

**SUBJECT: DISCUSSION/DIRECTION ON CITY AMENDMENTS TO THE
2021 INTERNATIONAL ENERGY CONSERVATION CODE**

DATE: SEPTEMBER 17, 2024

**PRESENTED BY: ROB ZUCCARO, AICP, COMMUNITY DEVELOPMENT
DIRECTOR
CHAD ROOT, CHIEF BUILDING OFFICIAL**

SUMMARY:

City Council has requested a review of the City's adopted amendments to the 2021 International Energy Conservation Code (IECC). The IECC provides minimum energy efficiency standards for residential and commercial development above those found in the International Residential Code (IRC) and International Building Code (IBC). The City adopted the 2021 IECC with strengthening amendments to promote its sustainability and carbon reduction goals for the community.

The City first adopted the 2021 IECC with amendments on October 19, 2021 by Ordinance 1816, Series 2021 (Attachment No. 1). The City then adopted additional amendments specific to commercial development on December 20, 2022 by Ordinance 1845, Series 2022 (Attachment No. 2). These two ordinances are combined in Chapter 15.18 of the Municipal Code. The amendments reference to and supplement the 2021 IECC base code.

LINK: [Municipal Code Chapter 15.18](#)

LINK: [2021 IECC Base Code](#)

While the City adopted numerous amendments to the base 2021 IECC, there are three primary strengthening amendments that staff recommends as the focus of this review, as they form the central policies that extend beyond the base 2021 IECC codes. These include:

1. Adoption of IECC Appendix RC – Zero Energy Residential Building Provisions, which established a net-zero energy use building standard.
2. Adoption of mandatory all-electric heat pump systems for space and water heating for commercial development.
3. Adoption of custom Appendix PT – Modeling to a Performance Target, which established minimum Energy Use Index (EUI) building performance standards for certain types of commercial development.

1. Appendix RC – Zero Energy Residential Building Provisions

This appendix overrides any prescriptive requirements in the base IECC code and instead requires that new homes be modeled and rated against an Energy Rating Index (ERI) and score of 47 or lower. The ERI score estimates energy use of the home with a lower number indicating more efficient construction. The code then

requires renewable energy offsets to achieve an ERI score of zero (e.g. solar or geothermal systems to offset energy use).

The following is summary of concerns with this code provision received by staff:

- Overall cost of compliance. To meet the minimum energy rating there are system and building envelope efficiency upgrades that add additional cost to construction. In some cases, the upgraded equipment and material are not common to the residential construction industry, leading to lack of trained labor, maintenance and repair issues, additional costs, and potential delays in acquiring materials and equipment.
- ERI Rating System. The ERI rating is not a standard rating system supported by local contractors that conduct energy ratings. The Home Energy Rating System (HERS) is similar and commonly used for home energy rating, but not directly interchangeable with the ERI rating standard.
- Securing Adequate Energy Offsets. Some homes and lots do not have adequate roof area or areas on-site to install enough solar capacity to off-set energy to a zero rating, resulting in the need to enroll in a local solar farm. There are concerns about solar farm capacity to meet the demand if there is a significant amount of new residential development.
- Electric Infrastructure. Xcel has limitations for new on-site solar installation that may add additional cost to comply with the energy offset requirement. Additionally, while the code does not mandate all-electric construction, the energy rating standards are favorable to all-electric construction. There may be limits in existing infrastructure to support the demand for all-electric construction or there may be significant additional infrastructure costs for new residential development.

Staff has drafted a package of amendments to address some of the concerns with the adopted code provisions. Council tabled this package of amendments pending this discussion on policy goals (Attachment No. 3).

LINK: [August 6, 2024 City Council Packet with Proposed Code Amendments](#)

If Council intends to keep Appendix RC, staff recommended amendments to address the noted concerns include:

- Allowing Home Energy Rating System (HERS) ratings in lieu of the Energy Rating Index (ERI) standard specified in the code.
- Allowing a HERS minimum standard of 50 rather than a 47, which will be more cost efficient to achieve, but still require efficient construction and still require renewable energy offset to a net-zero HERS of 0.
- Allowing an exception to meeting Appendix RC if a home is certified through the Passive House Institute US, Inc. (PHIUS) program.

The Building Code Board of Appeals (BCBOA) reviewed the latest proposed amendments and recommends removing any mandatory requirements for compliance with Appendix RC.

2. *Mandatory All-Electric Heat Pump Systems for Commercial Space and Water Heating*

The code requires all-electric heat pump systems for primary air and water heating, including electric supplemental heating when needed. These requirements are limited to general space heating systems and domestic water supply. The code does mandate electric or electric heat pump systems for any type of commercial or industrial processing or commercial cooking facilities. There are numerous exceptions built into the code for backup heating and other unique heating requirements based on industry.

The following is summary of concerns with this code provision received by staff:

- Overall cost of compliance. Heat pump systems are generally more costly than natural gas systems to install (notwithstanding the anticipated cost savings overtime from an efficient heat pump system).
- Supply constraints. There are supply issues with certain large capacity all-electric commercial heat pump systems that also have electric supplemental heating.
- Retrofitting existing development. Adding new all-electric heat pump systems to existing commercial development that is expanding may require costly upgrades to the electric supply system and electric supply to the building.

If Council intends to keep this the all-electric commercial space and water heating requirement in the code, staff recommended amendments to address the noted concerns include:

- Limiting the all-electric heat pump space and water heating requirement to all new construction and removes any standards for additions and alternations to existing commercial buildings.
- Allowing gas backup space heating equipment for the commercial all-electric space heating standards. This helps address supply constraint concerns with supply issues related to larger capacity commercial heat pump systems.

