# Energy Performance Approach Reach Code

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

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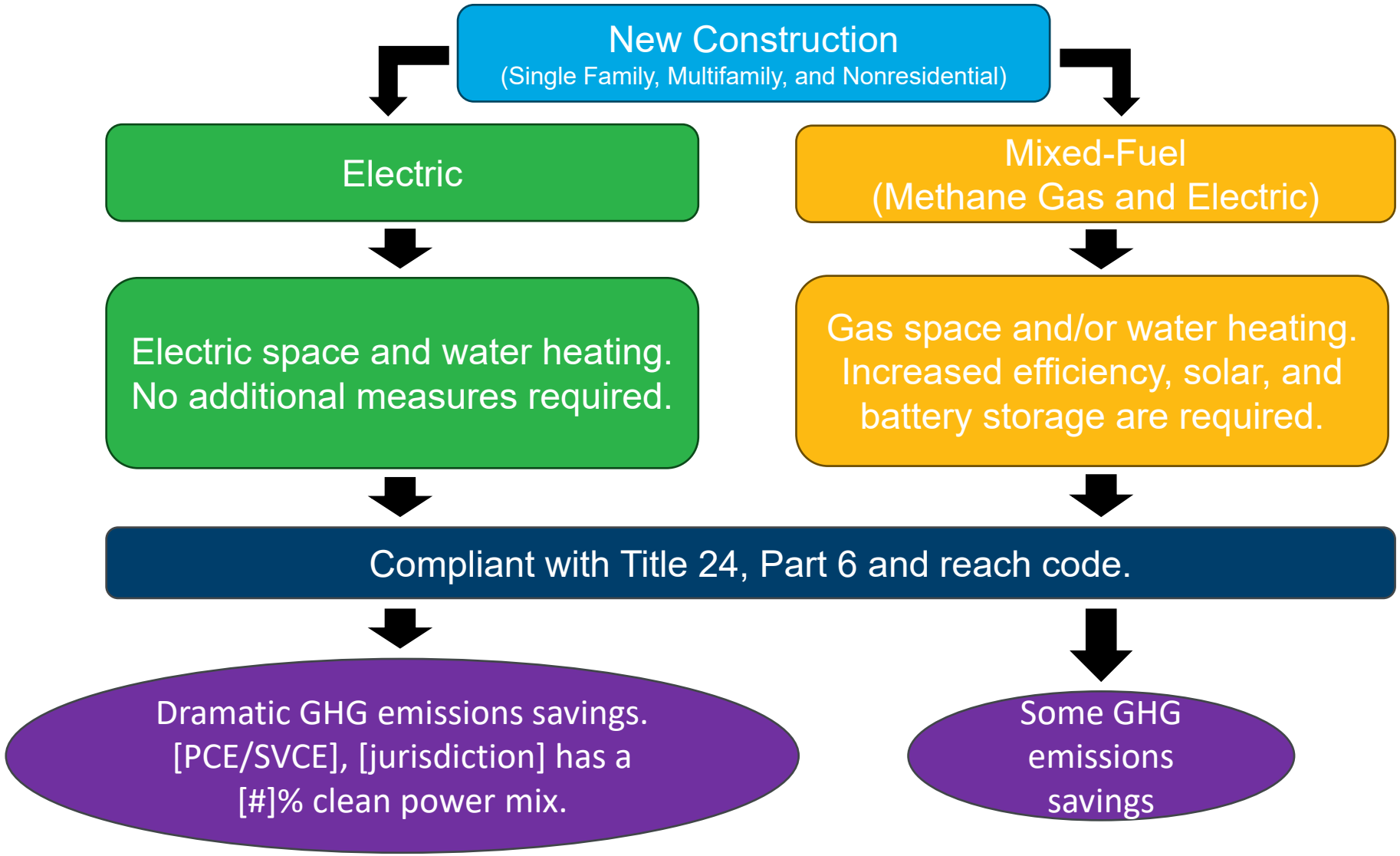
# What is the Energy Performance Approach?



