How-to Guide for Boulder's Building Performance Ordinance Efficiency Requirements and Exemptions

Step-by-step recommendations for commercial and industrial building owners to conduct an energy assessment, perform retro-commissioning, carry out lighting upgrades, and apply for exemptions.

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1. Introduction

In support of community energy and climate goals, the City of Boulder enacted the Boulder Building Performance Ordinance (Ordinance No. 8071) on October 20, 2015. The ordinance requirements, found in the Boulder Revised Code Title 10, Chapter 7.7[1], mandate privately-owned commercial and industrial buildings and city-owned buildings to do the following:

1) Annually rate and report (R&R) building energy consumption using ENERGY STAR Portfolio Manager (or approved alternative);
2) Perform energy assessments within three years of first energy use reporting deadline and every ten years thereafter;
3) Perform retrocommissioning (RCx) within three years of first reporting deadline and every ten years thereafter with cost effective RCx measures implemented within two years of the study; and
4) Implement one-time lighting upgrades to meet specific sections of the current International Energy Conservation Code (IECC) requirements.

This guide provides guidance and recommendations on how building owners can comply with, or apply for exemptions to, the efficiency requirements (energy assessments, RCx and lighting upgrades) of the ordinance.[2]

1.1. Is a Building Affected?

To verify whether a building is required to comply with these requirements:

1) **Check the Affected Building List.** The City of Boulder posts a list every year of the affected buildings subject to the requirements for the coming year. Check this list on the program website at www.BoulderBuildingPerformance.com.
2) **Determine if the building meets an exemption path.** The City of Boulder structured these requirements to reward efficient building owners. If an owner has constructed, purchased or upgraded a building with high levels of energy efficiency, they are encouraged to review the **Exemptions** section of this guide to see if they qualify for any of the exemption pathways. If an owner is close to achieving an exemption based on the buildings performance (for example, the ENERGY STAR score is a 70), it may be more cost-effective to implement efficiency measures to achieve the exemption than it would be to invest in the energy assessment, retrocommissioning, and lighting upgrades.

If an owner has determined their building is affected and is not eligible for an exemption pathway the owner must comply with the efficiency requirements of energy assessments, retrocommissioning, and lighting upgrades, as outlined in the following sections.

1.2. Compliance Deadlines

The compliance deadlines to meet the efficiency requirements are listed in the table below. These phased deadlines allow building owners time to plan for the upcoming requirements and associated investments.

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[1] The Boulder Revised Code is available at: https://www2.municode.com/library/co/boulder/codes/municipal_code?nodeId=TIT10ST_CH7.7COINENEF

[2] Additional information including Frequently Asked Questions can be found at www.BoulderBuildingPerformance.com

Efficiency Requirement Compliance Deadlines				
Affected Buildings	**Energy Assessment**	**Retrocommissioning**	**RCx Measure Implementation**	**Lighting Upgrade**
City buildings ≥ 10,000 sf	**May 1, 2019**	**May 1, 2021**	**May 1, 2023**	**May 1, 2021**
Existing buildings* ≥ 50,000 sf New buildings** ≥ 10,000 sf	**June 1, 2019**	**June 1, 2021**	**June 1, 2023**	**June 1, 2021**
Existing buildings ≥ 30,000 and < 50,000 sf	**June 1, 2021**	**June 1, 2023**	**June 1, 2025**	**June 1, 2023**
Existing buildings ≥ 20,000 and < 30,000 sf	**June 1, 2023**	**June 1, 2025**	**June 1, 2027**	**June 1, 2025**

**Existing buildings that meet the definition of a Large Industrial Campus (three or more buildings, at least partially used for manufacturing, served by a central plant or single utility meter) have custom requirements and deadlines due to their unique nature.*

***Any commercial or industrial building for which an initial building permit was issued on or after January 31, 2014.*

2. Energy Assessments and Retrocommissioning

This section provides information on the implementation of the energy assessment and retrocommissioning requirements of the ordinance. The following checklist should be used by affected building owners to ensure compliance with these requirements.

Energy Assessment and RCx Checklist

- ☐ **Verify if the building is affected (1.1)**
- ☐ **Review exemption eligibility (1.1)**
- ☐ **Determine deadlines (1.2)**
- ☐ **Understand the scope of requirements (2.1)**
- ☐ **Estimate costs and review eligible rebates (2.2, 2.3)**
- ☐ **Select a service provider (2.4)**
- ☐ **Manage the implementation process (2.5)**
- ☐ **Work with provider to report findings to the City of Boulder (2.6)**
- ☐ **Install required RCx measures (2.1.2)**
- ☐ **Maintain and track savings (Appendix C: How to Maintain and Track Your Energy Savings)**

2.1. Summary of Requirements

2.1.1. Energy Assessments

Affected building owners are required to complete energy assessments beginning 3 years following their first R&R deadline and every 10 years after. The energy assessment must meet or exceed the ASHRAE requirements as listed in the procedures for commercial building energy audits published by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) in 2011.

Energy Assessment Scope

The scope of the energy assessment required depends on the size of the building as shown in the table below.

Affected Building Size	Level of Assessment
Buildings < 50,000 sf	**ASHRAE Level I Energy Assessment***
Buildings ≥ 50,000 sf	**ASHRAE Level II Energy Assessment**
** Provided free of charge to Boulder businesses through the Partners for A Clean Environment (PACE) program.*	

A Level I energy assessment is a high level sweep for no-cost/low-cost energy saving opportunities. Activities include an assessment of energy bills and a brief site inspection of the building. A Level II energy assessment identifies the no-cost/low-cost opportunities, and also includes an in-depth analysis of energy costs, energy usage and building characteristics as well as a more refined survey of how energy is used in the building. Owners are provided enough detail from a Level II energy assessment to get a quote from contractors for specific upgrades and activities to implement following the assessment.

The City Manager Rules require all energy assessments to cover the following:

- Building envelope and infiltration;
- Plug loads;

- Base building systems; and
- Industrial processes (if these processes are responsible for 25% or more of total energy use).

As part of the bidding process for a Level II energy assessment, the service provider must conduct a preliminary assessment to scope and price the assessment, including a quick evaluation of potential for RCx at the building (see **Service Provider Responsibilities** for additional information).

Energy Assessment Report

The Level I energy assessment report must include everything required by ASHRAE guidelines, as well as a summary of available rebates and incentives, a recommendation on RCx benefits, and a statement of whether the building's lighting systems and controls meet each lighting requirement in the Building Performance Ordinance. See the Level I energy assessment report template on the website under "Energy Assessments" for guidance.

The Level II energy assessment report must include everything required by ASHRAE guidelines, as well as additional information in the table of practical measures and a recommended package of measures that would allow the building to achieve ENERGY STAR certification, if applicable. For buildings that are not eligible to receive an ENERGY STAR score, the report must recommend a package of measures to reduce annual energy costs by at least 25 percent.

The Level II energy assessment report template for the City of Boulder is based upon the ASHRAE Processes for Commercial Building Energy Audits 2011,[3] and the Investor Confidence Project's Energy Performance Protocol for Standard and Large Commercial Energy Audits.[4] See the Level II energy assessment report template on the website under "Energy Assessments" for guidance.

All energy assessments for compliance must be conducted by a professional energy assessment firm that is listed on the City of Boulder's qualified service provider list.

2.1.2. Retrocommissioning (RCx)

Affected building owners are required to perform retrocommissioning beginning 5 years following their first R&R deadline and every 10 years after. Cost-effective measures (with a simple payback of less than or equal to two years) must be implemented within two years of the study.

Retrocommissioning[5] is a process that improves a building's operations and maintenance procedures to enhance overall building performance and is designed to improve the efficiency of existing building operations by "tuning up" and calibrating existing functional systems to run as efficiently as possible through low- or no-cost improvements. RCx measures are typically operational in nature and can be implemented without major equipment changes or work.

Retrocommissioning Scope

The scope of the RCx study depends on the size of the building, as shown in the table below.

[3] ASHRAE, "Procedures for Commercial Building Energy Audits", second edition, 2011.
[4] "Investor Confidence Project", Commercial Protocols, http://www.eeperformance.org/project-development.html
[5] The term "recommissioning" is often used interchangeably with "retrocommissioning." Both terms refer to the process of bringing a building's operations in line with the intent of the original and optimal design.