The BCBOA recommends removing any mandatory requirements for compliance with all-electric heat pump commercial construction.

3. *Appendix PT – Modeling to a Performance Target*

This appendix is modeled after a program adopted by the City of Boulder that requires energy modeling and targets for new office, warehouse, hotel, and multi-family development and compliance monitoring and certification of energy use following construction. Compliance is checked through submetering of different building systems and compliance reporting after one year of building operations.

The following is summary of concerns with this code provision received by staff:

- Submetering the different systems and the requirement for compliance checks is complicated and adds cost to the building systems.
- The requirement for rating multi-family development conflicts with Appendix RC, which also applies to multi-family residential development.

If Council intends to keep Appendix PT in the code, staff recommended amendments to address the noted concerns include:

- Removing submetering requirements.
- Removing post-construction documentation, one-year compliance check, and monitoring requirements.
- Clarifying that R-1 and R-2 occupancies (hotel and multi-family residential) shall be subject to Appendix PT rather than Appendix RC.

The BCBOA recommends removing any mandatory requirements for compliance with the EUI performance targets outline in appendix PT.

BACKGROUND:

Ordinance No. 1816, Series 2021 – 2021 IECC and RC Appendix Adoption

By Ordinance No. 1816, Series 2021, City Council adopted the 2021 IECC with amendments and an electric vehicle charging code. Council was provided extensive information on all-electric construction codes, net zero codes, state initiatives on carbon reduction and electric construction policy and studies. The draft ordinance included in the packet did not include adoption of the RC Appendix. Appendix RC was provided as an attachment to the second reading staff memo for background at the request of Council. Council added the RC Appendix to the 2021 IECC adoption through the motion for final adoption at second reading.

The meeting minutes are provided as Attachment No. 4 and the following is a link to the full meeting packet.

LINK: [October 19, 2021 City Council Packet](#) (Starting on p. 231 of Packet)

Ordinance 1845, Series 2022 – Commercial EUI Performance Targets and All-Electric Heat Pump Standards.

As a follow up to the initial adoption of the 2021 IECC, the 2022 City Council workplan included consideration of adoption of a net-zero commercial standard or other strengthening code standards for commercial development. The City hired a consultant team that included Group 14 Engineering (Group 14) and Lotus Engineering and Sustainability (Lotus) to lead a public process and provide a final report with recommendations for City Council. Development of the final report included public and advisory board engagement, policy research and analysis, and modeling of cost and greenhouse gas impacts for several different commercial and multi-family scenarios.

The final report was reviewed by City Council at a discussion/direction session on September 27, 2022. Three policy options were provided to Council for consideration. Council direction was to develop a an EUI Performance Target Standard, which was one of the policy recommendation options provided by staff, and Council also added to the staff direct that an all-electric commercial code options be provided.

The meeting minutes are provided as Attachment No. 5 and the following is a link to the full meeting packet.

LINK: [Sept 27, 2022 City Council Packet](#)

City Council adopted Ordinance 1845, Series 2022 at their December 20, 2022 meeting. The meeting minutes are provided as Attachment 6 and the following is a link to the full meeting packet.

LINK: [December 20, 2022 City Council Packet](#) (Starting on p. 293 of Packet)

Post Adoption Public Input on Potential Code Amendments

In August of 2023 City staff and a City consultant with Shums Coda Associates held a public open house to gather feedback on the adopted codes. Staff received feedback from residents, business owners, landowners, developers and their design consultants on specific issues of concern. The feedback received at the open house is the basis for the package of code amendments that Council recently tabled. City staff has identified several code provisions as part of implementing the codes since their adoptions and after conducting further research that are included in proposed updates that service as “clean up” items to remove some conflicting provisions and provides some clarifications and intended improvements to the base codes.

State Energy Code Requirements

On June 6, 2022, the Governor signed into law HB22-1362, Building Greenhouse Gas Emissions. HB22-1362 requires municipalities that adopt new building codes after July 1, 2023 to adopt the 2021 IECC and the State’s Model Electric Ready and Solar Ready Codes, or codes with equal or better energy performance.

HB22-1362:

<https://leg.colorado.gov/bills/hb22-1362>

State Model Electric Ready and Solar Ready Codes:

<https://energyoffice.colorado.gov/buildings/building-energy-codes/energy-code-board>

The City will need to ensure compliance with these state-level mandated minimum codes with any future amendments.

Building Code Board of Appeals

The BCBOA has reviewed the last round of potential code amendments that were tabled and has created an alternative draft. The alternative draft would effectively eliminate any mandatory requirements for the three major policies: the RC Appendix, the EUI Performance Targets, and the Commercial All-Electric Heat Pump Standard for Space and Water Heating. The alternative draft and meeting minutes are included as Attachment Nos. 7-9.

Sustainability Advisory Board

The Louisville Sustainability Advisory Board (LSAB) initiated their own review of the tabled draft amendments and provided the attached memorandum with their recommendations (Attachment No. 10). The memo provides recommendations on several specific elements of the code, but overall recommends maintaining the three major policies: the RC Appendix, the EUI Performance Targets, and the Commercial All-Electric Heat Pump Standard for Space and Water Heating.

