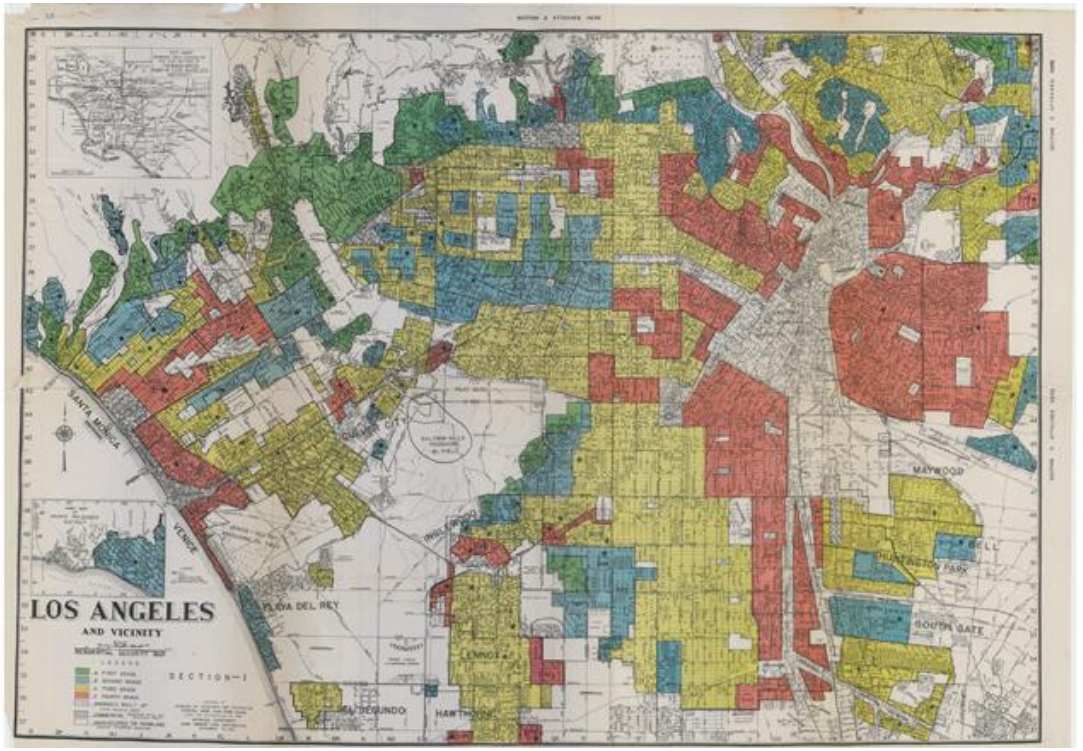
- Regionally specific reach codes that promote electrification and decarbonization
- Compliance pathways included for both all-electric and mixed fuel buildings to avoid legal risk while increasing electric equipment readiness
- Can include EV Infrastructure

Technical Assistance and Resources

- On-Call Technical Assistance
- Educational Resources (PPT slides and FAQs)
- Adoption Templates (Checklists and Submittal Forms)

Existing Buildings – Pilot Program

- **Member Agencies** include Santa Monica, West Hollywood, Ojai, and maybe more
- **Hands-On Technical Assistance**
  - Cost-benefit regionally specific analysis
  - Custom code development
  - Education support
- **Host Public Stakeholder Meetings** to facilitate equitable decision-making processes and ideally outcomes. Establish processes that outlast the project period.
  - Inequitable history that has led to existing market conditions (economic and environmental)
  - Stipends are available for community participation.
  - Assess a variety of options available (permits, property transfers, disclosures)



Building and EV Research & Design

- **Research:** Explore current programs, available funding opportunities and regulatory mechanisms that could drive building electrification and EV charging adoption

- **Focus areas:** Building incentives, appliance rebates, tools and resources, EV charging rebates, grants, including the Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA)

- **Interviews :** Research will include interviews with regional stakeholders, financing partners and gas station owners

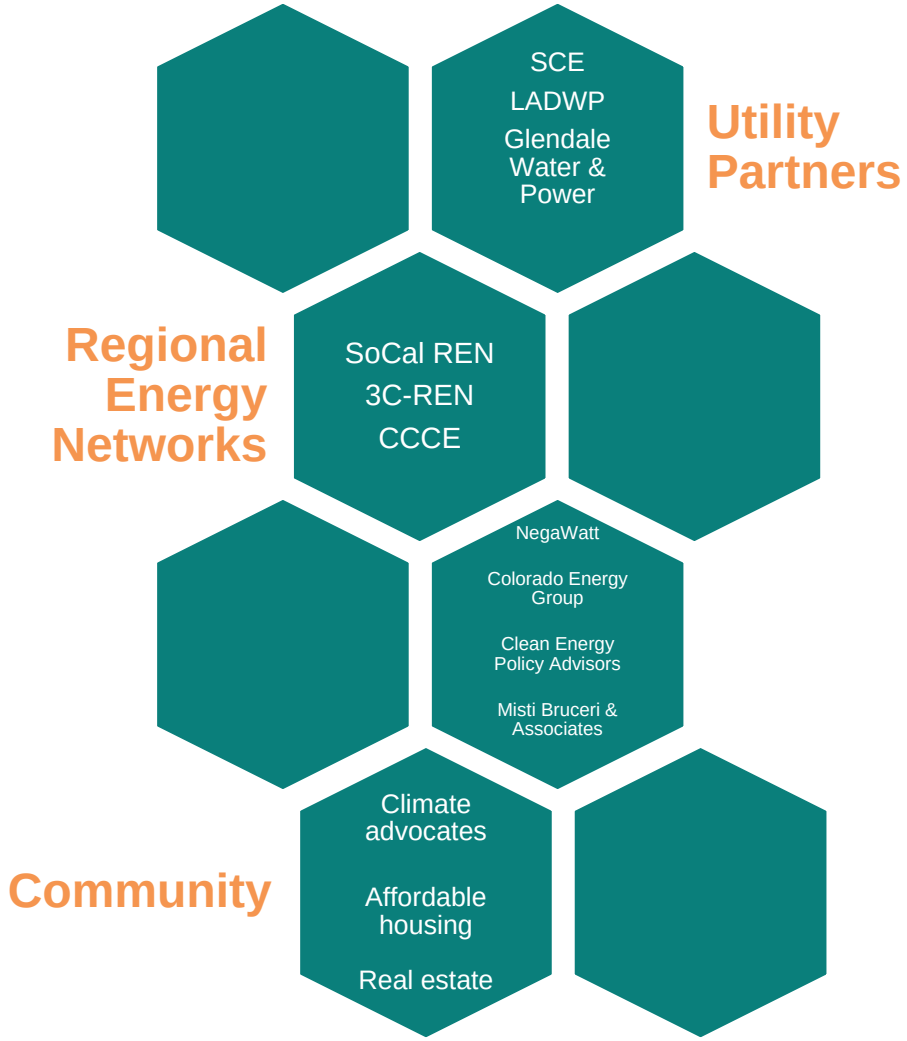
- **Final Report:** 3 potential program tracks outlining strategies that to drive electrification and EV adoption over a 3-year period and related impacts, GHG, cost, # of buildings

Findings will inform future CPA program design.

Source: *Los Angeles Times*

Regional Collaboration

- Ensures information sharing
- Drives collaboration among stakeholders
- Helps drive impactful change
- Aligns with other regional efforts, air quality, resiliency efforts, and climate planning
- Removes duplication of efforts



Financial Offerings

Award Type	Award Value	Requirements
New Construction: Early Adopter*	**$2,500**	• Applicant adopted a New Construction reach code prior to April 2023. • Commitment of 2-6 hours of staff time to share experiences and challenges from reach code adoption process in Reach Code Program workshops and/or in conversations with applicants over the Reach Code Program term • Required attendance at one kick-off and one model code workshop • Program Award Application
New Construction: Prospective Adopter**	**$12,500**	• Executed Program Participation Agreement • Applicant must commit to develop a New Construction reach code with the intent to present findings to City Council or Board of Supervisors ("BOS") for consideration of adoption during Reach Code Program term. Updated New Construction reach codes are not eligible for this award. • Program Award Application after submittal of code to City Council or BOS for approval
Existing Building Pilot	**$25,000 total**	

	Milestone 1: $12,500	• Executed Program Participation Agreement
		• Applicant must obtain a directive from City Council or BOS committing Applicant to investigate Existing Building reach codes. Directives include:
		  • Letter of Intent approved by City Council or BOS - or -
		  • Resolution passed by City Council or BOS to evaluate Existing Building reach codes - or -
		  • Adopted Climate Action Plan***
		• Program Award Application

	Milestone 2: $12,500	• Executed Program Participation Agreement • Program Award Application • Applicant must submit an Existing Building reach code to City Council or BOS for consideration of adoption during Reach Code Program term

* New Construction: Early Adopter awardees are also eligible for the Existing Building Pilot award, subject to meeting all applicable award requirements
** New Construction: Prospective Adopter awardees are also eligible for the Existing Building Pilot award, subject to meeting all applicable award requirements
*** A Climate Action Plan or similar document that has been adopted by City Council or BOS that includes an existing building reach code measure with a timeline of implementation that overlaps with CPA's 2-year Reach Code Program.

How to Join the Existing Building Pilot

Member agencies who are interested in being selected as an Existing Member Pilot should, in **1-2 paragraphs**, summarize why your jurisdiction is a good candidate to be an Existing Building Pilot.

Questions to address include:

- Is there support from your elected officials for pursuing or adopting an existing building reach code?
- Does your jurisdiction have support from community members, businesses or community representative organizations for existing building reach codes?
- Does your jurisdiction have staff time that you can dedicate to this process?
- Has your jurisdiction adopted a Climate Action Plan – or similar document – that requires your jurisdiction to investigate existing building reach codes?
- What are the population and building demographics of your jurisdiction?

Applications will be accepted on an ongoing basis

Submit **1-2 paragraph email** to cpareachcodes@cleanpoweralliance.org. Title your email: "*{Jurisdiction Name} Existing Building Pilot Application*". Applications will be accepted through January 2025.

If accepted, you will be asked to sign a **Participation Agreement.**

Participation Agreement

General Obligations:

- Must designate primary contacts
- Must engage with program team throughout process
- Primary contact or city/county representative must attend at least one model code workshop hosted by the program to help create new construction/existing building reach code templates.
- All tools, templates, and other resources generated by the program team during the development reach codes will be the intellectual property of CPA.
- Any adopted reach code may be posted on Reach Code Program websites by CPA.
- Participants who wish to receive a financial award must complete a Program Award Application and submit the required documentation.

- Participation does not obligate the jurisdiction to adopt the developed reach code
- Adoption of a reach code is done at the risk of the jurisdiction
- Participant agrees to conduct its own due diligence and review, including any technical or legal review of any proposed reach code it wishes to consider.

2022 CA Energy and Green Building Codes

- Current requirements

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CA Energy Code vs CALGreen

- CA Energy Codes live in two main sections of Title 24 of the California Code of Regulations, also known as the California Building Standards Code
- Contains the regulations that govern the construction of residential and non-residential buildings in California
- Updated every 3 years on a Triennial cycle, with an Intervening Code Adoption cycle happening after 18 months within that Triennial cycle

Part 6

The California Building Energy Code

- Regulates the energy efficiency for new residential and nonresidential buildings
- Regulated by the California Energy Commission (CEC)

Part 11

The CA Green Building Standards Code

- Regulates the use of electric vehicle charging, energy, water, and materials during and after construction
- Regulated by several state agencies including California Building Standards Commission (CBSC)and Housing and Community Development (HCD)
- Includes both Mandatory and Voluntary requirements

Resource: https://www.dgs.ca.gov/bsc

Title 24, Part 6 – 2022 CA Energy Code

- The Energy Code is a set of mandatory building requirements and containing energy, water efficiency, and indoor air quality requirements for newly constructed buildings, additions to existing buildings, and alterations to existing buildings.
- Governs things such as: the efficiency of window and doors, insulation, lighting, solar, HVAC, hot water heaters, electrical panels, faucets, and more.
- **Includes 2 options to comply:**
  - **Prescriptive option**, allowing builders to comply by using methods known to be efficient,
  - **Performance option**, allowing builders flexibility in their designs provided the building achieves the same overall energy 'budget' as an equivalent building following the prescriptive option

2022 Energy Code Benefits

- Increases on-site renewable energy generation from solar
- Increases electric load flexibility to support grid reliability
- Reduces emissions from newly constructed buildings
- Reduces air pollution for improved public health
- Encourages adoption of environmentally beneficial efficient electric technologies.

Find the CA Energy Codes here:
2022 Building Energy Efficiency Standards

Major 2022 Energy Code Updates

Heat Pumps: The New Standard

Heat pumps are an electric technology for water and space heating that increases efficiency, reduces GHGs, and enables load flexibility. It extracts heat and then transfers the heat to where it is or isn't needed.

Standards include:

- Single-family and Multifamily homes — heat pump water or space standard.
- Businesses — heat pumps standard for schools, offices, banks, libraries, retail, grocery

New Homes to Be Electric-Ready

The standards require single-family homes to be electric-ready, including:

- Electrical circuits for space heating, water heating, cooking/ovens, and clothes dryers.
- Electrical panel, branch circuits, and transfer switch for battery storage.
- Dedicated circuits and panels to easily convert from natural gas to electric in the future.

Solar and Storage Use Expanded

The 2022 Energy Code extends solar and introduces battery storage standards to the following building types:

- High-rise multifamily (apartments and condos) Hotel-motel
- Tenant space
- Office, medical office, and clinics
- Retail and grocery stores
- Restaurants
- Schools
- Civic (theaters, auditoriums, and convention centers)

Source: 2022 Building Energy Efficiency Standards Summary

2022 Energy Code Updates

New Construction

Heat pumps are the prescriptive baseline

- Residential
  - Space heating in climate zones 3, 4, 13, 14
  - Water heating remaining climate zones
- Nonresidential – water- and/or space-heating for most building types
- Res and Nonres: Performance credit for all-electric design

Residential measures supporting electrification

- Pre-wiring required for gas appliances
- Higher ventilation rate for gas stoves
- Energy storage readiness

Nonresidential: Solar PV and Battery Storage required

Existing Buildings

- Restricts newly installed electric resistance heating
- Simplified language for heat pump retrofits

Title 24, Part 11 - 2022 CALGreen

- CalGreen (the California Green Building Standards Code) is a set of mandatory minimum green building standards driven by California's goal to:
  - Reduce greenhouse gas emissions from buildings
  - Promote healthier environments to live in
  - Prevent wastage of energy and water resources.
- Standards include cost-effective reductions to greenhouse gases
- Includes Electric Vehicle Infrastructure and charging

Voluntary Tiers

- Local governments may opt for more restrictive regulations to achieve higher degree of compliance with Green Building principles.
- The need for these additional regulations may arise due to Climate Action Plan goals, or certain regional climatic, geological or topographical, or environmental conditions.
- This approach is adopted to achieve a further reduction in energy usage – **surpassing the targets set through mandatory measures by 15-30%.**

Find CalGreen Codes here:
2022 CALGreen Code

Reach Codes 101

- What are they?
- Why should we implement them?
- What's the process?
- Who else has done it in our region?

