Getting Buildings to Net Zero

National Energy Codes Conference
July 21, 2022
Overview

• Agency overview
• Denver’s greenhouse gas emissions inventory
• Policies for existing buildings
• Policies for new construction
• Incentives
Mission: Act with Urgency!

- Engage stakeholders
- Science-based strategies
- Cultivate resiliency
- Center on equity
Denver’s GHG Inventory

- > 25,000 sq ft: 82% of sq. footage, 3,000 buildings
- < 25,000 sq ft: 18% of sq. footage, 14,000 buildings
Guiding Plans

Denver’s Net Zero Energy (NZE) New Buildings & Homes Implementation Plan

January 2021

The Energize Denver Renewable Heating and Cooling Plan
Resilient Existing Buildings and Homes
Policies for Existing Buildings
Energize Denver Ordinance Sections

**Benchmarking**
- Implemented by CASR
- Buildings 25K+ sq. ft. must submit annual energy benchmarking data through ENERGY STAR Portfolio Manager

**Performance**
- Implemented by CASR
- 2030 Site EUI energy requirements for buildings 25K+ sq. ft
- Prescriptive Lighting or Solar Requirements for buildings 5,000 to 24,999 sq. ft.
- Focused on improving energy efficiency of existing buildings

**Electrification**
- Education/Incentives by CASR
- Building Code updates and permitting implemented by CPD
- All Commercial and Multifamily Buildings must partially electrify space and water heat equipment upon system replacement, when cost effective
Benchmarking since 2016

- Commercial and Multifamily Buildings 25,000 square feet and larger
- Reports submitted through Energy Star Portfolio Manager
- Due June 1 each year
- https://energizedenver.org/
2030 Energy Performance Targets

- Applies to all buildings 25,000 sq. ft. and larger
- Uses Site Energy Use Intensity, or EUI, as a measure of your building’s total energy usage (kBtu divided by square footage)
- Targets set at 85/15th percentile for all covered buildings in Denver
- Mixed-use buildings have a blended target based on % of 3 largest building types
- Unique bldg. types, ag/manufacturing: 30% reduction required

<table>
<thead>
<tr>
<th>ESPM Building Type</th>
<th>Target EUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>48.3</td>
</tr>
<tr>
<td>Hotel</td>
<td>61.1</td>
</tr>
<tr>
<td>Multifamily Housing</td>
<td>44.2</td>
</tr>
<tr>
<td>Performing Arts Center</td>
<td>53.2</td>
</tr>
<tr>
<td>Distribution Center</td>
<td>25.4</td>
</tr>
<tr>
<td>Restaurant</td>
<td>194.1</td>
</tr>
<tr>
<td>Medical Office</td>
<td>69.0</td>
</tr>
</tbody>
</table>

Example targets from master list. Targets set for 80 building types.
Small Building Performance Requirements

- Buildings 5,000-24,999 sq. ft.
- Perform 1 of these options:
  - Lighting Upgrade (install all LEDs)
  - OR
  - Solar Installation or Purchase (enough to meet 20% of the building’s annual energy usage)

<table>
<thead>
<tr>
<th>Building Size (sq. ft.)</th>
<th>Compliance Deadline</th>
</tr>
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<tbody>
<tr>
<td>15,001 - 24,999</td>
<td>December 31, 2025</td>
</tr>
<tr>
<td>10,001 - 15,000</td>
<td>December 31, 2026</td>
</tr>
<tr>
<td>5,000 - 10,000</td>
<td>December 31, 2027</td>
</tr>
</tbody>
</table>
# Electrification Requirements

Partial electrification of Space and Water Heat required in code upon System Replacement, when Cost Effective

<table>
<thead>
<tr>
<th>Amending Denver Building and Fire Code</th>
<th>2023</th>
<th>2025</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permit process changes to near parity in permitting between gas systems and electrification.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heat Pump Required upon Replacement of Easy-to-Electrify Equipment (furnaces, roof top units, individual water heaters) when cost-effective.</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Heat Pump Required upon Replacement of Hard-to-Electrify Equipment (PTACs, boilers, central hot water) when cost-effective.</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Policies for New Construction
Denver Code Adoption Process

- **Summer**: Develop City Proposed Amendments
  - Baseline + staff proposals

- **Summer/Fall**: Publish City Proposed Amendments
  - On CPD’s website

- **Summer**: Request Public Proposed Amendments

- **Jan – July 2022**: Technical Advisory Committee (TAC) Meetings

- **August 2022**: Publish amendments recommended by TAC for adoption

- **October 2022**: City Council
  - Briefing & Vote
  - If approved: 2022 Denver Building & Fire Code

**Legend**:
- City
- External/Public
- Code Technical Advisory Committee (Code Committee)
IECC High Impact Proposals: Commercial

- Require Partial Space Heating Electrification
- Require Partial Water Heating Electrification
- Simplify Prescriptive Path
- Expand Energy Modeling Path options
IECC High Impact Proposals: Residential

- Simplify Prescriptive Path
- Expand Energy Modeling Path options
- Require Minimum Renewables
Support and Incentives
Denver’s Support and Resources

- Resources and link to Help Center
- Additional technical assistance for Under-Resourced Buildings
- Steam Conversion Program
- Incentives for New Construction: Design and Pilot Projects
- Pilots for existing building electrification, incentives coming soon

Search for “Energize Denver Hub” -or- www.denvergov.org/energizedenver
Other Incentives and Financing

- **Xcel Energy**: Cost savings programs, lighting and equipment rebates, new building programs, electric vehicle options, renewable energy, strategic energy mgmt. cohort, access to the National Energy Improvement Fund
- Financing programs for energy improvement projects:
  - **C-PACE** financing
  - **Colorado Clean Energy Fund** (CO’s green bank)
THANK YOU!

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