POLICY DISCUSSION:

The City Council recently adopted Resolution No. 18, Series 2024, which updated the City's Clean Energy and Carbon Emission Goals. These goals include targets for reducing Louisville's residential and commercial/industrial carbon-free electricity needs and greenhouse gas emissions. The adoption of the 2021 IECC and the associated amendments help further these goals.

Figure 1: Resolution No. 18, Series 2024 Goals

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO:

Section 1. The City of Louisville hereby updates the following clean energy and carbon emission reduction goals:

1. Meet all of Louisville's municipal electric needs with 100% carbon-free sources by 2025.
2. Reduce energy-related municipal greenhouse gas emissions 60% below the 2016 baseline by 2030 and achieve carbon-neutrality by 2050.
3. Generate 75% of Louisville's residential and commercial/industrial electric needs from carbon-free sources by 2030.
4. Reduce energy-related residential and commercial/industrial GHG emissions 60% below the 2016 baseline by 2030 and achieve carbon-neutrality by 2050.

The City Council has identified several priority policy goals, including Sustainability, the promotion new business development and Economic Vitality, and the promotion of Affordable Housing. The strengthening codes help promote the City's sustainability policies, including those included in Resolution No. 18, series 2024. However, the costs

associated with the implementation of the 2021 IECC and strengthening amendments could impact the city's competitive position for business development and attraction of or ability to develop affordable housing due to the costs and complexity of compliance with the codes.

Staff recommends that the City Council consider how to balance each of these policies, which will influence each other. This could include determining whether to maintain each of the three primary strengthening policies/codes that extend beyond the base 2021 IECC, and considering if there are viable amendment to the existing codes to ensure they are reasonably attainable with current technology and aren't cost prohibitive.

PUBLIC COMMENTS:

Public Comments received by City Council are provided as Attachment # 11.

STAFF RECOMMENDATION:

Staff requests that Council provide direction to staff and the BCBOA on the intended policy direction for maintaining or eliminating any of the three major polices/codes discussed in this memo. Options could include:

- Maintaining the three major strengthening codes but consider amendments to those codes to address potential issues and concerns with feasibility and/or cost of implementation.
- Eliminating one or more of the three major strengthening codes and revert to the base 2021 IECC code.

Based on Council direction, staff would work with the BCBOA on drafting the ordinance for Council consideration.

ATTACHMENTS:

1. Ordinance 1816, Series 2021
2. Ordinance 1845, Series 2022
3. Tabled Draft Ordinance 1876, Series 2024
4. October 19, 2021 City Council Minutes
5. September 27, 2022 City Council Minutes
6. December 20, 2022 City Council Minutes
7. BCBOA Recommended Code Draft
8. May 2, 2024 BCBOA Meeting Minutes
9. May 16, 2024 BCBOA Meeting Minutes
10. Louisville Sustainability Advisory Board Memo
11. Public Comments Received by City Council 2024
12. Staff Presentation

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STRATEGIC PLAN IMPACT:

☐	 Financial Stewardship & Asset Management	☒	 Reliable Core Services
☒	 Vibrant Economic Climate	☐	 Quality Programs & Amenities
☒	 Engaged Community	☐	 Healthy Workforce
☐	 Supportive Technology	☐	 Collaborative Regional Partner

Second Reading Amendments

Ordinance No. 1816, Series 2021 is revised to read as follows (amendments are shown in **bold underline** and ~~**bold-strikeout**~~):

ORDINANCE NO. 1816

AN ORDINANCE ADOPTING BY REFERENCE THE 2021 INTERNATIONAL ENERGY CONSERVATION CODE, WITH AMENDMENTS, REPEALING CHAPTER 15.60 OF THE LOUISVILLE MUNICIPAL CODE CONCERNING THE PRESCRIPTIVE ENERGY CODE AND DESIGN CRITERIA, AND AMENDING TITLE 17 OF THE LOUISVILLE MUNICIPAL CODE CONCERNING ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

WHEREAS, the City Council has adopted from time to time certain building and construction standards; and

WHEREAS, it is deemed to be in the interest of the public health, safety and general welfare to adopt by reference thereto the 2021 edition of the International Energy Conservation Code; and

WHEREAS, the City of Louisville remains committed to its adopted goals to reduce energy consumption, increase clean energy sources, and support the transition to a low-carbon community as outlined in the Sustainability Action Plan and Resolution 25, Series 2019, “A Resolution Setting Clean Energy and Carbon Reduction Goals”; and

WHEREAS, reducing building energy consumption is an effective strategy to reduce community-wide energy consumption and increase long-term cost savings for residents and businesses; and

WHEREAS, the City Council desires to add requirements for solar readiness, electric vehicle charging infrastructure, and building electrification to build a more resilient building stock and support future building and transportation electrification efforts pursued by residents and businesses; and

WHEREAS, the City Council, after proper notice as required by law, has held a public hearing on this ordinance providing for the adoption of said codes; and

WHEREAS, the 2021 edition of the International Energy Conservation Code has been submitted to the City Council in writing and the City Council has determined that such codes should be adopted as herein set forth.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO:

Section 1. Chapter 15.18 of the Louisville Municipal Code is hereby repealed and reenacted to read as follows:

INTERNATIONAL ENERGY CONSERVATION CODE

Sec. 15.18.010. Adoption.

Sec. 15.18.020. Appendices adopted.

Sec. 15.18.030. Amendments and Deletions to the 2021 International Energy Conservation Code.

Sec. 15.18.040. Design criteria.

Sec. 15.18.050. Applicability.

Sec. 15.18.060. Copies available.