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What are Reach Codes?

Local ordinances adopted by the local government that exceed and enhance the state's green building standards.

Important Facts:

- Can be adopted at any time
- Improves economic and energy performance of buildings
- Reduces Greenhouse Gas (GHG) emissions, pollutants, and improves indoor air quality
- Helps to reduce energy use and improve grid resiliency
- Allows local governments to be leaders in climate solutions
- Helps to fulfill local Climate Action Plan, Energy Plan, or other policy goals

What are the types of Reach Codes?

Building Electrification (New Construction & Existing Buildings)

- **Goal:** to reduce the use of methane gas, ensure buildings are operating efficiently, and to prepare the market for statewide electrification goals

There are two reach codes pathways when amending the energy code:

- **Prescriptive Codes:** Require one or more specific energy efficiency or renewable energy measures
- **Performance Codes:** Require buildings to meet an energy budget/performance score through a custom design, allowing applicants flexibility

Electric Vehicle Infrastructure (EVI)

- **Goal:** to improve market readiness and increase equitable access to clean transportation EV charging stations

What Establish Reach Codes?

- 100% Green Power (renewable clean energy) provided by CPA, can be the most beneficial to our communities when buildings and vehicles are electrified to only use that clean energy.

- Electrification transitions buildings and vehicles away from natural gas and gasoline— both of which are extremely harmful to the environment, health, and safety of our communities

- All-electric buildings are **cost effective**, especially when adopted at the new construction stage.

What are the Main Benefits?

By developing electrification reach codes, cities and counties in CPA's service area can:

- Save energy and provide resiliency to communities
- Reduce the cost of new construction buildings and eliminate future retrofit costs
- Make progress toward Climate Action Plans
- Improve indoor air quality and reduce combustion fire risks
- Reduce greenhouse gas emissions and the negative effects of climate change

Now is the time.

- **Over 70 California municipalities** have adopted building electrification reach codes. Over 100 nationwide.
- Cities adopting building electrification codes, are also adopting EV infrastructure code.
- Electrification is the lowest-cost, lowest-risk pathway to decarbonization.
- Moving in advance of the State allows communities to:
  - Reduce sunk costs on gas infrastructure
  - Prepare the local market for electrification
  - Mitigate more greenhouse gas emissions
  - Improve the health and well-being of communities
  - Reach Climate Action Plan goals

How are Reach Codes Adopted?

- Every three years, cities and counties across the state can adopt local reach codes in line with the voluntary tiers of the latest CALGreen Code (aka Green Building Standards Code) surpassing the targets set through mandatory requirements by **15-30%.**

- **Municipal reach code amendments can be adopted at any time, and are not tied to the three-year state code cycle**

Reach Code Adoption Process (Part 1)

Member Agency Reaches Out to CPA for Support

Email CPAReachCodes@cleanpoweralliance.org to start the process

Introductory Meeting with TRC and CPA (1-2 weeks)

High level discussions of member agency goals and program offerings

Member Agency Signs Participation Agreement

Kick-Off Meeting with Program Team and Essential Jurisdiction Staff

In-depth discussions of specific member agency goals, policies, support needed, and next steps

Research, Education, and Support for Council Approval (1-3 months)

CPA team researches relevant policies, local policies and stakeholders, and provides technical assistance to the city/county and education at stakeholder events

Council Study/Information Session

City/county staff presents the reach code topic to council for information only. TRC requests presenting duties at the study session. Council may direct staff to conduct further research and stakeholder engagement before presenting a reach code ordinance to council.

Develop Draft Code for Review (1-3 months)

TRC will deliver a first draft of the model code

Reach Code Adoption Process (Part 2)

Stakeholder Engagement (1-3+ months)

Solicit feedback from the community. TRC answers technical questions. Option for multiple meetings targeted at specific groups.

Customize Code (1-3 months)

TRC continues code edits based on feedback from city/county departments and local stakeholders

1st Council Reading (1+ month after study session)

City/county staff present the reach code ordinance to council. There is a public comment period and council vote to advance the reach code to a 2nd reading. TRC is available to answer technical questions.

2nd Council Reading (2 weeks after 1st reading)

Council votes to pass the reach code. Usually, this is on consent but may go through public comment if the item is pulled from the consent calendar. TRC is available to answer technical questions.

Submittal to the CBSC and/or CEC (up to 1-3 months)

Once the ordinance is approved, staff file it with the state so the code can take effect

Reach Code Goes Into Effect! (Total of ~ 4-8 months)

Reach Code Examples

- What are some examples of reach codes?
- Who has implemented them?
- How did they perform?

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Member Agencies with adopted reach codes

CPA

Reflections on 2022 Reach Codes

Los Angeles County and Ventura County Cities

Jurisdiction	Type	Single	Multifamily	Nonresidential	EV Infrastructure	Exceptions
Agoura Hills	All-Electric CALGreen Amendment	X	X	X	X	Yes
Glendale	All-Electric CALGreen Amendment	X	X	X	X	No
Los Angeles (City)	All-Electric Municipal Code	X	X	X		Yes
Ojai	All-Electric Municipal Code	X	X	X		Infeasibility Only
Pasadena	All-Electric Municipal Code	X	X	X		Yes
Santa Monica	All-Electric Municipal Code	X	X	X	X	Yes
West Hollywood	EE, Cool Roofs Energy Ordinance	X	X	X		Yes
Ventura, County	All-Electric CALGreen Amendment	X	X	X		Yes

Source: Adopted Ordinances (localenergycodes.com))

Ventura County Electrification Model Code

All-Electric New Construction Additions/Alterations

	Ordinance
Single Family, Multifamily, Non-Residential Additions/ Alterations	>50% of existing building is added, then all equipment in the building shall be all-electric. >50% of estimated value, then all equipment serving the alteration shall be all-electric.
Exceptions	**Residential:** fireplaces/ fire pits, outdoor grills, pool and spa equipment, emergency generators **Nonresidential:** fireplaces/ fire pits, outdoor grills, pool and spa equipment, emergency generators. Buildings with public kitchens or specialized industry may apply for an exemption.

CPA

Source: Adopted Ordinances

City of Los Angeles Electrification Model Code

All-Electric New Construction

	Ordinance
Single Family, Multifamily, Non-Residential	All new buildings will be constructed as all electric buildings.
Exceptions	**Residential:** Attached accessory dwelling units using existing gas piping systems in conjunction with the primary dwelling. **Nonresidential:** F and L occupancies. Cooking equipment contained within kitchens located in a public use area, such as restaurants, commissaries, cafeterias, and community kitchens.

Source: Adopted Ordinances

City of San Luis Obispo New Construction Electrification Model Code

Energy Performance Approach (Source Energy Margin)

	Ordinance
Single Family	Energy Performance Approach Compliance Margin/EDR1 of at least 6 relative to standard design EDR1*
Multifamily	Three or less habitable stories: Compliance Margin of at least 9 percent Four or more habitable stories: Compliance Margin of at least 3 percent
Non-Residential	Source Energy Compliance Margin of at least 7 percent
Exceptions	**Single Family:** A newly constructed building that does not require a PV system in accordance with section 150.1(c)14. **Nonresidential:** when nonresidential occupancies are designed with single zone space-conditioning systems complying with Section 140.4(a)2.

*The Energy Performance Approach is based on ***EDR1*** hourly source energy which establishes a carbon-based performance metric. Installing all-electric measures can result in a lower cost of construction while achieving compliance. Instead of regulating appliance fuel infrastructure, ***the Energy Performance Approach*** sets a target energy score using the *EDR1/Source Energy margin* (used in modeling software for CA building permits).

Source: Adopted Ordinances; CEC Hourly Source Energy Presentation

Model Code Examples

Energy Efficiency New Construction

	Ordinance
Carlsbad (Single Family)	All newly constructed buildings shall install a service water-heating system that provides 60% of the energy needed from on-site solar energy (PV or solar water-heating) or recovered energy. Additions/Alterations: permit value greater than $60,000 shall include prescriptive energy efficiency measures depending on building
El Monte (Non-Res)	New and Re-roof: Low-slope; 3 Year Aged Solar Reflectance > 0.65, Thermal Emittance > 0.85, SRI > 78
Marin County (Multifamily)	Additions/Alterations: A project greater than 750 square feet must include CALGreen Tier 1 measures. All newly constructed buildings must include CALGreen Tier 1 measures.

Source: Adopted Ordinances

Existing Building Electrification Policy Types

Building Performance Standards are policies that require property owners to regularly report energy- or emissions- use intensity (EUI). In addition, the policies require incremental reductions in EUI over a set time horizon.

Time of Permit Reach Code policies require that applicants, when they are *already* pulling a permit for a renovation project, to abide by certain efficiency and/or electrification requirements. These policies avoid missed opportunities to electrify or incorporate electric-readiness at little-to-no additional cost.

Time of Property Transfer policies leverage real estate transactions to disclose relevant information on, incentivize, or require, certain home improvements.

EV Code Terminology

Speed

Level 1
3-4 miles per charging hour

Level 2
10-20 miles per charging hour

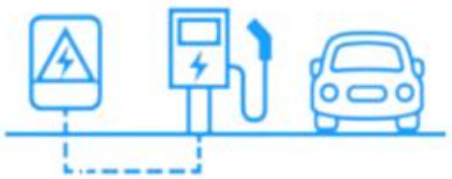
Level 3
150+ miles per charging hour

Readiness

EV **Capable**

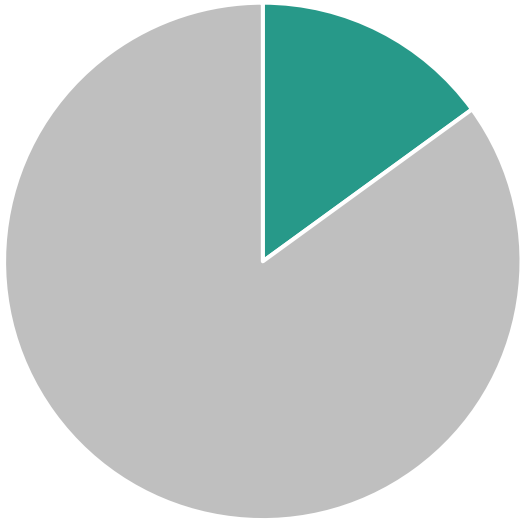
EV **Ready**

EV **Charging Station Installed**



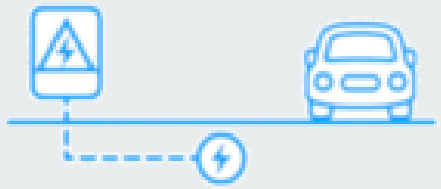
Number

Percent of Parking Spaces

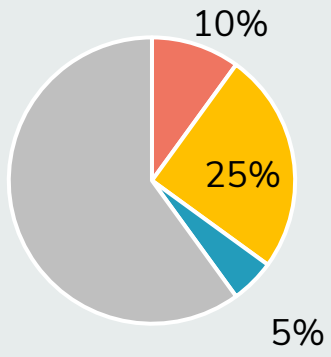
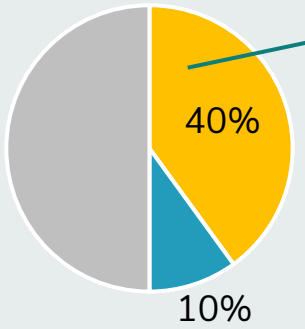
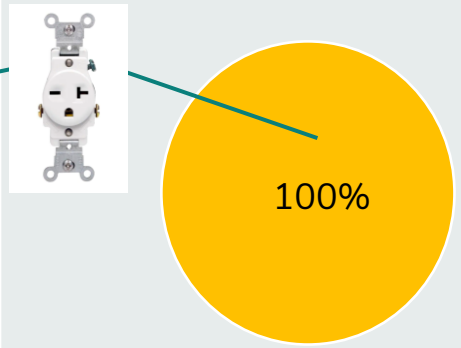
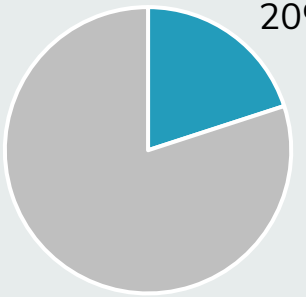


Source: [Cleanenergy.org EV Readiness]

EV Infrastructure Model Codes – New Construction

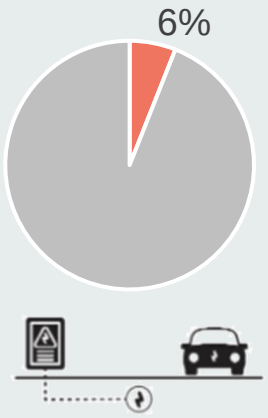
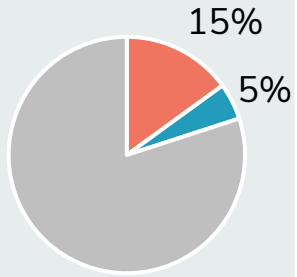
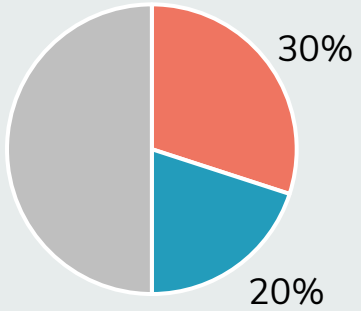
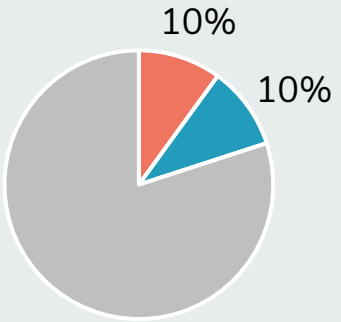
	2019 CALGreen	2022 CALGreen	Model Code
	Mandatory	Mandatory	
Single Family Homes and Two-Family Townhomes	(1) Level 2 EV Capable for one parking space per dwelling unit 		2 EV spaces total:  • 1 Level 2 EV Ready circuit  • 1 Level 1 EV Ready circuit 

EV Infrastructure Model Codes – Multifamily New Construction

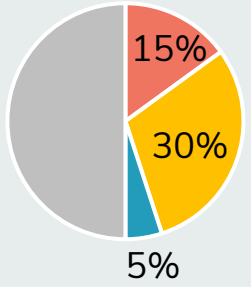
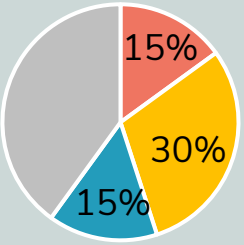
	2022 CALGreen	2022 CALGreen Intervening (July 1st 2024)	Recommendation: CALGreen Tier 2 Option B	
	Mandatory	Mandatory		
Multi-Family				 
	10% Level 2 EV Capable **25%** Level 2 EV Ready (low-power) **5%** Level 2 EVCS	**40%** Level 2 EV Ready (low-power) + Direct Wiring **10%** Level 2 EVCS	**100%** Level 2 (low-power) EV Ready + Direct Metering	**20%** Level 2 EVCS
	% of Parking Spaces		% of Spaces for Residents	% of Spaces for Common Use Parking

AUTOMATIC LOAD MANAGEMENT ENCOURAGED – 3.3kW/space

EV Infrastructure Model Codes – New Construction

	2019 CALGreen	2022 CALGreen	Model Code	
	Mandatory	Mandatory		
Non-Residential	% of Parking Spaces			
	 **6%** Level 2 EV Capable	 **15%** Level 2 EV Capable **5%** Level 2 EVCS	 Offices: **20%** Level 2 EVCS **30%** Level 2 EV Capable	 All other: **10%** Level 2 EVCS **10%** Level 2 EV Capable

LA County Adopted EV Reach Codes

Building Type	New Construction	EV Spaces
Single Family, Duplexes, and Townhouses	For each dwelling unit, install a listed raceway and a dedicated 208/240-volt branch circuit. (EV-Ready)	
Small Multifamily Projects (Less than 20 units)	• 15% of spaces Level 2 EV-Capable • 30% of spaces with Level 2 (Low Power) EV Ready • 5% of spaces with Level 2 EVCS (in addition to at least 1 common use EVCS)	
Large Multifamily Projects (20 units or more)	• 15% of spaces Level 2 EV-Capable • 30% of spaces with Level 2 (Low Power) EV Ready • 15% of spaces with Level 2 EVCS (in addition to at least 1 common use EVCS)	

Reference: [2022 Code Cycle – Electric Vehicle Ordinances in Los Angeles County]

2022 CALGreen - EV Infrastructure – Existing Buildings

Alterations or additions

- **Single Family** – Parking additions or electrical panel upgrades must meet new construction requirements

- **Multifamily** →
- **Nonresidential** →

When new parking facilities are added, or electrical systems or lighting of existing parking facilities are added/altered and the work requires a permit:

1. 10% of the total number of parking spaces added or altered shall be EVCS.
2. All existing EV Capable on-site shall be upgraded to minimum L1 EV Ready

Time certain policy (Zoning Code only)

- By January 1st, 2025, multifamily and nonresidential properties shall upgrade existing EV Capable spaces required by the locally adopted codes at the time the building was permitted to a minimum of Level 1 EV Ready.