# Which Appliances are Regulated?

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## What's included?

- Space heating/cooling
- Water heating


## What's not included?

- Stoves
- Laundry
- Pools
- Fireplace/pit

# How Does Compliance Work?

A compliance margin of “x” or higher is required for Single Family, Multifamily (low & high rise) and Nonresidential buildings.

***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
[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

- EDR2efficiency & EDR2total must achieve a score of “0” or higher to pass (per 2022 Title 24, Part 6).

# What is Source Energy?

- A rating system within the performance path that is used to regulate energy performance.
- Based on hourly source energy which establishes a carbon-based performance metric.
- For single family homes, Source Energy is 1 of 3 Energy Design Rating (EDR) metrics.

| ENERGY DESIGN RATINGS | | | | | | |
|---|---|---|---|---|---|---|
| | Energy Design Ratings | | | Compliance Margins | | |
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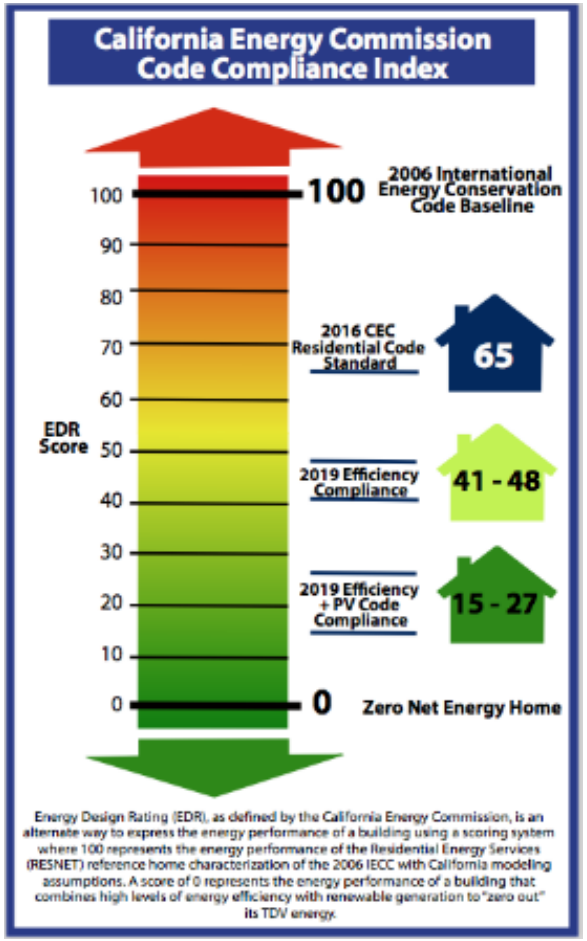
- Standard Design PV Capacity: 3.46 kWdc
- PV System resized to 3.46 kWdc (a factor of 3.459) to achieve 'Standard Design PV' PV scaling




*Source: [EnergyCodeAce]*

# Package Definitions

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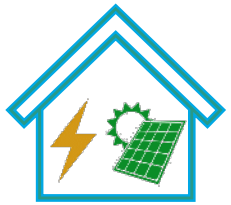
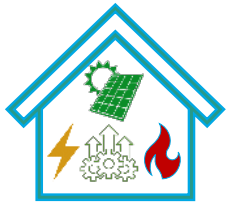
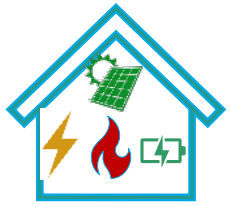
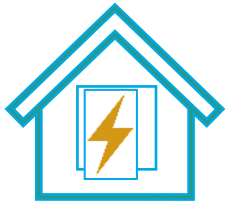
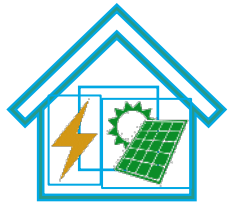
| All-Electric Standard: | All-Electric Efficient: | All-Electric Eff w/ PV: | Mixed-Fuel Eff w/ PV: | Mixed-Fuel Eff w/ PV & Battery: |
|---|---|---|---|---|
|  |  |  |  |  |
| All-Electric | All-Electric | All-Electric | Mixed Fuel | Mixed Fuel |
| Minimal efficiency | Expanded efficiency | Expanded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