Sec. 15.18.070. Violations and penalties.

Sec. 15.18.010. - Adoption.

The International Energy Conservation Code, 2021 Edition, published by the International Code Council, 4051 West Flossmoor Road, Country Club Hills, Illinois, 60478-5795, is hereby adopted by reference thereto and incorporated into and made a part of the Louisville Municipal Code. The subject matter of the International Energy Conservation Code is to regulate and govern energy efficient building envelopes and the installation of energy efficient mechanical, lighting and power systems in the City of Louisville, and to provide for the issuance of permits and collection of fees therefor. The International Energy Conservation Code, 2021 Edition, is adopted as amended by the City, including the outline table of contents and index, for the minimum requirements for minimum energy efficiency.

Sec. 15.18.20. Appendices adopted.

The following appendices of the 2021 International Energy Conservation Code are hereby specifically adopted; any appendices not listed are not adopted: **Appendix RC, Zero Energy Residential Building Provisions**, Appendix CB, Solar Ready Zone – Commercial and Appendix RB, Solar Ready Provisions – Detached One and Two-Family Dwellings and Townhouses. Group R2, R3, and R4, three stories or less shall comply with Appendix RB.

Sec. 15.18.030. - Amendments and Deletions to the 2021 International Energy Conservation Code

The 2021 International Energy Conservation Code adopted in Section 15.18.010 is hereby amended in the following respects. An ellipsis (...) indicates when the remainder of a section of the 2021 International Energy Conservation Code is to remain unchanged and in full force and effect.

1. **Section C101.1 Title**, is amended to insert "the City of Louisville" so the section will read:

C101.1 Title. These regulations shall be known as the Energy Conservation Code of the City of Louisville, and shall be cited as such. It is referred to herein as "this code."

2. Section C103.2 Information on construction documents, is hereby amended to read as follows:

C103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documented are permitted to be submitted when approved by the code official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment herein governed. Details shall include the following as applicable:

- 1. Energy compliance path.**
- 2. Insulation materials and their R-values**
- 3. Fenestration U-factor and solar heat gain coefficients (SHGCs).**
- 4. Area-weighted U-factor and solar heat gain coefficient (SHGC) calculations.**
- 5. Mechanical system design criteria.**
- 6. Mechanical and service water heating systems and equipment types, sizes, fuel source and efficiencies.**
- 7. Economizer description.**
- 8. Equipment and system controls.**
- 9. Fan motor horsepower (hp) and controls.**
- 10. Duct sealing, duct and pipe insulation and location.**
- 11. Lighting fixture schedule with wattage and control narrative.**
- 12. Location and daylight zones on floor plans.**
- 13. Air barrier and air sealing details, including the location of the air barrier.**
- 14. Location of pathways for routing of raceways or cable from the solar ready zone to the electrical service panel.**

2. 3. Section C202 General Definitions, is hereby amended by adding, in alphabetical order, the following definitions:

All-Electric Building: A building that contains no combustion equipment, or plumbing for combustion equipment, installed within the building or building site.

Combustion Equipment: Any equipment or appliance used for space heating, service water heating, cooking, clothes drying and/or lighting that uses fuel gas or fuel oil.

Electric Vehicle (EV): A vehicle registered for on-road use, primarily powered by an electric motor that draws current from a rechargeable storage source that is charged by being plugged into an electrical current source.

Electric Vehicle Supply Equipment (EVSE): The electrical conductors and associated equipment external to the electric vehicle that provide a connection between the premises wiring and the electric vehicle to provide electric vehicle charging.

Electric Vehicle Capable Space: A designated parking space that is provided with conduit sized and rated for a minimum 40-amp, 208/240-Volt dedicated branch circuit and shall be no less than 1" in size. Conduit must be continuous from the future or existing electrical panelboard or switchboard location(s) and end at a junction box or receptacle located within close proximity of the parking space. The electrical panel serving the parking space shall have sufficient capacity and physical space for a dual-pole, 40-amp breaker. The conduit shall be sealed at the junction or outlet box that is capped off, with the conduit sealed and the cap labeled as "For future electric vehicle charging".

Electric Vehicle Ready Space: A designated parking space that is provided with a dedicated branch circuit with wiring capable of supporting a minimum 40-ampere, 208/240- Volt circuit that terminates at a receptacle, plug, junction box, or an installed electric vehicle supply equipment within close proximity of the parking space. There shall be adequate reserved space in an electrical panelboard or switchboard to meet the electric vehicle requirements.

Electric Vehicle Supply Equipment (EVSE) Installed Space: A designated parking space with dedicated electric vehicle supply equipment capable of supplying a minimum 40-amp, dedicated circuit rated at 208/240 Volt from a building electrical panelboard.

~~3.~~ **4.** *Section C401.2 Application*, is hereby amended to read as follows:

C401.2 Application

Commercial buildings shall comply with Section C401.2.1

~~4.~~ **5.** *Section C401.2.1 International Energy Conservation Code*, is hereby deleted and replaced to read as follows:

C401.2.1 International Energy Conservation Code

Commercial buildings shall **be built all-electric unless the fuel gas options of C403.3.2 and the additional electric infrastructure requirements of C405.14 are met. All buildings must comply** with the following:

City of Louisville's Prescriptive Compliance. The Prescriptive Compliance option requires compliance with Sections C401.3, C401.4, C402 through C406, and Section C408.

Core and shell buildings shall be required to comply with the provisions of Section C402.1.3 through C402.5 of the 2021 International Energy Conservation Code.

