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- This document was created by removing the MAI building benchmarking and performance requirements from the main Technical Guidance document and creating this separate guide for MAI buildings.

City and County of Denver

Energize Denver Benchmarking and Energy Performance Requirements

Manufacturing, Agricultural, and Industrial (MAI) Buildings
25,000 Square Feet and Larger

DRAFT Technical Guidance

Version 1.0
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[Performance Requirements Lookup Tool](#)

Nothing in this Guidance shall supersede any Denver ordinance or regulation.

[Denver Revised Municipal Code, Chapter 10, Article XIV.](#)

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ACRONYMS

ACCA – Air Conditioning Contractors of America
ACO – alternate compliance option
AEE – Association of Energy Engineers
AIA – American Institute of Architects
ANSI – American National Standards Institute
ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
CASR - Office of Climate Action, Sustainability, and Resiliency
CB ECS – Commercial Buildings Energy Consumption Survey
CCD – City and County of Denver
[CMMS – computerized maintenance management system](#)
[CO – certificate of occupancy](#)
CPD – Community Planning and Development
DLC – Design Lights Consortium
DOE – United States Department of Energy
[DRMC – Denver Revised Municipal Code](#)
[EEM – energy efficiency measure](#)
[EMA – Energy Management Association](#)
EPA – United States Environmental Protection Agency
[EPB – equity priority building](#)
EPI – [ENERGY STAR Plant](#) Energy Performance Indicator
ESPM – ENERGY STAR Portfolio Manager
EUI – weather-normalized site energy use intensity
[EV – electric vehicle](#)
FF – fossil fuel
[GHG – greenhouse gas](#)
GWP - global warming potential
[IEQ – indoor environmental quality](#)
IES - Illuminating Engineering Society
[ITE – information technology equipment](#)
kBtu - kilo British thermal unit
kWh – kilowatt hour
LBNL – Lawrence Berkeley National Laboratory
LED – light emitting diode
MAI – Manufacturing/Agricultural/Industrial
NREL – National Renewable Energy Laboratory
O&M – operations and maintenance
PE – Professional Engineer
PPE – Photosynthetic photon efficacy
PUE – power use effectiveness
RA – Registered Architect
REC - Renewable Energy Credit
RMI – Rocky Mountain Institute
[ROI – return on investment](#)
WBDG – Whole Building Design Guide
 $\mu\text{Mol/J}$ – micromoles per joule

1. INTRODUCTION

The Office of Climate Action, Sustainability and Resiliency (CASR) and the Energize Denver Task Force was tasked with helping the City design a building performance policy for existing buildings that improves health and equity, creates jobs, and drives climate solutions in existing buildings to achieve net zero energy by 2040. Translating this goal into cumulative greenhouse gas emission reductions results in 13.7 million metric tons of CO₂e saved between now and 2040. Denver’s definition of a net zero energy building is highly energy efficient, all electric, provider of demand flexibility to the grid, and powered by renewable electricity. Existing buildings include all commercial and multifamily buildings, including all commercial uses such as manufacturing, agricultural, and industrial uses.

DENVER HAS COMMITTED TO ELIMINATING GREENHOUSE GAS EMISSIONS BY 2040. FOR BUILDINGS AND HOMES, THIS MEANS THE GOALS ARE:

- ALL NEW BUILDINGS AND HOMES “NET ZERO ENERGY” BY 2030
- ALL EXISTING BUILDINGS AND HOMES “NET ZERO ENERGY” BY 2040

The 2021 Task Force was a diverse group representing multiple sectors and stakeholders in Denver. Membership included building owners and managers, our local utility, energy providers, resident/tenant/non-profit representatives, labor and workforce representatives, environment and clean energy representatives, and a member of Denver City Council. Learn more on the overall timeline and stakeholder engagement for the Energize Denver policy on the [Energize Denver](#) website.

The Task Force recommendations were codified into law through the creation of the High-Performance Existing Building Program in an update to the Energize Denver Ordinance in 2021, which requires building owners of covered buildings to address existing building performance through energy efficiency and renewables. This policy expects to remove 11.8 million tons of cumulative emission reductions from the built environment to help the City and County of Denver achieve its climate action goal of zero greenhouse gas emissions in existing buildings by 2040. The boxes below outline the three sections of the Energize Denver Ordinance, implemented by both CASR and Community Planning and Development (CPD). This guidance manual covers policies and procedures for the benchmarking and performance requirements for Manufacturing, Agricultural, and Industrial (MAI) buildings.

Benchmarking	Performance	Electrification
<ul style="list-style-type: none"> • IMPLEMENTED BY CASR • BUILDINGS 25K SQ.FT. OR LARGER MUST SUBMIT ENERGY BENCHMARKING DATA THROUGH ENERGY STAR PORTFOLIO MANAGER ON AN ANNUAL BASIS 	<ul style="list-style-type: none"> • IMPLEMENTED BY CASR • 2030 SITE EUI ENERGY REQUIREMENTS FOR BUILDINGS 25K SQ.FT. OR LARGER • PRESCRIPTIVE LIGHTING OR SOLAR REQUIREMENTS FOR BUILDINGS 5,000 TO 24,999 SQ.FT. • FOCUSED ON IMPROVING ENERGY EFFICIENCY FOR EXISTING BUILDINGS 	<ul style="list-style-type: none"> • EDUCATION AND INCENTIVES FROM 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

2. APPLICABILITY

For benchmarking and performance requirements, a covered building means any commercial, multifamily, institutional, municipal, manufacturing, agricultural, or industrial building 25,000 square feet or larger in the City and County of Denver (CCD).

A Manufacturing/Agricultural/Industrial (MAI) Building is a subset of the covered building definition. A Covered MAI Building is a facility where energy is consumed in process loads for manufacturing, agricultural, or industrial purposes, or for other process loads. Process loads are energy consumed for bona fide purposes other than heating, cooling, ventilation, domestic hot water, cooking, lighting, appliances, office equipment, small, or other plug loads. This classification includes buildings with Class A data centers, food manufacturing, and ENERGY STAR Portfolio Manager building types Drinking Water Treatment & Distribution, Other – Utility, and Wastewater Treatment Plant.

Multi-use buildings with at least one tenant that meets this definition may be classified as an MAI Building. Distribution centers and warehouses do not qualify as MAI buildings unless a portion of the energy used in the building is consumed for MAI process loads.

3. ANNUAL BENCHMARKING REQUIREMENTS FOR MAI BUILDINGS

MAI building owners must benchmark the building's energy usage annually using the U.S. Environmental Protection Agency's (EPA) ENERGY STAR Portfolio Manager (ESPM) tool, and by June 1 each year, must accurately report energy performance information to CASR for the previous calendar year.¹

Please review the Energize Denver Technical Guidance for more information on the basic benchmarking process, benchmarking exemptions, data verification requirements, etc.

3.1. ENERGY STAR Portfolio Manager building types

ENERGY STAR Portfolio Manager building types "Drinking Water Treatment & Distribution," "Other – Utility," and "Wastewater Treatment Plant" are defined as Covered MAI buildings and must continue to benchmark as such. All other Covered MAI buildings, including cannabis growers and manufacturing plants, must benchmark as the ENERGY STAR Portfolio Manager building type "Manufacturing/Industrial Plant."

Starting with the 2025 benchmarking season, buildings which benchmark as the Manufacturing/Industrial Plant building type must [select their plant types](#) within ENERGY STAR Portfolio Manager.

3.2 Production Efficiency Metric

MAI buildings that are considering pursuing the production efficiency metric in the performance pathway must also benchmark a custom metric(s) relevant to the building's operations. To learn how to enter your custom metric data into ESPM, review [this step-by-step guide](#).

For an example of a custom metric, a cannabis grow facility could use a custom metric of pounds of flower produced per year; therefore, the growing efficiency would be calculated as the annual site energy usage divided by the pounds of flower produced. This would allow for growers to fill the canopy area with more plants and/or expand their production, so long as the production on a per-unit basis becomes more efficient. For a manufacturing facility, the custom metric could be the number of widgets produced per year for the

¹ D.R.M.C. § 10-403

manufacturer of a specific product, pounds of a particular food product produced per year for a food manufacturing, pounds of metal processed each year for a metal fabricator, number of glass bottles produced per year for a glass manufacturer, number of vehicles serviced per year at a vehicle repair facility, etc. In this way, the facility would be evaluated on its annual site energy usage divided by the chosen custom metric. This would allow the facility to expand its production, so long as the production on a per-unit basis becomes more efficient. The possibilities for the custom metric are theoretically unlimited, so long as the metric is emblematic of the main production process in the facility.

3.3 Plant Energy Performance Indicator Score

MAI Buildings that are considering pursuing the Plant Energy Performance Indicator (EPI) Score metric on the performance pathway must submit a completed EPI Score spreadsheet with their annual benchmarking submission. [Use this form](#) to submit the completed EPI Score spreadsheet.

4. MAI ALTERNATE COMPLIANCE OPTION

A major difference between the performance requirements for general buildings and MAI buildings is that general buildings are assigned a target Energy Use Intensity (EUI) that they must reach by 2030, based on the building's use-type(s), while MAI buildings must improve their energy performance over time compared to each MAI building's individual baseline. This section will outline the requirements of participating in this MAI alternate compliance option (ACO).

For general buildings' performance targets and options, please see the Energize Denver Technical Guidance for information on 2030 targets, target adjustments, renewable credit, and other considerations for commercial buildings.