# Package Details

| | Mixed-Fuel Home | All-Electric Standard | All-Electric Efficient |
|---|---|---|---|
| |  |  |  |
| Space Heating/Cooling: | Heat Pump | | High-Efficiency Heat Pump |
| Water Heating: | Natural Gas Tankless | HPWH | NEEA HPWH |
| Cooking: | Natural Gas | Electric Resistance | |
| Ceiling / Window Insulation: | R-30 / U=0.3 | | R-49 / U=0.24 |
| Ductwork Pressure: | Standard (0.45 W/CFM) | | Low (0.30 W/CFM) |
| PV System: | 2.9 kW | | 5.7 kW |

# Key Impacts: All Electric Standard

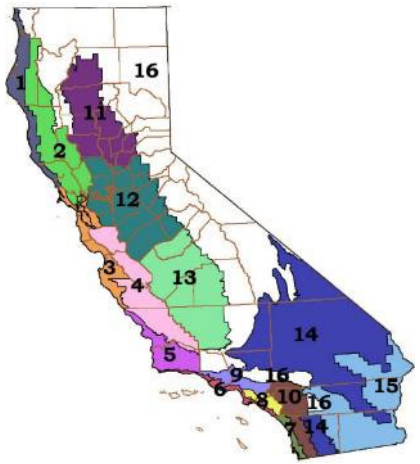
| | All-Electric Standard: |
|---|---|
| Construction Cost: (compared to mixed-fuel) | $5,100 **savings** |
| Bill Impact*: (compared to mixed-fuel) | $40 - $45/month **increase** |
| EDR1 | 8 |
| % CO2 Savings: | 36% |

*Values in range depends on climate zone

Source: 2022 Single Family NewCon Cost-eff Study

- All-Electric Standard Construction has a lower construction cost compared to the mixed-fuel baseline.
- Bill impacts increase due to price differences between natural gas and electricity. Adding efficiency measures or additional PV can cost-effectively help mitigate bill impacts.
- EDR1 for the All-Electric Standard package is 8.
- % CO2 savings demonstrates GHG emissions avoidance through electrification.

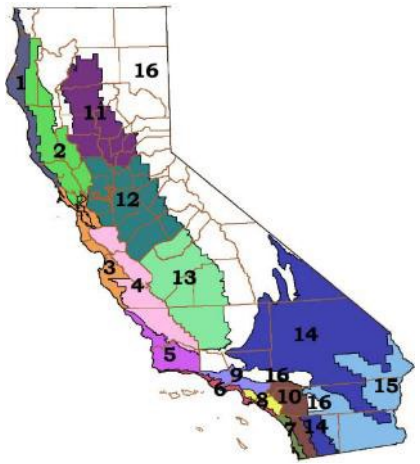
# Energy Performance Approach Impacts: CZ3




| | 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) | $5,100 **savings** | $3,500 **savings** | $2,200 **cost** | $3,500 **cost** | $7,700 **cost** |
| Bill Impact: (compared to mixed-fuel baseline) | $45/month **cost** | $25/month **cost** | $45/month **savings** | $20/month **savings** | $25/month **savings** |
| EDR1 | 8 | 11 | 13 | 3 | 14 |
| % CO2 Savings: | 36% | 43% | 46% | 7% | 31% |