Affected Building Size	Scope of RCx
Buildings < 50,000 sqft	Participate in the Xcel Energy Building Tune-Up Program* or meet the scope outlined in the City Manager Rules**
Buildings ≥ 50,000 sqft	Participate in the Xcel Energy RCx Study Program* or meet the scope outlined in the City Manager Rules**
See Xcel Energy for more information on programs, eligibility, and rebate offerings.* ***The RCx scope outlined in the City Manager Rules is included in* ***Appendix A: Required Retrocommissioning Scope*	

If the RCx is conducted through a local energy utility program, the scope for that program will satisfy the requirements of the ordinance, as long as it addresses both electricity and natural gas-consuming equipment and controls.[6]

If the RCx is conducted outside of a local energy utility program, the scope of the RCx shall include the activities listed in **Appendix A: Required Retrocommissioning Scope**. A monitoring-based commissioning (MBCx) approach may be used to investigate and evaluate building systems as part of the RCx process. However, while monitoring based commissioning is an excellent strategy to maintain the persistence of savings generated from a full RCx effort, but it is not a substitute for the RCx.

All RCx measures that are "cost effective" – defined as having an estimated simple payback of two years or less – are required to be implemented within two years of the RCx process completion.

*The **simple payback period** is the cost of the measures (less any rebates and incentives) divided by the energy cost savings, yielding the payback period in years. For example, if a measure costs $5,000 and the energy savings for that measure are worth $1,000 per year, then the payback period is five years.*

Retrocommissioning Report

If the RCx is conducted through a local energy utility program, the report produced for that program will satisfy the requirements of the ordinance. If the RCx is conducted outside of a local energy utility program, then the RCx report shall include summaries of building use, systems, operations and results of each completed RCx activity. It must also include a table of recommended RCx measures that clearly indicates the measures that must be implemented per the ordinance requirements. Please refer to **Appendix B: RCx Report Sample Outline** for an example report outline.

All RCx studies for compliance must be conducted by a service provider that is listed on the City of Boulder's qualified service provider list.

Once a building owner has determined the scope of the energy assessment and retrocommissioning required for their building, they can begin planning for the requirements, which includes estimating costs, determining cost savings opportunities, selecting a service provider, and preparing for and managing the process.

[6] If a building owner applies for a local utility program and is denied participation in the program because it is not applicable/no opportunities are identified, this may be cause for an exemption. See **Exemptions** for additional information.

2.2. Estimate the Costs

To plan for compliance with the efficiency requirements owners should first estimate the associated investments. The city has developed a cost estimation tool to assist with this effort.

2.2.1. Cost Estimation Tool

A cost estimation tool[7] has been developed to help building owners estimate typical costs of hiring energy professionals to perform energy assessments and RCx. Knowing the typical costs of the services required to comply with the ordinance can help with budgeting, and provide a basis for bid evaluations and negotiations, especially if a building owners does not have previous experience with these efforts.

This tool provides a typical range of costs for energy assessment and retrocommissioning services based on building assumptions. These cost ranges are strictly estimates. Building owners should collect quotes from multiple service providers to determine accurate costs for services. Guidance on how to use the tool to estimate costs is located in the "Instructions" tab.

***Historical energy assessment and RCx costs**: Typically range between $0.11 to $0.59 per square foot of building area depending on systems and complexity. One rule of thumb is that a Level II energy assessment typically should not exceed 10% of annual energy costs.*

2.3. Determine Cost Savings Opportunities

After estimating potential upfront costs, a building owner should evaluate the opportunities to realize cost savings through implementing services concurrently, participating in existing utility and city programs, and identifying applicable rebate and financing offers.

2.3.1. Concurrent Services

The cost estimation tool estimates the opportunity for cost savings from implementing the energy assessment concurrently with RCx. This means performing the Level II energy assessment and RCx at the same time with the same provider and is recommended when the provider can provide a cost quote that shows savings for providing the services concurrently instead of separately. These savings typically would be due to efficiencies gained by conducting detailed testing, logging or trending only once.

2.3.2. Participate in Existing Programs

When estimating costs for the efficiency requirements, note that there may be opportunities for cost savings by participating in existing utility or city programs.

Level I Energy Assessments

Buildings less than 50,000 sf must perform a Level I energy assessment and the city is funding free Level I assessments through the joint City of Boulder/Boulder County Partners for a Clean Environment (PACE)[8] program. The cost estimation tool shows the estimated value of this free assessment for the building. Xcel Energy also offers an energy audit program in which building owners pay $125 to $500 in exchange for an ASHRAE Level I energy assessment. However, because this program offering does not include the few additional requirements of the City Manager Rules, nor does it include the step of

[7] Find this tool under the "Energy Assessment" and "Retrocommissioning" drop down menus on the webpage.
[8] Partners for a Clean Environment provides free expert advisor services, incentives and a certification program to help businesses measure and gain recognition for their successful progress in energy, waste, water and transportation.

reporting the findings to the city, this assessment does NOT meet the requirements for the ordinance for any building. [9]

Level II Energy Assessments

Buildings 50,000 sf or larger must receive a Level II energy assessment. While the cost estimation tool provides an estimate for the cost of this assessment, this estimate does not include savings opportunities from the new City of Boulder Level II energy assessment rebates (see **Rebates, Incentives, and Financing Options**), or potential savings which may be garnered from participating in local utility programs.

Additionally, Xcel Energy's Level I assessment is a good foundational study for the buildings required to complete a Level II energy assessment. Building owners could then work with the contractor who completes the Xcel Energy assessment to develop a *separate* scope of work to complete the Level II assessment and report findings to the city. Because that contractor has already been onsite at the building as part of the Xcel Energy program offering, there may be cost savings when compared to the open market, as long as the provider is listed on the city's qualified list of service providers. View **Select a Service Provider** for further information.

Retrocommissioning

The cost estimation tool also estimates market costs for RCx. These estimates do not include the savings opportunities from complying with RCx through an Xcel Energy RCx program, which can offer significant savings. Xcel Energy's Building Tune-Up Program meets the required RCx scope for buildings less than 50,000 sf and costs $250-$500.[10] Xcel Energy's RCx Study Program meets the RCx scope for buildings 50,000 sf and larger and covers up to 75% of the study cost (capped at $25,000).[11] When comparing the cost estimation tool estimates to the Xcel Energy program costs, an owner can determine the significance of the cost savings the program may offer.

2.3.3. Rebates, Incentives, and Financing Options

Additional savings opportunities are available through existing rebates, grants and incentives that help offset some of the costs of implementing the efficiency requirements.

The first place to look for available rebates and incentives is the City of Boulder website under Rebates and Financing, which lists helpful information and links to various programs. The following table provides a high-level review of rebates and incentives currently available.

[9] If building owners choose to participate in Xcel Energy's energy audit program to comply, they must contract with the service provider through an additional separate scope to ensure the City Manager Rules and reporting requirements are met.

[10] Participants are required to use Xcel Energy's contractor for this program. Building owners must ensure that contractor is also listed on the City of Boulder's qualified list. See Xcel Energy for the most updated rebate amounts and program eligibility information.

[11] The RCx Study Program does require preapproval from Xcel Energy. Service Providers must be approved by Xcel Energy. If used for compliance, the service provider selected for this service must also be on the City of Boulder's Qualified List. See Xcel Energy for the most updated rebate amounts and program eligibility information.