4.1 Eligibility

To be eligible for this ACO, the building must meet the definition of a Covered MAI Building. Buildings where a portion of the building meets the MAI definition, and multi-tenant buildings which contain MAI and non-MAI tenants, may pursue this MAI ACO, but have slightly different compliance options.

4.1.1 Multi-Tenant and Mixed-Use MAI Buildings

Buildings where a portion of the building meets the MAI definition, and multi-tenant buildings which contain MAI and non-MAI tenants, may pursue this MAI ACO. Examples include multi-tenant warehouse buildings with MAI and non-MAI (i.e., general commercial) tenants and campuses with numerous buildings with different use types. This does NOT include, for example, a manufacturing building which has associated office and warehouse spaces that are associated with the manufacturing process/tenant.

Multi-tenant and mixed-use MAI buildings must choose one of the following compliance options:

1. Consider the entire building an MAI building and pursue the MAI ACO for the whole building. This option might be applicable to a building where sub-metering the energy usage of the MAI and non-MAI tenants is not possible. In this instance, the building must pursue one of the 30% Site EUI Reduction metrics. If the building owner in this instance chooses to pursue the Prescriptive Pathway (described below/above), then separate the energy audits and Action Plans for must encompass both the MAI and non-MAI portions of the building may be required.
- 1-2. Sub-meter the energy usage of the MAI and non-MAI tenants and treat them as separate buildings for compliance purposes; the MAI building would pursue the MAI ACO, and the non-MAI building would be assigned EUI targets based on the property type(s).
- 2-3. Remove the building's MAI designation and consider the entire building a mixed-use commercial building (not an MAI building). A site-specific blended 2030 Site EUI target will be assigned based on the percentage of Gross Floor Area assigned to each building type. The

Manufacturing/Industrial Plant property type will be assigned a 52.9 EUI target.

If a building wishes to pursue Option #3, they should have a conversation with the Industrial Administrator. The building would be removed from the MAI Alternate Compliance Option and would be moved into the commercial building program. CASR may grant a one-year extension on the first interim target year (i.e., the first interim target year would be extended from 2025 to 2026) to take this change into account. Verification from a third-party on the size and usage of the building may be required when requesting a mixed-use target.

4.1.2 New MAI Buildings

All new buildings will enter into the High-Performance Existing Buildings Program after they have received their certificate of occupancy (CO) and are in operation and consuming energy for 12 full calendar months. At that time, they are required to start reporting annual energy benchmarking data to CASR. CASR will set the 2030 target and interim targets within 6 months of receiving the first benchmarking report for that building.

For new construction that meet the definition of a Covered MAI building, the owner must apply for MAI designation and choose their compliance path upon becoming an existing building. If the owner of a new MAI building does not choose a compliance path, then the 30% EUI reduction performance metric will be assigned to the building for compliance purposes.

For example, if a new MAI building receives its certificate of occupancy in November 2024, the first benchmarking report will be due on June 1, 2026 for calendar year 2025 data, and the building owner must apply for MAI designation and choose their compliance path by June 1, 2027 (i.e., at the time that the second calendar year of benchmarking data is due).

The owner may choose any of the performance pathway and metric options presented in Section 4.4, or may choose the following additional option for new MAI buildings:

1. Efficiency Maintenance Target: The Owner of a New Covered MAI Building must choose one of the following metrics by the end of the second calendar year of benchmarking to maintain through 2030 and annually thereafter:
 - a. EUI
 - b. Production Efficiency
 - c. ENERGY STAR Energy Performance Indicator Score of 75

For example, if a new MAI building receives its certificate of occupancy in November 2024, the first benchmarking report will be due on June 1, 2026 for calendar year 2025 data, and the second benchmarking report will be due on June 1, 2027 for calendar year 2026 data; calendar year 2025 or 2026 data, or an average of the two years, for the chosen metric (whichever is more indicative of normal, efficient operations) must then be maintained indefinitely. The building owner or manager should have a conversation with CASR's Industrial Administrator to discuss their options and to determine if this is an appropriate compliance option for the building.

An existing commercial (i.e., non-MAI) building that undergoes significant redevelopment and/or renovation that triggers new building code requirements (e.g., due to a change in occupancy) and which is subsequently reclassified as an MAI building, may petition CASR to be considered a New Construction MAI building for compliance purposes. Similarly, a non-MAI commercial building that has achieved its 2030 EUI target and subsequently is reclassified as an MAI building may petition CASR to be considered a New Construction MAI building for compliance purposes.

4.2 Overview

While the MAI ACO is a specialized process that will be unique to each MAI building, there are a few high-level steps that each MAI building should consider in their compliance journey.

Step 1: Benchmarking

Ensure that you are benchmarking your building's annual site energy usage annually. MAI buildings must ensure that they include at least one of the approved MAI property types in their benchmarking submissions.

Step 2: MAI designation

The first step in the MAI compliance process is to apply for official MAI designation (Section 4.3). If you are not sure whether your building has received MAI designation, you can use the [Performance Requirements Look Up Tool](#) to search for the building's ID or address and look for the bolded "This building has official MAI designation" text.

Step 3: Check your baseline EUI and think about your compliance plan

It is anticipated that most MAI buildings will pursue the default compliance path for MAI buildings. The default compliance path for MAI buildings is either:

- A 30% Site EUI reduction target by 2030 (if the 2022 baseline EUI is above a 75.5), or
- A 52.9 Site EUI target by 2030 (if the 2022 baseline EUI is below a 75.5).

For buildings with official MAI Designation wishing to pursue this default compliance path, the MAI ACO application is not required – targets for the default compliance path will be assigned after March 1, 2025.

However, some MAI buildings will find that the default compliance path is not the most ideal for them. Other compliance options exist within the MAI ACO, which are detailed in the following sections. These include:

- The ability to request a baseline year prior to 2022, as early as 2018, to account for energy efficiency upgrades you have already implemented in the building.
- A Prescriptive Pathway to compliance (Section 4.4.2).
- A 2030 target of a 30% Production Efficiency Improvement (Section 4.4).
- A 2030 target of a 75 Plant ENERGY STAR Energy Performance Indicator score (Section 4.4).

To request any of these compliance options, the building must submit an [MAI ACO Application](#). The deadline to apply for this MAI ACO with your chosen compliance path is March 1, 2025 – after this date, MAI buildings that have not applied to the MAI ACO will be assigned to the default compliance path.

Step 3b: Do you need an energy audit?

Energy audits are recommended for most buildings – they help you identify and prioritize energy efficiency and electrification projects in your building. ASHRAE Level 2 energy audits are required when applying for a timeline adjustment (all buildings) or the Prescriptive Pathway (MAI buildings only). An energy audit can also help you make the most informed decision about your path to compliance with the MAI ACO.

Step 4: Now that you have your compliance path and performance targets, how will you get into compliance?

Some MAI buildings have already achieved their 2030 targets, and simply must maintain their energy performance going forward. Others will have to reduce their energy consumption or improve

their production efficiency over time. What energy efficiency projects will you implement to achieve the performance targets for your building? Can you electrify your gas systems? Will you purchase or install renewable energy? Do you need a timeline adjustment to plan for end of system life or other some other circumstance that requires more time? These are all questions to ask yourself as you approach the 2026 interim target year for MAI buildings.

4.3 MAI Designation Application

If you believe your building satisfies the eligibility criteria for MAI buildings, then the first step in applying for the MAI ACO is to apply for official MAI designation. To apply for this designation, the owner or representative must fill out a [MAI designation form](#) on the [Energize Denver MAI website](#). Only buildings with an approved MAI designation via the intake form are eligible for this Alternate Compliance Option.

For buildings designated as an MAI building, submitting the annual benchmarking report is an important part of maintaining the MAI designation, which gives you access to the MAI alternate compliance option. If the annual benchmarking is not submitted, it could jeopardize access to the MAI ACOs, and the building could be reclassified as an “Other” property type with a 49.2 Site EUI 2030 target.

For a covered building that benchmarks as a “Manufacturing/Industrial Plant” building type but does not apply for MAI building designation or the MAI ACO, the building will be classified as the “Other” building type and have a 2030 EUI target assigned from the table in Appendix A of the Energize Denver Technical Guidance.

4.4 Pathway and Metric Options

Covered Buildings with an MAI designation may choose from a variety of compliance paths and optional supplemental credits, as demonstrated in Figure 2 and detailed in this section. If a building owner of an MAI-designated building does not choose a pathway and metric by March 1, 2025, the building will default to the Performance Pathway with either a 30% Site EUI reduction or a 52.9 Site EUI, whichever is less stringent.

