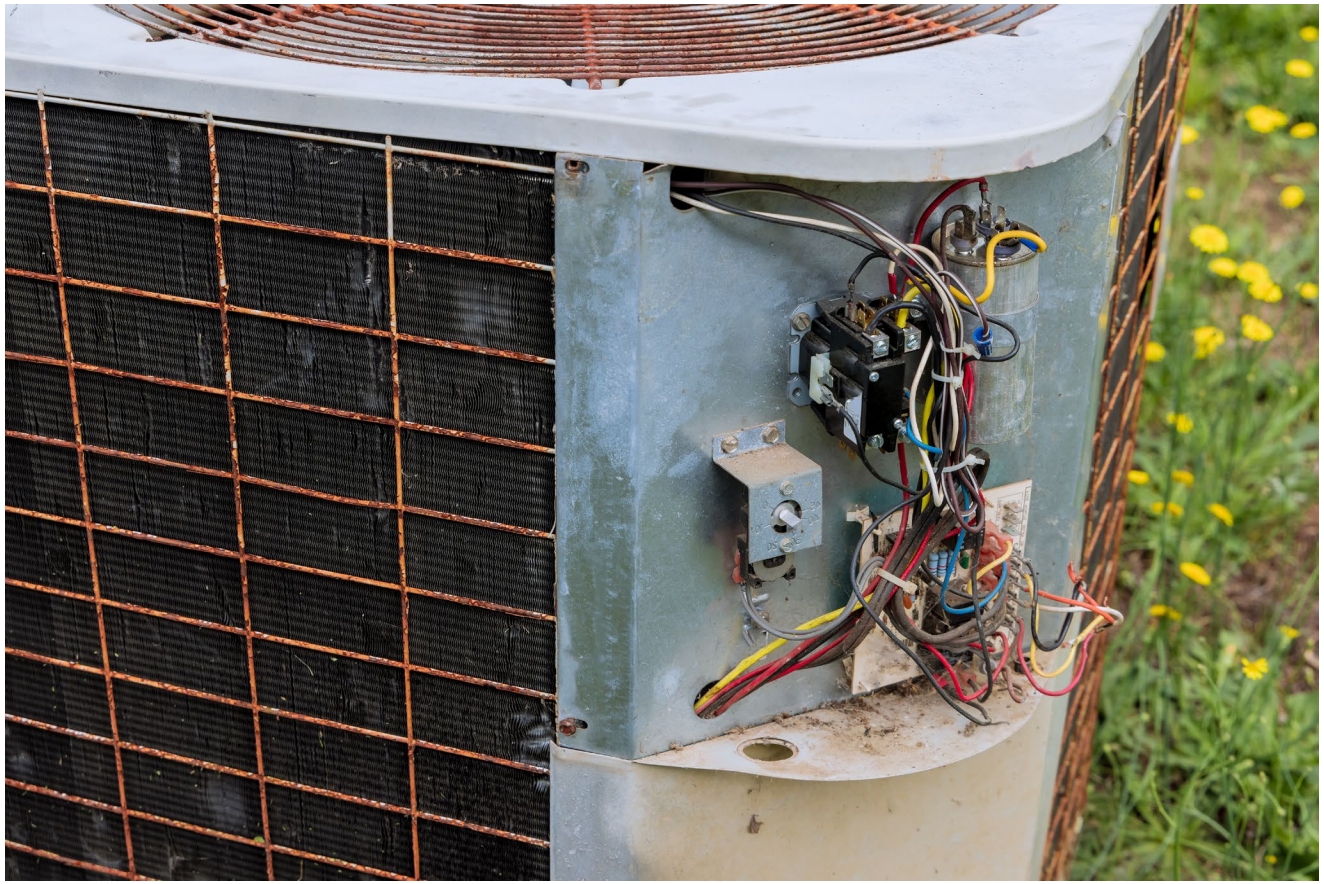
Existing Single Family Reach Code

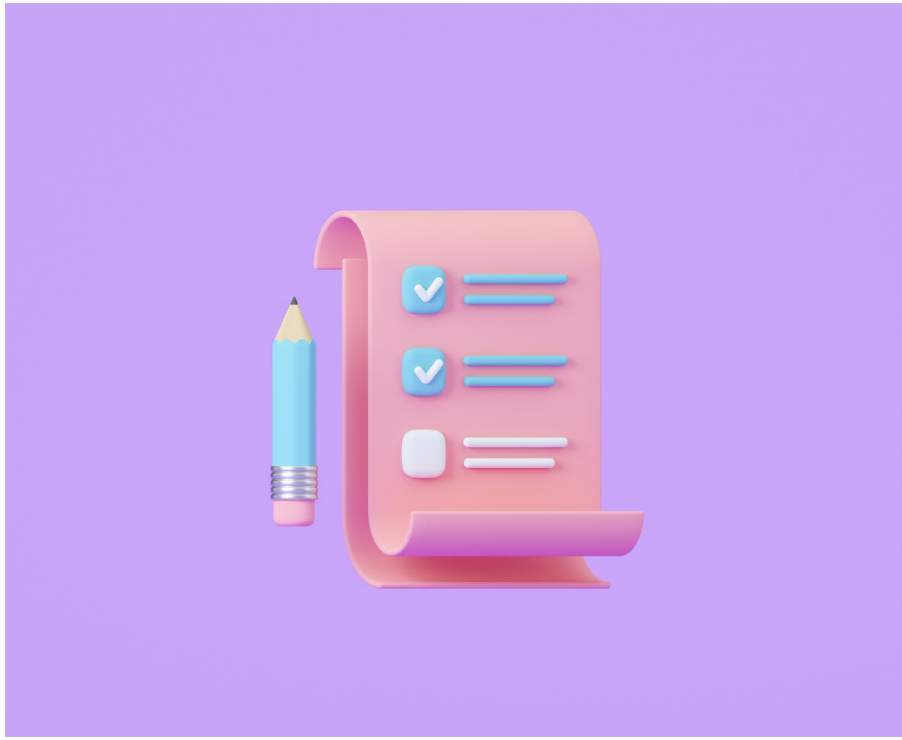
Air Conditioner Replacements/Additions



[Jurisdiction and Date]

Agenda