Rebates, Grants, Incentives and Financing Options	
Opportunity	**Information**
Level II Energy Assessment Rebates (≥50,000 sf)	The city is offering rebates at the following levels for Level II energy assessments:. Up to 30% of the total cost (2016-2017), up to 20% (2018), and up to 10% (2019) No rebate will exceed $12,000 or $0.08/sf.
Level I Energy Assessments through Partners for A Clean Environment (PACE)	PACE Business Sustainability Advisors can provide Level I Energy Assessments FREE of charge, and help owners apply for rebates offered through both EnergySmart and Xcel Energy. Contact an Advisor at 303-786-7223 or email info@PACEpartners.com
Xcel Energy RCx Programs	Xcel Energy business customers may qualify for a RCx study through one of Xcel Energy's existing programs. If the building is less than 50,000 square feet, the owner may be eligible to meet the RCx requirement through Xcel Energy's Building Tune-Up program. If the building is 50,000 square feet or more, the owner can apply for preapproval to participate in Xcel's Recommissioning Study program to comply.[12].
Xcel Energy Prescriptive Rebates	Xcel Energy can help owners reduce energy use, maximize efficiencies, and minimize costs by providing a wide variety of energy efficiency, expertise, and rebate programs. These include: lighting; heating and cooling; motors; and custom efficiency programs (for energy-efficiency investments that exceed standard options but are not covered under standard conservation programs).
Energy Smart Rebates, Incentives and Tax Credits	EnergySmart rebates, incentives and tax credits are available. In addition, the city has added funds to develop new custom rebates for measures identified in the ordinance-required energy assessments, which will be available in 2016. For more information, call 303-441-1300.
Solar Energy Rebates	Solar Rebates are available to Boulder residents and businesses that have installed solar electric or solar thermal (hot water) systems on their property. The city may rebate approximately 15 percent of the city sales and use tax paid on materials and permits for the solar installation. To be eligible, taxpayers must file a rebate application within 12 months of the city's final inspection.
Solar Grants	Solar Grants are available for installation of solar electric and solar thermal (hot water) systems for: site-based nonprofit organization and nonprofit organizations leasing city-owned facilities; low- or moderate-income housing owned by nonprofits; and individual residences that are part of an affordable housing program. These grants will only apply to buildings owned or leased by nonprofits with lease terms of twenty years or more. Grants are issued twice a year with applications accepted on a rolling basis. There is no maximum grant amount; however, in most cases, grants will be no more than 50 % of the total project cost after rebates, incentives and tax credits. *Grants are subject to funding availability. Income tax must be paid on the grant amount for the year received.*
Elevations Energy Loans	Elevations Energy Loans are available through Energy Smart and Elevations Credit Union, who are working together to offer a wide range of low-interest loans for a variety of energy efficiency and renewable energy upgrades.
Colorado Commercial Property Assessed Clean Energy (C-PACE) Program	C-PACE is an innovative financing mechanism that helps commercial, industrial and multi-family property owners access affordable, long-term financing for energy upgrades. C-PACE allows building owners to finance (for up to 20 years) qualifying energy efficiency and clean energy improvements through a voluntary assessment on their property tax bill. Property owners pay for the improvements over time through this additional charge on their property tax bill. Capital provided under the C-PACE program is secured by a lien on the property, so low-interest capital can be raised from the private sector.

[12] If the building tenants currently pay the utility bills, the owner should apply for the program using the house meter that the owner pays. If the owner does not have an Xcel Energy account for the building, they should include the tenant premises in the application and ensure the tenants are engaged in the process. Xcel Energy will work with you during the application process if this is the situation for your building.

If the building receives fuel from an energy provider other than Xcel Energy, contact that provider directly and ask about their energy efficiency programs. The Colorado Energy Office also provides information and links to other funding sources such as the Green Colorado Credit Reserve (GCCR), and other special programs for government buildings and schools.

Also, Energy Performance Contracting (EPC), a turnkey approach to making upgrades, is available for larger commercial buildings and projects. EPC allows building owners to finance assessment, design, implementation and measurement and verification phases of projects through a company that is reimbursed through the energy cost savings realized from the upgrades. If owners prefer this turn-key approach, they can start with the Colorado Energy Office list of Energy Services Companies (ESCO) that provide these services.

2.4. Select a Service Provider

Once the building owner has determined that an energy assessment, RCx study and/or lighting upgrade are required to meet the ordinance requirements, they must select a service provider to complete the work. Service providers may provide one or more of the services required. The following steps will help an owner select the best provider for their needs:

1) Review the city's qualified service provider list. All service providers offering energy assessments and RCx services for compliance purposes must be on the city's qualified service provider list.
   a) If the building must complete a Level I energy assessment, PACE advisors will be on the qualified list, and are offering the Level I energy assessment for free.
   b) If an owner is participating in the Xcel Energy RCx Study Program to comply with the RCx requirement, remember the service provider selected must be on the city's qualified service provider list and must also be approved by Xcel Energy.[13]
   c) If an owner is participating in the Xcel Energy Building Tune-up Program, they must use Xcel Energy's selected contractor; however, this contractor must also be on the city's qualified list to ensure the program meets compliance with the ordinance.
   d) Lighting upgrade service providers do not need to be on the city's qualified list. Building owners can use any provider they choose to meet the city's lighting requirements.
2) Define the budget, scope of work and time frame of the effort – including which specific services, building areas and systems you want included in the effort.
3) Request quotes from service providers based on your requirements.
   a) Owners can request quotes for multiple services, such as lighting upgrades, or concurrent services, such as the energy assessment and RCx combined.
   b) Ask the questions outlined below, compare quotes and make a selection based on which provider best meets your specific criteria.

[13] View the program website information on Xcel Energy's requirements.

Helpful Questions to Consider When Evaluating Service Providers:

1. *Is the provider on the city's qualified service provider list?*
2. *How many energy assessments or RCx studies has the provider completed on similar facilities?*
3. *How long has the provider been conducting energy assessments or RCx studies on similar facilities?*
4. *How recently has the provider conducted energy assessments or RCx studies on similar facilities?*
5. *Ask the provider for a sample report.*
6. *What types of capital efficiency, RCx operational, or lighting upgrades does the provider typically recommend for a building like ours?*
7. *Is the provider well versed in these Ordinance requirements?*
8. *Is the provider familiar with rebates and incentives offered by the utilities, City of Boulder, and EnergySmart for the services provided, and how will they help us obtain these rebates?*
9. *If the provider is offering to assist with assessing lighting updates, are they qualified and experienced with meeting current IECC lighting codes and do they provide the COMcheck™ compliance check as part of their service?*
10. *Is the provider local, and if not, how will this fact affect their work or fee?*
11. *Can they provide business references for similar scope in similar facilities?*

4) Agree upon the scope of work
   a) The owner can finalize the contract and requested scope of work with the service provider after deciding which services are needed (which may occur after the preliminary energy assessment scopes and prices the various requested services).
   b) Make the service provider aware of any previously completed energy assessments, energy projects and upgrades including lighting to help clarify the required scope.
   c) If an owner has a very large or complex project that would benefit from the additional work and cost of developing a formal request for qualification (RFQ) and/or request for proposal (RFP), a written scope of work should be included in the RFQ/RFP.

2.4.1. Service Provider Qualifications

Energy assessment providers and RCx providers must be pre-trained and listed on the City of Boulder qualified service provider list. In order to be placed on this list, service providers must watch a mandatory training video and successfully pass a multiple choice quiz on the requirements. Additionally, the service providers must possess certain professional qualifications.

Energy assessment service providers must meet at least one of the following qualifications for energy assessment services:

1) A registered design professional (either a Professional Engineer or Registered Architect), with at least three years professional experience performing energy assessments of equivalent scope on similar types of buildings;
2) A contractor approved by the local utility to perform energy assessments of equivalent scope on similar types of buildings as part of the utility's energy efficiency programs;

3) A contractor approved by the city to perform energy assessments of equivalent scope on similar types of buildings as part of the city's energy efficiency programs;
4) A Certified Energy Manager (CEM) or Certified Energy Auditor (CEA), certified by the Association of Energy Engineers (AEE), with at least three years professional experience performing energy assessments of equivalent scope on similar types of buildings;
5) A Building Energy Assessment Professional (BEAP) certified by ASHRAE, with at least three years professional experience performing energy assessments of equivalent scope on similar types of buildings; or
6) Other credentials based on review and approval, including:
   a) Energy Management Certification from the Northwest Water and Energy Education Institute with at least three years professional experience performing energy assessments of equivalent scope on similar types of buildings

Retrocommissioning service providers must meet at least one of the following qualifications for retrocommissioning services:

1) Licensed Professional Engineer with three or more years of proven commissioning or retrocommissioning experience with similar buildings; or
2) Hold relevant certification(s) with Associated Air Balance Council, National Environmental Balancing Bureau, Association of Energy Engineers, Building Commissioning Association, University of Wisconsin or the American Society of Heating, Refrigeration, and Air-Conditioning Engineers as a commissioning authority with three or more years of proven commissioning or retrocommissioning experience with similar buildings; or
3) An individual or firm with five or more years of proven commissioning or retrocommissioning experience with similar buildings; or
4) A contractor approved by the local utility to perform retrocommissioning of equivalent scope on similar types of buildings as part of the utility's energy efficiency programs; or
5) Other credentials based on review and approval.

Lighting service providers do not need to be listed on the city's qualified list; however, view **Lighting Provider Responsibilities** to ensure the selected contractor can provide the required services.

2.5. Prepare for and Manage the Process

Although the qualified provider will perform the vast majority of the work required for an energy assessment and RCx, there are tasks that the building owner must perform for the process to be successful. These preparation steps are based on best practices, and are not ordinance requirements unless stated.

