



Energize Denver Technical Guidance

Part 2 – December 2022

Agenda

December 7

Background, equity considerations, electrification updates to building code, benchmarking, performance requirements: setting targets, target adjustments, electrification credit, renewables credit

December 15

Alternate compliance options (minimum requirements, timeline adjustment, electrification option, 30% EUI reduction property type, MAI buildings), performance evaluation, penalties, small buildings, support and incentives

Vendor Training Series available online in [“Help, Resources, and Incentives”](#)
Pass quiz to be listed on Energize Denver [Service Providers Directory](#).

Session Setup

- Webinar will be recorded
- Video and slides will be posted to the website
- Participants are muted
- 45 - 60 minutes of content
- 30+ minutes of Q&A
- Use the Q&A box to ask questions



Alternate Compliance

Minimum Requirements for Documentation

Minimum Requirements for ACO Submissions

- ASHRAE Level 2 energy audit
- Retrofit Plan
- Electrification Feasibility Report
- Operations & Maintenance Program standard operating procedures

Energy Audit Minimum Requirements

Slightly different requirements for Campuses

- ANSI/ASHRAE/ACCA Std. 211-2018, Level 2
- **Energy auditor** must be one of the following:
 - Professional Engineer
 - Certified Energy Auditor
 - Certified Energy Manager
 - Building Energy Assessment Professional
 - High-Performance Building Design Professional
 - Multifamily Building Analyst
 - **New:** Energy Management Professional
 - ✓ **Must be third-party**
- **Baseline** identification:
 - Baseline should be calendar year 2019
 - Baseline should be in Weather-normalized Site EUI
- **Timeframe of Audit:**
 - Audits completed since January 1, 2020
 - If the audit was completed 2017-2019, the building energy use info and savings calcs must be updated to a 2019 baseline
- **Investment analysis** minimum requirements:
 - All existing equipment inventoried
 - All measures needed to reach 2030 target
 - Individual measure cost and savings, including SIR and ROI
 - Total project cost and savings, including total SIR and ROI

Tools available from PNNL/DOE

Audit Template Tool feeds into Asset Score Tool, BuildingSync, and future tools to help building owners understand and manage their energy footprint

Energy Audit must be submitted through the Denver-specific Audit Template



<https://buildingdata.energy.gov>

Retrofit Plan

Template available in
Appendix E

The retrofit plan is intended to give CASR a summary look into what it going to be retrofitted and the implementation timeline (maximum of 5 pages). It must cover 4 things:

1. What improvements are you going to perform to achieve the 2030 target?
 - Operations & Maintenance
 - Short-term payback actions
 - Long-term payback actions
 - EEMs listed in Energy Audit but not taking action on
2. When are you going to perform the improvements or upgrades?
3. How do those actions enable the building to meet the 2030 target?
4. A proposal for performance evaluation due dates and reporting progress

Electrification Feasibility Report

If the application for an alternate compliance option involves:

- the upgrade or replacement of natural gas or fossil-fuel powered space or water heating equipment or a unitary air conditioner or heat distribution equipment that distributes heat from a boiler;
- that is near the end of its useful life (10 years or less) according to the service life chart in Appendix C,

an Electrification Feasibility Report will be required as a submission document to analyze how that system might be replaced partially or fully with a heat pump.

EFR Template available on the
Energize Denver Hub

Electrification Feasibility Report Trainings

In-depth contractor trainings on requirements, permitting, and EFRs start in January 2023

- HVAC Contractor Training - January 26, 1 – 4 pm
- HVAC Contractor Training - February 15, 4 – 7 pm
- Plumber Training - February 16, 1 – 4 pm
- Energy Professional Training - March 2, 1 – 4 pm
- Design Engineer Training - August 10, 1 – 4 pm



Operations & Maintenance Program

- This document shows that the building follows standard operating procedures that meet:
 - ANSI/ASHRAE/IES Standard 100-2018 (ASHRAE 100)
 - Chapter 6, Annex D and Annex L, addendum a
- The O&M program document submitted should at a minimum include:
 - O&M Objectives as described in ASHRAE 100, 6.2
 - O&M Implementation in accordance with ASHRAE 100, 6.4 and Annex L
 - O&M Tasks as described in ASHRAE 100, 6.4 and Annex D



Alternate Compliance

Timeline Adjustment

Timeline Adjustment

Apply for a timeline for a variety of reasons that could make achieving the interim or 2030 targets difficult.