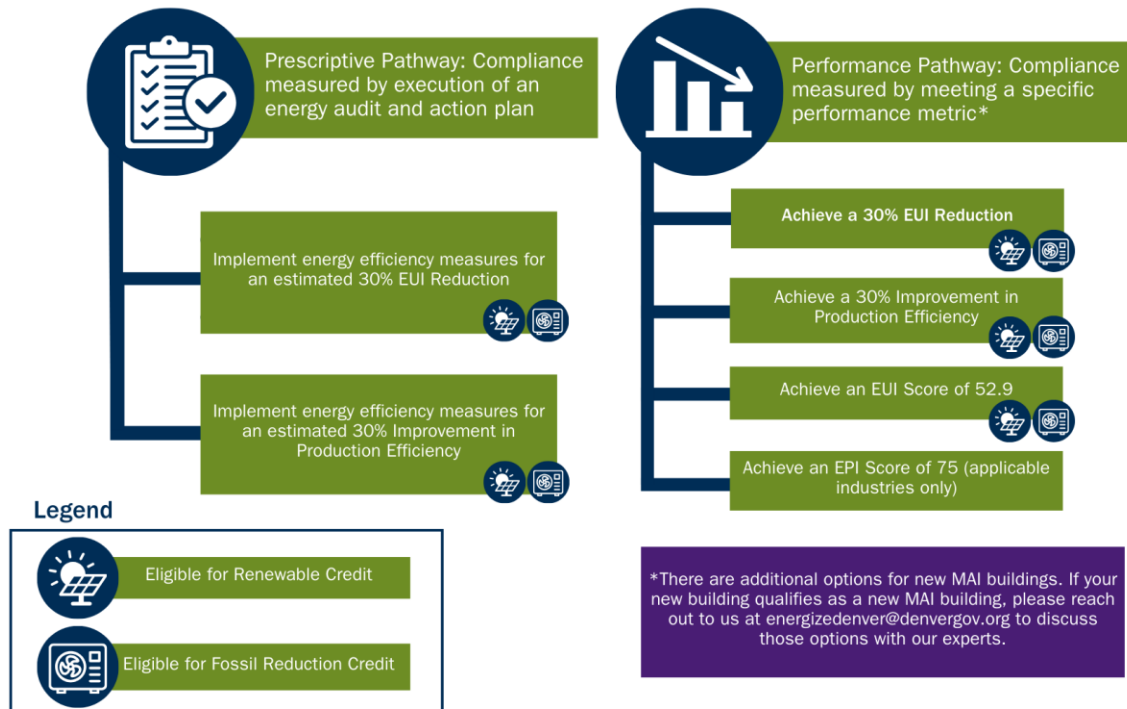


FIGURE 1 – VISUAL REPRESENTATION OF MAI ACO PATHWAYS AND METRICS

4.4.1 Performance Pathway

In the performance pathway, the building owner chooses a metric that is most applicable to their operations and meets that metric's reduction goals by the deadlines.

4.4.1.1 Metric Options

4.4.1.1.1 30% EUI Reduction Metric

A 30% EUI Reduction metric is for the building to achieve a 30% reduction in their Site EUI metric in 2030 relative to the building's baseline year.

4.4.1.1.2 30% Production Efficiency Metric

A 30% Production Efficiency Improvement is similar to a 30% EUI Reduction, but instead of the weather-normalized annual site energy usage being normalized to the square footage of the building, it is normalized to a custom metric that the building owner proposes to CASR. The intent of the production efficiency metric is to normalize an energy use metric specifically to the operations conducted in the building, which will allow for changes in production volume over time. Examples of a weather-normalized annual site energy usage production efficiency metric could be:

- annual-site energy usage per weight of flower produced (cannabis)
- annual-site energy usage divided by PUE (data centers)
- annual-site energy usage divided by pounds of a particular food product produced (food manufacturing)
- annual-site energy usage divided by pounds of metal processed (metal fabricator)
- annual-site energy usage divided by number of glass bottles produced (glass manufacturer)
- annual-site energy usage divided by number of vehicles serviced per year (vehicle repair facility)
- annual-site energy usage per widgets produced (manufacturing)
- annual-site energy usage divided by any other metric(s) proposed by the building owner.

The building owner must propose the custom metric to CASR, indicating the methodology they will use to consistently calculate the custom metric from year to year and to prove that the production efficiency has improved over time. The proposed production efficiency metric will be reviewed and approved by CASR on a case-by-case basis. When proposing a production efficiency metric, the building owner must provide proof, such as annual sales or production reports, that the chosen metric is the right metric for your operations. This option may not be viable for manufacturers that produce non-standard custom products, but all building owners wishing to pursue this metric are encouraged to work with CASR to find an agreeable production metric, if possible.

A building owner may propose that their building's production efficiency metric be evaluated based on a 30% GHG reduction metric (e.g., GHG per sq ft or GHG per production efficiency metric). The GHG emissions will be based on benchmarking data and will include both direct (Scope 1) and indirect (Scope 2) emissions as defined and measured through ENERGY STAR Portfolio Manager. CASR's methodology for calculating limitations of indirect emission reductions will mirror the emissions factor used by the State of Colorado, described in their technical guidance to be released in 2024. If a building owner were to propose that their building be evaluated based on a 30% GHG reduction metric, then the building would not be eligible for the Renewable Credit or the Fossil Fuel Reduction Credit because GHG reductions for renewable or reductions in fossil fuel use would be included in the GHG accounting.

4.4.1.1.3 ~~30~~ 52.9 Site EUI Score

The ~~30~~ 52.9 EUI Score is similar to the 2030 EUI Target for each building type listed in the table in Appendix A of the Energize Denver Technical Guidance in that the final target is set regardless of the baseline EUI. This metric was established to account for certain MAI buildings that are already highly efficient and currently have low Site EUI scores.

4.4.1.1.4 ENERGY STAR Energy Performance Indicator (EPI) Score

The EPI Score is an EPA ENERGY STAR score designed for certain manufacturing industries. Similar to commercial ENERGY STAR scores, the higher the score, the more efficient the building, and the scores have been normalized across similar plants in the United States. These EPI Scores are currently the only federal standards for analyzing and comparing the energy efficiency of certain manufacturing plant types. Eligible industries are encouraged to fill out their relevant EPI spreadsheet to determine their baseline EPI Score and the 2030 goal would be to achieve a 75 for the EPI Score.

4.4.1.2 Performance Pathway Process

A building owner choosing the performance pathway must choose one of the following four metric options and follow the instructions for demonstration within the section:

1. 30% EUI Reduction
 - a. Eligibility: Available to all MAI-designated buildings; if a building owner does not choose a performance pathway and metric, then this pathway and metric will be assigned to the building by default for compliance purposes.
 - b. Baseline Year: 2022, but the building owner may request a baseline year as early as 2018. An earlier baseline year is especially pertinent if the building owner has already made investments into energy efficiency in their building (e.g., high-efficiency HVAC equipment, LED lighting, compressed air leak detection programs, etc.). The building owner must ensure that benchmarking data for the building is available prior to when the energy efficiency investments were made in the building. For example, if the building installed a new high-efficiency boiler in 2021, then the building owner should ensure that benchmarking data is on-file with the city every year beginning in at least 2020. To use an earlier baseline year, benchmarking data for that year and all subsequent years must either be on-file with the City already, or back-reported through CASR's Historical Benchmarking Submission form. Furthermore, if 2022 did not reflect normal operations (e.g., production was still ramping up), the building may request to use another baseline year, with a justification as to why this adjustment is needed.
 - c. Additional Benchmarking Submission Requirements: None
 - d. Target: Reduce the building's EUI by 30% by the end of the final performance year, as compared to the baseline year. The building must realize a 15% EUI reduction by the interim performance year and a 30% EUI reduction by the final performance year, as verified through annual benchmarking data.
 - e. Credits Available: Renewables Credit, Fossil Fuel Reduction Credit
2. 30% Production Efficiency Improvement
 - a. Eligibility: Available to all MAI-designated buildings which produce a standard product.
 - b. Baseline Year: 2022, but the building owner may request a baseline year as early as 2018.
 - c. Additional Benchmarking Submission Requirements: Annual submission of chosen custom metric(s) with benchmarking submission.
 - d. Target: Improve the building's production efficiency (see definition in Appendix B) by 30% by 2030, as compared to the baseline year. The building must realize a 15% efficiency improvement by the interim performance year and a 30% efficiency improvement by the final performance year, as verified through annual benchmarking data.
 - e. Credits Available: Renewables Credit, Fossil Fuel Reduction Credit
3. ~~52.930~~ EUI Target
 - a. Eligibility: Available to all MAI-designated buildings; a good option for buildings with a baseline Site EUI below approximately a 75.5 43(meaning they would have less than a 30% reduction)
 - b. Baseline Year: 2022, but the building owner may request a baseline year as early as 2018.
 - c. Additional Benchmarking Submission Requirements: None
 - d. Target: Reduce the building's Site EUI to a ~~52.930~~ by 2030, with the interim target established for 2026 as the halfway point between the baseline Site EUI and the final 2030 EUI target. If the Site EUI for the building is maintained at ~~52.930~~ or below, the building is

- automatically in compliance once the building owner chooses this pathway.
- e. Credits Available: Renewables Credit, Fossil Fuel Reduction Credit
4. 75 EPI Score Target
- a. Eligibility: Available to MAI designated buildings that qualify as an eligible plant type. Building owners are encouraged to visit the [EPA Plant EPI Score website](#) to determine whether the building is an eligible plant type. Eligible plant types include (plant type, corresponding North American Industry Classification System [NAICS] code):
- i. aluminum casting, 331521, 331524
 - ii. automobile assembly, automobile engine plant, and automobile transmission, 336111, 336112, 336310, 336350
 - iii. cement manufacturing, 327310
 - iv. commercial bread & roll bakery, 311812
 - v. container glass manufacturing, 327213
 - vi. cookie and cracker bakery, 311821
 - ~~vi-vii.~~ distilled spirits, 312140
 - ~~vii-viii.~~ flat glass manufacturing, 327211
 - ~~viii-ix.~~ fluid milk and yogurt processing, 311511
 - ~~ix-x.~~ frozen fried potato processing, 311411
 - ~~x-xi.~~ integrated paper and paperboard manufacturing, 322121, 322130
 - ~~xi-xii.~~ integrated steel plant, 331111
 - ~~xii-xiii.~~ iron casting plant, 331511
 - ~~xiii-xiv.~~ juice processing, 311421, 312111
 - ~~xiv-xv.~~ nitrogenous fertilizer plant, 325311, 325312
 - ~~xv-xvi.~~ pharmaceutical manufacturing, 325400
 - ~~xvi-xvii.~~ pulp mill, 332110
 - ~~xvii-xviii.~~ wet corn milling, 311221
- b. Baseline Year: 2022, but the building owner may request a baseline year as early as 2018.
- c. Additional Benchmarking Submission Requirements: Annual submission of completed EPI Score spreadsheet, due to CASR at the time of the annual benchmarking submission.
- d. Target: Achieve an EPI score of 75 (out of 100) by 2030, with the interim target established for 2026 as the halfway point between the baseline EUI and the final 2030 target.
- e. Credits Available: None

4.4.1.3 Timeline

Buildings pursuing the MAI ACO Performance Pathway must follow the following timeline in Table 1 for compliance, unless said the timeline is adjusted through a timeline adjustment alternate compliance option.

