Energy Performance Approach
Reach Code

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

New Construction
(Single Family, Multifamily, and Nonresidential)

Electric
Electric space and water heating. No additional measures required.

Mixed-Fuel
(Methane Gas and Electric)
Gas space and/or water heating. Increased efficiency, solar, and battery storage are required.

Compliant with Title 24, Part 6 and reach code.

Dramatic GHG emissions savings. [PCE/SVCE], [jurisdiction] has a [#]% clean power mix.

Some GHG emissions savings
Which Appliances are Regulated?

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:**

<table>
<thead>
<tr>
<th>Energy Design Ratings</th>
<th>Energy Design Ratings</th>
<th>Compliance Margins</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Source Energy (EDR1)</td>
<td>Efficiency^1 EDR (EDR2efficiency)</td>
</tr>
<tr>
<td>Standard Design</td>
<td>35.6</td>
<td>45.8</td>
</tr>
<tr>
<td>Proposed Design</td>
<td>26.5</td>
<td>39.6</td>
</tr>
</tbody>
</table>

**RESULT^3:** PASS

- 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.

Source: EnergyCodeAce
## Package Definitions

<table>
<thead>
<tr>
<th>Package Type</th>
<th>Description</th>
<th>Efficiency Level</th>
<th>Solar Level</th>
<th>Batteries</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-Electric Standard</td>
<td>All-Electric</td>
<td>Minimal efficiency</td>
<td>Minimal solar</td>
<td>No battery</td>
</tr>
<tr>
<td>All-Electric Efficient</td>
<td>All-Electric</td>
<td>Expanded efficiency</td>
<td>Minimal solar</td>
<td>No battery</td>
</tr>
<tr>
<td>All-Electric Eff w/ PV</td>
<td>All-Electric</td>
<td>Expanded efficiency</td>
<td>Optimal solar</td>
<td>No battery</td>
</tr>
<tr>
<td>Mixed-Fuel Eff w/ PV</td>
<td>Mixed Fuel</td>
<td>Expanded efficiency</td>
<td>Optimal solar</td>
<td>Battery</td>
</tr>
<tr>
<td>Mixed-Fuel Eff w/ PV &amp; Battery</td>
<td>Mixed Fuel</td>
<td>Expanded efficiency</td>
<td>Optimal solar</td>
<td>No battery</td>
</tr>
</tbody>
</table>

Source: [2022 Single Family NewCon Cost-eff Study](#)
## Package Details

<table>
<thead>
<tr>
<th>Space Heating/Cooling:</th>
<th>Mixed-Fuel Home</th>
<th>All-Electric Standard</th>
<th>All-Electric Efficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat Pump</strong></td>
<td></td>
<td>High-Efficiency Heat Pump</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Heating:</th>
<th>Natural Gas Tankless</th>
<th>HPWH</th>
<th>NEEA HPWH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat Pump</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cooking:</th>
<th>Natural Gas</th>
<th>Electric Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electric Resistance</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ceiling / Window Insulation:</th>
<th>R-30 / U=0.3</th>
<th>R-49 / U=0.24</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-Efficiency Heat Pump</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ductwork Pressure:</th>
<th>Standard (0.45 W/CFM)</th>
<th>Low (0.30 W/CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low (0.30 W/CFM)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PV System:</th>
<th>2.9 kW</th>
<th>5.7 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-Efficiency Heat Pump</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: [2022 Single Family NewCon Cost-eff Study](#)
Energy Performance Approach Impacts: CZ3

- **All-Electric Standard:**
  - Construction Cost: $5,100 savings
  - EDR1: 8
  - % CO2 Savings: ↑

- **All-Electric Efficient:**
  - Construction Cost: $3,500 savings
  - EDR1: 11
  - % CO2 Savings: ↑

- **All-Electric Eff w/ PV:**
  - Construction Cost: $2,200 cost
  - EDR1: 13
  - % CO2 Savings: ↑

- **Mixed-Fuel Eff w/ PV & Battery:**
  - Construction Cost: $3,500 cost
  - EDR1: 3
  - % CO2 Savings: ↓

- **Mixed-Fuel Eff w/ PV:**
  - Construction Cost: $7,700 cost
  - EDR1: 14
  - % CO2 Savings: ↑

Source: 2022 Single Family NewCon Cost-eff Study
Energy Performance Approach Impacts: CZ4