~~5. 6.~~ *Section C401.2.2 ASHRAE 90.1*, is hereby deleted in its entirety.

~~6. 7.~~ A new *Section C401.4 Mandatory Requirements for Commercial Buildings*, is hereby added to read as follows:

C401.4 Mandatory Requirements for Commercial Buildings.
Commercial buildings must comply with Table C401.4.

**Table C401.4 (Mandatory)
Requirements for Commercial Buildings**

Title	IECC Section
Air leakage	C402.5
Calculation of heating and cooling loads	C403.1.1
Data centers	C403.1.2
System Design	C403.2
Heating and cooling equipment efficiency	C403.3
Heating and cooling system controls	C403.4, except C403.4.3, C403.4.4, C403.4.5
Economizer fault detection and diagnostics	C403.5.5
Ventilation and exhaust systems	C403.7, except C403.7.4.1
Fan and fan controls	C403.8, except C403.8.6
Large diameter ceiling fans	C403.9
Refrigeration equipment performance	C403.11, except C403.11.3
Construction of HVAC system elements	C403.12
Mechanical systems located outside of the building thermal envelope	C403.13
Service water heating	C404
Electrical power and lighting systems	C405, except C405.3

~~7. 8.~~ **Table C402.1.3 Opaque Thermal Envelope Insulation Component Minimum Requirements, R-Value Method**, is hereby deleted and replaced with the following:

Table C402.1.3 (Mandatory)
Opaque Thermal Envelope Insulation Component of an Average Minimum Requirements, R-Value Method in following locations:

Roof C402.2.1	
Insulation entirely above roof deck	R-49
Metal buildings ^a	R-21 + R-11 LS
Attic and other	R-49
Walls. Above grade C402.2.2	
Mass ^d	R-21
Metal buildings	R-21
Metal framed	R-21
Wood framed and other	R-21
Walls, Below grade C402.2.5	
Below-grade wall ^b	R-10
Floors C402.2.3	
Mass ^c	R-21
Joist/framing	R-38
Slab-on-grade floors C402.2.4	
Unheated	R-20 for 24"
Heated ^e	R-15 for 36" below + R-5 full slab

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 4.88 kg/m², 1 pound per cubic foot = 16 kg/m³.

NR = No Requirement, LS = Liner System.

a. Where using R-value compliance method, a thermal spacer block shall be provided.

b. Where heated slabs are below grade, below-grade walls shall comply with the exterior insulation requirements for heated slabs.

c. "Mass floors" shall be in accordance with Section C402.2.3.

d. "Mass walls" shall be in accordance with Section C402.2.2.

e. The first value is for perimeter insulation and the second value is for full, under-slab insulation.

~~8. 9.~~ **Section C402.1.4 Assembly U-factor, C-factor or F-factor-based method**, is hereby deleted in its entirety.

~~9. 10.~~ **Section C402.1.5 Component performance alternative**, is hereby deleted in its entirety.

~~10. 11.~~ **Table C402.4 Building Envelope Fenestration Maximum U-Factor and SHGC Requirements**, is hereby deleted and replaced with the following:

**Table C402.4
Building Envelope Fenestration**

Vertical Fenestration	
Maximum U-Factor	0.30
Maximum SHGC	0.33
Maximum Air leakage rate for all fenestration except curtain walls and storefront glazing	.20 cfm/ft ²
Maximum air leakage rate for curtain walls and storefront glazing	.06 cfm/ft
Skylights	
Maximum U-Factor	0.50
Maximum SHGC	0.40
Maximum Air leakage rate	.20 cfm/ft ²

~~11. 12. Section C402.4.1 Maximum area,~~ is hereby deleted and replaced with the following:

C402.4.1 Minimum area of natural lighting. Not less than eight percent of the floor area shall be glazed.

~~12. 13. Section C402.4.2 Minimum skylight fenestration area,~~ is hereby deleted and replaced with the following:

C402.4.2 Minimum area of natural lighting. A minimum skylight area of three percent of the roof area shall be provided for all roofs.

Exception: Roof areas designated for solar ready zones shall not be included in roof area calculation.

~~13. 14. Section C403.3.2 HVAC equipment performance requirements, is hereby deleted in its entirety and replaced to read as follows:~~

~~A. The first paragraph is hereby deleted in its entirety and replaced to read as follows:~~

C403.3.2 HVAC/fuel fired equipment performance requirements. Unless built all-electric, all new combustion equipment shall comply with the more efficient HVAC equipment performance of Sections C406.2, C406.2.3, and C406.2.4 and the additional electric infrastructure requirements in Section C405.14. A mechanical compliance certificate demonstrating compliance with section C406.2.3 and/or C406.2.4 shall be required for all HVAC, fuel fired and Service Water Heating equipment.

The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. (Tables C403.2.(1) through (16) are expressly retained and remain applicable to HVAC equipment performance.)

Exceptions:

1. Factory, laboratory, and high hazard occupancy combustion equipment, except for HVAC and domestic water heating.
2. Commercial Kitchens.
3. Other combustion equipment approved by the Building Official based on demonstration by the applicant that compliance with this section is not feasible and the equipment proposed is the most efficient appliance reasonably available.