Building Electrification

- What is it?
- Why should we implement Building Electrification Reach Codes?
- What are the benefits?

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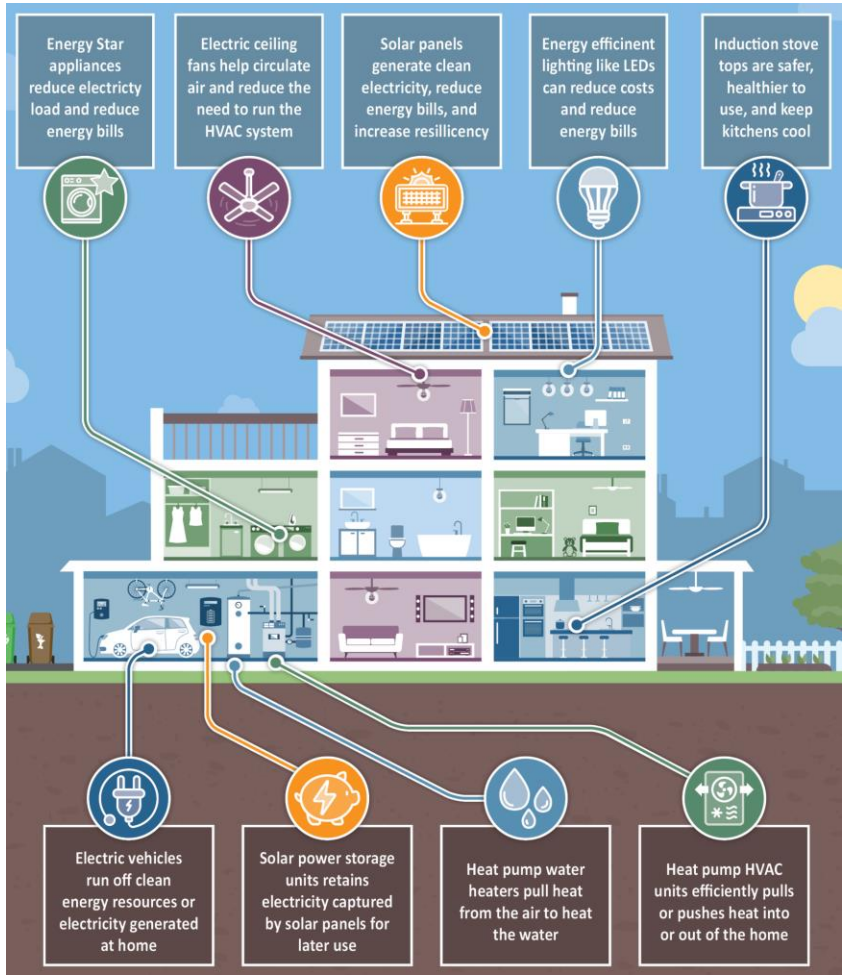
What is Building Electrification?

- Building electrification is the process of converting our buildings to use electric appliances and measures rather than ones that run on natural gas or other fossil fuels.

- **This includes the electrification of:**
  - Heating, Ventilation, and Air Conditioning
  - Hot water heater
  - Clothes dryers
  - Kitchen appliances
  - Vehicles

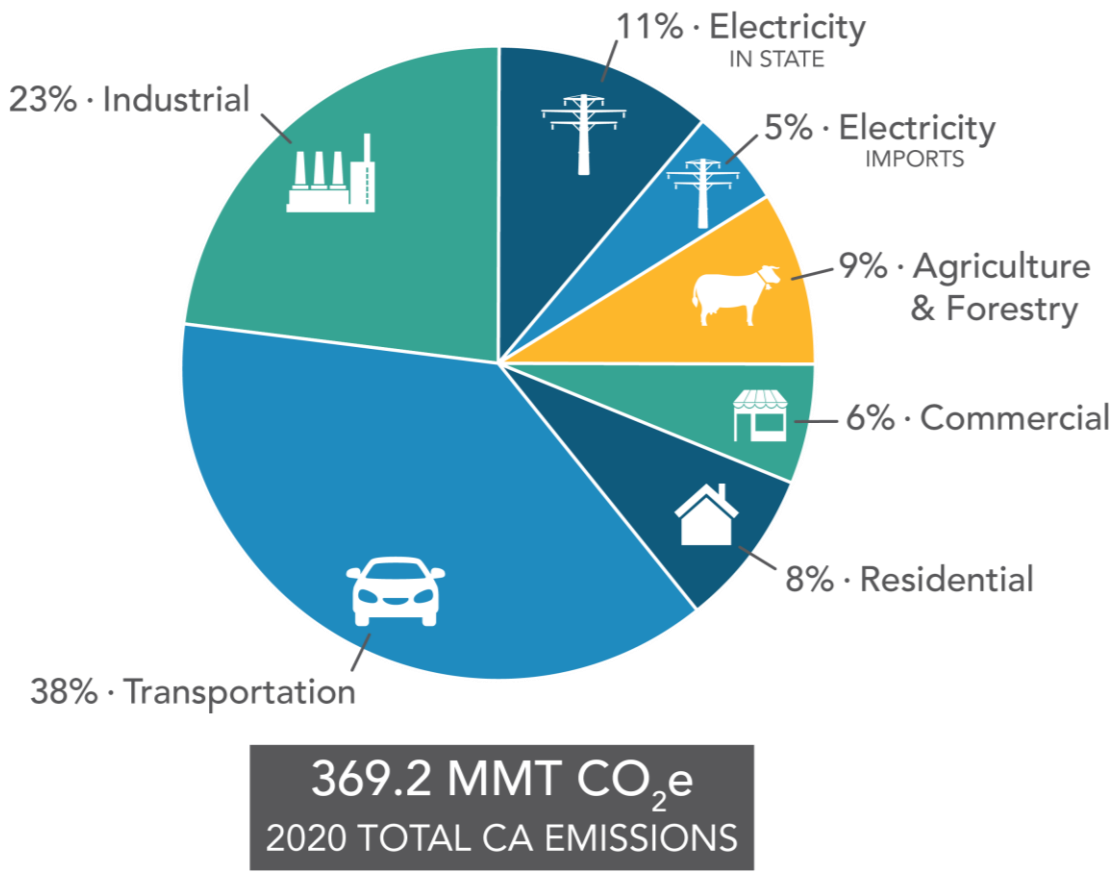


Source: Rincon Consultants

California Carbon Emissions by Economic Sector

- **Emissions from Transportation and Commercial and Residential buildings account for 52% of the CA inventory in 2020**
  - Mainly from the fossil fuel combustion
  - Nearly all gas appliances, except some high-temperature industrial applications, can be electrified.

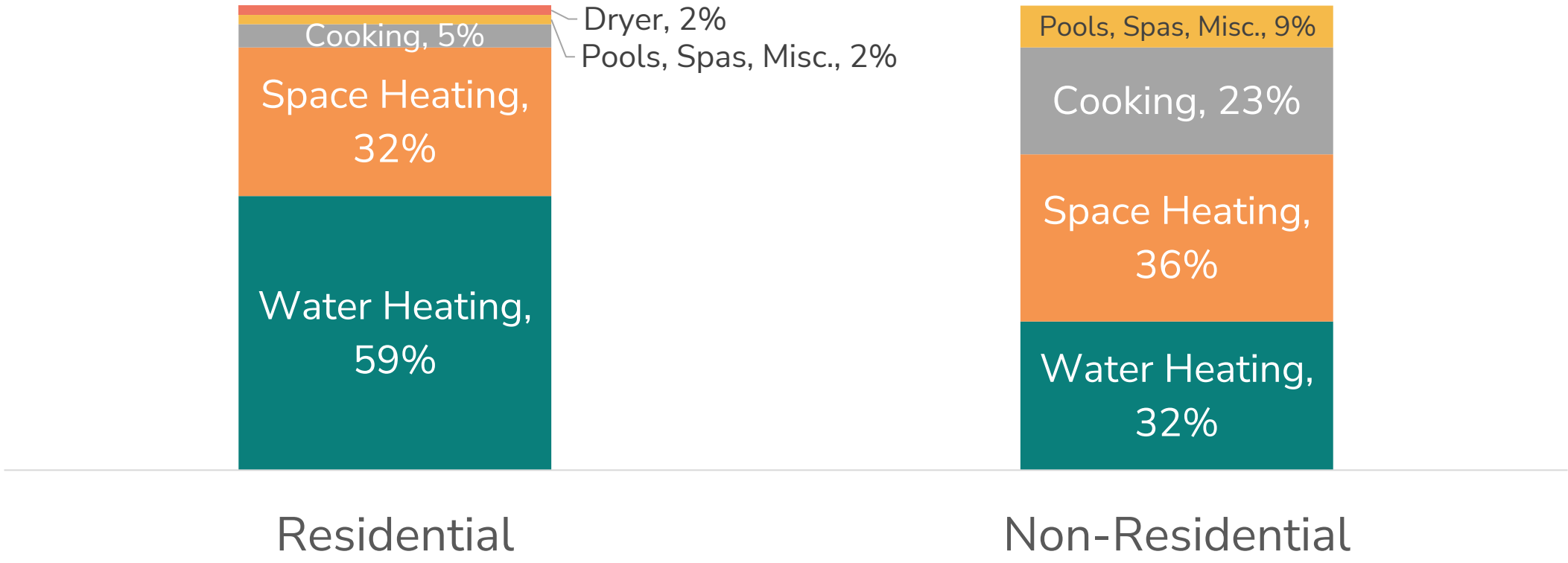
2022 California GHG Emission Inventory



Source: California Air Resources Board, 2022

California Buildings Gas Usage

The combined gas usage for **cooking, water heating,** and **space heating** accounts for **91%** in residential and **68%** in non-residential sectors.



Sources: 2019 Residential Appliance Saturation Survey and California Building Decarbonization Assessment

Electrification Benefits

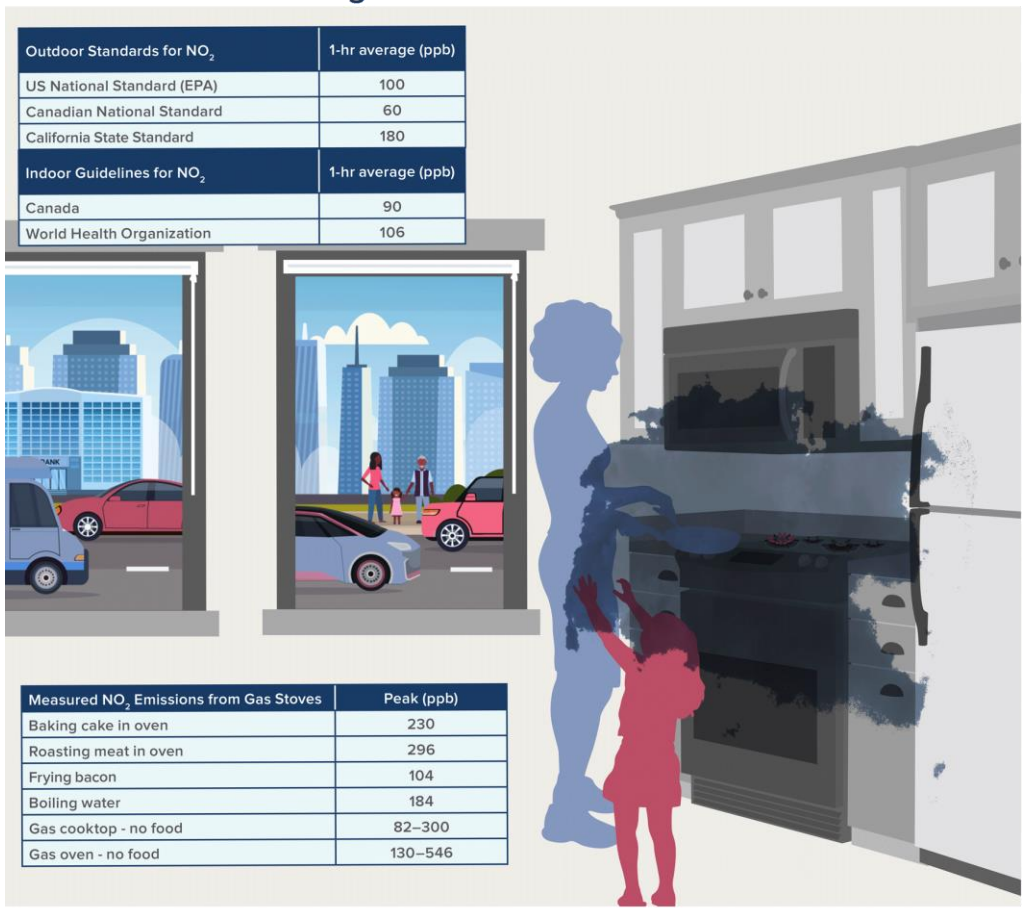
Healthier Indoor Air

- Electrification will eliminate the release of harmful pollutants indoors, leading to better air quality, fewer respiratory issues, and overall improved health.

"An analysis of 41 studies found that children living in homes with gas stoves had a 42% higher risk of experiencing asthma symptoms, and, over their lifetime, a 24% increase in the risk of being diagnosed with asthma."