1) Draft a work plan to include the tasks for the owner and the tenants, such as compliance schedule, required meetings and attendees, and arrangements for the provider to access the building.[14]
2) Provide the service provider with access to all building energy data for the previous two years as well as the most recent bill for all utilities so they can determine the rates and carry out the utility analysis.

[14] The ordinance requires that tenants provide access to tenant space within 30 days of request, so allow time in your plan for this advance notice and discuss with your tenants and provider.

3) The energy assessor will also require lighting and HVAC documentation including items such as
   a) Architectural drawings,
   b) Equipment schedules,
   c) One-line diagrams,
   d) Controls diagrams,
   e) Systems manuals,
   f) Commissioning reports and testing, and
   g) Testing, adjusting and balancing (TAB) reports, if available.
4) Ensure facility management personnel and, if applicable, outsourced firms who maintain the systems and/or manage the facility, are available to answer questions, provide access, and assist with the assessment when required.
5) Ensure that potential Level II energy assessors conduct a preliminary energy assessment during the bidding process that provides a scope and price for the energy assessment and determines the potential for RCx.

2.5.1. Owner and Tenant Responsibilities

If the owner decides to pass any capital costs related to complying with these requirements through to tenants, please note that the City Manager Rules require that these costs be amortized as follows, rather than passed through in a bulk assessment in a single year:

- For the energy assessment and RCx study: costs must be amortized over a 10-year period.
- For the required RCx measure implementation: costs must be amortized over the length of the predicted payback period (as determined by the Retrocommissioning Professional).

The city has developed a Split Incentive Guide to help distinguish the specific responsibilities of the building owners and tenants as it relates to compliance with the ordinance. In general, the building owner is responsible for implementing the energy assessment and RCx within the required timeframe.

If a tenant owns the lighting or HVAC systems, it is still the responsibility of the owner to ensure that all requirements are met. Depending on the lease arrangements, the financial responsibility for the upgrade may fall to the tenant. In cases where multiple tenants in a single building own distinct HVAC systems, please contact the city's Program Administrator (RankinK@bouldercolorado.gov) for alternate compliance paths that could better suit this unique situation.

2.5.2. Service Provider Responsibilities

The service provider is responsible for carrying out the services they are contracted to perform with the owner. This includes meeting the scope and requirements outlined in the City Manager Rules such as the required reporting to the City of Boulder as described in **Report Findings to the City**.

As part of the Level II energy assessment bidding process, the City Manager Rules require the service provider complete a preliminary site visit to scope and price the assessment and conduct a quick evaluation to determine if there are any possible RCx opportunities for the building. This RCx recommendation is based upon factors such as level of building controls, operations practices, current equipment scheduling and operability of equipment. If the provider determines the building is not recommended for retrocommissioning, the building owner will need a statement including justification from the provider for not recommending RCx in order to apply for an exemption from RCx as outlined in the section **Other Exemptions** However, if there is potential for RCx, the service provider must submit

the bid with a scope and price estimate for the energy assessment alone and concurrently provided with RCx.

According to the City Manager Rules, the energy assessor is also required to assess whether the building is currently in compliance with the lighting upgrades, as part of either a Level I or Level II energy assessment. If the building is already in compliance, the provider will need to work with the owner to report that to the city following the steps outlined in the lighting section **Report Upgrades to the City.**

2.6. Report Findings to the City

Once the energy assessment and RCx are complete, the service provider must register in the city's Standard Energy Efficiency Data (SEED) database and report the energy assessment and RCx study findings. To resister in the database, service providers must follow the steps in **Appendix D: Service Provider Registration in SEED**.

The steps to complete the required reporting process are coming soon!

3. Lighting Upgrades

This section provides information on the requirements, deadlines, and implementation of the lighting upgrades required by the ordinance. The following checklist should be used by affected building owners to ensure compliance with this requirement.

Lighting Upgrade Checklist

- ☐ **Verify if the building is affected (1.1)**
- ☐ **Review exemption eligibility (1.1)**
- ☐ **Determine deadlines (1.2)**
- ☐ **Understand scope of requirements (3.1)**
- ☐ **Review eligible rebates (2.3)**
- ☐ **Select a service provider (2.4)**[15]
- ☐ **Manage the implementation process (3.2)**
- ☐ **Work with provider to report findings to the City of Boulder (3.3)**

3.1. Summary of Requirements

The City of Boulder's Building Performance Ordinance requires that building owners implement one-time lighting upgrades within five years of the building's first R&R deadline. The lighting upgrade must be compliant with the current[16] adopted IECC for specific sections of the code.

The specific upgrades required are:

1) Replace or upgrade any interior or exterior lighting fixture that does not meet the lighting power allowances set forth in the most current version of the IECC;[17]
2) Comply with the most recent versions of the IECC requirements for automatic time switch control devices, occupancy sensors, and exterior lighting controls; and
3) Replace or upgrade internally illuminated exit signs that are not in compliance with the most current version of the IECC.

The IECC is upgraded in three-year cycles, and typically becomes more stringent over time. Therefore, it may be in owner's best interest from a cost perspective to perform the lighting upgrades sooner than later. As the code is updated every three years, use the correct code base year for the lighting upgrade work.

What do the IECC "Lighting Power Allowances" really mean?

The IECC lighting code calculations for lighting power allowance are capping the amount of power that goes to lighting the interior and exterior of the building - this maximum allowable power is measured in watts per square foot (W/sf). This unit of measure is known as the building's lighting power density

[15] While building owners will want to ensure they collect quotes from multiple service providers before selecting one for the lighting upgrade as listed in section **2.4**, remember lighting service providers are not required to meet minimum qualifications from the city, nor must they be listed on the city's qualified list.
[16] The IECC is considered "current" as of Jan. 1 of the code year (e.g. the 2015 IECC is considered current as of Jan. 1, 2015).
[17] Any exterior lighting upgrades must also comply with the City of Boulder Outdoor Lighting Ordinance passed in 2003 that seeks to prevent light trespass, reduce light pollution, reduce excessive glare, promote energy conservation, and improve safety and security.

(LPD). The IECC typically lowers the allowed LPD with each code cycle (every three years) to match the improving energy efficiency of commercially available lighting and controls.

3.1.1. Current IECC

The version of the IECC considered current is 2015 and the code language is accessible from the lighting section of the program website. The specific code sections for the required upgrades are listed in the table below.

Lighting Requirement	Code Section
Occupancy Sensor Controls	C405.2.1
Time-switch Controls	C405.2.2
Exterior Lighting Controls	C405.2.5
Exit Signs	C405.3
Interior Lighting - Power	C405.4
Exterior Lighting - Power	C405.5

There are several IECC exceptions to these requirements such as emergency lighting, special needs lighting, and historic landmarks. The applicable current IECC tables and exceptions are available online. In additions, exceptions are listed in the sections of the code identified above.

3.2. Prepare for and Manage the Lighting Upgrade

Although the lighting service provider will perform the vast majority of the work, there are still tasks that the building owner must perform for the lighting upgrade to be successful. These tasks are all based on industry best practices and are not required by code unless otherwise indicated.

1) Draft a work plan to include the tasks for the owner and the tenants, such as compliance schedule, required meetings and attendees, and arrangements for the provider to access the building.[18]
2) Work with the service provider to apply for available lighting rebates (see available rebates under Rebates, Incentives, and Financing Options).
   a) The federal tax code section 179D provides tax deductions of from $0.30 to $0.60 per square foot for meeting specific lighting requirements. Be sure to discuss this specific incentive with the lighting service provider selected to see if these benefits may apply to the affected building.
3) Ensure that the chosen lighting service provider is familiar with the COM*check*™ tools[19] and what information is required to complete the lighting power density (LPD) calculation for the COM*check*™ compliance effort.
4) Provide the lighting service providers with the following documents:
   a) Drawings such as electrical one line diagrams,
   b) Lighting equipment schedules,
   c) Reflected ceiling plans, and
   d) Lighting maintenance records and materials list.

[18] The ordinance requires that tenants provide access to tenant space within 30 days of request, so allow time in your plan for this advance notice and discuss with your tenants and provider.
[19] COM*check*™ is a Dept. of Energy tool that simplifies the process of determining whether a building meets IECC requirements, as well as other code requirements.

5) Ensure facility management personnel responsible for lighting operations and maintenance are available to answer questions.

3.2.1. Owner and Tenant Responsibilities

If the owner decides to pass any capital costs related to complying with these requirements through to the tenants, the City Manager Rules require those costs be amortized over the length of the predicted payback period, not as a lump sum payable in a single year.