Can apply for one or multiple timeline adjustments in one application

- Planning for end of major equipment system life
- Planning for major renovation
- Landmark Preservation Commission review process delays
- Financial distress
- Electrification of space and water heating equipment or the entire building
- Benchmarking exemption (1-year) during an evaluation year
- Steam loop district system limitations
- Innovative approach to energy efficiency
- Change of building ownership
- Under-resourced buildings may qualify for additional reasons not listed
- Other reasons on a case-by-case basis

Timeline Adjustment Application

Slightly different application for Campuses and Demolition

- Application form - questions about what reasons are present, justification for the delay, and details on renewable plans
- Attachments:
 - Energy Audit that meets the minimum requirements
 - Retrofit Plan (Word or PDF) document (Appendix E)
 - Electrification Feasibility Report, if required
 - O&M Program document
 - Supporting documentation that would support the request (see technical guidance)

Results in a Timeline Adjustment Agreement that is the building's new compliance plan that includes:

- details of the retrofit plan
- agreed-upon timeline
- reporting requirements
- penalties that would be assessed if the plan is not completed as agreed

Submission Deadline

- Deadlines for submission are dependent on the target date that needs adjustment and early action by the building owner. The earlier the application is submitted and approved; the lower possible penalty amount the building could be assessed in the future.
- Timeline adjustment reviews may take some time and multiple conversations to come to an agreement, so CASR encourages building owners to not wait until the deadline to submit their application.
- Target adjustments for 2027 and 2030 will be considered on a case-by-case basis after the deadlines listed.

Target	Application Deadline	Alternate Compliance Penalty
2024	June 30, 2023	\$0.30/kBtu not achieved
2024	December 31, 2023	\$0.35/kBtu not achieved
2024	December 31, 2024	\$0.40/kBtu not achieved
2024	Received After December 31, 2024	\$0.50/kBtu not achieved

2024 Interim Target Timeline Adjustment

CASR has approved a one-year timeline adjustment to the 2024 target for **all buildings that have a complete 2021 calendar year Benchmarking Report** (2022 Reporting Year) on file with CASR.

- For buildings that **are in compliance** with the 2021 calendar year benchmarking, the first interim target will be due in **2025**.
- For buildings that **are not in compliance** the 2021 calendar year benchmarking, the interim target will remain due in **2024**.

Check your benchmarking compliance status by looking up the 2022 Reporting Year status at www.energizeddenver.org.



Alternate Compliance

Electrification

Electrification Option

- This option is for building owners that would like more certainty to apply the credit at the time of ACO approval and work towards electrification with established interim and final targets.
- **Working through this ACO means that 80% minimum electrification of the building becomes a requirement of the compliance plan**
- This results in an alternate compliance agreement that could have higher penalties if agreement is not completed
- Deadlines for the submission are the same as the timeline adjustment.

Electrification Option Application

- Application form
- Attachments:
 - Electrification Feasibility Report
 - Retrofit Plan document outlining which improvements will be made in the building, when such improvements will be made, and how those improvements will result in the building reaching the goal of 80% whole building electrification and the adjusted 2030 EUI target. The plan should also include how the installation of renewables, on- or off-site could help the building achieve its EUI target. (Appendix E)



Alternate Compliance

30% EUI Reduction Property Type Adjustment

Unique Building Types

Due to their unique building types and lack of data to be able to set Site EUI targets, certain building types received a general 30% energy use reduction goal resulting in a 2030 EUI target using a 2019 baseline.

The building may have already made significant advancements in energy efficiency and may not be able to meet the 30% reduction goal.

Requests to adjust the target/timeline will be considered on a case-by-case basis.

Only 32 buildings (outside of historical buildings) qualify for this ACO!