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

# Energy Performance Approach Impacts: CZ4




| | 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) | $5,100 **savings** | $3,400 **savings** | $1,600 **cost** | $3,400 **cost** | $8,100 **cost** |
| Bill Impact: (compared to mixed-fuel baseline) | $40/month **cost** | $25/month **cost** | $35/month **savings** | $15/month **savings** | $20/month **savings** |
| EDR1 | 8 | 11 | 12 | 3 | 13 |
| % CO2 Savings: | 36% | 42% | 45% | 6% | 28% |

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

# 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 main 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

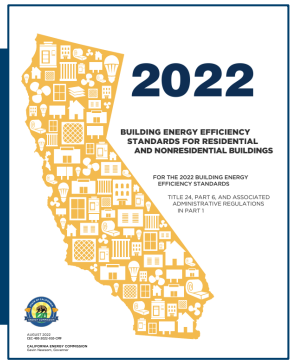
## Electric Vehicle Infrastructure (EVI)

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

# Reach Code Context in 2024

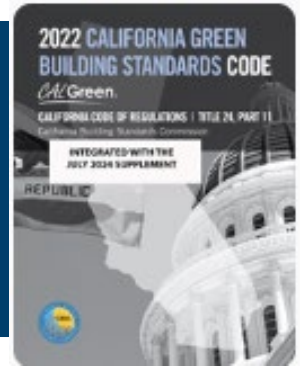
## Building Electrification (New Construction & Existing Buildings)

**Recent Context:** Due to the latest decision for the CRA v Berkeley Ruling, some jurisdictions are re-assessing their approach to building electrification reach codes to mitigate the risk of litigation.




## Electric Vehicle Infrastructure (EVI)

**Recent Context:** The CALGreen EV code goes through triennial updates (2022, 2025, etc.) and intervening updates at the mid point between triennial updates. Currently, the CALGreen EV code has intervening updates to the 2022 code that will be in effect on July 1, 2024. Jurisdictions may want to update their reach code according to the new baselines.



# What are the Main Benefits?

**Reduce Greenhouse Gas Emission** in line with state/agency goals and Climate Action Plans.

**Provide Financial Benefits** related to lower-cost electric construction.

**Support Public Health** by improving indoor air quality and decreasing air pollution emissions.

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

# Reach Code Litigation

## California Restaurant Association v. City of Berkeley

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### July 2019

The City of Berkeley adopts a municipal gas ban/all-electric Ordinance.

The Ordinance prohibits, with some exceptions, natural gas infrastructure in newly constructed buildings.

### Nov 2019

Four months after the Ordinance was passed, the California Restaurant Association sued the City of Berkeley on the grounds that the Ordinance was preempted by the federal Energy Policy and Conservation Act (EPCA).

### July 2021

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 CRA appealed that decision.

### April 2023

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.

### May 2023

The City of Berkeley filed a petition for an En Banc rehearing.

### January 2024

The Ninth Circuit denied an En Banc rehearing.

The last remaining option for the City of Berkeley is to raise the issue to the Supreme Court.

Some jurisdictions are evaluating new building reach code approaches.

**Next Steps:** For cities looking for an alternative reach code that could mitigate legal risk, there are several approaches available.

*Source: Climate Case Charts, Columbia Law blog and Earthjustice blog; "Gloom Not Doom: The Latest in the Berkeley Decarbonization Case."*

# The Bay Area and California's Upcoming Electrification Changes

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## 2026

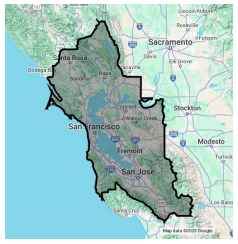
**CA State Energy Code Update**

Replacements of air conditioning systems in existing buildings will be heat pumps

## 2027

**BAAQMD Low NOx water heater requirements**

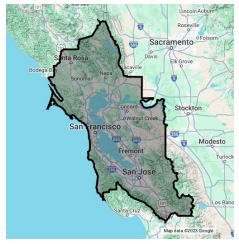
Tank-type gas water heaters no longer sold in Bay Area