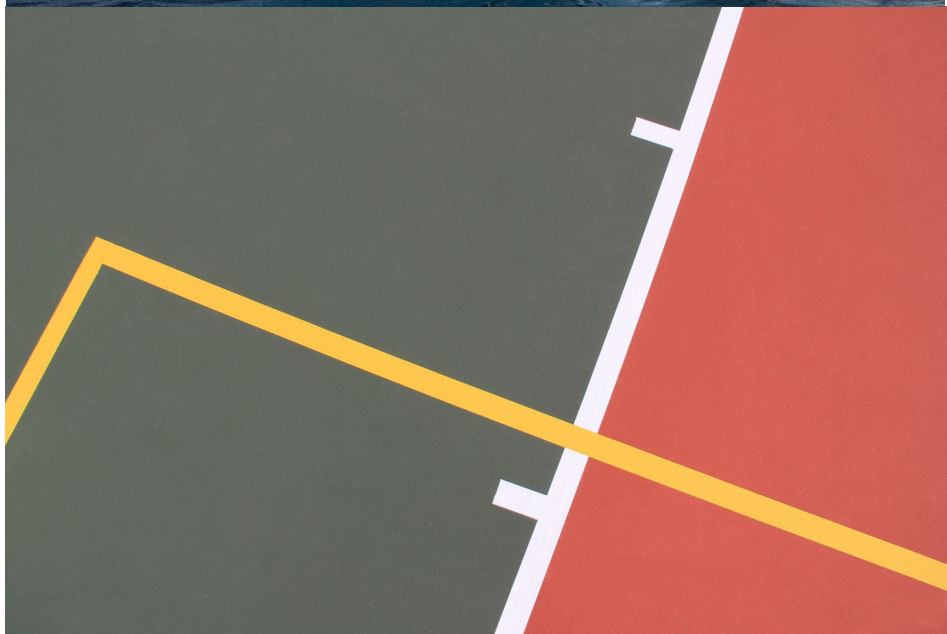
- Objectives and Scope
- Background & Policy Context
- Proposed Policy Requirements & Exceptions
- Development Process and Next Steps
- Ways to Provide Feedback
- Q&A Discussion