Gas Stoves Can Emit Elevated Indoor Nitrogen Dioxide (NO_2) Levels Often Exceeding Indoor Guidelines and Outdoor Standards

Outdoor Standards for NO_2	1-hr average (ppb)
US National Standard (EPA)	100
Canadian National Standard	60
California State Standard	180
Indoor Guidelines for NO_2	**1-hr average (ppb)**
Canada	90
World Health Organization	106



Measured NO_2 Emissions from Gas Stoves	Peak (ppb)
Baking cake in oven	230
Roasting meat in oven	296
Frying bacon	104
Boiling water	184
Gas cooktop - no food	82–300
Gas oven - no food	130–546

Source: Rocky Mountain Institute, 2020, Slate 2020, John Hopkins, Lawrence Berkeley National Laboratory

Electrification Benefits

Reduced Greenhouse Gas Emissions

- Electrification, especially when energy sourced from a clean renewable energy from CPA, helps to reduce harmful greenhouse gas emissions and mitigate negative climate change effects

Electrification Benefits

Lowest-cost, lowest-risk pathway

- Electrification is cost effective, especially in New Construction
- Gas infrastructure and fuel costs are highly volatile

Additional Cost Effectiveness Resources:

- 2022 Single Family New Construction Cost-effectiveness Study
- 2022 Multifamily New Construction Cost-effectiveness Study
- 2022 Nonresidential New Construction Cost-effectiveness Study
- Residential Building Electrification in California

Energy Performance Approach
Single Family Average Cost Impacts (CZ 6,8,9,16)

	All-Electric Standard:
Construction Cost*: (compared to mixed-fuel)	$3,300 - $5,300 **savings**
Bill Impact*: (compared to mixed-fuel)	$22 - $45/month **increase**
% CO2 Savings*:	17% - 49%

**Range of values depends on climate zone*

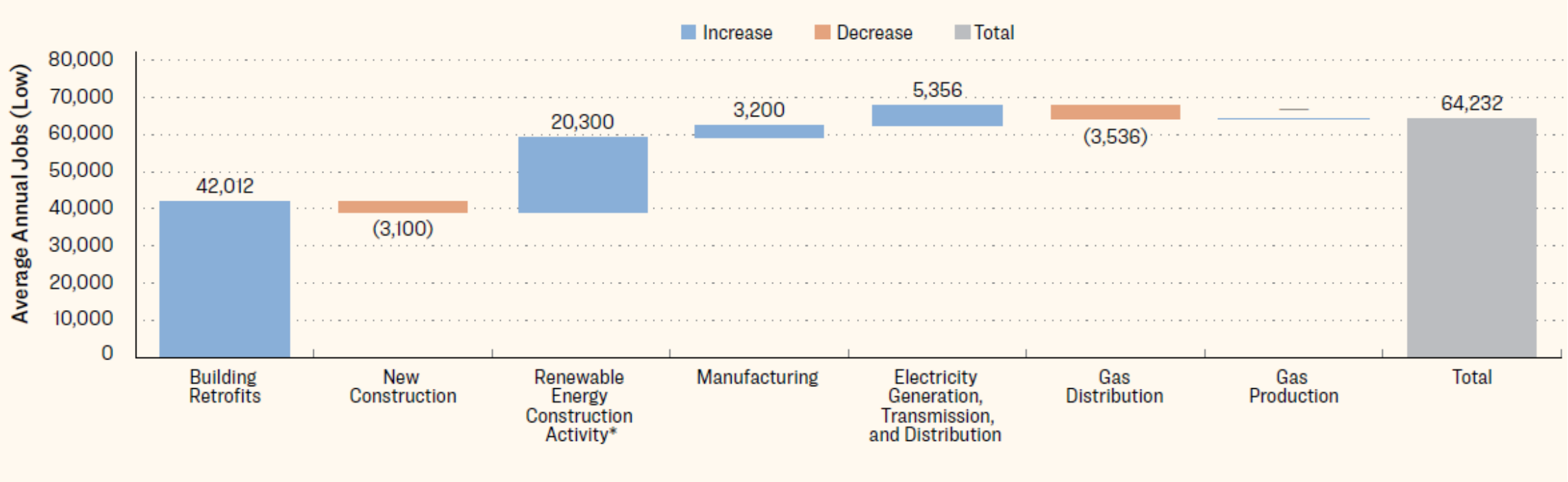
CPA

Source: Cost Study of the Decarbonization Code; The Challenge of Retail Gas in California's LowCarbon Future

Electrification Benefits

Job Creation

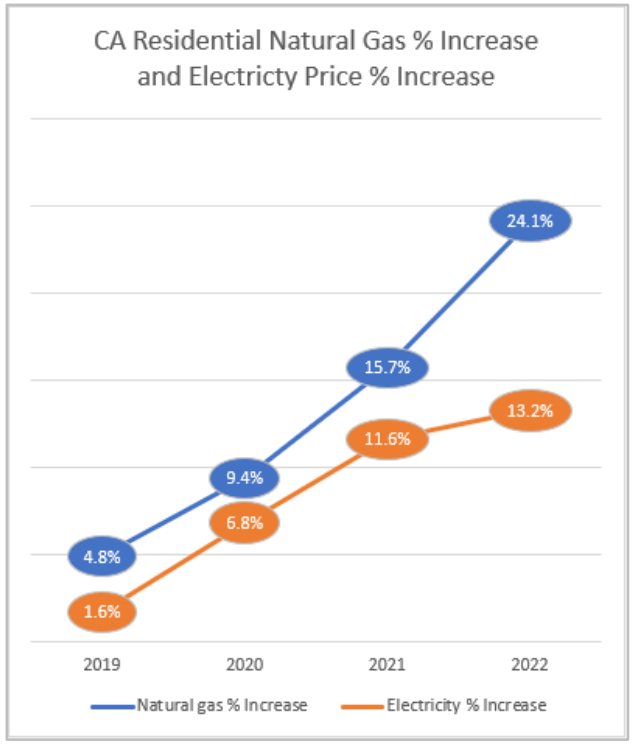
- The shift towards electrification generates new employment opportunities in manufacturing, construction, and electricity generation, transmission and distribution.



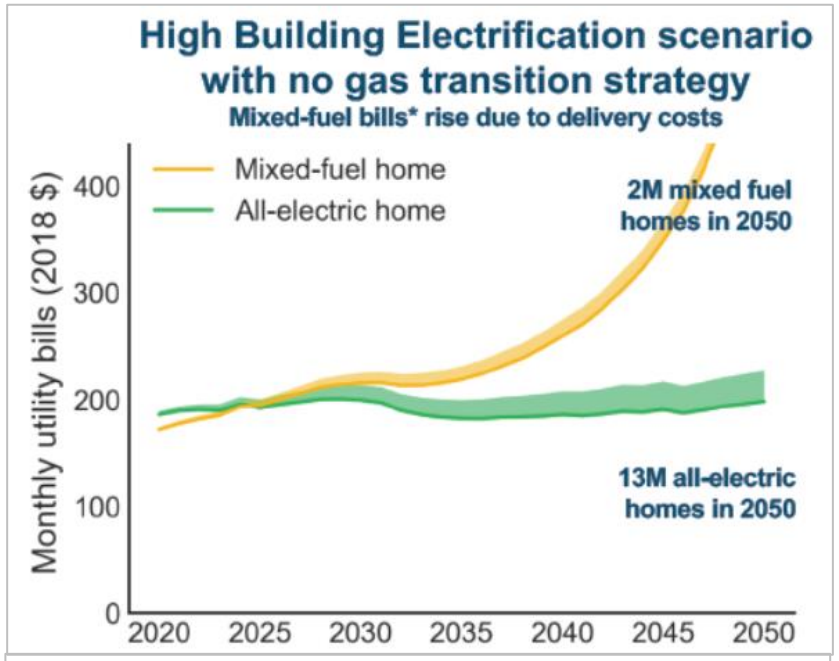
Sources: UCLA 2019, UMass 2021

Gas Issues: Natural Gas Costs Climbing

CA residential natural gas prices increased **5.2%** per year faster than electricity prices from 2019 to 2022



Trend expected to continue:

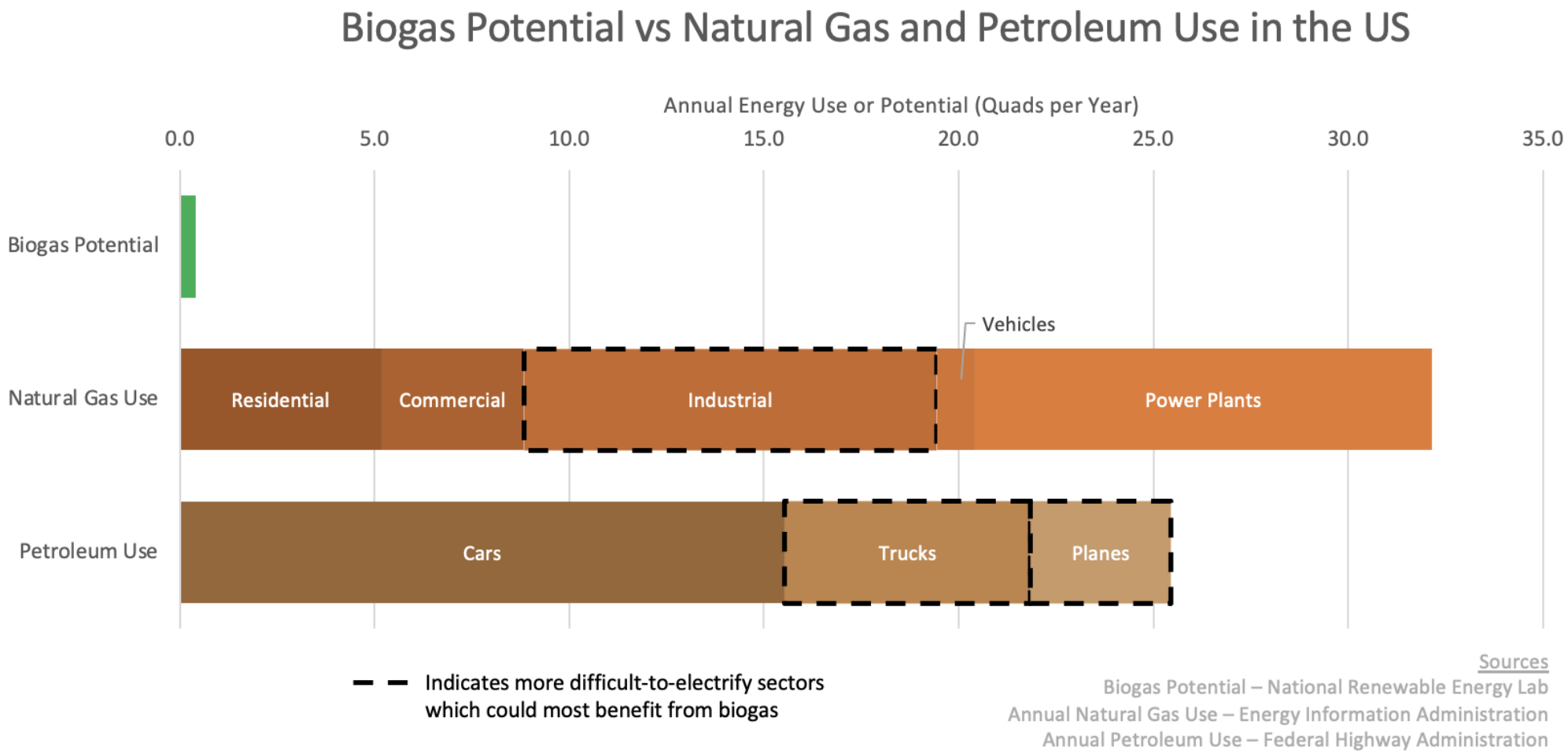


CEC Workshop June 6, 2019: Draft Results from E3 study on the Future of Natural Gas Distribution in California

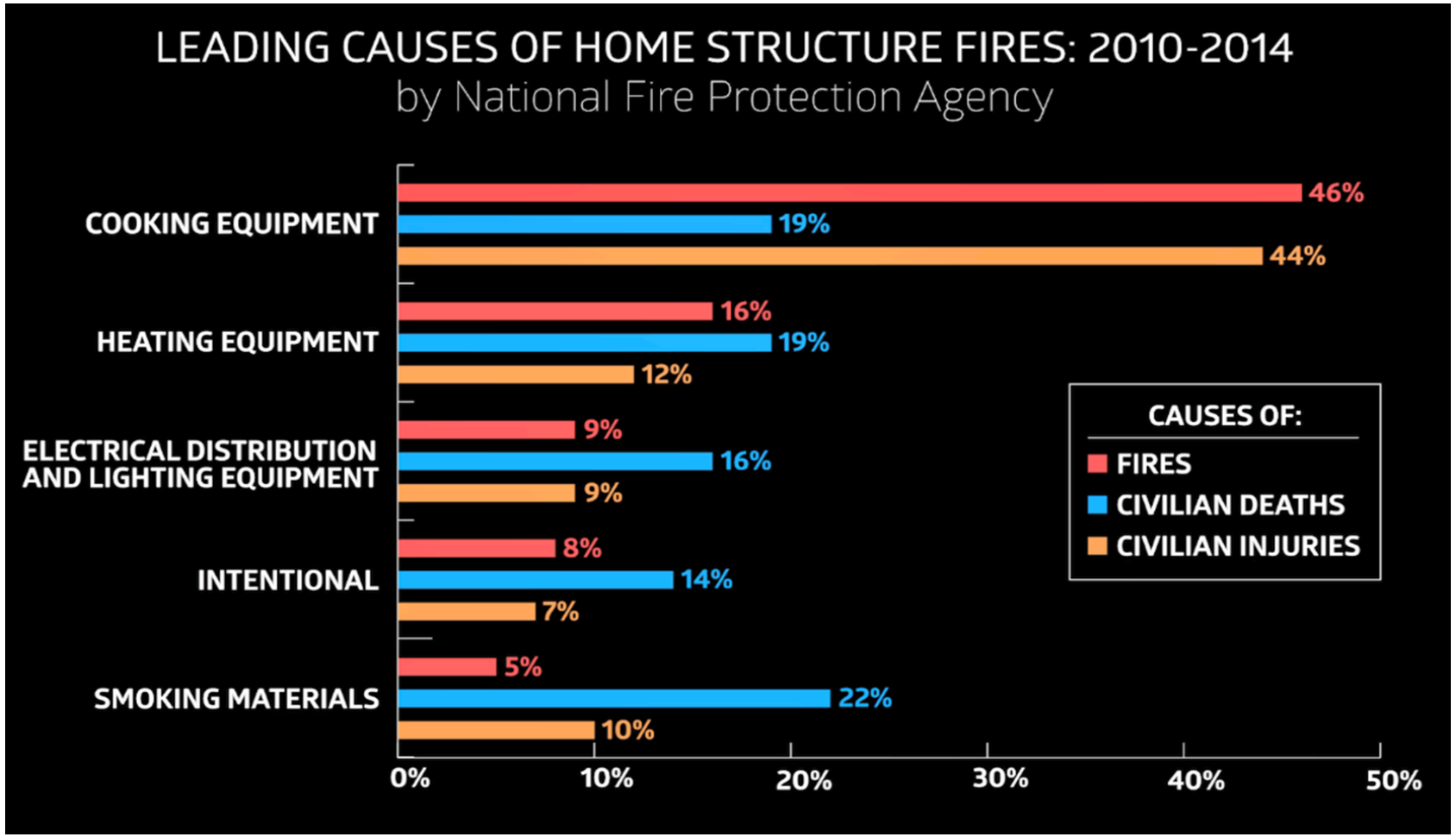
The AB3232 Report represents the most current CEC research supporting that *Aggressive Electrification* is the primary pathway to meeting GHG reduction targets.