- Aquarium
- Museum
- Convention Center
- Ice/Curling Rink
- Indoor Arena
- Other–Entertainment/Public Assembly
- Other–Technology/Science
- Transportation Terminal/Station
- Zoo
- Historical buildings where the LPC has limited the measures

30% Type Application

- Online application form
- A completed Form D in Normative Annex C of ASHRAE 100 (equal to a ASHRAE Level 1 audit)
- Additional documentation that supports the request

Review

1. CASR compares building information with rubric on national medians and local Site EUI data of similar buildings. Performs analysis between submission and EUI data.
2. Talks with building owner about what the building could do based on the submission and a possible target adjustment.
3. If the building owner disagrees with the initial assessment, CASR would need more information about the existing energy efficiency of the building to make an adjustment. The building owner would need to follow energy audit process from “timeline adjustment” process and resubmit request.



Alternate Compliance

Manufacturing, Agricultural, and Industrial Buildings

MAI Definition

MAI Rules must be finalized by
December 1, 2023

Manufacturing, Agricultural, or Industrial (MAI) buildings are on a different timeline for developing performance requirements.

Definition: a facility where a portion of energy is consumed in process loads for manufacturing, agricultural, or industrial purposes. 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. Includes ESPM building types Drinking Water Treatment & Distribution, Energy/Power Station, Other – Utility, and Wastewater Treatment Plant. Also includes Class A data centers.

Data Centers are split into two categories based on the square footage it occupies in the building:

- Class A: 15% or more of the square footage of the building (MAI designation)
- Class B: Less than 15% of the square footage of the building (target adjustment available)

MAI Buildings Must Declare Their Designation

- Manufacturing/Agriculture building types are currently exempt from benchmarking.
- Building owners must fill out a form to officially designate the building as MAI under this alternate compliance option.
- Stakeholder engagement in progress now to develop performance requirements

Performance Evaluation

Performance Evaluation Periods

Target	Performance Period	Benchmarking & Renewable Credit Submission Deadline
2024	January 1, 2024 to December 31, 2024	June 1, 2025
2025	January 1, 2025 to December 31, 2025	June 1, 2026
2026	January 1, 2026 to December 31, 2026	June 1, 2027
2027	January 1, 2027 to December 31, 2027	June 1, 2028
2028	January 1, 2028 to December 31, 2028	June 1, 2029
2029	January 1, 2029 to December 31, 2029	June 1, 2030
2030	January 1, 2030 to December 31, 2030	June 1, 2031
2031	January 1, 2031 to December 31, 2031	June 1, 2032
20XX	January 1, 20xx to December 31, 20xx	June 1 following year

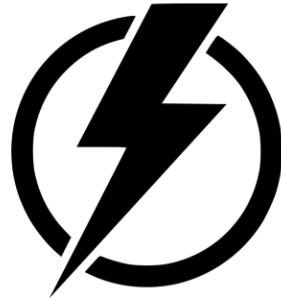
Performance Evaluation Steps

Step 1

ACO

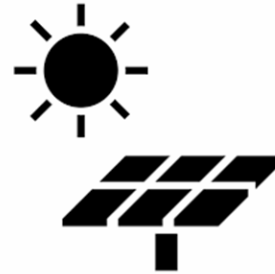
Does an Alternate
Compliance
option apply?

Step 2



Percent
Electricity Evaluated;
Adjust Target if
applicable

Step 3



Apply Renewable
Credit kBtu value

Step 4

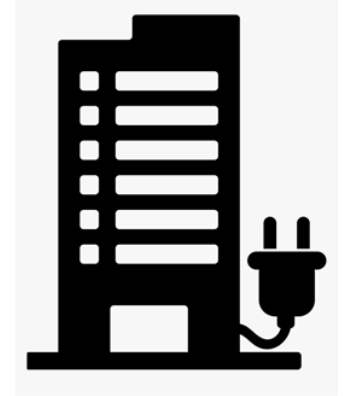


Evaluation:
Does the Site EUI
meet the target?

Did the Building Meet the Target?

When evaluating performance, CASR is examining the difference between the EUI (including the renewable and electrification credits if applicable) achieved during the performance period with the EUI Target required.