Objectives and Scope

Ordinance Objectives

- Require energy upgrades when replacing or adding a central air conditioner
  - Upgrade to an electric heat pump space conditioner (heater) and comply with State Code
    - May keep or replace furnace for supplemental heating only.
  - Keep gas furnace and make additional energy improvements
- Meet Federal and State requirements
  - Electric heat pump is not required, but encouraged



Background and Context

Policy Context

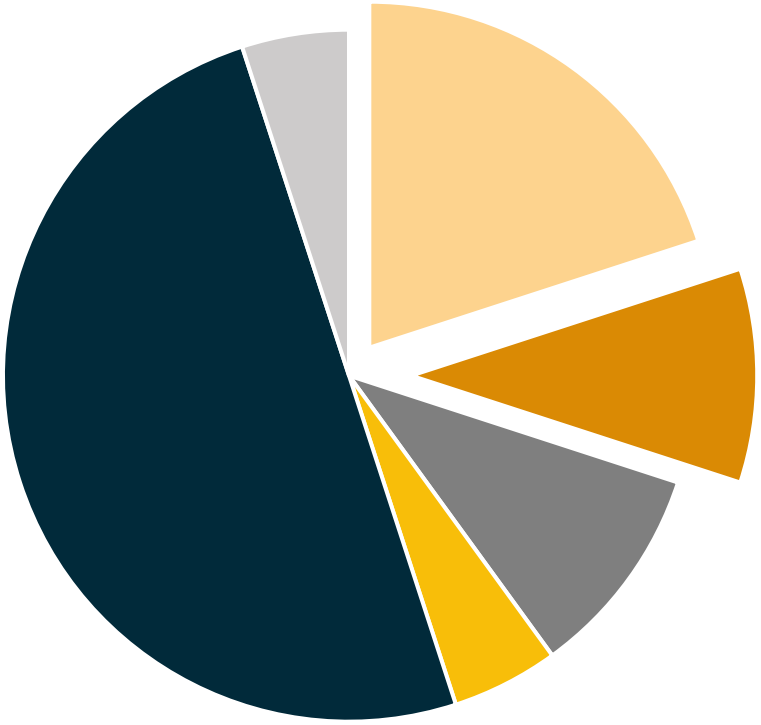
Local Policy

- *Cite CAP (or other policy document) regarding existing buildings*
- *Recite history, other reach codes*

State Policy

- AC to Heat Pump offered as voluntary measure for local adoption under California Green Buildings Standard Code (CALGreen)
- Proposed reach code includes some changes to CALGreen text to facilitate implementation