<table>
<thead>
<tr>
<th>Construction Cost: (compared to mixed-fuel baseline)</th>
<th>All-Electric Standard:</th>
<th>All-Electric Efficient:</th>
<th>All-Electric Eff w/ PV:</th>
<th>Mixed-Fuel Eff w/ PV:</th>
<th>Mixed-Fuel Eff w/ PV &amp; Battery:</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDR1</td>
<td>$5,100 savings</td>
<td>$3,400 savings</td>
<td>$1,600 cost</td>
<td>$3,400 cost</td>
<td>$8,100 cost</td>
</tr>
<tr>
<td>% CO2 Savings:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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?
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
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
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**

<table>
<thead>
<tr>
<th>Jan 2019</th>
<th>Nov 2019</th>
<th>July 2021</th>
<th>April 2023</th>
<th>May 2023</th>
<th>Jan 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>The City of Berkeley adopts a municipal gas ban/all-electric Ordinance.</td>
<td>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).</td>
<td>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.</td>
<td>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.</td>
<td>The City of Berkeley filed a petition for an En Banc rehearing.</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Next Steps:** For jurisdictions 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

**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

**2045**
- California Achieves Carbon Neutrality
  - Statewide gas piping projected decommissioning date
## Why We Need Reach Codes

### Continuous Signal to the Market
- Avoid a progress gap for new construction from 2024-2026
- Send clear, continuous message to market
- Avoid stranded asset cost of continued gas investment

### Local Control
- Enables innovative approaches for cost-effective decarbonization policy
- Ability to design customized exemptions
- Jurisdictions with more progressive climate targets can pass more progressive reach codes

### State and BAAQMD Codes are Limited
- Lacks specific existing building measures
- Cannot regulate remodels or other types of triggers for cost-effective building electrification
- Ignores many methane appliances

### Local Reach Codes Influence the State
- Statewide electrification codes incorporate elements from local reach codes
- Statewide EV charging codes have been inspired by San Mateo’s EV Reach Codes
- 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
- 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?
<table>
<thead>
<tr>
<th>Approach</th>
<th>Description</th>
<th>Advantages</th>
<th>Challenges</th>
<th>Who’s done it?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Quality</strong></td>
<td>Regulates building or appliance emissions through CALGreen, Part 11.</td>
<td>• Uses Clean Air Act authority rather than Energy Policy and Conservation Act</td>
<td>• Legally untested</td>
<td>Los Altos Hills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Regulates all emitting equipment (cooking, fireplaces, dryers, etc.)</td>
<td>• Potentially new enforcement approach</td>
<td>New York City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Likely to result in all-electric construction, which includes construction cost savings</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Direct benefit to air quality / health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High impact on emissions reduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Energy Performance</strong></td>
<td>Requires a higher Source Energy compliance margin than what the state requires through the performance path of the Energy Code, Part 6.</td>
<td>• Mitigates legal risk by allowing methane gas pathways</td>
<td>• Limited to regulating space heating/cooling and water heating</td>
<td>Santa Cruz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Can provide an all-electric cost-effective pathway</td>
<td>• Likely lower carbon savings compared to all-electric only pathways</td>
<td>San Jose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enforcement process is already in place, the compliance margin is increased</td>
<td></td>
<td>San Luis Obispo</td>
</tr>
<tr>
<td>Description</td>
<td>Advantages</td>
<td>Challenges</td>
<td>Who’s done it?</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
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<td></td>
</tr>
</tbody>
</table>
| **Time of Replacement** | Require that property owners at the time of equipment replacement (upgrades or burnouts) abide by zero-NOx requirements and/or electric readiness requirements. | • Simple policy  
• Replacements occur more frequently than major renovations | • Emergency replacements  
• May result in some bypassing the permit process | San Mateo, Portola Valley, Marin County, Palo Alto |
| **Time of Renovation** | Require applicants that are already pulling a permit for a renovation project to abide by certain energy efficiency measures and/or electric readiness requirements. | • Customizable triggers  
• Unlikely to impact small or low-cost renovation projects  
• Unlikely to bypass the permit process | • More complex policy  
• Clarity of permit data  
• Low permit/renovation rates can increase time to make impact | San Mateo, Portola Valley, Piedmont, Marin County |
| **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. | • Monitor building stock  
• Customizable triggers  
• Regular enforcement cycles | • Large administrative burden (cost/time) | Cities: Denver, Reno, Chula Vista, St. Louis, etc.  
States: Oregon, Washington, Maryland, Colorado |
| **Time of Property Transfer** | Leverage real estate transactions to disclose relevant information on, incentivize, or require, certain home improvements.  
*We do not recommend policies which inhibit or delay the sale of a property.* | • Leverages major financial transaction  
• Allows responsibility to be shared between buyer and seller | • Limited precedence for jurisdictional authority  
• Jurisdiction regulation of property transfer process  
• Low transfer rates can increase time to make impact | Piedmont, Berkeley, Davis |