Source: EIA
https://www.eia.gov/dnav/ng/hist/n3010ca3m.htm
https://www.eia.gov/electricity/data/state/

Gas Issues: BioGas Can't Get Us There



Gas Issues: Gas is a Fire Risk



Sources: https://drscleanup.com/2017/10/house-fire-causes-be-safe/
https://www.nfpa.org/News-and-Research/Data-research-and-tools/Building-and-Life-Safety/Home-Structure-Fires

Energy Performance Approach (Source Energy Margin) Reach Code:

Single Family, Multifamily, and Non-Residential New Construction

- What is it?
- How do we implement Source Energy Reach Codes?
- What are the benefits?

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What is Source Energy?

- **Source Energy** (referred to as EDR1 for single family) is a rating score index used to regulate energy performance within specific building designs (aka performance pathways).
- Source Energy is based on hourly source energy which establishes a carbon-based performance metric.
- In single family, Source Energy is 1 of 3 Energy Design Rating (EDR) metrics.

ENERGY DESIGN RATINGS

	Energy Design Ratings			Compliance Margins		
	Source Energy (EDR1)	Efficiency[1] EDR (EDR2efficiency)	Total[2] EDR (EDR2total)	Source Energy (EDR1)	Efficiency[1] EDR (EDR2efficiency)	Total[2] EDR (EDR2total)
Standard Design	35.6	45.8	31.3			
Proposed Design	26.5	39.6	28.4	9.1	6.2	2.9
RESULT[3]: PASS						

[1]Efficiency EDR includes improvements like a better building envelope and more efficient equipment
[2]Total EDR includes efficiency and demand response measures such as photovoltaic (PV) system and batteries
[3]Building complies when source energy, efficiency and total compliance margins are greater than or equal to zero and unmet load hour limits are not exceeded

- Standard Design PV Capacity: 3.46 kWdc
- PV System resized to 3.46 kWdc (a factor of 3.459) to achieve 'Standard Design PV' PV scaling

Figure: Example of Single Family EDR and Compliance Margins

Source: EnergyCodeAce; CEC Hourly Source Energy Presentation

Performance Path Compliance Approach: Source Energy

Single Family Example

ENERGY DESIGN RATINGS						
	Energy Design Ratings			Compliance Margins		
	Source Energy (EDR1)	Efficiency[1] EDR (EDR2efficiency)	Total[2] EDR (EDR2total)	Source Energy (EDR1)	Efficiency[1] EDR (EDR2efficiency)	Total[2] EDR (EDR2total)
Standard Design	35.6	45.8	31.3			
Proposed Design	26.5	39.6	28.4	x	6.2	2.9
RESULT[3]: PASS						

[1]Efficiency EDR includes improvements like a better building envelope and more efficient equipment

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[3]Building complies when source energy, efficiency and total compliance margins are greater than or equal to zero and unmet load hour limits are not exceeded

- Standard Design PV Capacity: 3.46 kWdc
- PV System resized to 3.46 kWdc (a factor of 3.459) to achieve 'Standard Design PV' PV scaling

- In order to pass, a score of “x” or higher is required for the EDR1 Compliance Margin (per reach code).
- EDR2efficiency & EDR2total must achieve a score of “0” or higher to pass (per 2022 Title 24, Part 6).

Source Energy Benefits

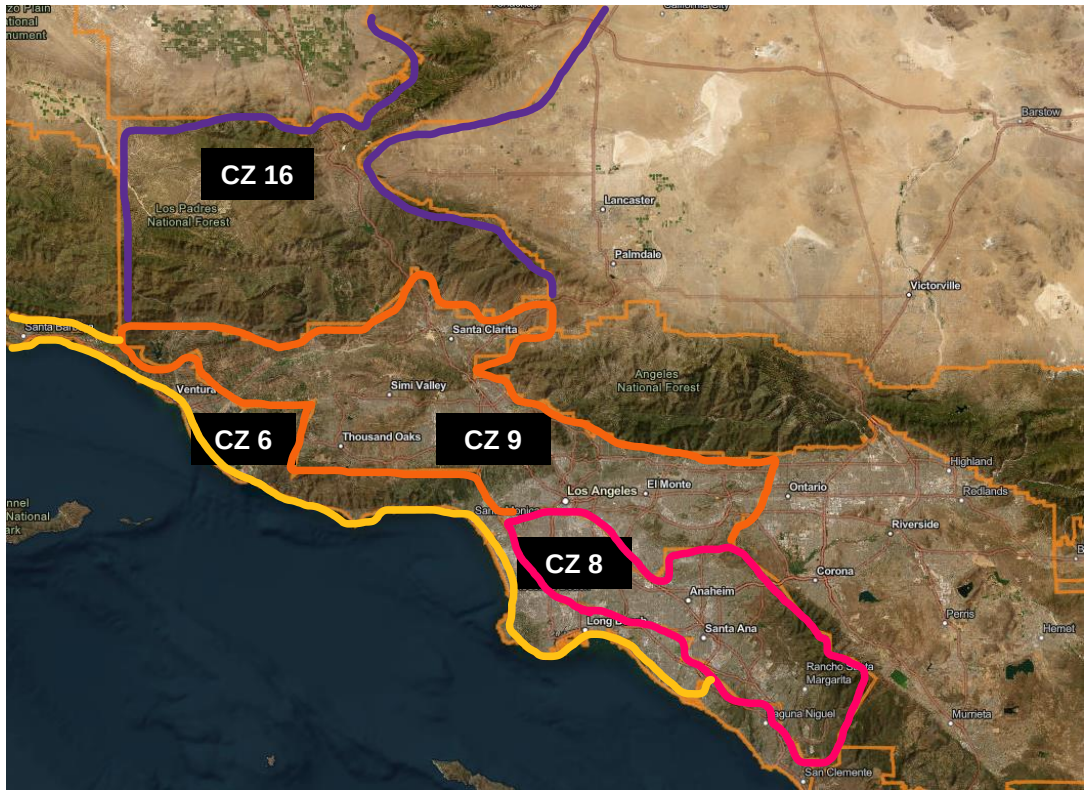
Reducing Greenhouse Gas Emission in line with state and agency goals;

Providing Financial Benefits related to lower-cost electric construction;

Supporting Public Health by decreasing air pollution emissions and exposure.

Avoiding Legal Risk by providing compliance pathways for all-electric and mixed-fuel buildings.

CPA Climate Zone Reference Map



Los Angeles County

- CZ 6, 8, 9 & 16

Ventura County

- CZ 6, 9 & 16

CZ 6

- Camarillo
- Carson
- Hermosa Beach
- Malibu
- Manhattan Beach
- Oxnard
- Redondo Beach
- Rolling Hills Estates
- Santa Monica
- Ventura

CZ 8

- Culver City
- Downey
- Hawaiian Gardens
- Hawthorne
- Paramount

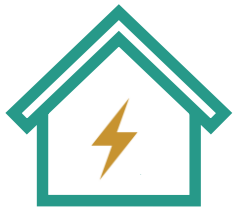
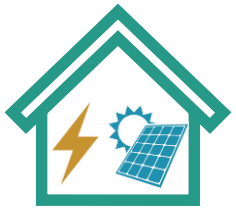
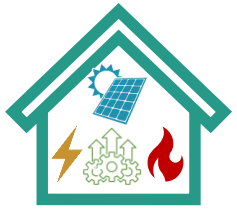
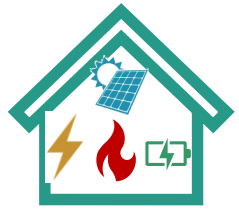
CZ 9

- Agoura Hills
- Alhambra
- Arcadia
- Beverly Hills
- Calabasas
- Claremont
- Monrovia
- Moorpark
- Santa Paula
- Sierra Madre
- Simi Valley
- South Pasadena
- Temple City
- Thousand Oaks
- West Hollywood
- Westlake Village
- Whittier

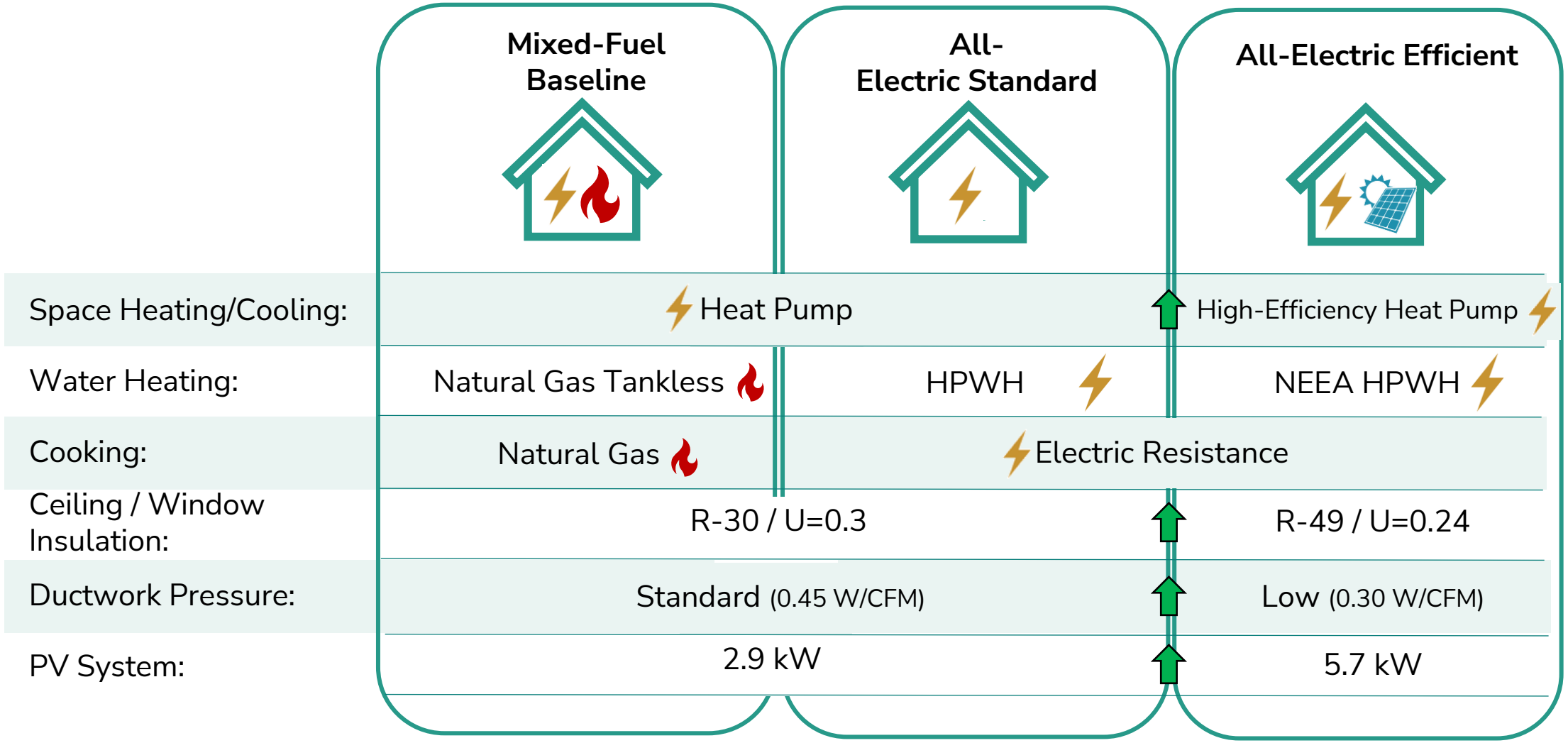
CZ 16

- Ojai

Package Definitions

All-Electric Standard:	All-Electric Efficient:	All-Electric Eff w/ PV:	Mixed-Fuel Eff w/ PV:	Mixed-Fuel Eff w/ PV & Battery:
				
All-Electric	All-Electric	All-Electric	Mixed Fuel	Mixed Fuel
Minimal efficiency	Expanded efficiency	Expanded efficiency	Expanded efficiency	Expanded efficiency
Minimal solar	Minimal solar	Optimal solar	Optimal solar	Optimal solar
No battery	No battery	No battery	No battery	Battery

Building Package Equipment Details



Energy Performance Approach Cost Impacts: Average of CZ

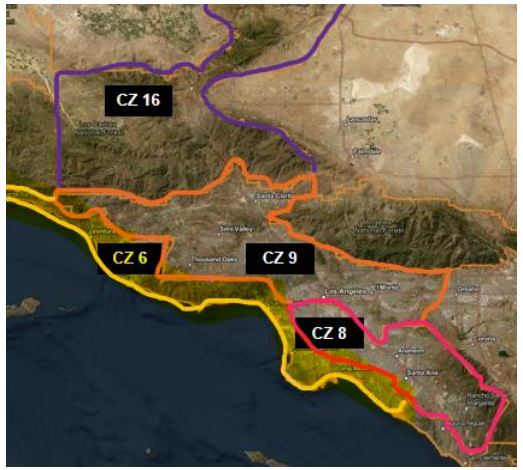
	All-Electric Standard:
Construction Cost*: (compared to mixed-fuel)	$3,300 - $5,300 **savings**
Bill Impact*: (compared to mixed-fuel)	$22 - $45/month **increase**
EDR1*	2 to 23
% CO2 Savings*:	17% - 49%

**Range of values depends on climate zone*

- All-Electric Standard Construction has a lower construction cost compared to the mixed-fuel baseline.
- Bill impacts slightly increase due to price differences between natural gas and electricity.
- EDR1 varies by climate zone.
- % CO2 savings demonstrates GHG emissions avoidance through electrification.