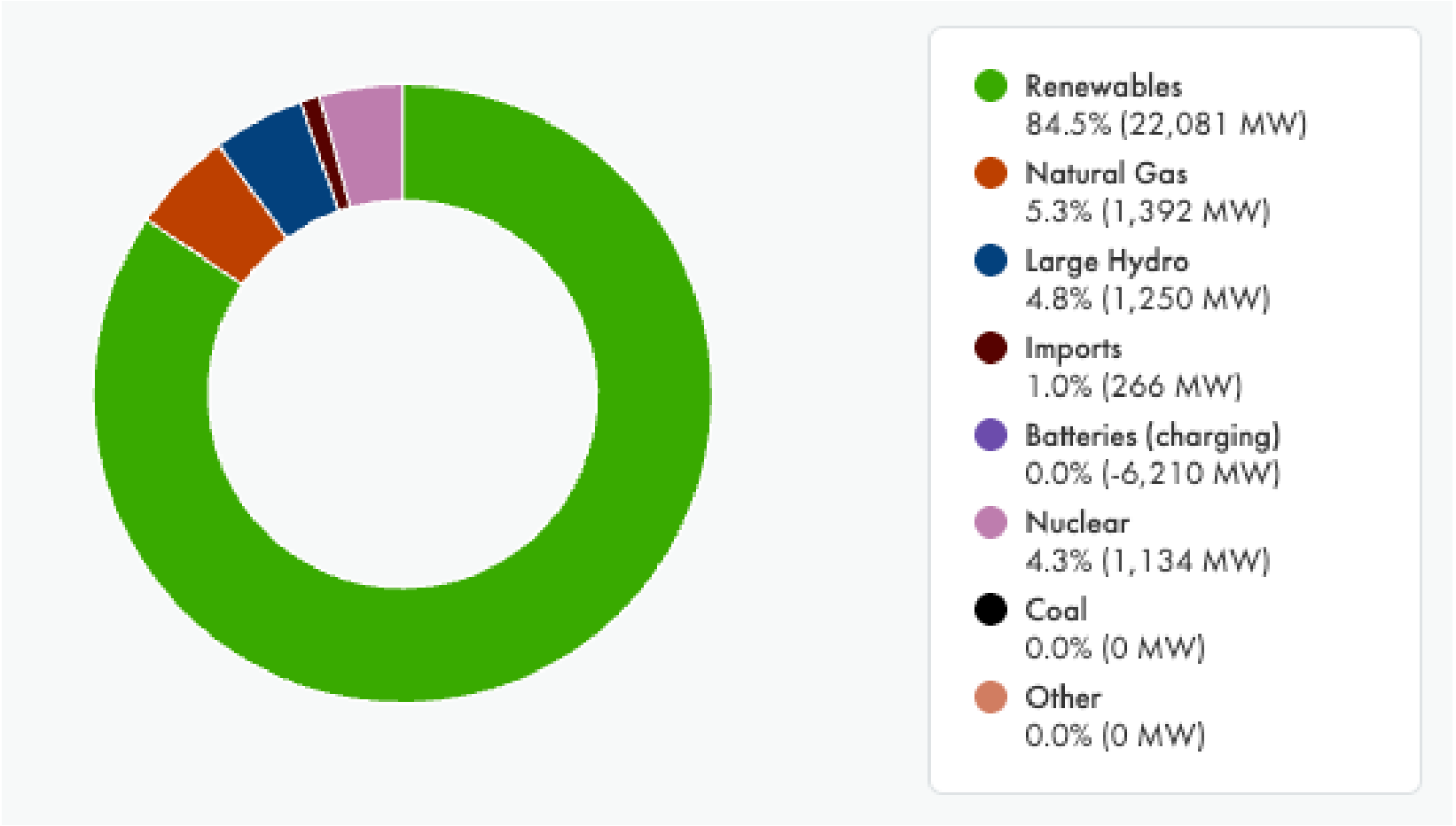
Context: GHG Emissions Projections 2030 *[use local data]*



- Existing Single Family Buildings: Gas
- Existing Single Family Buildings: Electricity
- Other Existing Buildings
- New Buildings
- Transportation
- Other

Why Go All-Electric?

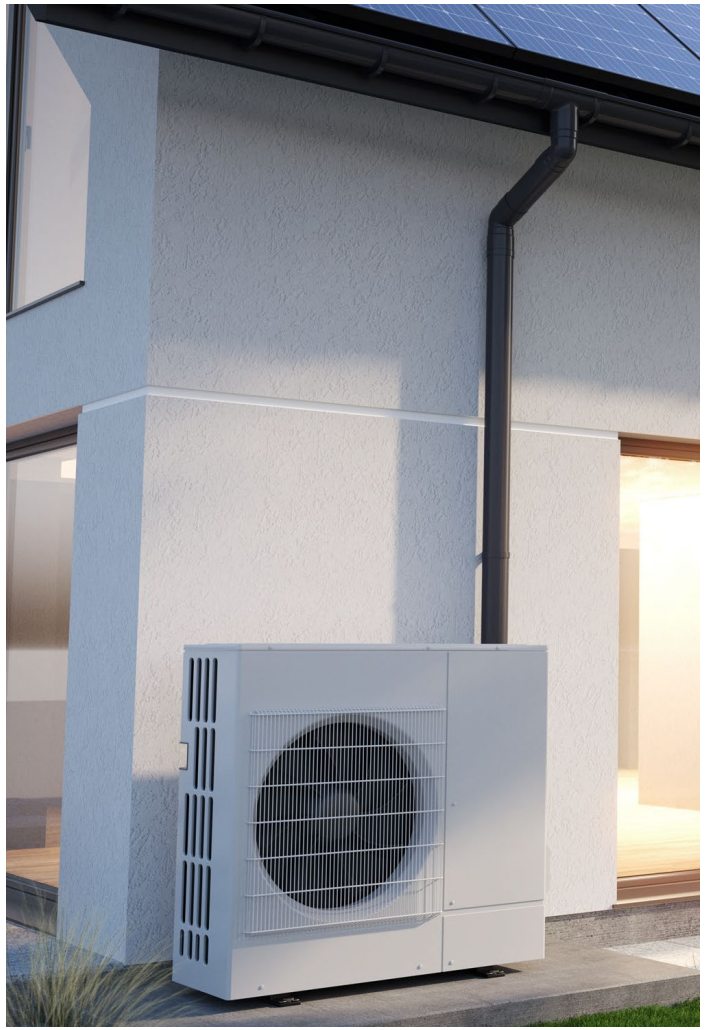
Power Supply Mix in CA – An Instantaneous Snapshot