The city has provided a Split Incentive Guide to help distinguish the specific responsibilities of the building owners and tenants as it relates to compliance with the new energy ordinance. In general, the building owner is responsible to implement the lighting upgrade within the required timeframe.

If a tenant owns the lighting systems, it is still the responsibility of the owner to ensure that all requirements are met. Depending on the lease arrangements, the financial responsibility for the lighting upgrades may fall to the tenant. In cases where multiple tenants in a single building own distinct lighting systems, please contact the city's Program Administrator (RankinK@bouldercolorado.gov) for alternate compliance paths that could better suit this unique situation.

3.2.2. Lighting Provider Responsibilities

The lighting upgrade provider is responsible for:

- Understanding the lighting requirements of the Building Performance Ordinance;
- Understanding the requirements of the City of Boulder Outdoor Lighting Ordinance;
- Determining what upgrades are necessary for compliance;
- Implementing those upgrades (if needed); and
- Developing and working with the owner to submit the required documentation to the city.

If a building permit is required for the lighting renovation, please note that there is a special permit application available for lighting renovations required by the Building Performance Ordinance. Additional information on this permit is available on the program website.

3.3. Report Upgrades to the City

The service provider, the owner, or a representative on their behalf, must submit materials and information to the city to verify compliance with these requirements. To demonstrate compliance with the lighting requirements, the following must be submitted to the city:

1) COM*check*™ compliance certificate
   a) The lighting upgrade provider must provide the owner, tenant(s), and the City of Boulder with the COM*check*™ compliance check certificate[20] for the current IECC indicating that the existing lighting or proposed lighting upgrades PASS the lighting compliance check for the specific ordinance requirements.
2) As-built lighting plans and specifications detailing:
   a) Lamp wattage, and
   b) Ballast wattage, or
   c) Fixture wattage.

[20] The City of Boulder will only accept the U. S. Department of Energy Building Energy Codes Program's COM*check*™ software report as evidence of compliance with the lighting upgrade requirements. As the COM*check*™ compliance check is code required, it is typically completed by a firm that has a professional engineer on staff and applicable engineering insurance.

3) Paid in full invoice(s) for lighting upgrades and lighting controls work.

The building owner, or their designated representative who will report the lighting upgrades to the city, must register in the Standard Energy Efficiency Data (SEED) database to report the lighting compliance information. To resister in the database, follow the steps in **Appendix D: Service Provider Registration in SEED**.

The steps to complete the required reporting process are coming soon!

4. Exemptions

This section describes the available exemptions from the ordinance requirements and provides examples and recommendations for applying for an exemption. Building owners are required to meet all requirements of the ordinance unless they have applied for, and received, an exemption from the City Manager. Applications must be received by the city at least 60 days prior to the requirement deadline.

To apply for an exemption, owners must fill out and submit the Boulder Building Performance Exemption Request[21] with all required supporting documentation for that exemption. The city may request additional documentation during the review beyond what is included in this section.

4.1. Why Are Exemptions Available?

The City of Boulder structured this ordinance to reward building owners who have already been prioritizing efficiency. If an owner has constructed, purchased or upgraded a building with high levels of energy efficiency, they are encouraged to review the exemptions to see if they qualify. The exemptions also address unique situations, such as dealing with financial hardship, which may inhibit a building owner's ability to meet the ordinance requirements.

4.2. Exemptions from All Requirements

Commercial and industrial building owners may be exempt from *all* requirements if:

1) **The building is unconditioned and unlit.**
   a) **Exemption period:** One year, re-apply annually 60 days or more prior to requirement deadline.
   b) **Required for submittal**:
      i) A narrative describing the space and a description of what, if anything, consumes energy.
      ii) The city may request additional documentation during the review.

> ***Example:*** *You have an out building that used to be a repair shop. You now use it for storage and do not light or heat the building. There are gas powered lawn mowers and snow blowers stored there. Do you qualify for an all requirements exemption for that space?* ***Answer:*** *YES, especially if you can show the electrical and gas connections are shut off.*
>
> ***Example:*** *You have an airplane hangar that has lighting and a gas space heater, but is only used a few hours per month. Do you qualify for an all requirements exemption for this space?* ***Answer:*** *NO, as long as the space is still occupied, and being lighted or heated, the building is subject to the ordinance requirements.*

2) **The building is under financial hardship.**
   a) **Exemption period**: One year, re-apply annually 60 days or more prior to requirement deadline.
   b) **Required for submittal**:
      i) Proof the building is the subject of a qualified tax lien sale or public auction due to property tax arrangements; or,
      ii) Proof the building is controlled by a court appointed receiver; or,
      iii) Proof the building has been acquired by deed in lieu of foreclosure.

> ***Example:*** *Your building is currently under a tax lien by the County for unpaid tax. Do you qualify for a*

[21] The most updated version is always available on the website under the "Exemptions" drop down at www.BoulderBuildingPerformance.com

financial hardship exemption? ***Answer:*** *YES as long as you can provide proof of your financial hardship as outlined above.*

Example: *You have not been able to lease your building due to a poor commercial market for an extended period and have fallen behind on your building's mortgage payments but still have six months before the building goes into foreclosure. You have an energy ordinance deadline for this space due in one year. Do you qualify for a financial hardship exemption for this space?* ***Answer:*** *NO, as long as the space is still not in foreclosure and you have time to resolve. However, you can plan to apply for an exemption within 60 days of your foreclosure date if not resolved or extended.*

4.3. Exemptions from Rating and Reporting Only

Affected building owners may be exempt from rating and reporting for one reporting year if:

1) **The building has less than 12 months of energy data.**
   a) **Exemption period**: One year, re-apply annually 60 days or more prior to requirement deadline.
   b) **Required for submittal**:
      i) Certificate of occupancy.

Example: *Your building was built during the reporting year (in this case, 2015) and your certificate of occupancy shows an occupancy data of June 2015. This means you only have energy consumption for the building June-Dec 2016. Do you qualify for an exemption?* ***Answer:*** *YES as long as you provide a copy of the certificate of occupancy.*

Example*: You purchased the building in March 2016 and you did not pay the energy consumptions bills for the building in 2015 so you do not know the energy consumption for the reporting year. Do you qualify for an exemption?* ***Answer:*** *NO. As long as the building was occupied, heated, and lit during the entire calendar year, the building is still subject to the ordinance requirements. As the owner you must collect the whole-building energy consumption for the reporting year by either using Xcel Energy's automatic upload service, or by working with the previous owner or tenants to collect the usage.*

4.4. Exemptions from Energy Assessment Requirements Only

Buildings that have recently performed an energy assessment may be exempt from the energy assessment requirement if:

1) **The building received an equivalent energy assessment to what would be required by the energy ordinance.**
   a) The building must have received an energy assessment that met the ASHRAE Level I or Level II requirements based on square footage (Level I for < 50,000 sf, and Level II for > 50,000 sf); and
   b) The assessment must have been completed within ten years of the first deadline for energy assessments; and
   c) The building owner must have implemented the cost-effective measures that were recommended (measures with a payback < five years) or can justify why implementation was infeasible for the building.
   d) **Exemption period**: Ten years or until the next ten-year compliance deadline, whichever is later; one-time exemption.
   e) **Required for submittal**:
      i) Assessment report or signed documentation from assessor with date of assessment and list of recommended measures including capital costs, rebates and incentives, and payback times.

ii) An itemized invoice or receipt or signed document from contractor identifying installed measures, including OR schedule a free walkthrough with a PACE Business Sustainability Advisor (303-786-7223 or info@PACEpartners.com) to verify these measures.
   (1) If not all cost effective measures were implemented, present documentation and reasoning to the reasons they were not implemented.