CPA *Source: 2022 Single Family NewCon Cost-eff Study*

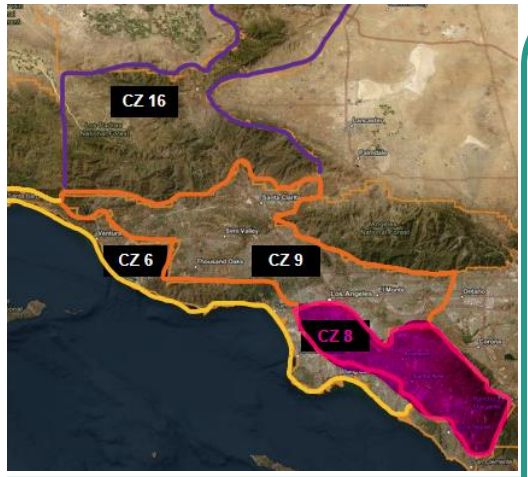
Energy Performance Approach Impacts: CZ6



	All-Electric Standard:	All-Electric Efficient:	All-Electric Eff w/ PV:	Mixed-Fuel Eff w/ PV:	Mixed-Fuel Eff w/ PV & Battery:
Construction Cost: (compared to mixed-fuel baseline)	$5,300 **savings**	$3,600 **savings**	$0	$3,000 **cost**	$8,100 **cost**
Bill Impact: (compared to mixed-fuel baseline)	$20/month **cost**	$15/month **cost**	$25/month **savings**	$20/month **savings**	$30/month **savings**
EDR1	4	6	8	3	18
% CO2 Savings:	22%	27%	32%	8%	46%

Source: *2022 Single Family NewCon Cost-eff Study*

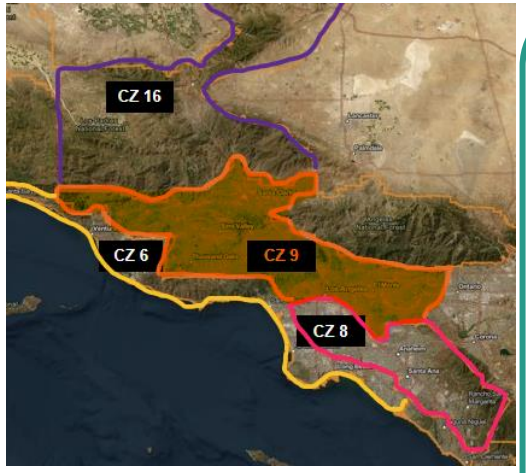
Energy Performance Approach Impacts: CZ8



	All-Electric Standard:	All-Electric Efficient:	All-Electric Eff w/ PV:	Mixed-Fuel Eff w/ PV:	Mixed-Fuel Eff w/ PV & Battery:
Construction Cost: (compared to mixed-fuel baseline)	$5,300 **savings**	$4,100 **savings**	$700 **savings**	$2,400 **cost**	$7,500 **cost**
Bill Impact: (compared to mixed-fuel baseline)	$20/month **cost**	$15/month **cost**	$20/month **savings**	$15/month **savings**	$30/month **savings**
EDR1	2	4	5	2	17
% CO2 Savings:	17%	22%	27%	5%	46%

Source: *2022 Single Family NewCon Cost-eff Study*

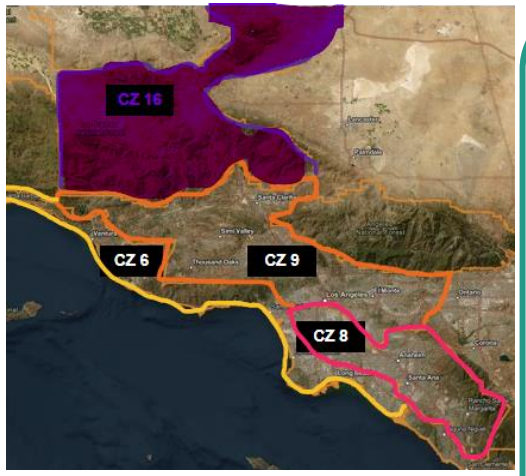
Energy Performance Approach Impacts: CZ9



	All-Electric Standard:	All-Electric Efficient:	All-Electric Eff w/ PV:	Mixed-Fuel Eff w/ PV:	Mixed-Fuel Eff w/ PV & Battery:
Construction Cost: (compared to mixed-fuel baseline)	$5,300 **savings**	$4,100 **savings**	$500 **savings**	$2,400 **cost**	$7,500 **cost**
Bill Impact: (compared to mixed-fuel baseline)	$20/month **cost**	$15/month **cost**	$20/month **savings**	$15/month **savings**	$30/month **savings**
EDR1	3	5	7	2	16
% CO2 Savings:	20%	25%	30%	6%	43%

Source: *2022 Single Family NewCon Cost-eff Study*

Energy Performance Approach Impacts: CZ16



	All-Electric Standard:	All-Electric Efficient:	All-Electric Eff w/ PV:	Mixed-Fuel Eff w/ PV:	Mixed-Fuel Eff w/ PV & Battery:
Construction Cost: (compared to mixed-fuel baseline)	$3,300 **savings**	$1,900 **savings**	$7,100 **cost**	$3,300 **cost**	$10,800 **cost**
Bill Impact: (compared to mixed-fuel baseline)	$45/month **cost**	$35/month **cost**	$90/month **savings**	$45/month **savings**	$45/month **savings**
EDR1	23	25	28	13	21
% CO2 Savings:	49%	52%	57%	24%	36%

Source: *2022 Single Family NewCon Cost-eff Study*

Electric Appliances & Technology

- Electric appliance facts and benefits

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Electric Measures are Common

Of national new construction homes:[1]

56% use electric space heating

(40% of which are heat pumps) [2]

53% use electric water heating

52% use electric cooking

76% use electric clothes drying

Sources: 1 - 2019 American Housing Survey Report, 2 - 2017 IEA Heat Pump Conference Proceedings

Electric Cooking is Better in Every Way

Restaurateurs viewed coal more favorably than natural gas at beginning of 20th Century. Natural gas was better in every way – just like **electric** is now.

Older tech	Newer tech
More polluted	Healthier
Hotter	Cooler
Louder	Quieter
More maintenance	Less cleaning
Less productive	More productive

Sources: Physicians for Social Responsibility, Chris Galarza

Stoves: Consumer Reports Prefers Induction

- 6 of top 8 Ranges for 2020 were electric, top 2 were Induction
- Gas stove tops were priced higher than the induction

Fuel	Model	Consumer Reports Rating	Cost
Induction	GE Profile PHS930SLSS	86	$2,432
Induction	Kenmore Elite 95073	84	$1,525
Gas	LG Signature LUTD4919SN	84	$3,000
Induction	LG LSE4617ST	82	$2,500
Induction	LG LSE4616ST	82	$1,700
Smoothtop	Whirlpool WGE745c0FS	82	$1,000
Gas	Samsung NY58J9850WS	81	$2,725
Induction	Frigidaire Gallery FGIF3036TF	81	$1,035

Source: A Pocket Guide to All Electric Retrofits of Single Family Homes

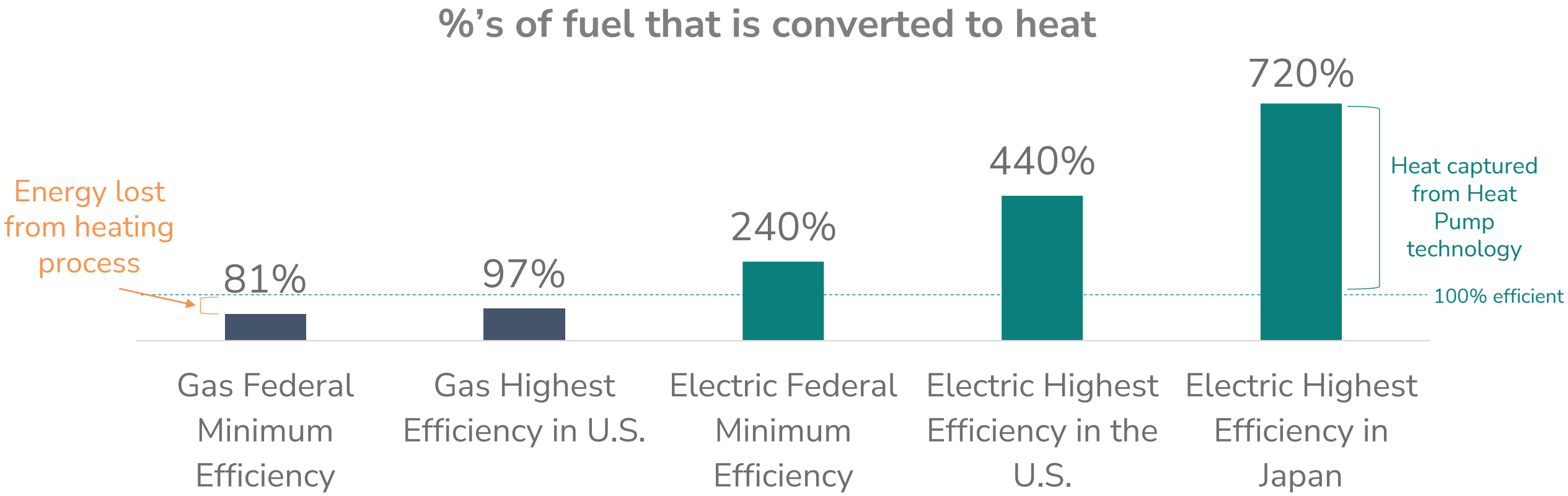
Examples of Electric Appliances and Equipment

	Heat Pump Space Heating	Heat Pump Water Heating	Induction Cooking	Electric Clothes Drying
Residential				
Commercial				

Heat Pumps

- Cuts climate pollution from the average California home by more than half over the next 15 years compared to homes that burn gas
- A heat pump is nearly identical to a central air conditioner with one small but important difference: a reversing valve that allows it to provide **heating and cooling**
- **All-electric heat pumps are highly efficient and effective, even** in weather far colder than ours

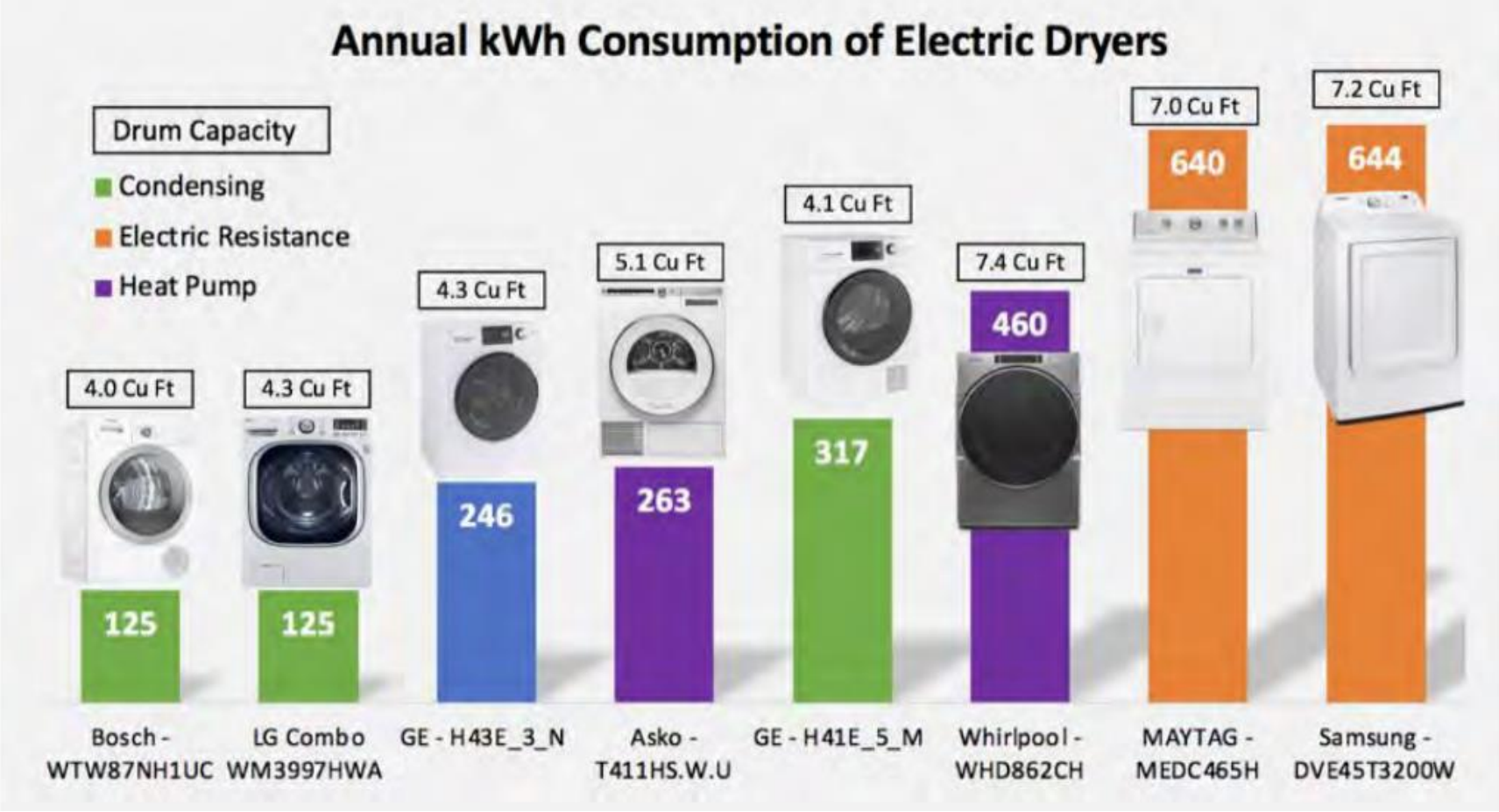
Electric HVAC Systems are Significantly More Efficient



Since electric systems, like Air Source Heat Pumps, can move existing heat from the air instead of generating it by burning fuel, these systems are more efficient than a traditional gas fueled space heater

Reference: Redwood Energy, 2022

Choosing Efficient Equipment is Important



Condensing dryers and heat pump dryers use *roughly* **half the energy** of a standard electric resistance dryer.

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Source: Redwood Energy, 2022; Energy Star Product Finder

Electric Vehicle Infrastructure (EVI)

- What is it?
- Why should we implement EVI Reach Codes?
- What are the benefits?