Source: https://www.caiso.com/todays-outlook, May 10, 2025

Why Heat Pumps?

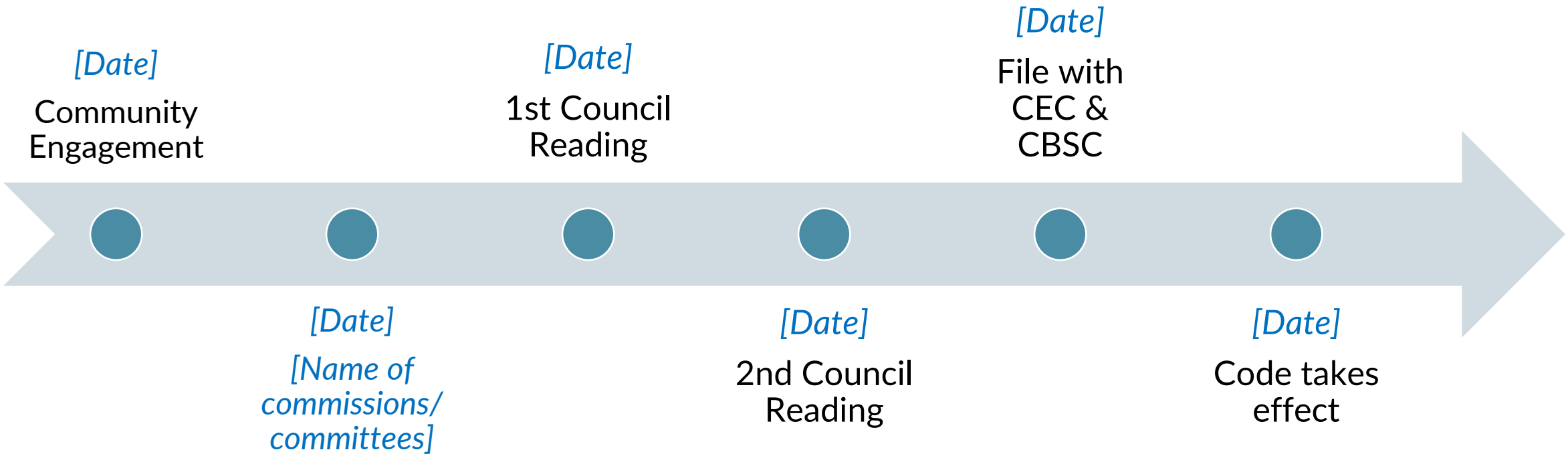
- Heat pumps result in major greenhouse gas emission reductions
  - Two to four times more efficient than gas furnaces
  - Powered by electricity, which in California, is mostly from renewable energy sources
- Can be both an air conditioner and a space heater
- No on-site combustion of gas
- No risk of carbon monoxide poisoning from the space conditioning system



Air Conditioners in Existing [Jurisdiction] Homes

- *XX* existing single family homes, duplexes and townhomes
- *YY* with central air conditioning and gas heating
- *ZZ* annual permits for air conditioner replacements
- *AA* projects affected by proposed requirements