Example: *If your 60,000 sq mixed use building received an audit from Xcel Energy in 2015, are you exempt from the energy assessment requirement?* ***Answer:*** *NO, because the ordinance requires that buildings 50,000 sq or larger perform a Level II energy assessment and Xcel Energy's audits do not meet ASHRAE Level II requirements. However, you could contact the service provider that conducted the Xcel Level I assessment and contract with them to provide additional services to satisfy the requirements of the Level II assessment.*

Example: *You performed a previous equivalent energy assessment two years ago and have a copy of the study, but can't find documentation from the firm that installed the measures, and they have since gone out of business. Do you qualify for an energy assessment exemption?* ***Answer:*** *YES, as long as you contact PACE partners and they provide the free walkthrough confirming the installation of all the measures with payback periods of less than or equal to five years. You will need to submit the PACE documentation to qualify.*

4.5. Exemptions from All Efficiency Requirements

High performing, energy-efficient buildings will still be required to rate and report, but may be exempt from the other efficiency requirements, including energy assessments, retrocommissioning, and lighting upgrades. Buildings will be considered for the efficiency exemption if they meet any of the following criteria:

1) Current ENERGY STAR certification.
   a) Must achieve and maintain an ENERGY STAR score of 75 or better
   b) **Exemption period**: Ten years or until the next ten-year compliance deadline, whichever is later, if the requirements for maintaining an exemption in future years are met (see **Maintaining an Efficiency Exemption** below).
   c) ENERGY STAR certification must have been achieved within three years of soonest efficiency reporting deadline.
   d) **Required for submittal**: Copy of current ENERGY STAR Certification

2) Current LEED EBOM certification (Leadership in Energy and Environmental Design: Existing Building Operations and Maintenance).
   a) **Exemption period**: Ten years or until the next ten-year compliance deadline, whichever is later, if the requirements for maintaining an exemption in future years are met (see **Maintaining an Efficiency Exemption** below).
   b) **Required for submittal**: Copy of LEED EBOM Certification with clear issue and renewal date.

3) Can demonstrate a pattern of significant and consistent improvements in energy efficiency or greenhouse gas emissions subject to approval by the City Manager and demonstrated by provided information, as outlined below.
   a) **Exemption period**: Permanent exemption from lighting requirements, exempt from first round of energy assessment and retrocommissioning requirements; re-apply 60 days or more prior to requirement deadline of the next round of efficiency requirements (see **Maintaining an Efficiency Exemption** below).

b) **Required for submittal**:
   i) ENERGY STAR Portfolio Manager report or other records showing energy consumption and/or greenhouse gas emissions for the past five years; and,
   ii) A narrative and documentation of initiatives, activities, etc. used to achieve the reductions.22 The narrative should include the following:
   iii) An explanation of why this building is ineligible for ENERGY STAR or LEED EBOM certification and if applicable; and (choose one of the following):
      (1) **Path 1**: (only available to buildings ineligible to receive an ENERGY STAR score): Provide justification that this building's energy performance is better than at least 75 percent of similar buildings and provide the dataset used for administrative review. The dataset used to justify performance should include building site energy use intensity data of at least five similar buildings, normalized for climate, building use, and occupancy or a similar dataset that can be justified. This can include the Portfolio Manager median calculation; or,
      (2) **Path 2**: Using 2015 as the baseline year energy use intensity (EUI), implement measures with a combined deemed savings that will achieve at least a 15% reduction in EUI. Applicants must provide those deemed savings calculations to the city with proof of installation of each measure; or,
      (3) **Path 3**: An alternative approach with supporting documentation showing a pattern of significant and consistent improvements.

Example: *Your building recently underwent a renovation and you upgraded much of your major HVAC equipment. Do you qualify for an exemption from all energy efficiency requirements?* ***Answer:*** *IT DEPENDS. You will still be required to rate and report, so first look at your ENERGY STAR score – are you eligible for certification or close to it? If you're not eligible for a score, how does your EUI compare to the median? Is it in the top 25% of like buildings or close? If you are close to either, it is probably more cost-effective to invest in a few more efficiency measures to achieve the exemption than it would be to spend the capital on the assessment, RCx, and lighting upgrades.*

Example*: Your building is not eligible for an ENERGY STAR score, but you have been prioritizing efficiency. Do you qualify for an exemption from all energy efficiency requirements?* ***Answer:*** *IT DEPENDS. Can you prove your building is in the top 25% of like buildings when looking at EUIs? If not, consider getting an energy assessment or working with a contractor to identify additional efficiency measures that will result in a 15% savings reduction (based on deemed savings) from your EUI reported in your first R&R compliance report. If you can submit proof of installation of those measures that would achieve a 15% reduction by the first efficiency deadline you may be eligible for the efficiency exemption.*

4.5.1. Maintaining an Efficiency Exemption

If an exemption is granted for having a current U.S. Environmental Protection Agency ENERGY STAR certification, or a current LEED EBOM certification from the U.S. Green Building Council, the building owner must maintain that exemption.

1) If the exemption is granted for an ENERGY STAR certification:

[22] If a building owner is considering applying for this exemption, note that the owner will likely be asked to submit proof of payment for the upgrades implemented.

   a) The exemption will be valid as long as the ENERGY STAR score of the building is in the certified range (minimum of 75), as submitted through the rating and reporting requirement, with an actual re-certification required every 10 years.
   b) If the building's score falls below the certified range (below 75), the owner will be required to get a free Level I energy assessment through the city's Partners for a Clean Environment (PACE) Program to help diagnose the cause of the increased energy use. The owner will then have one more rating and reporting cycle to improve their ENERGY STAR score above 75 – if they fail to do so, the exemption will no longer be valid and the owner will have to comply with all future efficiency requirements.
2) If the exemption is granted for a LEED EBOM certification:
   a) The exemption will be valid as long as the LEED Certification is valid (re-certification is required every five years through LEED to stay current).
   b) If the building loses its LEED certification, the exemption will no longer be valid, and the owner will have to comply with all future efficiency requirements.
3) If the exemption is granted for showing a significant pattern of continuous reductions in greenhouse gas emissions:
   a) The exemption will be valid for the first round of efficiency requirements following when the exemption is granted. For example, if this exemption is granted on June 1, 2016, the building owner would be exempt from the required energy assessment in 2019 and the required RCx and lighting upgrades in 2021. The owner would be subject to the next round of requirements starting in 2029 when the next energy assessment would be required.

Example: *In 2015 you received an ENERGY STAR score of 78 and decided to certify the building. You then applied for and received an exemption from the efficiency requirements that begin in 2019. However, your 2017 rating and reporting efforts show that your building has been using steadily more energy especially over the last two years and Portfolio Manager shows an ENERGY STAR score of 73. Are you still exempt from all energy efficiency requirements that begin in 2019?* ***Answer:*** *NOT NECESSARILY. You must get a free Level I assessment from PACE in 2017 to figure out why your score has fallen and how to get it back up. You then must get your score back up by your 2018 rating and reporting or you will lose the exemption.*

4.6. Exemptions from Public Disclosure

As a city government, all information in its possession is public and subject to the Colorado Open Records Act (CORA). Any building owner that wishes data to be withheld from public disclosure for CORA purposes, both during the initial grace period and after, must submit a document detailing why this disclosure would cause substantial harm to their competitive position. Exemptions will only be granted if they meet the requirements of a CORA exemption, which are trade secrets, privileged information, and confidential data. Concern that potential tenants might shy away from renting or buying buildings with poor energy performance will NOT qualify for this exemption.

If the submission is sufficient and exemption is approved, the city will withhold the information from public disclosure and from any CORA request.[23]

1) Building information includes trade secrets, privileged or confidential information.[24]

[23] If you have questions on CORA, please view this additional information.

a) **Exemption period**: One year, re-apply annually 60 days or more prior to requirement deadline.
b) **Required for submittal**:
   i) A statement that includes the manner in which public disclosure would cause substantial harm to the owner's trade secrets, privileged or confidential commercial information.

***Example**: You plan to complete the rating and reporting requirement, but don't want your data made public because your building is currently inefficient and you don't want this to deter potential tenants or buyers. Do you qualify for a public disclosure exemption? **Answer:** NO, inefficient energy usage alone will not be considered confidential commercial information.*

***Example:** You own a manufacturing facility and are rating and reporting using the Energy Tracking Tool and a metric of energy use per unit of production. However, you do not want your total annual production numbers publically disclosed as it is considered proprietary information. Do you qualify for a public disclosure exemption? **Answer**: YES, if you can prove that disclosing production data would threaten your competitive advantage or trade secrets of your business. If approved, the city would publically disclose EITHER the energy use per unit of production OR the total energy use, but not both (which would allow someone to calculate the total units produced in the reporting year). However, the production information would still be submitted to the city for compliance purposes as part of the energy report. The exemption would only ensure that the confidential information would not be publically reported.*

4.7. Other Exemptions

There are several possibilities for an exemption which are not listed as a separate item on the Exemption Request Form. This section on the form is for any item not covered elsewhere in the form. Also, if an owner thinks they deserve an exemption for one of the other categories, but can't meet that specific requirement, they can try for an exemption here. One possible "other" exemption is listed below as an example.