- kBtu difference is negative = building is in compliance!
- kBtu difference is positive = “kBtu not achieved”



Site Energy Use
Intensity
(kBtu/sq. ft./year)

Penalties & Enforcement

Penalties

- CASR prefers that building owners invest in their buildings to reach the 2030 targets instead of paying penalties.
- CASR is committed to supporting building owners with their efforts and exploring the flexibility that **renewable credits** and **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.”
- CASR is committed to assisting under-resourced buildings with designing and implementing compliance plans so that penalties are not imposed.

Penalties

- 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.”
- Ordinance allows CASR to assess a civil penalty of up to 70¢ for each kBtu not achieved in that year but will assess at 30¢/kBtu based on median cost of compliance research.
- Penalty assessed by examining 12-month performance period for the target year after benchmarking is received by June 1 the following year

Calculation:

Actual kBtu used – Target kBtu = “kBtu not achieved”

“kBtu not achieved” X Cost/kBtu = \$ penalty amount

Types

- **Target Penalty** - assessed if the building did not reach the 2024 Interim Target, 2027 Interim Target, or 2030 Target (or timeline adjusted targets). If the building has not met either the interim targets or the 2030 target, it will stay at the target penalty level until the target is met.
- **Maintenance Penalty** - If the building reached the interim targets or the 2030 target by each deadline, it would be switched over to a maintenance penalty to maintain the 2030 target annually.

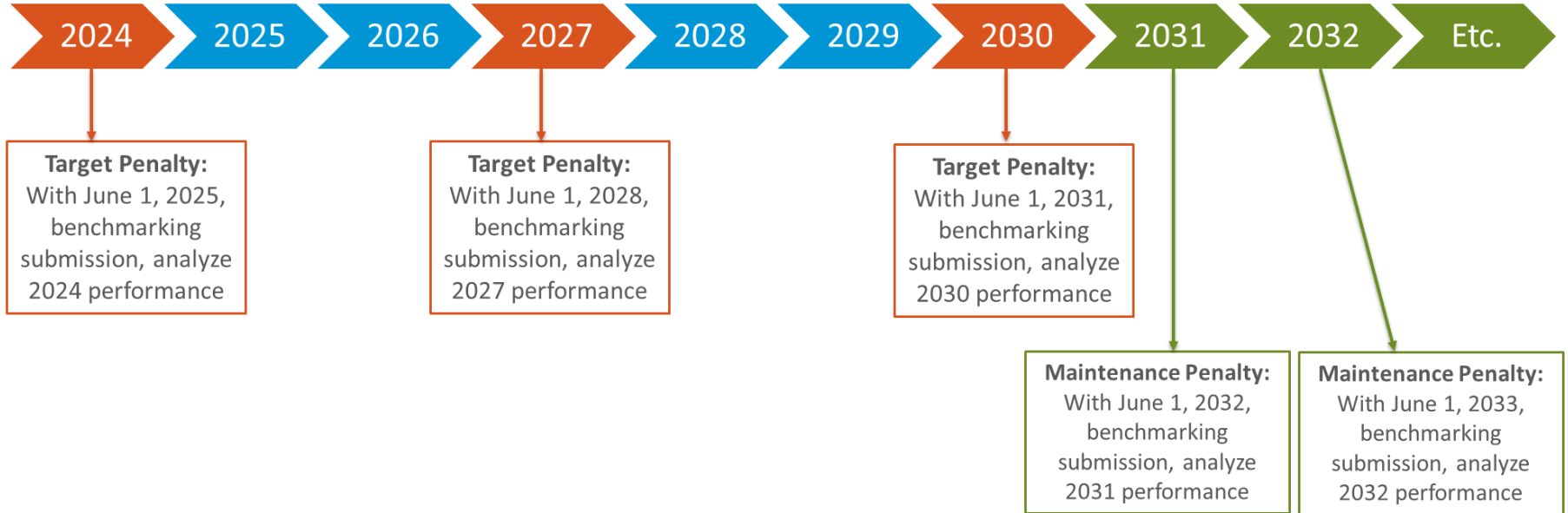
*For maintenance penalties, if the building's annual site EUI is 5% worse than the target it is supposed to be maintaining, the building would switch back to the target penalty level until the target has been achieved again.