Policy Development Timeline

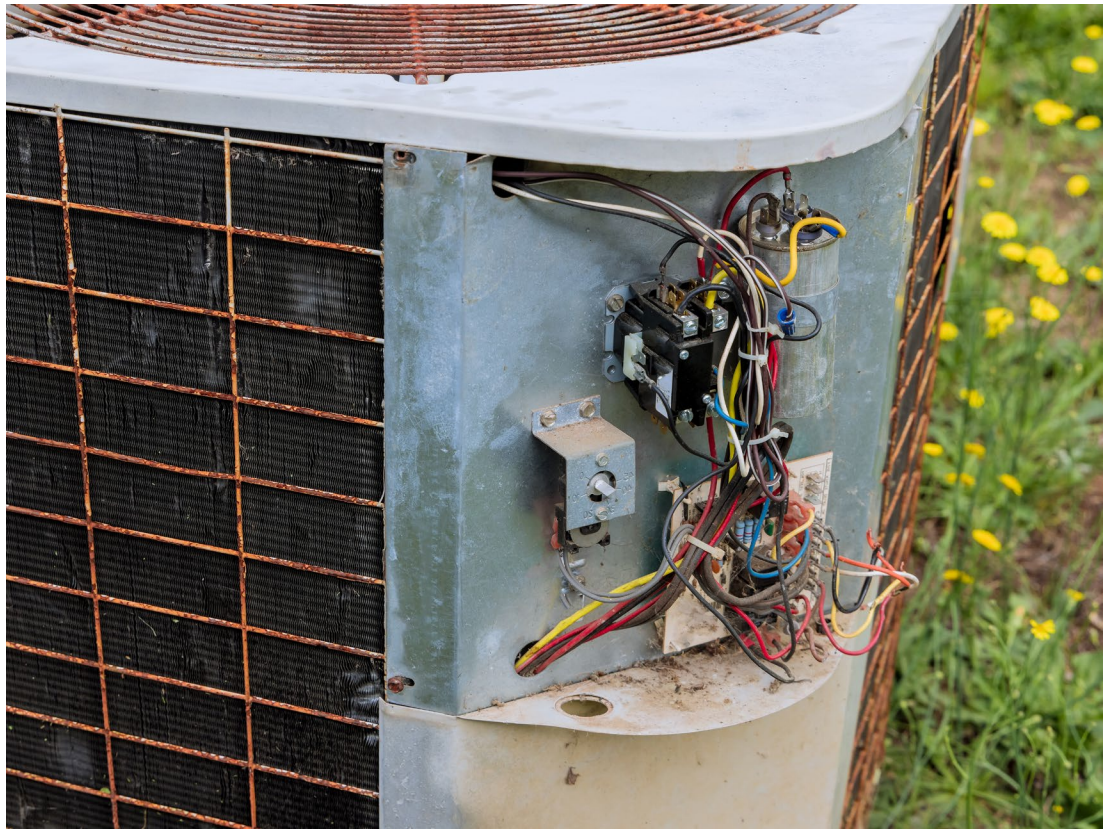


Proposed Policy Requirements

Policy at a Glance:
Existing Single Family Homes, Duplexes and Townhomes

When replacing or adding a central air conditioner, either:

- Install model that functions as a heat pump space heater and meet State code requirements that apply to the project (may keep existing or replace gas furnace for supplemental heating only), **OR**
- Keep a gas furnace, meet State code requirements that apply to the project **AND** meet additional local reach code requirements.



New Heat Pump Only

- Duct Insulation: No Requirement
- Duct Sealing: 10% or RA Path
- Airflow: 300 CFM/ton or RA Path
- Fan Efficacy: No requirement
- Ref Charge

New AC Only

- Duct Insulation: No Requirement
- Duct Sealing: 10% or RA Path
- Airflow: 300 CFM/ton or RA Path
- **Fan Efficacy: 0.45 W/CFM or RA Path**
- **Ref Charge**
- **Attic Insulation: R-49 Exception: Exist R-38**
- **Air Sealing: Ceiling Exception: Exist R-38**

Solid blue:
Reach over state code
Gradient: Reach in some CZ
No fill: Same as state code
RA: Reference Appendix