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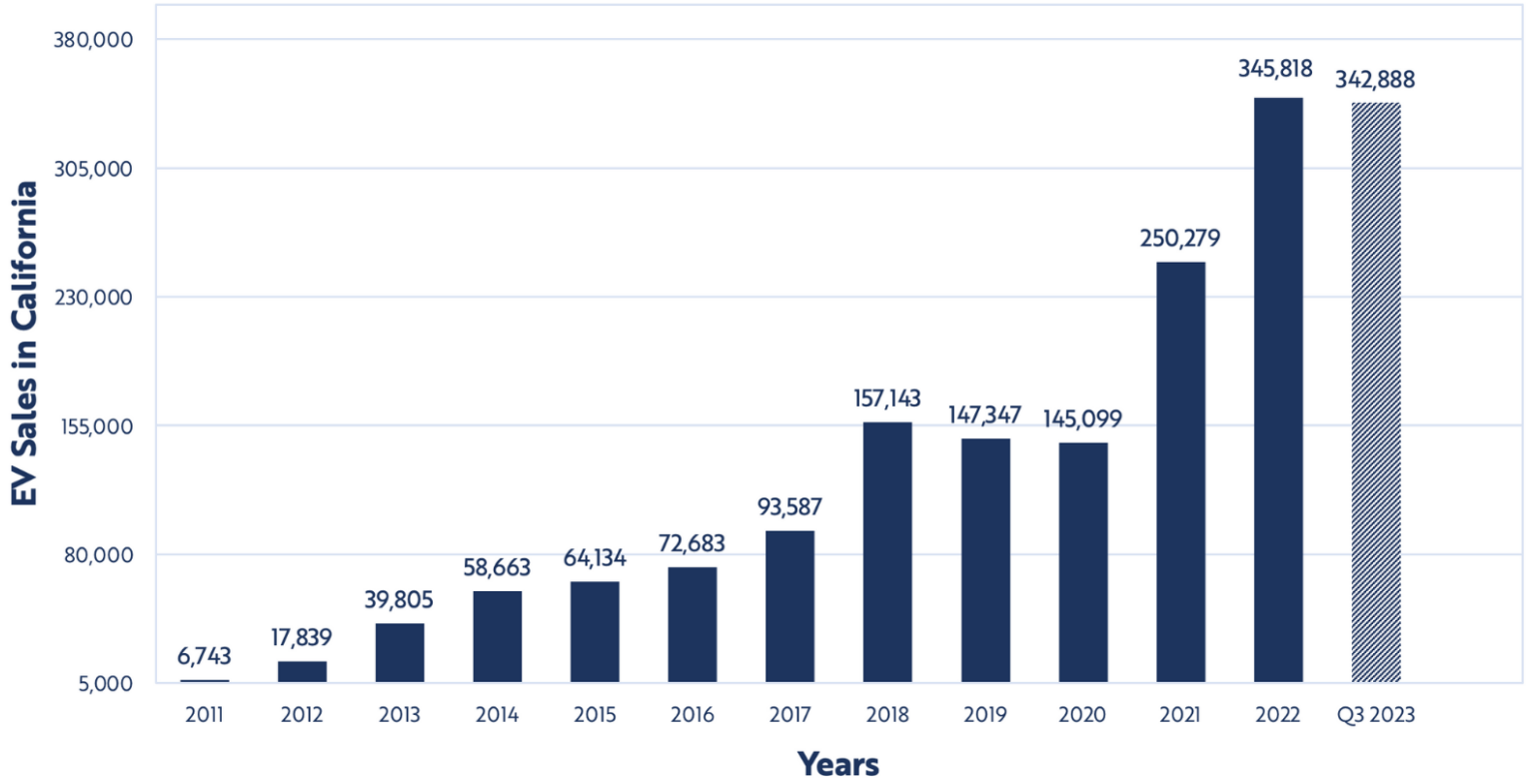
EV Charging Demand

VELOZ

Annual Electric Vehicle Sales in California



Data source: California Energy Commission Light-Duty ZEV Sales Data (October 2023).

Q3 2023 data update: Cumulative data from 2011 – 2023.

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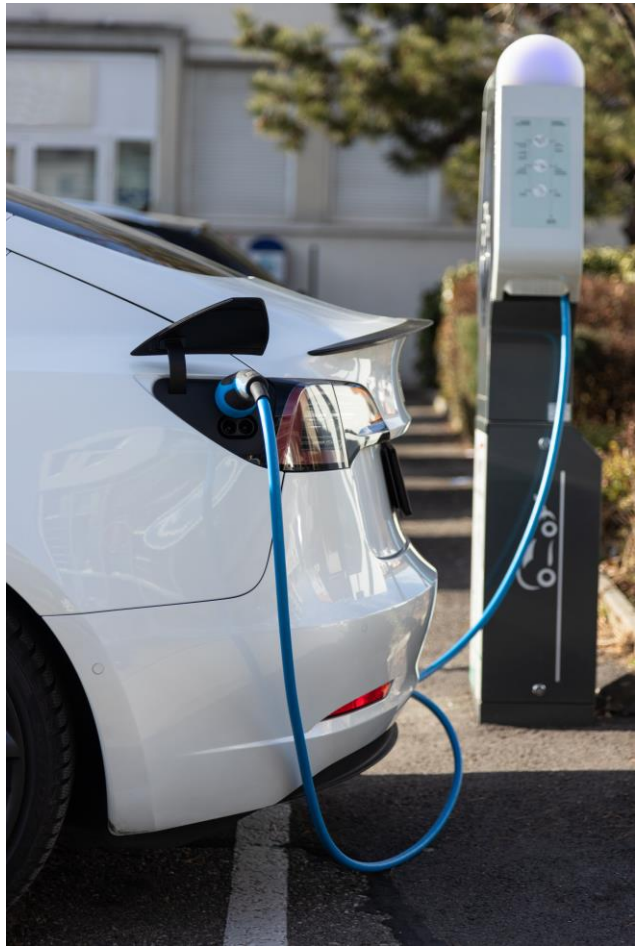
Sources: [Veloz, 2023]

What is Electric Vehicle Infrastructure (EVI)?

- **The integral equipment and materials necessary to support Electric Vehicle (EV) charging.**

- **This includes:**
  - Electrical capacity (utility service, transformers, and feeders)
  - Panel space for EV dedicated breaker
  - Conduit/Raceway/Pathways for circuits
  - Wiring (circuits) for EV charger
  - EV dedicated receptacles
  - EV charging plug and cord
  - Energy management software



Benefits of installing EVI?

- Helps to meet market demand
- Improves market readiness
- Reduces GHG emissions
- Reduces harmful pollution in communities
- Enable future resiliency benefits (V2B or V2G)

Why Reach Codes for EV Charging?

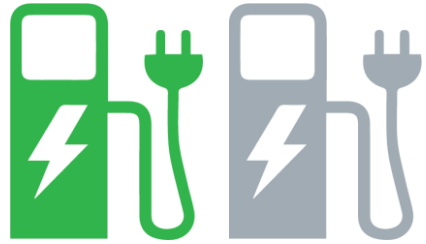
- Supports a clean transportation future
- Significantly reduces GHG emissions
- Reduces harmful pollution in communities
- Creates resiliency benefits to the grid
- Helps to meet Climate Action Plan goals

Lack of EV charging locations at residences and in the community is harmful to a quick transition

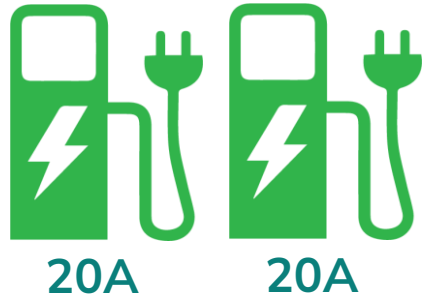
Dynamic Load Management or Circuit Sharing

Dual Head or Dual Port Charger

1 car charging



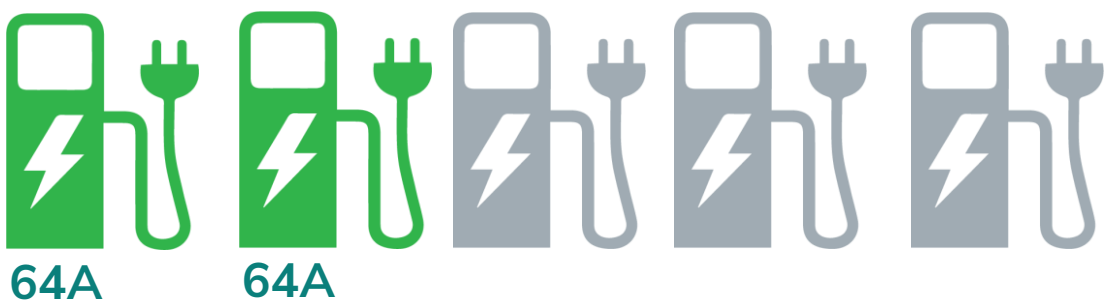
2 cars charging



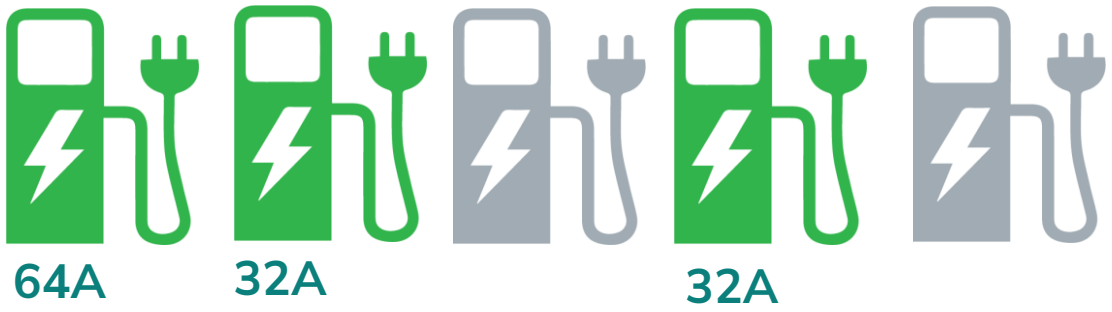
Source: Enphase

Automatic Load Management

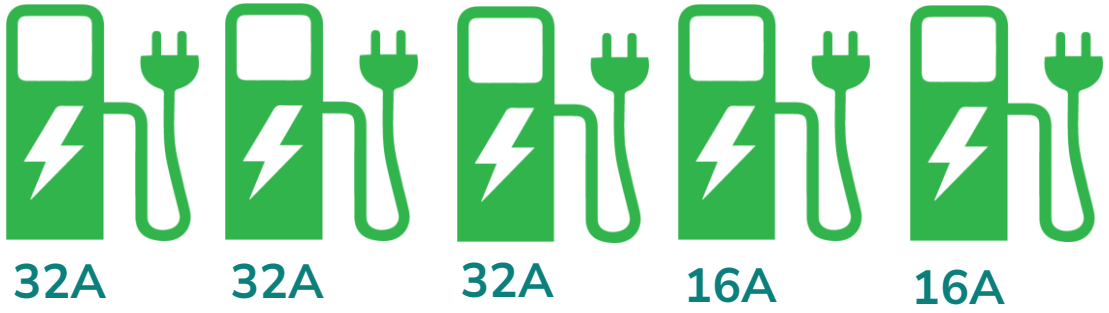
2 cars charging



3 cars charging



5 cars charging



EV Reach Code Cost Impacts

EVI requirements in reach codes add less than 2% to total cost to developers:

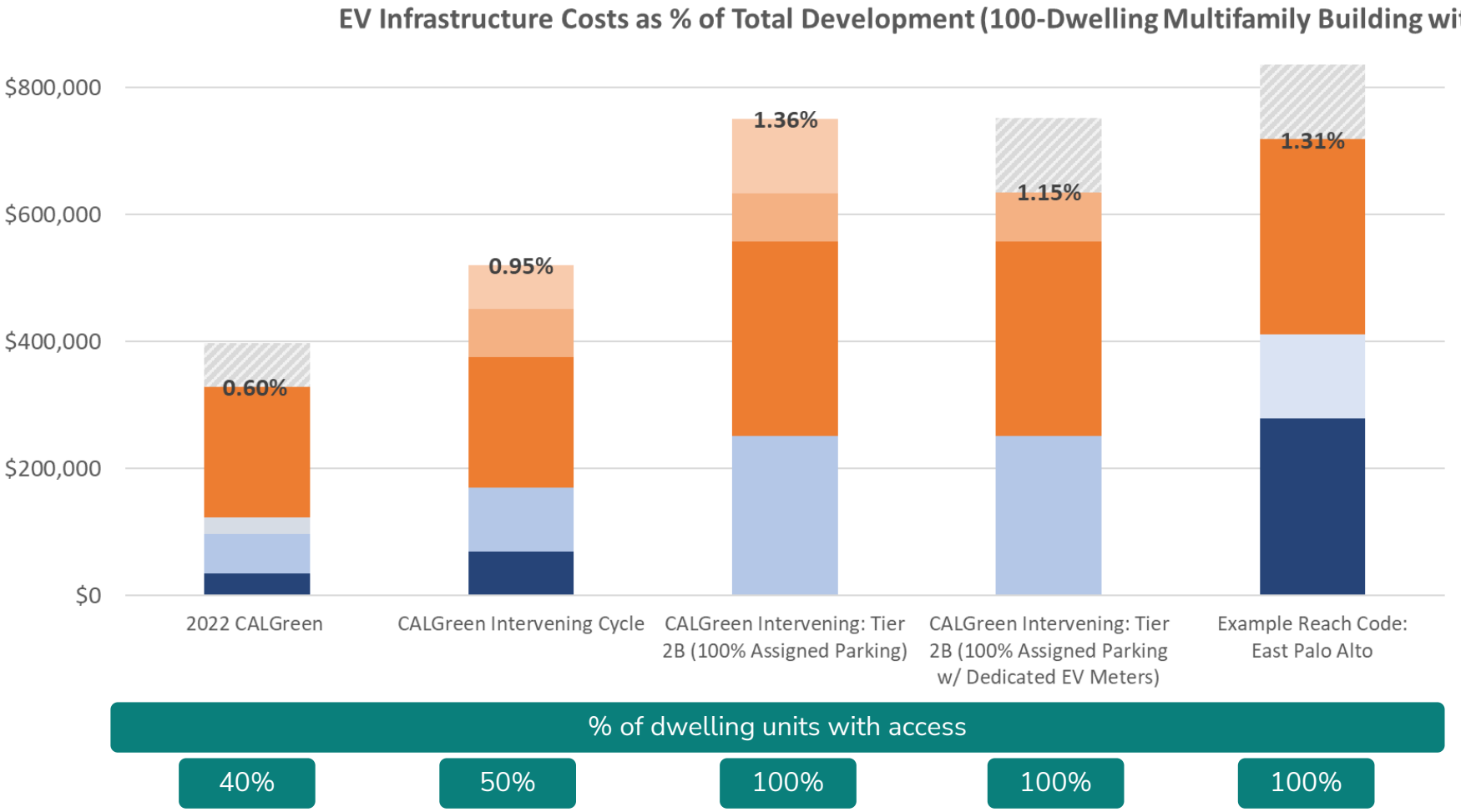
Greater electrical capacity for EV charging requires upsizing electrical utility service and equipment upstream of the utility meter, and more equipment to bring power to parking spaces downstream of the meter.

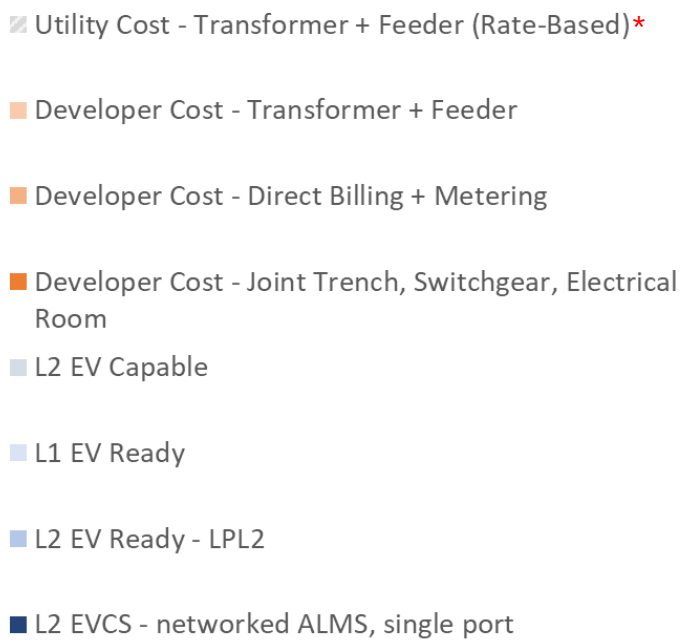
- **Upstream:** Utility Distribution Grid to Meter
  - Transformer & feeder
  - Joint trench
  - Switchgear sizing
  - Electrical room square footage
  - Direct billing & metering (if applicable)

- **Downstream:** Electrical Panel to Charging Station
  - Circuit breakers
  - Conduits
  - Wiring
  - Junction boxes (for EV capable)
  - Outlets (for EV ready)
  - Charging stations (for EVSE installed)

Use of Low-Power Level 2 EV Ready spaces in residential reach codes can allow for greater access to EV charging while minimizing cost impacts to developers

100% EV Access is achievable at minimal incremental cost from 2024 CALGreen base code





(*Cost covered by SCE due to Rule 29)

Each scenario is 1.15% – 1.35% of construction cost

Assumes $314/ft2 to build (dwelling and parking)
Sources: Turner and Townsend, 2023, Rider, Levett, Bucknall, 2022.