Minimum Penalty Schedule

Full schedule with minimum and maximum levels available in Technical Guidance

Type	Penalty Level	Assessment Period
Benchmarking, failure to correct errors, knowingly withholding or providing inaccurate information	\$2,000	annually
Target Penalty	\$0.30/kBtu	2024, 2027, 2030
Maintenance Penalty	\$0.05/kBtu	Starting 2031 then annually
Failure to reach target as agreed in Alternate Compliance Agreement	According to date of submission in Table 5	As outlined in agreement

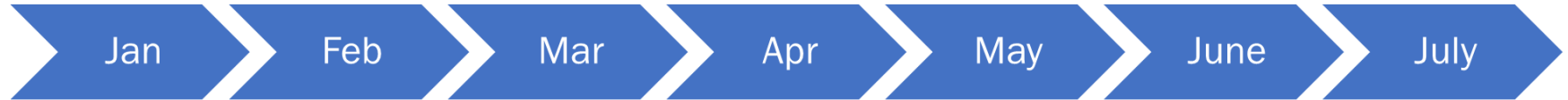
Assessment Timeline



Performance Enforcement Timeline



Bench- marking Due	Performance Evaluation	Warning Notice: Owner has 90 days to apply for ACO	Notice of Violation: Owner has 30 days to appeal
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Citation Issued: Owner has 180 days from date of Notice to pay	Lien placed on property
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Compliance Scenarios

A 150,000 square foot Office building with a baseline EUI of 80 and a 2030 target of 48.3

Example – No Reduction

- Did not receive the electrification credit
- Did not purchase or install renewables
- Did not apply for a timeline adjustment ACO
- No reduction from 2019 baseline of 80 EUI

Year	EUI Targets	EUI Actual	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2024	69	80	12,000,000	10,350,000	1,650,000	\$0.30/kBtu	\$495,000
2027	59	80	12,000,000	8,850,000	3,150,000	\$0.30/kBtu	\$945,000
2030	48.3	80	12,000,000	7,245,000	4,755,000	\$0.30/kBtu	\$1,426,500
						Cumulative Penalties	\$2,866,500

Example – Some Reduction

- Did not receive the electrification credit
- Did not purchase or install renewables
- Did not apply for a timeline adjustment ACO
- Reduced EUI from 80 to 52

Year	EUI Targets	EUI Actual	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2024	69	67	10,050,000	10,350,000	-	\$0.30/kBtu	\$0
2027	59	58	8,700,000	8,850,000	-	\$0.30/kBtu	\$0
2030	48.3	52	7,800,000	7,245,000	555,000	\$0.30/kBtu	\$166,500
						Cumulative Penalties	\$166,500

Example – Reduction & Renewables

- Did not receive the electrification credit
- Purchased long-term off-site renewables
- Did not apply for a timeline adjustment ACO
- Reduced EUI from 80 to 52

Year	EUI Targets	EUI Actual	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2024	69	72 + RC	10,300,000	10,350,000	-	\$0.30/kBtu	\$0
2027	59	62 + RC	8,700,000	8,850,000	-	\$0.30/kBtu	\$0
2030	48.3	52 + RC	7,100,000	7,245,000	-	\$0.30/kBtu	\$0
Cumulative Penalties							\$0

Example – Reduction & Electrification Credit

- Did receive the electrification credit
- Did not purchased or install renewables
- Did not apply for a timeline adjustment ACO
- Reduced EUI from 80 to 52

Year	EUI Targets	EUI Actual	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2024	72	68	10,300,000	10,800,000	-	\$0.30/kBtu	\$0
2027	60	62	9,300,000	9,000,000	300,000	\$0.30/kBtu	\$90,000
2030	53.1	52	7,100,000	7,245,000	-	\$0.30/kBtu	\$0
Cumulative Penalties							\$90,000

Example – Timeline, Reductions & Renewables

- Renovations in 2025 – Timeline Adjustment
- Did not receive the electrification credit
- Installed renewables
- Reduced EUI from 80 to 42