TABLE 1 – MAI ACO PERFORMANCE PATHWAY TIMELINE

Deadline	Performance Pathway Requirements	Benchmarking & Renewable Credit Submission Deadline
December 1, 2023		December 1, 2023
December 1, 2024	Submit chosen pathway and metric	June 1, 2024
<u>March 1, 2025</u>	<u>Submit chosen pathway and metric</u>	June 1, 2025
2026	Interim year – make at least 50% progress to 2030 goal (reported June 1, 2027)	June 1, 2026
		June 1, 2027
		June 1, 2028
		June 1, 2029

2030	Final target year – achieve final performance target (reported June 1, 2031)	June 1, 2030
June 1, 2031	City communicates compliance status, issues penalties (as necessary), and informs the building on next steps	June 1, 2031

4.4.1.4 Demonstration of Compliance

At a base level, all a building owner has to do to prove compliance with the performance target is to turn in an annual benchmarking report by the deadline in the year when the evaluation is due. Renewables and alternate compliance options are voluntary and only flexibility options to tailor compliance to an individual building. Compliance with targets is demonstrated through the submission of the annual Benchmarking report with [additional annual benchmarking data for custom metrics or EPI Scores \(if applicable\)](#), and the additional submission of renewable credit information (if applicable). The schedule of performance targets and their submission deadlines is presented in Table 2. If a building is exempt from Benchmarking in a given compliance year, then the building must comply through an alternate compliance option.

TABLE 2 - TARGET AND PERFORMANCE PERIOD SCHEDULE

Target	Performance Period	Benchmarking & Renewable Credit Submission Deadline
2025 Maintenance	January 1, 2025 to December 31, 2025	June 1, 2026
2026 Interim	January 1, 2026 to December 31, 2026	June 1, 2027
2027 Progress check	January 1, 2027 to December 31, 2027	June 1, 2028
2028 Progress check	January 1, 2028 to December 31, 2028	June 1, 2029
2029 Progress check	January 1, 2029 to December 31, 2029	June 1, 2030
2030 Target	January 1, 2030 to December 31, 2030	June 1, 2031
2031 Maintenance	January 1, 2031 to December 31, 2031	June 1, 2032
20XX Maintenance	January 1, 20xx to December 31, 20xx	June 1 following year

4.4.1.5 Performance Evaluation

CASR will begin the performance evaluation process on June 1 each year. The process includes:

- Confirming the benchmarking submission is complete
- Assessing the building’s [change in on-site fossil fuel consumption over time](#)
- Checking if the owner submitted a renewable credit submission
- Checking [the owner’s chosen performance metric](#) compared to the target

When evaluating performance, CASR is examining the difference between the performance target achieved during the performance period (minus the renewable and fossil fuel reduction credits if applicable) with the performance target required.

Performance Evaluation:

- If the kBtu difference is a positive number, the building used more kBtu than the target allowed, resulting in a “kBtu not achieved” value. This means the building did not meet their performance target for the performance period.
- If the kBtu difference is a negative number, the building used less kBtu than the target allowed, meaning the building met their performance target and is in compliance for the performance period.

[If the building did not submit a Benchmarking Report for the year of performance evaluation, the most recent approved Benchmarking Report will be used to evaluate compliance and assess penalties.](#)

Building owners will be notified of the building’s compliance status by an email to the contacts on file. [See the Energize Denver Technical Guidance for a detailed explanation of the compliance notification timeline.](#) If

CASR does not have a building contact email, a letter will be mailed to the building's main address.

4.4.2 Prescriptive Pathway

In the prescriptive pathway, the building owner completes an energy audit of the building and proposes a prescriptive list of projects that result in a 30% reduction in energy that will be completed by the deadlines.

4.4.2.1. Metrics

A building owner choosing the prescriptive pathway must choose one of the following two metric options:

1. Estimated 30% Site EUI Reduction
 - a. Eligibility: Available to all MAI buildings.
 - b. Baseline Year: 2022, but the building owner may request a baseline year as early as 2018..
 - c. Additional Benchmarking Submission Requirements: None
 - d. Target: Reduce the building's Site EUI by an estimated 15% by the interim performance year and by an estimated 30% by the end of the final performance year, as compared to the baseline year.
 - e. Credits Available: Renewables Credit, Fossil Fuel Reduction Credit
2. Estimated 30% Production Efficiency Improvement
 - a. Eligibility: Available to all MAI buildings which produce a standard product.
 - b. Baseline Year: 2022, but the building owner may request a baseline year as early as 2018.
 - c. Additional Benchmarking Submission Requirements: Annual submission of chosen custom metric(s) with benchmarking submission.
 - d. Target: Improve the building's production efficiency (see definition in Appendix B) by an estimated 15% by the interim performance year and by an estimated 30% by the end of the final performance year, as compared to the baseline year.
 - e. Credits Available: Renewables Credit, Fossil Fuel Reduction Credit

4.4.2.2 Demonstration of Compliance for the Prescriptive Pathway

Step 1: MAI Buildings with an approved MAI Designation must apply to the MAI ACO by December-March 1, 2025. The application for the Prescriptive Pathway requires the following:

- Receive an energy audit from an auditor listed on the trained MAI vendor list, available on CASR's website. To be listed, energy auditors must have attended an MAI vendor training and passed a quiz on the compliance structure for MAI buildings. The energy audit must satisfy the CASR-defined minimum requirements outlined in Section 4.4.2.4. Please refer to the MAI Energy Audit Educational Guide for further detail.
- The building owner must create an Action Plan upon completion of the energy assessment. The Action Plan will document what recommendations will be implemented by the interim year (2026; achieve 50% of the 2030 goal required by the chosen metric) and the final year (2030; 100% of the chosen metric goal). The Action Plan should be a maximum of 10 pages.
 - The Action Plan may reflect the investments already made in the building if said investments were made after the chosen baseline year. The associated savings and supporting documentation must be provided as an attachment to the Action Plan, proving that the investments were made and the savings were realized. These investments will count toward the interim performance target if the savings can be proven via benchmarking data.
 1. For example, if the building owner chooses a baseline year of 2018 and had made investments in the building in 2019 which resulted in an actual 10% EUI reduction (based on benchmarking data, the building's actual energy performance), and the building owner chose the 30% EUI reduction metric, then goal could be an estimated 20% EUI reduction. If a building has this situation, the building owner or manager should have a conversation with

CASR's Industrial Administrator.

- The Renewables Credit and the Fossil Fuel Reduction Credit may be included as part of the building's Action Plan. However, if, upon completion of the energy audit, the identified opportunities for a building do not result in an estimated 30% savings in the chosen metric, the building must include one or both supplemental credits in the Action Plan to reach the target. See Sections 4.4.3 and 4.4.4 for more information on supplemental credits.
- Agricultural Building Minimum Requirements: If, as part of the Action Plan, the owner of an agricultural building installs new grow lights, they must ensure that all grow lights are DLC-listed horticultural grow lights, to ensure a minimum PPE of 1.9 $\mu\text{Mol/J}$. PPE is an industry-accepted metric for horticultural lighting efficacy.
- The energy audit report and completed Action Plan are due to CASR by ~~December~~ March 1, 2025.

Step 2: CASR will review and approve, amend, or reject the Action Plan. The review process is as follows:

- After all deliverables (i.e., energy audit report and completed Action Plan) have been submitted, CASR will review the complete package to ensure that it aligns with all requirements. CASR may request additional documentation or clarification on any of the submitted documents. After CASR has completed its review, it will use the proposed information to create and issue an Action Plan Approval ~~Letter~~. After CASR has issued the Action Plan Approval ~~Letter~~, the building owner will have thirty (30) days to appeal the approval by submitting a revised Action Plan. CASR will review the revised Action Plan and either issue a new Action Plan Approval ~~Letter~~, ask for additional clarification or documentation, or reject the appeal. If the appeal is rejected, the building owner may proceed using the previously approved Action Plan or choose a Performance Pathway.
- All items included in the Action Plan Approval ~~Letter~~ become requirements of the Prescriptive Pathway for that building and a building owner must successfully complete all of the requirements to be in compliance. If a building cannot complete a given item in the signed Action Plan by the deadline, the building owner must contact CASR and indicate which measure(s) cannot be completed, a reason for the inability to complete the measure(s), and an explanation of why the building owner cannot apply for a timeline adjustment in order to complete the measure at a date beyond the performance period. CASR will work with the building owner to adjust the Action Plan accordingly, if applicable.