Common Concerns and FAQ

- Typical questions and concerns answered

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Common Concerns (1 of 2)

Concern	Response
Distribution grid upgrades are expensive	**Sometimes true**. Utilizing low amp or energy efficient equipment and circuit sharing solutions, combined with renewable energy strategies can help to avoid transformer upgrades. Costs are generally split between the developer and the utility depending on the type of project.
Resilience, power-shutoffs	**Real problem, but gas does not help**. Gas appliance ignition is electric. In emergencies gas is also shut-off. CA battery installation has grown 10x from 2020 to ’23.
Uniformity issues, Berkeley ruling uncertainty	**Fair Concern, but all-electric is simpler & not adopting ensures future risk**. Regional partners are encouraging consistency. Flexible or alternative pathways are simple and inaction locks in future cost (retrofits, rates) and risk (fire).
In multifamily, central heat pump water heating requires more design expertise and space than gas boilers.	**True, training is needed.** There are scores of working systems, and best practice guidance is available.

Common Concerns (2 of 2)

Concern	Response
All-Electric heating uses too much energy or can't work in our cool climate	**False. All-electric heat pumps are highly efficient and effective** in weather far colder than ours. DOE studies show heat pump space heaters as highly efficient at as little as 5 degrees Fahrenheit.
Energy is not clean	**False**. CPA GreenPower service is 100% GHG free today
Equipment is not available	**Mostly false**. Some scenarios for high-volume or steam applications are more challenging to address. Heat pumps and induction stoves have a long-established history, are widely adopted in other states, but market awareness needs to grow.

Will Electrification Reduce Resilience?

Most gas appliances already require the use of electricity to operate

Gas furnaces require electric fans (but fireplaces still work).

Space Heating

Gas water heaters require electronic ignition or pumps

Water Heating

Gas stoves will work without electricity, but can be unsafe due to lack of proper ventilation

Cooking

Gas dryers use electric motors to run tumbler

Clothes Drying

Can the Grid Handle the Load Increase?

- Reliability is a concern only during summer peak cooling times. Increases in cooling demand are **primarily due to climate change** increasing summer temperatures.

- California Energy Commission's AB3232 analysis indicates that *aggressive* electrification will result in **20 percent additional summer peak load** through 2030. Summer load will continue to be greater than winter peak load.*

- All-electric technologies can **draw power flexibly**. Electric vehicles can charge during off-peak periods, water heating tanks can increase temperature ahead of peak periods, thermostat setbacks can reduce space conditioning demand, and several other approaches will avoid power outages.

- **Over the long-term, utilities and local jurisdictions have opportunities to make upgrades and implement strategies to produce, store, and manage clean energy to provide grid resiliency**

**Represents PG&E territory. Assumes all-electric for 100% new construction, 90% replace on burnout, and 70% early retirement for remaining existing buildings.*

Source: 1) AB3232 Decarbonization Assessment 2021

Will the Grid be Reliable?

1. CEC has determined that **electrification is the lower cost, lower risk approach** to decarbonization, compared to all alternatives.

2. CA-ISO has performed a 20-year study and has recommended **over $30B in transmission investments** to account for increased renewables and decommissioned gas power plants

3. Utility-scale **battery power installation increased 10-fold** during heatwaves from 2020 to 2023. Having diversity in electrical power sources has already improved grid performance.

4. The electricity suppliers have a **service obligation** to meet your needs. "**PG&E fully expects to meet the needs** that all-electric buildings will require" -Robert S. Kenney, Vice President, PG&E

Sources: 1) CA Energy Commission 2018 2) CA-ISO 3) CAISO 4) 2) CPUC R1901011 2022

2019 Reach Code Litigation- California Restaurant Association v. City of Berkeley

- In July 2019, **Berkeley adopted a municipal gas ban/ all-electric Ordinance**
  - The Ordinance prohibits, with some exceptions, natural gas infrastructure in all newly constructed buildings.
- **Four months after the Ordinance was passed, the California Restaurant Association sued Berkeley on the grounds that the Ordinance was preempted by the federal Energy Policy and Conservation Act (EPCA)**
  - EPCA is a federal statute that regulates the use of certain consumer products, sets energy conservation standards for those products, and provides for certain test procedures and labeling and manufacturing requirements. The EPCA does not directly regulate piping, and it does not regulate fuel distribution or delivery.
- **The District Court originally rejected the CRA challenge**
  - Because the ordinance does not directly regulate either energy use or energy efficiency of covered appliances, the California Restaurant Association appealed that decision.
- **The Ninth Circuit reversed the District Court decision**
  - The appeals court concluded that EPCA preempted Berkeley's ban because it prohibited the onsite installation of natural gas infrastructure necessary to support covered natural gas appliances.

Latest News and Next Steps: Berkeley filed a petition for an En Banc rehearing and it was denied in January 2024

Source: Climate Case Charts

California Restaurant Association (CRA) v. City of Berkeley

High-level Overview: Berkeley adopted a municipal gas infrastructure ban/all-electric ordinance in 2019. The CRA sued on the grounds that the ordinance was preempted by the federal Energy Policy and Conservation Act (EPCA).

The district court originally rejected the suit, CRA appealed, and that decision was reversed by the Ninth Circuit Court of Appeals.

Latest News and Next Steps: Berkeley filed a petition for an En Banc rehearing, and that rehearing was denied in January 2024. The City of Berkeley has 90 days to petition the US Supreme Court to review the 9th Circuit opinion.

- The panel deleted its statement implying that EPCA preempts any "building codes that regulate natural gas use," adding a statement in the amended opinion specifically preempting "building codes" that "prohibit [ ] natural gas piping in new construction buildings [sic] from the point of delivery at the gas meter."
- If the rehearing isn't granted, **the recent Ninth Circuit conclusion that EPCA preempted Berkeley's gas ban, will stand**

Takeaway: There will be substantial legal uncertainty for the coming months or years. For cities that want to act now, there are legally defensible approaches with varying pros and cons.

Sources: Columbia Law blog and Earthjustice blog; "Gloom Not Doom: The Latest in the Berkeley Decarbonization Case."

Initial City Responses

- Many cities that adopted all-electric reach codes or gas bans are still enforcing the requirements.
- A small handful of cities have paused enforcement of their all-electric reach codes or gas bans

Cities Taking Action

San Jose

- Still enforcing their gas ban
- Adopted Source Energy Model Code (Energy Performance Approach)

San Luis Obispo and Santa Cruz

- Paused their gas ban
- Adopted Source Energy Model Code (Energy Performance Approach)

Moving Forward with Less Litigation Risk

Alternative Solutions

1. **Energy Performance Approach:** Requiring higher building performance scores that limit source GHG emissions (via the California Energy Commission's hourly source energy metric).
2. **Air Quality Code:** Limit on-site NOX emissions or GHG emissions, in alignment with New York City and air quality control agencies
3. Continue to educate jurisdictions and stakeholders on the benefits of electrification

Adopt codes explicitly **meeting the Energy Policy and Conservation Act (EPCA) requirements**

- **EPCA requirements** (excerpts) that building codes must
  1. Permit a builder to… select items whose combined energy efficiency meet an overall building energy target;
  2. Do not specifically require any EPCA-covered appliance to exceed federal standards
  3. Offer options for compliance, on a 1-for-1 equivalent energy use **or** equivalent cost basis

Alternative Solution – Energy Performance Approach

OBJECTIVE	• Requires GHG emissions reduction • Allows pathway for mixed-fuel buildings • Support efficiency, electric-readiness, solar PV, and battery storage
SCOPE	• New construction - Residential and commercial buildings • Leveraging cost-effectiveness results for CEC approval
CONSIDERATIONS	• Directly meet EPCA criteria, reduce litigation risk • Ease of adoption and implementation

Energy Performance Approach Summary

1. Common margin across both mixed-fuel and all-electric systems presents the lowest risk to EPCA

- All-electric achieves margins more easily than mixed-fuel
- Mixed-fuel residential will likely need additional battery storage

2. Does not regulate cooking, laundry appliances

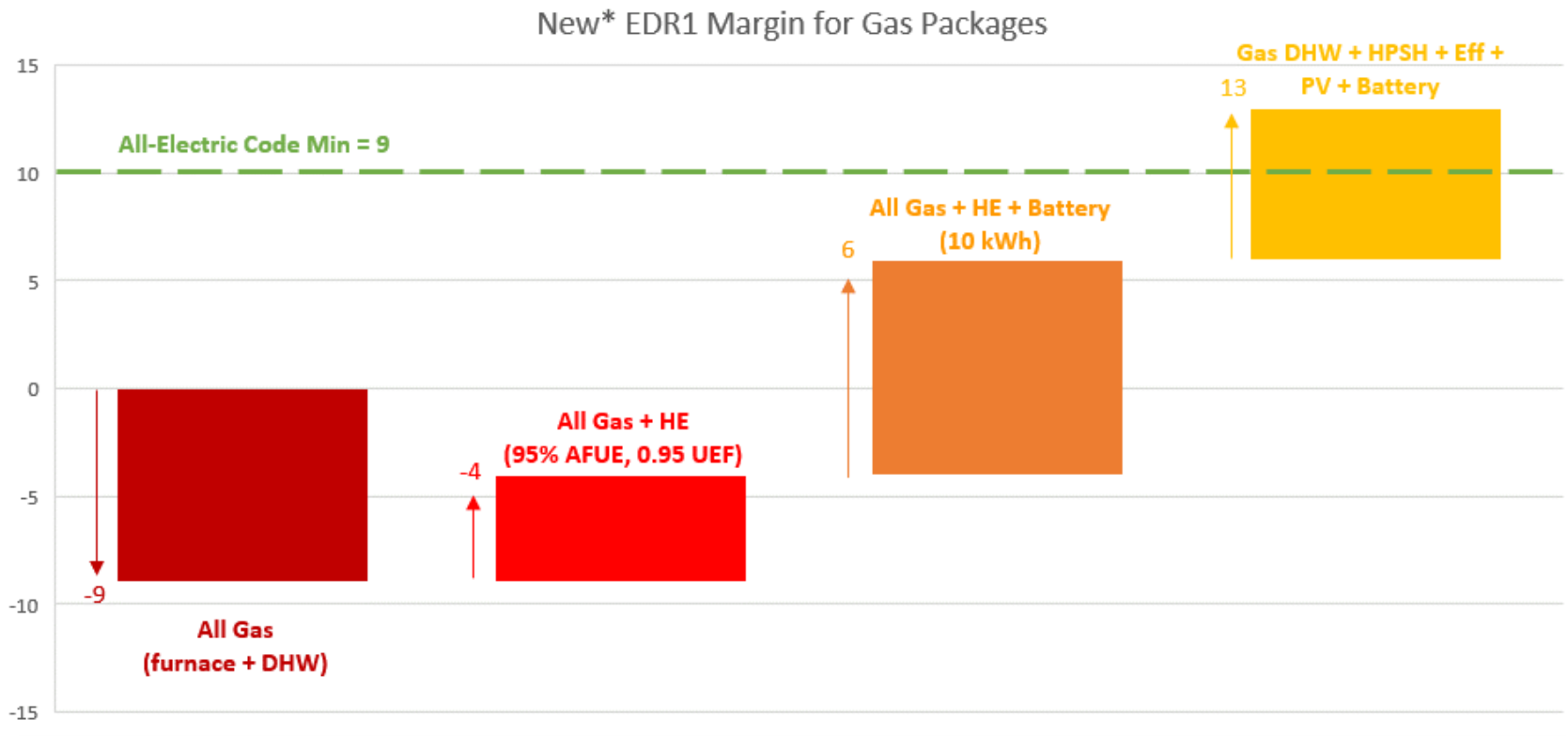
- Doing so would present higher EPCA risks
- However, space and water heating represent the largest sources of emissions

3. Source energy margin is a Performance Approach

- Prescriptive pathway can be drafted but is rarely taken
- Significantly exceeds state's model code (CALGreen Voluntary)

EDR1 Margins for Gas Packages (example)

A gas building would need to install a Heat Pump Space Heater and add added efficiency, solar PV and a battery to become compliant



Above values represent San Mateo County, but a similar illustration can be made for your city/county.

Sources: *Cost Effectiveness Explorer*

Additional Resources

To help you on your journey towards electrification

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Industry Resources

- **Building and Home Energy Resource Hub** -provided by the California Energy Commission. Includes a comprehensive list of information, guidance, and rebates
- **LocalEnergyCodes.com** - provides comprehensive list of adopted model codes and cost effectiveness studies
- **Building Electrification Technology Roadmap** - covers the technical capabilities of a variety of end-uses
- **Ecosizer** - guides engineers and energy consultants for proper design of central heat pump water heating systems
- **Building Standards Commission Resources** - Title 24 guidebooks for local jurisdictions
- **California Air Resources Board 2022 Scoping Plan Appendix F Building Decarbonization** - overview of efficient building decarbonization research, important benefits, cost and cost savings, and strategies
- **Redwood Energy Electrification Guides and Research** - a series of comprehensive guides ranging in electrification topics including construction, retrofits, electric transportation, appliances, and strategies
- **The Switch Is On** – developed by the Building Decarbonization Coalition (BDC), this website provides a wealth of educational resources for communities, contractors, and residents to understand the benefits, incentives, and contractor support available for electric appliances

Federal Policy: Inflation Reduction Act

Inflation Reduction Act includes $369 billion in clean energy & climate.

1. **Solar**
   - Extension of Investment Tax Credit (ITC) – 30% with prevailing wage, storage added
   - Direct pay option allows government agencies to secure ITC directly
2. **Electric Vehicles**
   - Continuation of $7,500 tax credit for new vehicles
     Vehicle cost up to $55k for cars and $80k for SUVs and trucks, lifting the manufacturer's cap, families earning under $300k/yr
   - $4,000 tax credit for used electric vehicle
     Cost up to $25k, families earning under $150k/yr
3. **Buildings**
   - $4.5B for up to $14,000 in rebates for electric appliances
     up to 50% of costs for moderate-income households and 100% for low-income households.
     $8,000 for heat pump HVAC, $1,750 for water heaters, $840 induction cooktop, $840 heat pump dryer, up to $9,100 for panels, wiring, insulation
   - Tax credits up to $2,000 for heat pumps
   - Energy efficiency up to 50% whole home retrofit or >80% for low/moderate income

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Sources: American Progress - 5 Major Benefits of IRA/ NatLawReview - IRA Act Includes Expansive Tax Incentives

Questions

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Thank you!

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