Year	EUI Targets	EUI Actual	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2026	60	42 + RC	5,800,000	9,000,000	-	\$0.40/kBtu	\$0
2030	48.3	42 + RC	5,800,000	7,245,000	-	\$0.40/kBtu	\$0
Cumulative Penalties							\$0

Example - Maintenance

- Building met their 2030 target and switched to maintenance penalties
- Maintained target for two years but went above 5% threshold in 2034, so target penalty level assessed (5% threshold = 50.7 EUI or 7,605,000 kBtu)

Year	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2031	7,245,000	7,245,000	0	\$0.05/kBtu	\$0
2032	7,200,000	7,245,000	0	\$0.05/kBtu	\$0
2033	7,295,000	7,245,000	50,000	\$0.05/kBtu	\$2,500
2034	8,000,000	7,245,000	755,000	\$0.30/kBtu	\$226,500
2035	7,200,000	7,245,000	0	\$0.05/kBtu	\$0

Quick Poll on Compliance Letter Preferences

Currently finalizing compliance letters that will go out in mid-January. Trying to decide how to give examples of the possible penalties within the letter that's most useful for building owners.

- Option # 1: Calculate possible penalty if no reductions are made from 2019 baseline (cumulative \$ amount only in a sentence)
- Option # 2: Calculate cumulative \$ amount of no reductions from 2019 baseline but present it in a chart like you just saw (see next slide)
- Option # 3: State “\$0.30/kBtu not achieved” value and point them to the website for examples (online scenario calculator will be available in late January)

Example – No Reduction

Year	EUI Targets	EUI Actual	kBtu Performance	kBtu Target	kBtu not achieved	Penalty Level	Penalty
2024	69	80	12,000,000	10,350,000	1,650,000	\$0.30/kBtu	\$495,000
2027	59	80	12,000,000	8,850,000	3,150,000	\$0.30/kBtu	\$945,000
2030	48.3	80	12,000,000	7,245,000	4,755,000	\$0.30/kBtu	\$1,426,500
						Cumulative Penalties	\$2,866,500

Prescriptive Requirements

Commercial, Multifamily, Institutional, Municipal, Manu/Agri/Ind.
5,000 – 24,999 square feet

Small Building Requirements

Applies to almost 6,000 buildings in Denver!

- Buildings 5,000-24,999 sq. ft.
- Perform 1 of these options:

Lighting Upgrade (equivalent to 90% LED lighting load)

OR

Solar Installation or Purchase (enough to meet 20% of the building's annual energy usage)

Building Size (sq. ft.)	Compliance Deadline
15,001 - 24,999	December 31, 2025
10,001 - 15,000	December 31, 2026
5,000 - 10,000	December 31, 2027

Stakeholder Engagement

- Currently developing technical details through stakeholder engagement focus groups
- Technical details will be finalized with an updated rulemaking in mid-2023
- “Claim your building” letters going out in November 2022: bit.ly/ClaimMyBuilding
- Sign up for a focus group occurring Dec 2022 – Mar 2023
- Questions go to energizesmallbuildings@denvergov.org

Disclosure Before and Upon Sale

All buildings 5,000 square feet and larger

Information to Transfer:

- Building 25,000 square feet and larger:
 - the most recent benchmarking submission
 - existing ENERGY STAR Portfolio Manager property profile
 - any energy and space use data that has been collected
 - any information, plans, or reports submitted to CASR for alternate compliance options
 - information describing progress toward meeting the Energize Denver performance requirements (including technical assistance received as an under-resourced building)
- Buildings 5,000 – 24,999 square feet:
 - information describing progress toward meeting the Energize Denver performance requirements for smaller buildings



Support and Incentives

Support and Resources

- Resources and technical assistance available through the [Energize Denver Hub](#)
- Materials: How-to guides, check lists, etc.

Energize Denver Hub

Welcome to the Energize Denver Hub. This is your one-stop shop for all things related to the Energize Denver Requirements that were passed by the Denver City Council on November 22, 2021 and are based on recommendations from the Energize Denver Task Force.