Step 3: The building must complete the first half of the Action Plan (i.e., 50% of the estimated savings goal) by the end of the interim performance year (2026). This will be confirmed in the Interim Implementation Report, due by March 1, 2027. The building owner must submit to CASR an interim implementation report confirming the successful implementation of the first half of the Action Plan.

- Note: During the year of the required submission of the Interim Implementation Report (i.e., March-December 2027), CASR will visit a minimum 10% of MAI buildings pursuing this Prescriptive Pathway to verify the successful implementation of the measures outlined in the first half of the Action Plan.

Step 4: The building must complete the Action Plan by the end of the final performance year (2029). This will be confirmed in the Final Implementation Report, due by March 1, 2030. The building owner must submit to CASR a final implementation report confirming the successful implementation of the entire Action Plan.

- Note: During the year of the required submission of the Final Implementation Report (i.e., March-December 2030), CASR will visit a minimum 10% of MAI buildings pursuing this Prescriptive Pathway to verify the successful implementation of the measures outlined in the Action Plan.

Step 5: The building must complete and submit to CASR an Evaluation, Monitoring, and Verification Report by June 1, 2031, along with the annual benchmarking submission. This step allows CASR and the building owner to measure and verify the performance of the energy efficiency investments made in the building against the predicted savings, based on 2030 data.

- Based on the completed Action Plan, buildings are estimated to see a 30% savings. If the Evaluation, Monitoring, and Verification Report and the 2030 benchmarking data shows less than a 20% actual savings, after the evaluation of the fossil fuel reduction and renewables credits, the building owner must complete Step 6.

Step 6: If the Evaluation, Monitoring, and Verification Report and the 2030 benchmarking data shows less than a 20% actual savings, the building must take one additional step, and implement a Corrective Action Plan to ensure that the new equipment was commissioned correctly and is operating as intended. The completed Correction Action Plan would then be due on June 1, 2032, along with the annual benchmarking submission.

- If at least a 20% actual savings is realized, then Step 6 will not be required.

4.4.2.3. Timeline

Buildings pursuing the MAI ACO Performance Pathway must follow the following timeline in Table 3 for compliance, unless ~~said the~~ timeline is adjusted through a timeline adjustment alternate compliance option (Section 5).

TABLE 3 – MAI ACO PRESCRIPTIVE PATHWAY TIMELINE

Deadline	Prescriptive Pathway Requirements	Benchmarking & Renewable Credit Submission Deadline
		December 1, 2023
December 1, 2024	Submit chosen pathway and metric, energy audit, and Action Plan	June 1, 2024
March 1, 2025	Submit chosen pathway and metric, energy audit, and Action Plan	June 1, 2025
December 31, 2026	Interim year – Building completes half of Action Plan (i.e., 50% of the estimated savings goal)	June 1, 2026
March 1, 2027	Building submits interim Implementation Report	June 1, 2027
		June 1, 2028
December 31, 2029	Building completes Action Plan	June 1, 2029
March 1, 2030	Building submits final Implementation Report	June 1, 2030
June 1, 2031	Building submits Evaluation, Monitoring, and Verification Report; City communicates compliance status, issues penalties (if needed), and informs the building on next steps and whether a Corrective Action Plan is required	June 1, 2031
June 1, 2032	Building submits Corrective Action Plan (if required)	June 1, 2032

If a building pursuing the Prescriptive Pathway does not comply with the Action Plan or any other requirement of the Prescriptive Pathway, then the ~~building will default to the Performance Pathway with either a 30% Site EUI reduction or a 52.9 Site EUI, whichever is less stringent, will be assigned for compliance and penalty evaluation purposes for performance evaluation and penalty assessment.~~

4.4.2.4 Energy Audit Minimum Requirements for the MAI [Prescriptive Pathway](#)

MAI Buildings completing an energy audit for a Timeline Adjustment Application *only* may follow the instructions in the Energize Denver Technical Guidance. For an energy audit that satisfies the requirements of both the Timeline Adjustment and the MAI Prescriptive Pathway, follow the instructions in this section.

For the Prescriptive Pathway in the MAI Alternate Compliance Option: Energy audits for individual MAI buildings must follow ANSI/ASHRAE/ACCA Standard 211-2018 and have the following minimum requirements:

- Energy auditor must have passed CASR’s MAI Energy Auditor Training. If you prefer to use a specific energy auditor, please encourage the individual to receive the training to be included in the list prior to the audit being conducted. You can view a list of auditors who have passed the MAI Energy Auditor Training by [going to the “Directory of Trained Service Providers”](#) on the Energize Denver Hub.
- Energy auditor must have one of the following licenses, credentials, or certifications:
 - Professional Engineer (licensed in the United States)
 - Certified Energy Auditor (Association of Energy Engineers)
 - Certified Energy Manager (Association of Energy Engineers)
 - Building Energy Assessment Professional (ASHRAE)
 - High-Performance Building Design Professional (ASHRAE)
 - Energy Management Professional (Energy Management Association)
- Energy Auditor must be a third-party individual or company and not be employed by the organization that owns or operates the building.
- Energy audit must be a minimum of an ASHRAE Level 2.
- MAI Buildings are *not* required to submit their energy audit through the online Denver Audit Template tool [for the Prescriptive Pathway. However, if an MAI building also wishes to apply for a Timeline Adjustment and/or an energy audit rebate, the energy audit must be submitted through the online Denver Audit Template tool.](#)
- Baseline identification:
 - Baseline should be calendar year 2022 by default, but a building owner may request a baseline year as early as calendar year 2018
 - Baseline EUI should be in Weather-normalized Site EUI (or Site EUI if the building cannot receive a weather-normalized version)
- Timeframe of Audit
 - Audits completed since July 1, 2023 will be accepted.
 - If the building owner wishes to use an audit completed between January 1, 2017 and July 1, 2023, CASR will accept the audit, so long as the audit is updated to include the minimum requirements needed for the Prescriptive Pathway.
- Investment analysis minimum requirements:
 - Individual measure cost and estimated site EUI savings and/or production efficiency improvement, including savings to investment ratio (SIR) and simple ROI calculations.
 - Total project cost and site EUI savings and/or production efficiency improvement, including total SIR and simple ROI.
 - The energy audit should evaluate both electric and fossil fuel systems in the building. If the chosen energy audit program does not include an evaluation of fossil fuel systems, the building owner is encouraged to pay for an additional evaluation of said equipment.

4.4.3 Supplemental Credits: Renewable Credit

The Renewable Credit works the same for MAI buildings as it does for all commercial and multifamily buildings. Please see the Energize Denver Technical Guidance for more detailed information on the Renewable Credit. A building owner may supplement any of the MAI performance metrics listed above with the Renewable Credit, *except* for the EPA Plant EPI Score metric.

Technically, any MAI building could satisfy its performance requirements by sourcing at least 30% of overall

energy demand for the building from renewables, provided the renewables satisfy the requirements outlined in the Renewable Credit.

4.4.4 Supplemental Credits: Fossil Fuel Reduction Credit

The Fossil Fuel Reduction Credit is only available to MAI buildings. This is offered in lieu of the Electrification Credit, which is only available to commercial and multifamily buildings.

A building owner may supplement any of the MAI performance metrics listed above, *except* for the EPA Plant EPI Score metric, with the Fossil Fuel Reduction Credit. If, between the baseline year and the performance evaluation year, an MAI building reduces its direct FF consumption (e.g., through efficiency improvements, the electrification of fossil fuel equipment, the removal of extraneous fossil fuel equipment, etc.), then the percentage of fossil fuel reduction, relative to the baseline year, will be directly credited towards the chosen metric, using the following formula:

$$\text{Credit} = \frac{\text{Baseline FF Usage} - \text{Final FF Usage}}{\text{Baseline Total Energy Usage}} \times 100\%$$

Where “Baseline FF Usage” is the annual site energy usage from fossil fuels in the baseline year, “Final FF Usage” is the annual site energy usage from fossil fuels in the performance year, and “Baseline Total Energy Usage” is the annual site energy usage from all energy sources in the baseline year.

Simply stated, if an MAI building reduces its fossil fuel consumption over time, it will receive the Fossil Fuel Reduction Credit. The maximum possible credit is 10% and will be applied to the building’s 2030 target. For example, if the MAI building’s 2030 performance target is a 50 EUI and the building receives a 10% credit, the building only must realize a 55 EUI.

The Fossil Fuel Reduction Credit will be evaluated during each building’s performance evaluation of the 2026 and 2030 targets. During the evaluation, if it is found that a building has reduced its absolute fossil fuel consumption as compared to the baseline year, the credit will be applied to the chosen pathway and metric before assessing renewable credits and then evaluating the performance of the chosen compliance path.