~~13.~~ **15.** *Section C403.4.1 Thermostatic controls*, is hereby deleted and replaced with the following:

C403.4.1 Thermostatic controls. The supply of heating and cooling energy to each *zone* shall be controlled by individual thermostatic controls capable of responding to temperature within the *zone*. Where humidification or dehumidification or both is provided, no fewer than one humidity control device shall be provided for each humidity control system. Occupancy sensors shall be provided on the thermostat to setback in accordance with C403.4.2.1

Exception: Independent perimeter systems that are designed to offset only building envelope heat losses, gains or both serving one or more perimeter *zones* also served by an interior system provided that both of the following conditions are met:

1. The perimeter system includes not fewer than one thermostatic control *zone* for each building exposure having exterior walls facing only one orientation (within ± 45 degrees) (0.8 rad) for more than 50 contiguous feet (15 240 mm).
2. The perimeter system heating and cooling supply is controlled by thermostats located within the *zones* served by the system.

~~14.~~ **16.** *Section C403.12.1 Duct and plenum insulation and sealing*, is hereby deleted and replaced with the following:

C403.12.1 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with not less than R-12. Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the International Mechanical Code.

~~15.~~ **17. Section C403.12.3 Piping insulation,** is hereby amended to read as follows:

C403.12.3 Piping insulation. Piping serving as part of a heating or cooling system shall be thermally insulated to R-5.

~~16.~~ **18. Section C404.4 Insulation of piping,** is hereby amended to read as follows:

C404.4 Insulation of piping. Piping from a water heater to the termination of the heated water fixture supply pipe shall be insulated to R-3. On both the inlet and outlet piping of a storage water heater or heated water storage tank, the piping to a heat trap or the first 8 feet (2438 mm) of piping, whichever is less, shall be insulated. Piping that is heat traced shall be insulated to R-3 or the heat trace manufacturer's instructions.

~~17.~~ **19. Section C405.2.1 Occupant sensor controls,** is hereby amended to read as follows:

C405.2.1 Occupant sensor controls. Occupant *sensor controls* shall be installed to control lighting.

~~18.~~ **20. Section C405.2.2 Time-switch controls,** is hereby deleted in its entirety.

~~19.~~ **21. Section C405.2.2.1 Time-switch control function,** is hereby deleted in its entirety.

~~20.~~ **22. Section C405.2.3 Light-reduction controls,** is renumbered to C405.2.2.

~~21.~~ **23. Section C405.2.3.1 Light-reduction function,** is renumbered to C405.2.2.1.

~~22.~~ **24. Section C405.2.4 Daylight-responsive controls,** is renumbered to C405.2.3.

~~23.~~ **25. Section C405.2.4.1 Daylight-responsive control function,** is renumbered to C405.2.3.1.

~~24.~~ **26. Section C405.2.4.2 Sidelit daylight zone,** is renumbered to C405.2.3.2.

~~25.~~ **27. Section C405.2.4.3 Toplit daylight zone,** is renumbered to C405.2.3.3.

~~26.~~ **28. Section C405.2.4.4 Atriums,** is renumbered to C405.2.3.4.

~~27.~~ **29. Section C405.2.5 Specific application controls,** is renumbered to C405.2.4.

~~28.~~ 30. *Section C405.2.6 Manual controls*, is renumbered to C405.2.5.

~~29.~~ 31. *Section C405.2.7 Exterior lighting controls*, is renumber to C405.2.6.

~~30.~~ 32. *Section C405.2.7.1 Daylight shut off*, is renumbered to C405.2.6.1.

~~31.~~ 33. *Section C405.2.7.2 Building façade and landscape lighting*, is renumbered to C405.2.6.2.

~~32.~~ 34. *Section C405.2.7.3 Lighting setback*, is renumbered to C405.2.6.3.

~~33.~~ 35. *Section C405.2.7.4 Exterior time-switch control function*, is renumbered to C405.2.6.4.

~~34.~~ 36. *Section C405.2.8 Parking garage lighting control*, is renumbered to C405.2.7.

37. *Section C405.4.3 Gas lighting, is hereby amended to read as follows:*

C405.4.3 Gas lighting. Gas-fired lighting appliances shall not be permitted.

~~35.~~ 38. A new *Section C405.13 Electric vehicle charging infrastructure for new construction and building addition of 25% or more of original square footage*, is hereby added to read as follows:

Section C405.13.1 Electric vehicle charging infrastructure for new construction and building addition of 25% or more of original square footage. Electric vehicle charging shall be provided and installed in accordance with this section, National Electrical Code (NFPA 70), and Section 17.20.170 of the Louisville Municipal Code. When parking spaces are added or modified without an increase in building floor area, only the new parking spaces are subject to this requirement. All *EVSE Installed*, *EV Ready* and *EV Capable* spaces are to be included in the calculation for the number of minimum vehicle spaces required, as provided by the applicable article of the Louisville Zoning Code.

Section C405.13.2 Identification. The circuit breakers or circuit breaker spaces reserved for the *EVSE Installed*, *EV Ready*, and *EV Capable* spaces shall be clearly identified in the panelboard directory. The conduit for electric vehicle capable spaces shall be clearly identified at both the panelboard and the termination point at the parking space.

~~36.~~ 39. A new *Section C405.14 Additional electric infrastructure*, is hereby added to read as follows:

Section C405.14 Additional electric infrastructure. All *combustion equipment* and end-uses shall be installed in accordance with this section.

C405.14.1 Electric infrastructure for dwelling and sleeping units. *Combustion equipment* and end-uses serving individual dwelling units or sleeping units shall comply with Section R404.5.