Energize Denver will provide over \$1 billion in benefits to the City through avoided social cost of carbon, which is the cost of the damages created by carbon dioxide emissions, while providing co-benefits such as improved local and indoor air quality and reduced energy bills. As the buildings improve their energy use and lower the cost of operations, Denver will become a more competitive, attractive city for businesses and residents.

Benchmarking

By June 1st each year all buildings in Denver 25,000 square feet and larger are required to annually assess and report their energy performance using the free ENERGY STAR Portfolio Manager tool.

Resource Center

The Resource Center provides guides, links, and information to building owners and managers as they work to achieve Energize Denver Performance Requirements.

Under-Resourced Buildings

CASR is in the process of equitably co-creating additional support for under-resourced buildings 25,000 sq. ft. and larger to assist in meeting their performance requirements.

Regulation Basics

Here you can view detailed

Energize Denver Forms

Here you will find forms related to

Find a Vendor: Energize Denver

Work With Tenants to Reach EUI Targets

20% of buildings in Denver are leased space!

Participate in Denver's Smart Leasing program to receive **tools**, **training** and **resources** to better align the interests of tenants and landlords to achieve **healthy**, **high-performance**, **energy-efficient** buildings **through better conversations** at all stages of the leasing process.



Check it out:

denvergov.org/smartleasing

or contact the program manager at
Lucy.Ehrenclou@denvergov.org

Incentives and Financing

- [Xcel Energy](#): Cost savings programs, lighting and equipment rebates, new building programs, electric vehicle options, renewable energy, strategic energy mgmt. cohort. Contact your account manager or the Business Solutions Center at 855-839-8862, or EnergyEfficiency@xcelenergy.com
- [CASR Steam to Electric Conversion Incentive Program](#) can help contribute to the refinancing capital stack and to help pay for upgrades in buildings on steam.
- Financing programs for energy improvement projects: [C-PACE](#) financing and [Colorado Clean Energy Fund](#)



Getting Started

- Get an on-site [energy assessment](#) from Xcel Energy to understand areas of improvement. If you're considering an energy audit, perform an [ASHRAE Level 2](#) at a minimum.
- Explore [electrification](#) and how much it could reduce your EUI
- Consider on-site or off-site solar as a way to reduce your EUI and check out Denver's [resources and programs](#)
- Start creating an implementation plan following [Strategic Energy Management](#) ideas

Program Contacts

Program	Contact
Benchmarking and Performance Requirements for 25K ft ² and larger	Energizedenver@denvergov.org (844)-536-4528
Prescriptive requirements for buildings 5,000 – 24,999 ft ²	Energizesmallbuildings@denvergov.org
Green Building Ordinance	Christy.collins@denvergov.org
Green Building Ordinance Energy Program	Tom.Gleason@denvergov.org
Electrification feasibility reports, training, and incentives	Electrification@energizedenver.org
Equipment Permitting and Building Code	CPD - Contact us - CPD
Smart Leasing Program	Lucy.ehrenclou@denvergov.org
Steam to Electric Conversion Incentive Program	Jan.keleher@denvergov.org

Compliance Letters to be Re-issued

- Plan is to mail/email the letters the week of January 17
- 24% of the buildings already meet their 2030 target
- 10% of the buildings met the threshold for the 10% electrification credit
- 10% of the buildings saw a change in their final targets as a result of updates, corrections, and/or use changes.
- 20% of the buildings saw a change in their interim targets as a result of updates, corrections, and/or baseline changes.

2024 Interim Target Timeline Adjustment

CASR has approved a one-year timeline adjustment to the 2024 target for **all buildings that have a complete 2021 calendar year Benchmarking Report** (2022 Reporting Year) on file with CASR.

- For buildings that **are in compliance** with the 2021 calendar year benchmarking, the first interim target will be due in **2025**.
- For buildings that **are not in compliance** the 2021 calendar year benchmarking, the interim target will remain due in **2024**.

90% of our buildings will see this change reflected in their January letter

Questions?

Energize Denver Hub:
general support and questions

www.denvergov.org/energizedenver
energizedenver@denvergov.org
or 844-536-4528

Enter questions in the
Q&A section now!