4.4.5 MAI Pathway Agreement Notice

After CASR has completed its review of the submission, it will create a Performance ~~Pathway Agreement~~ or Prescriptive Pathway ~~Agreement Notice~~ that ~~is binding as will state~~ the new performance requirements for the building. The ~~Agreement Notice~~ will include:

- details of the Action Plan (for the Prescriptive Pathway)
- agreed-upon timeline
- reporting requirements
- penalties that would be assessed if the plan is not completed as agreed
 - ~~For the Performance Pathway—follow the agreed-upon schedule in the Performance Pathway Agreement~~
 - ~~For the Prescriptive Pathway—If the owner chooses a prescriptive pathway but does not comply with the Prescriptive Pathway Agreement, then the Performance Pathway, 30% EUI Reduction will be assigned for compliance purposes.~~

4.4.6 Changing MAI ACO Pathways and Metrics

A building owner may apply to CASR to change their chosen ~~(or default) performance pathway compliance path~~ after the ~~December-March 1, 2025~~ deadline, but the building must ~~then~~ comply with the timeline of the new chosen pathway. ~~The signed ACO agreement will be adjusted accordingly.~~

5. OTHER ALTERNATE COMPLIANCE OPTIONS

A MAI building owner is also eligible for two additional alternate compliance options to apply to adjust the timeline of implementation:

- [Interim Compliance Hold](#)
- Timeline Adjustment ACO

MAI buildings that wish to apply for an Interim Compliance Hold should follow the instructions in Section 7.1 of the Energize Denver Technical Guidance. For MAI buildings choosing the performance pathway, the owner should follow the instructions in Section 7.2 of the Energize Denver Technical Guidance. For MAI buildings choosing the prescriptive pathway, the owner should have a conversation with CASR's Industrial Administrator to combine the timeline adjustment process with the prescriptive pathway application (additional instructions to be added in this section in the final draft of this document in January 2025).

6. ENFORCEMENT

CASR prefers that building owners invest in their buildings to reach the performance targets instead of paying penalties to the city and is committed to supporting building owners with their efforts and exploring the flexibility that alternate compliance options can afford. As recommended by the Task Force, CASR will “focus its efforts on doing everything it can to support those out of compliance in quickly putting a plan in place and implementing upgrades as soon as possible, rather than simply fining those who missed their first compliance target.” The team is also committed to assisting under-resourced buildings with designing and implementing compliance plans so that penalties are not imposed.

6.1 Benchmarking

Owners of covered buildings will be subject to a civil penalty if the building's benchmarking report is not submitted by the annual deadline. The following is an outline of the steps for benchmarking penalty assessments, shown as a timeline in Figure 2:

1. **Warning Notice:** Once the deadline has passed, CASR will send a warning notice by email. The building owner will have a 30–60-day grace period from the benchmarking deadline to submit the benchmarking report or correct data issues in a “pending” submission. The length of the grace period will be determined by CASR on an annual basis.
2. **Civil Penalty - Administrative Citation:** If the building owner is not in compliance by the end of the grace period, an administrative citation is issued. The building owner has 30 days to either submit the benchmarking report (which nullifies the citation) or file an appeal (Section 8).
3. **Payment:** If the building owner does not file an appeal or submit the benchmarking report, the owner has one hundred eighty (180) days from the date of the citation to pay the penalty amount with the manager of finance.
4. **Property Lien:** If a building owner fails to pay the required amount within one hundred eighty (180) days, the civil penalty will be considered a debt to the city until paid in full. The debt is a perpetual lien on the property, and is superior and prior to all other liens, regardless of their dates of recordation, except for liens for general taxes and prior special assessments, until the civil penalty owed, delinquent interest, and recording fees have been paid in full.

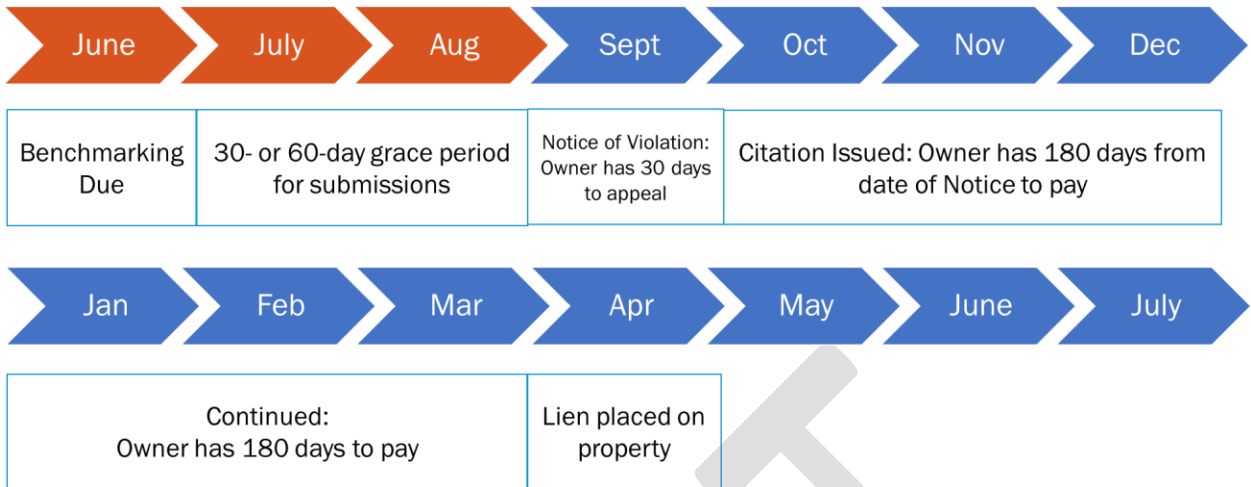


FIGURE 2: BENCHMARKING REQUIREMENTS ENFORCEMENT TIMELINE

6.2 Performance Requirements

Building owners will be subject to a civil penalty, in accordance with Table 10, if targets have not been achieved or maintained or another reason previously listed. The following is an outline of the steps for penalty assessments, shown as a timeline in Figure 3:

1. **Warning Notice:** Once the performance evaluation has been completed for a covered building, CASR will send a warning notice. The building owner will have ninety (90) days from the date of the warning notice to submit an application for a timeline adjustment or other alternate compliance option, if applicable.
2. **Notice of Violation:** If the building owner has not applied for a timeline adjustment or other alternate compliance option by the end of the 90 days, CASR will issue a notice of violation. The building owner will have thirty (30) days to file an appeal of the notice of violation (Section 6).
3. **Civil Penalty – Administrative Citation:** If the building owner has not filed an appeal, an administrative citation is issued. The building owner has one hundred eighty (180) days to pay the penalty with the manager of finance.
4. **Property Lien:** If a building owner fails to pay the required amount within one hundred eighty (180) days, the civil penalty will be considered a debt to the city until paid in full. The debt is a perpetual lien on the property, and is superior and prior to all other liens, regardless of their dates of recordation, except for liens for general taxes and prior special assessments, until the civil penalty owed, delinquent interest, and recording fees have been paid in full.

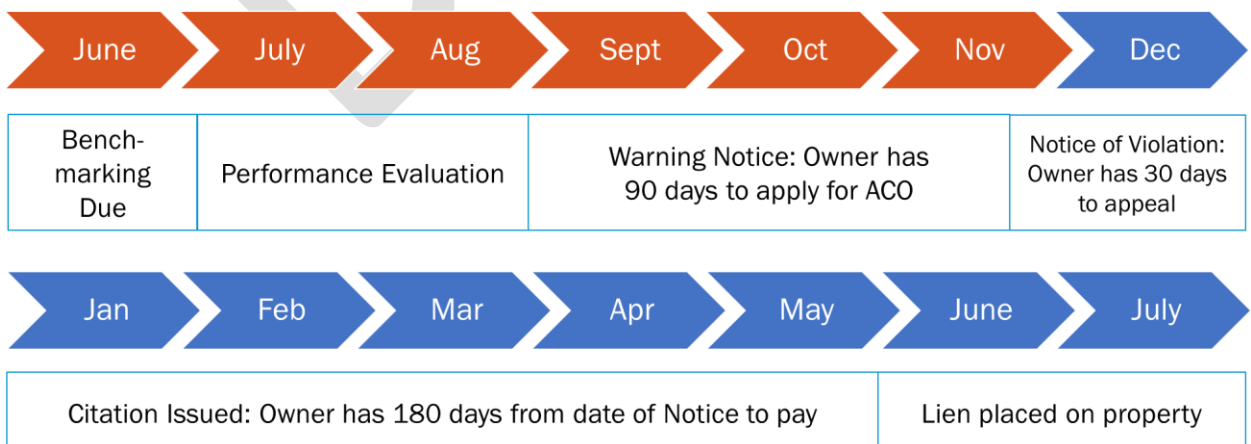


FIGURE 3: PERFORMANCE REQUIREMENTS ENFORCEMENT TIMELINE

7. PENALTIES

CASR structured the penalties to be slightly higher than the average cost of compliance to assist project and facility managers with getting approvals on projects with good returns from energy savings.

7.1 Types of Penalties

For the benchmarking and performance requirements, there are three main types of penalties: a *benchmarking penalty*, a *performance target penalty*, and a *performance maintenance penalty*.

- Benchmarking penalty - A complete and accurate Benchmarking report was not submitted by the annual deadline.
- Performance Target Penalty - A *target penalty* is assessed if the building did not reach the Interim or Final Targets by their deadline. If the building has not met the final target by the deadline, it will stay at the target penalty level annually assessed until the target is met.
- Performance Maintenance Penalty - Once the building reaches its 2030 target, it would be switched over to a *maintenance penalty* on an annual basis for not maintaining the 2030 target indefinitely. If the building's annual site EUI is 5% worse than the target it is supposed to be maintaining, the building would switch back to the target penalty level until the target has been achieved again.