1) During the preliminary energy assessment, or when the owner applied for the local utility's RCx programs, the service provider or utility issued a recommendation that retrocommissioning is unnecessary for the building.
   a) Examples of why a service provider would make a recommendation that RCx is not necessary for a building: No control system, no cost-effective measures to add controls, or all schedules, maintenance, and efficient control strategies are already in place.
   b) **Exemption Period**: Ten years or until the next RCx compliance deadline, whichever is later; re-apply every ten years 60 days or more prior to requirement deadline.
   c) **Required for submittal**:
      i) Statement in writing from a qualified service provider that a preliminary RCx potential analysis has been performed and that there are no current cost-effective measures so the building would not benefit from an RCx effort.
      ii) The statement must be accompanied by a list of possible measures that were checked, and the results of those checks leading to the conclusion, including any proof of the conclusions including notes, photos, drawings, or calculations.

[24] If this exemption request is approved, the information provided will not be publically disclosed. In the event a Colorado Open Record Act (CORA) request is made, the city will deny the CORA request based on this exemption. However, if this denial is challenged, the building owner must defend the exemption, not the city.

***Example**: My greenhouse gas emissions are largely from the product supply chain (i.e. packaging and transport) and we have invested in bringing down those emissions instead of reducing emissions at our building. Do I qualify for an exemption not listed for my building? **Answer**: POSSIBLY. You will need to provide proof that your supply chain emissions are significantly greater than the emissions from operating your building, then show what you have done to reduce emissions, how much you spent, and what savings you've had from your investment.*

Appendix A: Required Retrocommissioning Scope

If the retrocommissioning is conducted through a local energy utility program, the scope for that will satisfy the requirements of the ordinance, as long as it addresses both electricity and natural gas-consuming equipment and controls.

If the retrocommissioning is conducted outside of a local energy utility program, the scope of the retrocommissioning shall include the activities below. A monitoring-based commissioning approach may be used to investigate and evaluate building systems as part of the retrocommissioning process. However, while monitoring based commissioning is an excellent strategy to maintain the persistence of savings generated from a full RCx effort, but it is not a substitute for the RCx.

Activity	Buildings ≥ 50,000 sf	Buildings < 50,000 sf	Activity Description
Develop and RCx Plan	✓		Develop a plan that outlines the activities, roles and responsibilities, schedule and documentation requirements of the RCx process.
Review and Optimize Equipment Scheduling	✓	✓	Any time of day schedules that are programmed in a building management system (BMS), programmable thermostat or time clock system shall be reviewed and if necessary, corrected to ensure they reflect the current facility requirements.
Review BMS Sequence of Operations	✓	✓	The current BMS sequence of operations shall be reviewed to ensure they are appropriate for the current facility requirements.
Review BMS Temperature, Pressure and Airflow Setpoints	✓	✓	The current BMS setpoints shall be reviewed to ensure they reflect the sequence of operations and current facility requirements. If needed, adjust the setpoints to meet the current facility requirements.
Test BMS Automatic Reset Functionality	✓	✓	Any automatic reset function that is currently programmed in the building management system shall be tested to confirm proper operation per the sequence of operations. An automatic reset function may include but is not limited to supply air temperature reset, static pressure reset, and chilled water supply temperature reset.
Pre-functional Checks on All Major Equipment	✓		Visually check all equipment identified in the RCx plan as ones to be functionally tested to ensure proper equipment and component assemblies are in proper condition and sensors are properly calibrated.
Comprehensive Functional Testing on All Major Base Building Equipment	✓		Perform functional testing on all major Base Building Systems to verify the sequence of operations and proper component functionality to include but not be limited to damper and valve actuation, motor modulation, on/off commands, lighting occupancy sensors and controls, etc.
Boiler Combustions Testing	✓		A combustion efficiency test shall be conducted for each boiler serving a Base Building System.
Review Economizer Functionality	✓	✓	If economizer functionality exists and is included in the sequence of operations, perform functional testing to verify proper operation during economizer conditions including proper damper controls. If economizer is not functioning properly, adjust sequence of operations and

			setpoints, adjust and/or repair damper linkage and actuator motors for proper operation and current facility requirements.
Sensor Calibration Checks (All Critical Sensors)	✓		Each critical sensor that is part of an HVAC control sequence shall be tested to ensure proper calibration. For each sensor that is out of calibration, recalibrate or replace this sensor.
Sensor Calibration Checks (OAT & RAT Only)		✓	All outside air temperature (OAT) sensors and return air temperature (RAT) sensors that are part of an HVAC control sequence shall be tested to ensure proper calibration. For each sensor that is out of calibration, recalibrate or replace the sensor.
Check Coils for Cleanliness	✓	✓	Visually inspect hot water, chilled water, steam and DX coils for cleanliness. If coils are visually loaded, clean all coils as appropriate.
Boiler/Furnace Tune-Up	✓	✓	Perform a tune-up on any boilers or furnaces serving Base Building Systems.
Review & Adjust Domestic Hot Water Temperatures	✓	✓	Review current domestic hot water temperature setpoints and compare to the current facility requirements. If needed, adjust the setpoints to meet the current facility requirements.
Check Air Filters	✓	✓	All air filters shall be checked to verify that the pressure drop across the filters are within the manufacturer's recommended limits.
Install Programmable Thermostats if No Controls Exist	✓	✓	If there is no central building Energy management system, and no programmable thermostats, install programmable thermostats in every regularly occupied thermal zone.

Appendix B: RCx Report Sample Outline

If a building owner chooses to meet the RCx requirement by participating in the Xcel Energy RCx or Building Tune-up program, the program report is acceptable for compliance.

If a building owner chooses to hire a service provider to complete RCx outside of an existing program (such as completing RCx concurrently with the energy assessment), the final RCx report should include the following information:

1. Title Page
2. Executive Summary
3. Summary of building use (with square footage breakdown) and typical operation
4. Summary of building systems including mechanical, electrical, and control systems
5. Summary of the results of each completed activity required in the retrocommissioning scope
6. Table of recommended retrocommissioning measures including:
    a. Capital costs
    b. Applicable rebates and incentives
    c. Annual energy savings
    d. Annual maintenance savings
    e. Payback period
    f. Recommended implementation timeline for each measure
7. Documentation of RCx measures
    a. Finding description
    b. How was the measure found
    c. How the measure is to be implemented
    d. How the measure will save energy
    e. How the savings where determined (calculation methodology)
    f. What evidence of implementation is required

Appendix C: How to Maintain and Track Your Energy Savings

To realize the most benefit from complying with these efficiency requirements, build owners should adopt on-going best practices to maintain and track their building's energy savings. Performing annual rating and reporting on the building's energy use is an important first step and is required by the City's Building Performance Ordinance. But beyond that, building owners should consider adopting the following best practices:

- Provider Engagement
- Measure commissioning
- Staff Training
- Operations and Maintenance (O&M) Practices
- Measurement and Verification (M&V)
- Periodic RCx and Ongoing Commissioning

Measure Commissioning

Measure commissioning (MCx) includes performance testing and documentation of implemented measures similar to what would be done in a new building. These services should adhere to the appropriate ASHRAE commissioning standards and typically include design review, performance testing, drawings that include improved sequences of operations, performance testing results, logging and trending recommendations for important data points, and recommended re-testing intervals.

Training

Staff training should always be carried out with the implementation of new measures. This can be classroom or hands-on training typically done by equipment vendors during equipment start-up. The crucial aspect of this training is that those people responsible for the operation and maintenance of this equipment have a thorough understanding of any new equipment, what the intended operation is, and how to maintain it.

Operations and Maintenance Practices

O&M practices should be provided at during implementation and include new equipment drawings, warranty information, recommended operations practices, maintenance schedules and sensor calibration intervals. Ensure that all calibrations are done to the equipment manufacturer's recommended precision levels.[25]

Measurement and Verification

M&V allows for the tracking of energy use and compares this to a benchmark usage. M&V should follow the international industry standard for energy retrofits by the Efficiency Valuation Organization, called the IPMVP (International Performance Measurement and Verification Protocol) standard. An M&V effort typically consists of an M&V Plan completed before the measure is implemented, and M&V Reports one year after implementation of the measures.

Periodic RCx and Ongoing Commissioning

Periodic RCx has been shown to greatly improve the persistence of measures that have been implemented. With recent advances in computer and wireless technologies, a new approach known as

[25] Calibration equipment should follow the National Institute of Science and Technology Traceability policy.

ongoing commissioning (OCx), or monitoring-based commissioning (MBCx) has evolved over the last few years and promises to improve energy savings persistence, occupant comfort, systems uptime, and awareness of energy users in modern buildings.