C405.14.2 Combustion equipment. *Combustion equipment* shall be provided with conduit that is continuous between a junction box located within 3 feet (914 mm) of the appliance or equipment and an electrical panel. The junction box, conduit and bus bar in the electrical panel shall be rated and sized to accommodate a branch circuit with sufficient capacity for an equivalent electric appliance, equipment or end use with an equivalent equipment capacity. The electrical junction box and electrical panel shall have labels stating, "For Future Electric Equipment".

Exception: Industrial and manufacturing uses are exempt from Section C405.14.

~~37.~~ **40. Section C505.1 General,** is hereby amended to read as follows:

C505.1 General. Where the use in a space changes from one use in Table C405.3.2(1) or C405.3.2(2) to another use in Table C405.3.2(1) or C405.3.2(2), the installed lighting wattage shall comply with Section C405.3. Where the space undergoing a change in occupancy or use is in a building with a fenestration area that exceeds the limitations of Section C402.4.1, the space is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.

Exception: Egress doors with fenestration are allowed to bring total fenestration percentages over the allowed maximum amount of vertical fenestration.

~~38.~~ **41. Section R101.1 Title,** is amended to insert "the City of Louisville" so the section will read:

R101.1 Title. These regulations shall be known as the Energy Conservation Code of the City of Louisville and shall be cited as such. It is referred to herein as "this code."

42. Section R103.2 Information on construction documents, is amended to read as follows:

R103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic

media documented are permitted to be submitted when approved by the code official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment herein governed. Details shall include the following as applicable:

1. Energy compliance path.
2. Insulation materials and their R-values
3. Fenestration U-factor and solar heat gain coefficients (SHGCs).
4. Area-weighted U-factor and solar heat gain coefficient (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water heating systems and equipment types, sizes, fuel source and efficiencies.
7. Equipment and system controls.
8. Duct sealing, duct and pipe insulation and location.
9. Air sealing detail.
10. Location of pathways for routing of raceways or cable from the solar ready zone to the electrical service panel.

39. ~~43.~~ *Section R202 General Definitions*, is hereby amended by adding, in alphabetical order, the following definitions:

All-Electric Building: A building that contains no combustion equipment, or plumbing for combustion equipment, installed within the building or building site.

Combustion Equipment: Any equipment or appliance used for space heating, service water heating, cooking, clothes drying and/or lighting that uses fuel gas or fuel oil.

Electric Vehicle (EV): A vehicle registered for on-road use, primarily powered by an electric motor that draws current from a rechargeable storage source that is charged by being plugged into an electrical current source.

Electric Vehicle Supply Equipment (EVSE): The electrical conductors and associated equipment external to the electric vehicle that provide a connection between the premises wiring and the electric vehicle to provide electric vehicle charging.

Electric Vehicle Capable Space: A designated parking space that is provided with conduit sized and rated for a minimum 40-amp, 208/240-Volt dedicated branch circuit and shall be no less than 1" in size. Conduit must be continuous from the future or existing electrical panel board or switchboard

location(s) and end at a junction box or receptacle located within close proximity of the parking space. The electrical panel serving the parking space shall have sufficient capacity and physical space for a dual-pole, 40-amp breaker. The conduit shall be sealed at the junction or outlet box that is capped off, with the conduit sealed and the cap labeled as "For future electric vehicle charging".

Electric Vehicle Ready Space: A designated parking space that is provided with a dedicated branch circuit with wiring capable of supporting a minimum 40-ampere, 208/240- Volt circuit that terminates at a receptacle, plug, junction box, or an installed electric vehicle supply equipment within close proximity of the parking space. There shall be adequate reserved space in an electrical panel board or switchboard to meet the electric vehicle requirements.

~~40.~~ **44. Section R401.2 Application,** is hereby deleted and replaced with the following:

R401.2 Application. Residential buildings shall be built 100% all-electric unless the fuel gas options of R403.7 and additional electric infrastructure requirements of R404.5 are met. ~~and all~~ All residential buildings shall comply with the R401.2.1 City of Louisville's Prescriptive Compliance or R406 Energy Rating Index with a maximum rating index of 50 before the installation of solar panels.

Exception: Additions, alterations, repairs and changes of occupancy to existing buildings complying with Chapter 5.

~~41.~~ **45. Section R401.2.1 Prescriptive Compliance Option,** is hereby deleted and replaced with the following:

R401.2.1 City of Louisville's Prescriptive Compliance. The City of Louisville's Prescriptive compliance requires compliance with Sections R401 through R404.

~~42.~~ **46. Section R401.2.2 Total Building Performance Option,** is hereby deleted in its entirety.

~~43.~~ **47. Section R401.2.4 Tropical Climate Region,** is hereby deleted in its entirety.

~~44.~~ **48. Section R401.2.5 Additional Energy Efficiency,** is hereby amended to read as follows:

Section R401.2.5 Additional Energy Efficiency. Building shall comply with one of the additional efficiency options and shall be installed in according to Section R408.2.

~~45.~~ **49. A new Section R401.4 Mandatory requirements for residential buildings,** is hereby added to read as follows:

R401.3 Mandatory requirements for residential buildings. Residential building must comply with the following sections from the 2021 International Energy Conservation Code.