## 2029

**BAAQMD Low NOx space heater requirements**

Gas furnaces no longer sold in Bay Area




## 2030

**CARB Low NOx Standards**

Gas water heaters and space heaters no longer sold, statewide

## 2045

**California Achieves Carbon Neutrality**

Statewide gas piping projected decommissioning date

# Why We Need Reach Codes

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| | |
|---|---|
| Continuous Signal to the Market | • Avoid a progress gap for new construction from 2024-2026<br>• Send clear, continuous message to market<br>• Avoid stranded asset cost of continued gas investment |
| Local Control | • Enables innovative approaches for cost-effective decarbonization policy<br>• Ability to design customized exemptions<br>• Jurisdictions with more progressive climate targets can pass more progressive reach codes |
| State and BAAQMD Codes are Limited | • Lacks specific existing building measures<br>• Cannot regulate remodels or other types of triggers for cost-effective building electrification<br>• Ignores many methane appliances |
| Local Reach Codes Influence the State | • Statewide electrification codes incorporate elements from local reach codes<br>• Statewide EV charging codes have been inspired by San Mateo's EV Reach Codes<br>• Smoother implementation of BAAQMD ruling if similar requirements are adopted before 2027 |
| Allows More Action, Sooner | • Greenhouse gas emissions are cumulative, so earlier actions have exponential savings<br>• Existing building policy is needed immediately to meet 2030, 2035, and 2040 climate goals |

# Reach Code Options

- What choices are there for new construction?
- What choices are there for existing construction?
- What are the pros and cons?

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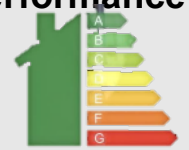
# New Construction Policy Comparison

| Approach | Description | Advantages | Challenges | Who's done it? |
|---|---|---|---|---|
| **Air Quality**  | Regulates building or appliance emissions through CALGreen, Part 11. | • Uses Clean Air Act authority rather than Energy Policy and Conservation Act<br>• Regulates all emitting equipment (cooking, fireplaces, dryers, etc.)<br>• Likely to result in all-electric construction, which includes construction cost savings<br>• Direct benefit to air quality / health<br>• High impact on emissions reduction | • Legally untested<br>• Potentially new enforcement approach | Los Altos Hills<br>New York City<br><br>CA Air Resources Board has proposed a Part 11 building standard for Housing and Community Development consideration |
| **Energy Performance**  | Requires a higher *Source Energy* compliance margin than what the state requires through the performance path of the Energy Code, Part 6. | • Mitigates legal risk by allowing methane gas pathways<br>• Can provide an all-electric cost-effective pathway<br>• Enforcement process is already in place, the compliance margin is increased | • Limited to regulating space heating/cooling and water heating<br>• Likely lower carbon savings compared to all-electric only pathways | Santa Cruz<br>San Jose<br>San Luis Obispo |

# Existing Building Policy Comparison

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| | Description | Advantages | Challenges | Who's done it? |
|---|---|---|---|---|
| **BPS**  | 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. | • Monitors customized building stock for balance degree of impact and ease of implementation | • Large administrative burden (cost/time) | **Cities:** Denver, Reno, Chula Vista, St. Louis, etc.<br><br>**States:** Oregon, Washington, Maryland, Colorado |
| **Time of Permit**  | 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. | • Electric/efficiency or Air Quality approach<br>• Customizable triggers balance degree of impact and ease of implementation | • Some loopholes<br>• May result in some bypassing the permit process<br>• Low permit/renovation rates can increase time to make impact | San Mateo, Portola Valley, Piedmont, Marin County |
| **Time of Property Transfer**  | Leverage real estate transactions to disclose relevant information on, incentivize, or require, certain home improvements. | • Limited loopholes to bypass policy | • Low transfer rates can increase time to make impact | Piedmont, Berkeley, Davis |