There are other reasons why a penalty may be assessed:

- Errors in data the Owner has submitted to CASR, that could include energy use data, solar generation, and capacity, use attributes, building information, calculations, or results. The Owner must correct such errors, submit the updated benchmarking report to CASR, and notify CASR of the updated submission. Failure to correct the errors would be considered a failure to submit a complete and accurate report for that year.
- Knowingly withholding information or submitting inaccurate information that affects performance evaluation
- Building owner does not satisfy the requirements of an Alternate Compliance Timeline Adjustment notice

7.2 Penalty Assessment

For the performance requirements, penalties are assessed by taking the “kBtu not achieved”, then multiplying it by the cost per kBtu to calculate the penalty amount.

$$\text{“kBtu not achieved”} * \text{Cost/kBtu} = \$ \text{ penalty amount}$$

For buildings that have received an approved benchmarking exemption and alternate compliance option for the performance evaluation year, penalties would be assessed according to the ACO notice. If the building did not submit a Benchmarking Report for the year of performance evaluation, the most recent approved Benchmarking Report will be used to evaluate compliance and assess possible penalties. If the previous benchmarking report is used, the assumption will be that no improvements have been made and performance is at the same level.

7.3 Penalty Schedule

Energize Denver's Task Force recommended that “fines should be somewhat more than the cost of compliance and should be heftier for buildings with an alternate compliance timeline. The compliance obligation and status of the building must be tied to the building with disclosure requirements, an attachment to the deed or a development agreement that attaches to the parcel.” The Energize Denver Ordinance enables CASR to assess a civil penalty of “up to \$0.70 for each required kBtu reduction per year that the owner's covered building fails to achieve in that year.” [CASR plans to assess penalties at the](#)

[minimum level provided in Table 3](#) so building owners can focus on achieving the 2030 targets without maintenance penalties along the way. *CASR reserves the right to enforce penalties at the maximum level.*

The Target Penalties for existing MAI buildings were calculated across two compliance periods (one interim target and one final target) and the Target Penalty for new MAI buildings was calculated for one compliance period (one final target), which accounts for the differences in penalty levels in Table 4.

TABLE 4 – MAI BUILDING MINIMUM PENALTY SCHEDULE

Type	Penalty Level	Assessment Period
Benchmarking, failure to correct errors, knowingly withholding or inaccurate information	\$2,000	annually
Target Penalty – Alternate Compliance Option for Existing MAI Buildings	\$0.42/kBtu	2026, 2030
Target Penalty – Alternate Compliance Option for New MAI Buildings	\$0.63/kBtu	2030
Maintenance Penalty	\$0.05/kBtu	Starting 2031 then annually
Failure to reach target as agreed in Timeline Adjustment	As outlined in the notice	As outlined in notice

7.4 Example Compliance Scenarios for MAI Buildings

This section contains several examples of combining different compliance strategies and resulting penalties assessed for MAI buildings pursuing the MAI alternate compliance option. Penalties are cumulative because the interim target (if applicable) is designed to help the building be on track to meet the 2030 target, so early action is encouraged. In all of these examples, the minimum level for target penalties were assessed in an MAI building that is 150,000 sq. ft.

The chosen metric in these examples was assumed to be the 30% EUI Reduction metric, but the same concepts and calculations apply to other metric options. For example, EUI can be substituted for production efficiency in the below examples using the following formula:

$$Production\ Efficiency\ \left(\frac{kBtu}{Widget}\right) = \frac{Total\ Building\ Energy\ \left(\frac{kBtu}{year}\right)}{Total\ Widgets\ Produced\ per\ Year}$$

If an MAI building chooses a metric in the Performance Pathway and for some reason their penalties are higher than they would have been in the 30% EUI Reduction metric, the maximum penalty the building will be assessed will be the penalty for the 30% EUI Reduction metric.

For the interim calculation for the 75 EPI Score Target, the EPI tool “Reference Plant” will be adjusted by the CASR team to determine the level of site energy (kBtu/year) needed to achieve the required interim score with an equivalent level of production. The actual plant energy may increase or decrease by a different percentage if the level of production has changed.

7.4.1 Example # 1

This example shows an existing MAI building that did nothing to improve their EUI (Table 5).

Scenario:

- Did not receive the fossil fuel reduction credit
- Did not purchase or install renewables
- Did not apply for a timeline adjustment ACO
- Building achieved *no reduction* from a 2022 baseline of 80 EUI

TABLE 5 – EXAMPLE 1: NO REDUCTIONS

Year	EUI Targets	EUI Actual	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2026	68	80	12,000,000	10,200,000	1,800,000	\$0.42/kBtu	\$756,000
2030	56	80	12,000,000	8,400,000	3,600,000	\$0.42/kBtu	\$1,512,500
Cumulative Penalties							\$2,268,000

7.4.2 Example # 2

This example shows an existing MAI building that did make some progress on their 2030 target but did not take advantage of the renewables or fossil fuel reduction credits to fill in the gap (Table 6).

Scenario:

- Did not receive the fossil fuel reduction credit
- Did not purchase or install renewables
- Did not apply for a timeline adjustment ACO
- Building achieved *some reduction in EUI* from a 2022 baseline of 80 EUI

TABLE 6 – EXAMPLE 2: SOME EUI REDUCTIONS

Year	EUI Targets	EUI Actual	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2026	68	68	10,200,000	10,200,000	N/A	\$0.42/kBtu	\$0
2030	56	60	9,000,000	8,400,000	600,000	\$0.42/kBtu	\$252,000
Cumulative Penalties							\$252,000

7.4.3 Example # 3

This example shows an existing MAI building that knew they were going to miss the 2026 target but purchased renewables instead of submitting a timeline adjustment application. It did make some progress on its 2030 target and used renewables again as well as the fossil fuel reduction credit in 2030 to fill in the gap (Table 7).

Scenario:

- Received the fossil fuel reduction credit in the final performance year
- Purchased long-term off-site renewables contract
- Did not apply for a timeline adjustment ACO
- Building achieved *some reduction in EUI* from a 2022 baseline of 80 EUI

TABLE 7 – EXAMPLE 3: SOME EUI REDUCTIONS AND RECEIVED ADDITIONAL CREDITS

Year	EUI Targets	EUI Actual	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2026	68	75+RC	10,200,000	10,200,000	N/A	\$0.42/kBtu	\$0
2030	56	70+RC+Fossil Fuel	8,000,000	8,400,000	N/A	\$0.42/kBtu	\$0

		Reduction Credit						
							Cumulative Penalties	\$0

7.4.4 Example # 4

This example shows a new MAI building that was pursuing the renewable power generation metric and made some progress on their 2030 target, but fell short of the goal (Table 8).

Scenario:

- Purchased long-term off-site renewables contract and/or installed on-site renewables
- Did not apply for a timeline adjustment ACO
- Building installed or purchased *some but not all* of the renewables necessary to hit the 30% goal, given a performance year EUI of 80

TABLE 8 – EXAMPLE 4: NEW MAI BUILDING WITH SOME RENEWABLES

Year	EUI in 2030	kBtu renewables required	kBtu renewables generated	kBtu not achieved	Penalty Level	Penalty	
2030	80	3,600,000	3,000,000	600,000	\$0.63/kBtu	\$378,000	
						Cumulative Penalties	\$378,000

7.4.5 Example # 5

This example shows a new MAI building that was constructed in November 2024 and was pursuing the efficiency maintenance metric with a 2026 baseline year. The building’s energy efficiency worsened in between the baseline year and when compliance was due in 2030 (Table 9).

Scenario:

- Did not purchase or install renewables
- Did not apply for a timeline adjustment ACO
- Building *increased its EUI* from a 2026 baseline of 80 EUI

TABLE 9 – EXAMPLE 5: NEW MAI BUILDING WITH AN INCREASE IN EUI

Year	EUI in 2030	EUI Target	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty	
2030	85	80	12,750,000	12,000,000	750,000	\$0.63/kBtu	\$472,500	
							Cumulative Penalties	\$472,500

8. APPEALS

A building owner has the right to appeal a Decision, Notice, or Order (administrative citation) by filing a “petition for review.” Please review the instructions in Section 11 of the Energize Denver Technical Guidance.

Appendix A – Useful Links and Best Practices

ASHRAE [Standard 100-2018](#) with [addendum a](#)

ASHRAE [Standard 180-2018](#)

ASHRAE [Standard 211-2018](#)

EPA [ENERGY STAR® Portfolio Manager®](#)

Enterprise [Green Communities Program](#)

US DOE [Engaging Tenants in Energy Efficiency Resources](#)

California Commissioning Collaborative [Commissioning Guide: Existing Buildings](#)

US DOE [Federal Energy Management Program Tools](#)

IMT [Green Lease Leaders Library](#)

AIA [Guide to Building Lifecycle Assessment in Practice](#)

LBNL [Integrated System Packages and Energy Analytics](#)

New Buildings Institute [Zero Energy Performance Targets for New Construction](#)

NREL [Handbook for Planning and Conducting Charrettes for High-Performance Projects](#)

NREL [Strategies for 50% Energy Savings in Large Office Buildings](#)

RMI [Deep Energy Retrofits Using Energy Savings Performance Contracts: Success Stories](#)

RMI [The Retrofit Depot](#)

WBDG [Comprehensive Facility Operations & Maintenance Manual](#)

WBDG [Planning and Conducting Integrated Design Charettes](#)

WBDG [Project Delivery Teams](#)

Appendix B - Definitions

Administrative Citation: a citation for a violation of the Code, the rules and regulations adopted by the Director and promulgated by the Manager, or noncompliance with an Order issued by the Manager by which a civil penalty for the violation or noncompliance is assessed.