New Heat Pump and New Ducts

- Duct Insulation: R-6 in CZ 3, 5-7 R-8 in CZ 1, 2, 4, 8-16
- Duct Sealing: 5%
- Airflow: 350 CFM/ton
- Fan Efficacy: 0.58 W/CFM
- Ref Charge
- Attic Insulation: R-49 CZ 1-4, 6, 8-16 Only. Exc. R-19 in CZ 1, 3, 6
- Air Sealing: Ceiling CZ 2, 4, 8-16 Only. Exception - Exist R-19

New AC/Furnace and New Ducts

- **Duct Insulation: R-8**
- Duct Sealing: 5%
- Airflow: 350 CFM/ton
- **Fan Efficacy: 0.35 W/CFM**
- **Ref Charge**
- Attic Insulation: R-49 CZ 1-4, 6, 8-16 Only. Exc. R-19 in CZ 1, 3, 6
- Air Sealing: Ceiling CZ 2, 4, 8-16 Only. Exception - Exist R-19

Summary of Requirements

Heat Pumps

Ducts	State Code Requirements	Additional Local Code Requirements
Existing	• Duct sealing (10% leakage) • Airflow efficiency (300 CFM/ton) • Refrigerant charge verification	• None
New	• Duct sealing (5% leakage) • Airflow efficiency (350 CFM/ton) • Refrigerant charge verification • Attic insulation (R-49) [CZs 1-4, 6, 8-16] • Air sealing [CZs 2-4, 8-16]	• None

Air Conditioners

Ducts	State Code Requirements	Additional Local Code Requirements
Existing	• Duct sealing (10% leakage) • Airflow efficiency (300 CFM/ton) • Refrigerant charge verification [CZs 2, 8-15]	• Fan efficacy (0.45 watts/CFM) • Attic insulation (R-49) • Air sealing • Refrigerant charge verification [CZs 1, 3-7, 16]
New	• Duct sealing (5% leakage) • Airflow efficiency (350 CFM/ton) • Refrigerant charge verification [CZs 2, 8-15] • R-6 Duct insulation [CZ 3, 5-7] • R-8 Duct insulation [CZs 1-2, 4, 8-16] • Attic Insulation (R-49) [CZs 1-4, 6, 8-16] • Air sealing [CZs 2-4, 8-16]	• Refrigerant charge verification [CZs 1, 3-7, 16] • Fan efficacy (0.35 watts/CFM) • R-8 Duct insulation [CZs 3, 5-7]

Incremental Cost and Savings of Heat Pumps

Assumes Furnace Would Be Replaced Anyway

Incremental first cost	$XX,XXX
Lifecycle savings	$YY,YYY

Assumes Furnace Remains in Place (dual fuel system)

Incremental first cost	$XX,XXX
Lifecycle savings	$YY,YYY

Modify by climate zone using the notes

GHG Reductions

Approach	Metric Tons			Percentage		
Vintage	Pre-1978	1978-1991	1992-2010	Pre-1978	1978-1991	1992-2010
Heat pump with furnace as backup				%	%	%
Heat pump & new air handler (no furnace)				%	%	%

Populate using data from model staff report

General Exceptions

- Where the capacity of the existing main electrical service panel is insufficient to supply the electrical capacity of a heat pump sized to meet the heating load
- Where the required capacity of a heat pump is 12,000 Btu/hr more than the air conditioner capacity

Specific Exceptions

- R-49 attic insulation and air sealing for projects using existing ducts and no heat pump
    - Not required if attic is already insulated to R-38
- All other exceptions in the State code apply

Resources for Homeowners

Inflation Reduction Act Residential Energy Rebate Programs

- Home Electrification and Appliance Rebates (HEEHRA): rebates for qualifying, energy saving appliances and equipment to income-eligible, single-family households and multifamily properties
- Equitable Building Decarbonization Direct Install Program: no-cost energy retrofits for low-income households
- Pay for Performance Program: rebates for whole home energy retrofits for Californians regardless of household income

Federal tax credits are available for most residential energy upgrades (approximately 30% for each improvement, with caps per measure and total in a given tax year)

Federal activities have created uncertainties for many programs. Check current status and requirements.

Ways to Provide Feedback

Stakeholder and Community Engagement

[Provide details on outreach and engagement activities]

Q & A Discussion

Thank you!

We appreciate your time

Name
email

Name
email

url