These OCx/MBCx systems are typically comprised of sensors that monitor critical systems, push this information into a database, and report the data in a user friendly format like an energy dashboard. More importantly, these systems also have algorithms that look for problems with systems that can affect energy use, comfort and equipment life.

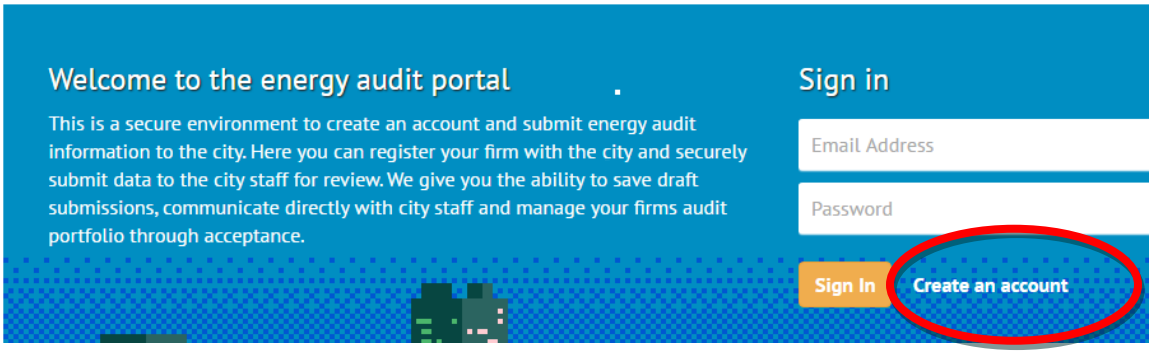
Although OCx/MBCx systems can improve persistence in the interim period between RCx efforts, they do not replace the RCx effort required by the Ordinance once each ten year period.

Appendix D: Service Provider Registration in SEED

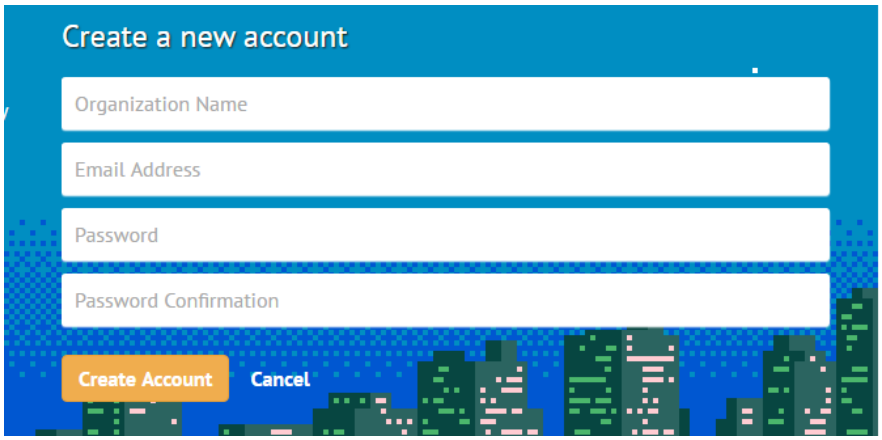
Service providers must register in SEED to submit findings to the city for compliance. Service providers must complete the City of Boulder training (Under "For Service Providers") prior to registering in SEED if offering energy assessments or retrocommissioning services.

Step 1: Create an Account

- The registration page is: https://auditron.buildingenergy.com/.
- Follow the link above and select "Create an account" under Sign In.



- To create your account, enter your company name, email address, and select a password.
- Select "Create Account."



Step 2: Complete you Profile

- Enter your name and contact information.
- Select the City of Boulder as the city you are creating the profile for.
- Enter you qualifications for each of the services you are registering for by selecting the qualification from the drop down.
    - If you are only registering for one service, select "N/A" in the drop down you are not registering for.
- Under "Certification/License Number or Degree-Granting Institution" provide a free text response that provides additional information on your qualifications.

- This can include the type of certification(s) you have, your PE license number, or the utility you are registered with, as shown below.

- Enter your total years of experience.

Step 3: Submit your Profile

- After completing the form, read and check the affirmation statement.
- Submit your profile.
- You have now registered in SEED and are able to begin submitting findings for compliance purposes.
- **Note** – the city will review your profile submission and verify you have completed the training and meet the minimum qualifications for each service you have registered for. The city will then accept or reject your submission. If additional information is needed the city will contact you.
- See **Report Findings to the City** for steps to report findings in SEED upon completion of your assessment and/or RCx study.

Glossary

- "Base Building Systems" mean the systems or sub-systems of a building that use Energy and/or impact Energy consumption including but not limited to: Primary HVAC (heating, ventilation, air conditioning) systems; Conveying systems; Domestic hot water systems, and; Electrical and lighting systems. Base Building Systems shall not include equipment used for Industrial Processes.
- "Cost Effective" means any investment or project with a predicted Payback Period of five years or less.
- "Current Facility Requirements" means the Owner's current operational needs and requirements for a building and systems including but not limited to space temperature and humidity set points, operating hours, ventilation, filtration and any integrated requirements such as controls, personnel training, warranty review, and service contract review.
- "Energy" means electricity, natural gas, steam, hot or chilled water, heating oil, or other product for use in a building, or renewable on-site electricity generation, for purposes of providing heating, cooling, lighting, water heating, or for powering or fueling other end-uses in the building and related facilities.
- "Energy Assessment" means a systematic evaluation to identify modifications and improvements to building equipment and systems which use Energy.
- "Energy Assessment Report" means a report prepared and certified by an Energy Assessor on the approved list on the Project Website, covering the scope provided by the City Manager.
- "Energy Performance Score" means the numeric rating generated by the ENERGY STAR Portfolio Manager tool or equivalent tool adopted by the City Manager that compares the Energy usage of the building to that of similar buildings.
- "ENERGY STAR" means the U.S. Environmental Protection Agency program related to improving Energy efficiency in buildings and products.
- "ENERGY STAR Portfolio Manager" means the Internet-based tool developed and maintained by the U.S. Environmental Protection Agency to track and assess the relative Energy performance of buildings nationwide.
- "Energy Use Intensity (EUI)" means the total kBTUs (1,000 British Thermal Units) used per square foot of floor area.
- "Industrial Processes" means any business related process supported by mechanical or electrical terms other than Base Building Systems.
- "Large Industrial Campus" means a facility in which three or more buildings, at least partially used for manufacturing uses, are served by a central plant or single utility meter.
- "Manufacturing" means any building which has a primary use of assemblage, processing, and/or manufacturing products from raw materials or fabricated parts OR one that has the majority of its Energy usage come from process loads.
- "Owner" means any person who is a commercial or industrial building Owner, or is an Owner's representative, such as a property manager, who has charge of, or controls any building or parts thereof.
- "Partners for a Clean Environment" (PACE) is a joint program with the City and County of Boulder that provides free expert advisor services, financial incentives and a certification program to help businesses measure and gain recognition for their Energy, waste, water, and transportation achievements. EnergySmart is PACE's Energy service program.
- "Payback Period" means the length of time required to recover the capital cost (less rebates and incentives) of an investment through operational savings.

- "Project Website" means www.BoulderBuildingPerformance.com, the website maintained by the City Manager for the implementation of these requirements.
- "Rating and Reporting Tool" means the U.S. Environmental Protection Agency's Internet-based tool, ENERGY STAR Portfolio Manager, and any additional tool adopted by the City Manager for this purpose.
- "Requests for Qualifications" RFQ and "Requests for Proposals" (RFP). RFQs and RFPs are typically requested for very large and complex projects (in the million dollar or more project cost range), or where there is a policy requiring these efforts. Typically there will be two levels of selection, although sometimes the RFQ and RFP are combined. If split, RFQs are requested first. The list of possible candidates is then reduced based on the provider's qualifications through a selection of remaining candidates for the RFP. This pre-selected group of providers then responds to an RFP after scoping the project, and a single provider is chosen.
- "Retrocommissioning" means identifying and correcting building system issues to achieve optimal building performance, in a manner specified by the City Manager.
- "Retrocommissioning Measure" means a corrective action or facility improvement identified during the investigation or evaluation phase of Retrocommissioning.
- "Retrocommissioning Report" means a report prepared and certified by a Retrocommissioning Professional on the approved list on the Project Website, covering the scope provided by the City Manager.
- "Site Energy" means the amount of Energy consumed by a building as reflected in utility bills or other documentation of actual Energy use.
- "Source Energy" means all the Energy used in delivering Energy to a building, including power generation and transmission and distribution losses, to perform a specific function, such as but not limited to space conditioning, lighting, or water heating.