Annual Site Energy Usage: the total energy consumed by the building in one year measured in kBtu, including all equipment and fixtures attached to the building energy meters

Benchmarking: measuring a covered building's energy performance using the ENERGY STAR Portfolio Manager tool or other similar platforms as CASR may designate.

Benchmarking Submission: the data submitted each year via the ENERGY STAR Portfolio Manager tool, or other similar platforms as CASR may designate, using a template and submission link to be distributed and publicized by CASR. All information expressly denoted as mandatory by either ENERGY STAR Portfolio Manager or CASR shall be included in the submission.

Campus: a collection of two or more buildings, of any building type or size, that act as a single cohesive property with a single shared primary function and are owned and operated by the same party, such as higher education or hospital campuses.

Data Center: a room or series of rooms that share data center systems, whose primary function is to house equipment for the processing and storage of electronic data and that has a design total Information Technology Equipment (ITE) power density exceeding 20 watts per square foot (20 watts per 0.092 m²) of conditioned area and a total design ITE load greater than 10 kW. Class A is where 15% or more of the square footage of the building is a data center. Class B is where less than 15% of the square footage of the building is a data center.

Decision: any CASR approval or denial of an Owner's application for a target adjustment, timeline adjustment, renewable credit submission, or alternate compliance option.

Deep-energy retrofit: a deep energy retrofit is a building-specific, whole-building analysis designed to identify points in the building lifecycle where investments in energy efficiency can achieve the highest return. A deep energy retrofit may occur over a few years and will require a more significant financial commitment than conventional energy retrofits. The energy savings created with a deep energy retrofit are generally greater than 40%.

Energy audit: an evaluation of a building that identifies potential energy efficiency measures for building systems and operations in accordance with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 211-2018 Level 2

ENERGY STAR Portfolio Manager: the online tool created by the US Environmental Protection Agency used to measure and track a building's energy use, water consumption, and greenhouse gas emissions

Existing Building Performance: the energy efficiency and renewable energy of a covered building measured by site Energy Use Intensity (EUI), or EUI adjusted for renewable energy using data reported via the ENERGY STAR Portfolio Manager tool or other platforms as CASR may designate

Final Decision: for an appeal of a Decision, Notice, or Order means the Director's decision arrived at after review of the Recommended Decision or its decision after hearing the matter or review of written briefs in the first instance or a Recommended Decision for which Director review is not timely filed.

Fossil Fuel: a hydrocarbon-containing form of energy consumed in a building, such as natural gas, fuel oil, propane, or coal/coke.

Frontline communities: those communities that experience “first and worst” the consequences of climate change and have been underrepresented and underserved throughout the years. These include low- to medium-income communities, communities of color and indigenous people, those who speak languages other than English, people with disabilities and chronic conditions, older adults, young children, people with criminal records, LGBTQ+, and refugees and immigrants.

Green Power: Green Power is a generic term for renewable energy sources and specific clean energy technologies that emit fewer GHG emissions compared to other energy sources that supply the electric grid. You may use green power directly from an on-site renewable system or purchase green power from your utility or independent green power supplier.

Gross Floor Area (GFA): the total building square footage, measured between the outside surface of the principal exterior fixed walls of a building. GFA should include lobbies, tenant areas, common areas, meeting rooms, break rooms, atriums (base level only), restrooms, elevator shafts, stairwells, mechanical equipment areas, basements, storage rooms. GFA should not include exterior spaces, balconies, patios, exterior loading docks, driveways, covered walkways, outdoor play courts, parking, or crawl spaces.

Hearing Officer: the person the Director delegates pursuant to the Code to conduct a hearing or review a case that has been submitted for determination based on written argument and written statement of facts.

High Performance Existing Buildings Program: the administrative program implemented by CASR requiring the Benchmarking, reporting, and Existing Building Performance in commercial and multifamily buildings that are located within the City and County of Denver.

Lighting Power Density: the lighting power load per unit area of a building or a space in a building as measured in watts per square foot.

Manufacturing/Agricultural/Industrial Building is a subset of the Covered Building definition, and means a facility where energy is consumed in process loads for manufacturing, agricultural, or industrial purposes, or for other process loads. Process loads are energy consumed for bona fide purposes other than heating, cooling, ventilation, domestic hot water, cooking, lighting, appliances, office equipment, small, or other plug loads. This classification includes buildings with Class A data centers, food manufacturing, and ENERGY STAR Portfolio Manager building types Drinking Water Treatment & Distribution, Other – Utility, and Wastewater Treatment Plant. Multi-use buildings with at least one tenant that meets this definition may be classified as a Covered MAI Building.

Maintenance Penalty: a penalty assessed if the building met its interim or 2030 targets and switches to a lower level of cost per kBtu not achieved.

New Covered Building: a building that received its certificate of occupancy after November 22, 2021 and meets the definition of a covered building.

New Covered MAI Building: a building that received its certificate of occupancy after November 22, 2021 and meets the definition of a covered MAI building.

Notice or Order: any notice or order, civil penalty assessment, or administrative citation issued pursuant to the Director's authority under the Code.

Off-site green power or renewables: green power purchases from your utility or independent suppliers.

On-site green power or renewables: electric generation systems located at your property that produce Green Power.

Operations and maintenance (O&M): the functions, duties and labor associated with the daily operations and normal repairs, replacement of parts and structural components, and other activities needed to preserve an asset so that it continues to provide acceptable services and achieves its expected life

Operation and maintenance program: A plan meeting the specifications found in American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 100-2018, Section 6, that addresses every applicable building system and element as outlined in Annex D and follows the implementation requirements laid out in Annex L that address the functions, duties and labor associated with the daily operations and normal repairs, replacement of parts and structural components, and other activities needed to preserve an asset so that it continues to provide acceptable services and achieves its expected life

Owner: the person or entity having a legal or equitable interest in real property and its fixtures and appurtenances, which shall explicitly include but not be limited to a homeowner's association.

Percent Electricity: the percent of total site energy use that is electricity. Calculated in kBtu, it combines grid-purchased electricity with renewable electricity used at the building and divides it by the total energy used.

Performance period: the defined timeframe of benchmarking data that is used for evaluation of energy performance requirements for compliance

Process load: a process load is energy consumed for bona fide purposes other than heating, cooling, ventilation, domestic hot water, cooking, lighting, appliances, office equipment, or other plug loads.

Production Efficiency: the annual site energy usage in a Covered MAI building divided by a standard manufacturing or agricultural production unit(s), such as kBtu per widgets produced or kBtu per pounds of flower produced. Additional examples of production efficiency may include power use effectiveness (PUE; data centers), or some other metric for other industrial uses.

Production Efficiency Improvement: a reduction in energy use intensity from baseline where energy use intensity is calculated as the annual site energy usage divided by a standard manufacturing or agricultural production unit(s).

Power use effectiveness (PUE): a measure of Data Center infrastructure efficiency, representing the amount of energy that is needed per unit delivered to IT equipment. It is computed as the total annual source energy divided by the annual IT source energy.

Recommended Appeal Decision: a Hearing Officer's findings of fact, conclusions of law, and the decision he or she recommends to the Director following a hearing or review of written briefs.

Renewable Energy Certificate (REC): Renewable Energy Certificates (RECs) are the tradable, legal rights to the environmental benefits of green power. These rights can be sold separately from the actual electricity (kWh).

Retro-commissioning: a process to improve the efficiency of an existing building's equipment and systems. It can often resolve problems that occurred during design or construction, or address problems that have developed throughout the building's life as equipment has aged, or as building usage has changed.

Qualifying Financial Distress: any of the following: (1) the building is the subject of a qualified tax lien sale or public auction due to property tax arrearages; (2) the building is controlled by a court appointed receiver; or (3) the building has been acquired by a deed in lieu of foreclosure.

Savings to investment ratio (SIR): the total lifetime cost savings of an EEM divided by the initial cost to implement the EEM

Return on investment (ROI): the total annual cost savings of an EEM divided by the initial cost to implement the EEM.

Simple payback: estimated initial energy efficiency measure cost (including the subtraction of incentives, rebates, and tax credits) divided by the energy efficiency measure first-year calculated utility savings. Both savings and costs are in dollars (\$), and the simple payback is expressed in years. Incentives, rebates, and tax credits should include any programs available through Xcel Energy, Colorado Energy Office, the State of Colorado, and federal income tax credits such as the 179D tax credit.

Site Energy Use Intensity (EUI): a building's weather normalized energy use expressed as energy per square foot per year as a function of its size, normalized for weather and other characteristics that are significant drivers of energy performance as feasible with the reporting platform used. A building's EUI is calculated by dividing the total energy consumed by the building in one year (measured in kBtu) by the total Gross Floor Area of the building.

Target Penalty: a penalty level assessed if the building did not reach the 2024 Interim Target, 2027 Interim Target, or 2030 Target during the applicable performance period.

Tenant: a person or entity entitled to the possession, occupancy, or the benefits of any rental unit owned by another person or entity.

Under-resourced building: CASR's evaluation of a building's status as "under-resourced" includes, but is not limited to, consideration of the following: presence of affordable housing; presence of non-profits and human service providers; buildings of significance to frontline community members; and buildings in areas with high energy burden, asthma rates, low-income residents, and other social equity indicators.