Table R401.3
Mandatory requirements for residential buildings

Title	IECC Section
Vapor retarder	R402.1.1
Eave baffle	R402.2.3
Access hatches and doors	R402.2.4.1
Crawl space wall insulation	R402.4.1.2
Maximum fenestration U-factor and SHGC	R402.5
Mechanical Controls	R403.1
Ducts	R403.3 except R403.3.2, R403.3.3, and R403.6
Mechanical system piping insulation	R403.4
Heated water circulation and temperature maintenance systems	R403.5.1
Drain Water heat recovery units	R403.5.3
Mechanical ventilation	R403.6 including E403.6.1
Equipment sizing and efficiency rating	R403.7
Systems serving multiple dwelling units	R403.8
Snow melt and ice systems	R403.9
Energy consumption of pools and spas	R403.10
Portable spas	R403.11
Residential pools and permanent residential spas	R403.12
Lighting equipment	R404.1
Interior lighting controls	R404.2

46: **50. Section R402.1 General**, is hereby amended to read as follows:

R402.1 General. The building thermal envelope shall comply with the requirements of Section R402.1.1 and R402.1.2.

47: **51. Section R402.1.2 Insulation and fenestration**, is hereby deleted and replaced with the following:

R402.1.2 Insulation and fenestration. Assemblies shall have R-value of insulation materials equal to or greater than that specified in Table R402.1.2 unless an alternative path is specified while using HERS energy rating index of 50.

Table R402.1.2
Average Insulation and Fenestration Requirements by Component

Roof	R-60
Above grade walls	R-21
Below grade walls	R-21
Floors	R-38
Non heated slab on grade	R-10 for 4ft
Heated slab on grade^a	R-15 for 4 ft + R-5 under full slab
Fenestration U-Factor	.30
Fenestration SHGC	.33
Skylight U-Factor	.50
Skylight SHGC	.40

a. The first value is for perimeter insulation and the second value is for full, under-slab insulation.

~~48.~~ **52.** *Section R402.1.5 Total UA alternative*, is hereby deleted in its entirety.

~~49.~~ **53.** *Section R402.3.3 Glazed fenestration exemption*, is hereby amended to read as follows:

R402.3.3 Glazed fenestration exemption. Not greater than 15 square feet (1.4 m²) of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements in Section R402.1.2.

~~50.~~ **54.** *Section R402.4.1.2 Testing*, is hereby deleted and replaced to read as follows:

Section R402.4.1.2 Testing. All new buildings or dwelling units that are heated or cooled, and additions over 500 square feet shall be tested for air leakage.

~~51.~~ **55.** *Section R402.5 Maximum fenestration U-factor and SHGC*, is hereby deleted and replaced with the following:

Section R402.5 Maximum fenestration U-factor and SHGC. The maximum U-factor and solar heat gain coefficient (SHGC) for fenestration shall not be required in storm shelters complying with ICC 500.

~~52.~~ **56.** *Section R403.3.1 Ducts located outside conditioned space*, is hereby deleted and replaced with the following:

R403.3.1 Ducts located outside conditioned space. All supply and return ducts shall be insulated to a minimum R-8 if located outside a conditioned space.

~~53. 57.~~ *Section R403.5.2 Hot water pipe insulation,* is hereby deleted and replaced with the following:

R403.5.2 Hot water pipe insulation. All service hot water piping shall be insulated to a minimum R-5.

~~54. 58.~~ *Section R403.6.1 Heat and recovery ventilation,* is hereby deleted and replaced in its entirety and the following is hereby added in lieu thereof:

R403.5.2 Heat and recovery ventilation. All new buildings and additions over 500 square feet shall be provided with a heat recovery or energy recovery ventilation system. The system shall be balanced with a minimum sensible heat recovery efficiency of 65 percent at 32°F (0°C) at a flow greater than or equal to the design airflow.

~~55. 59.~~ *Section R403.7 Equipment sizing and efficiency rating,* is hereby deleted and replaced with the following:

R403.7 Equipment sizing and efficiency rating. All new buildings and additions greater than 500 square feet with heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies. In addition to complying with Sec. R404.6 Additional Electric Infrastructure, new and replacement **electrical** heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed. **New gas heating equipment shall comply with the following efficiencies:**

- 1. Gas furnaces shall have a minimum of 96% efficiency.**
- 2. Gas boilers shall have a minimum of 90% AFUE.**
- 3. On demand water heaters shall have greater than .92 uniform energy factor.**

Exception: Solid fuel stoves/gas fireplaces, outdoor fire pits, gas stoves and ovens.

60. Section R404.1.1 Fuel gas lighting equipment, is hereby amended to read as follows:

R404.1.1 Fuel gas lighting equipment. Fuel gas lighting systems shall not be installed.

~~56.~~ **61.** A new *Section R404.4 Electric vehicle charging infrastructure for new construction and building addition of 50% or more of original square footage*, is hereby added to read as follows:

Section R404.4 Electric vehicle charging infrastructure for new construction and building addition of 50% or more of original square footage. Electric infrastructure for the current and future charging of *electric vehicles* shall be installed in accordance with this section per Section 17.20.170 of the Louisville Municipal Code. *EV ready spaces and EV capable spaces* are permitted to be counted toward meeting minimum parking requirements.

R404.4.1 One- and two- family dwellings and townhouses. One- and two-family dwellings and townhouses with a dedicated attached or detached garage or on-site parking spaces shall be provided with electric vehicle charging in accordance with Section 17.20.170 of the Louisville Municipal Code.

R404.4.1.1 Minimum EV Ready infrastructure. Minimum EV Ready Space infrastructure shall require the following:

1. Installation of conductors:
 - a. Conductors shall be installed of sufficient size to accommodate a minimum 240VAC 40Amp branch circuit to each parking space where required.
 - b. Conductors shall terminate in either a receptacle, plug, junction or outlet box, or an *EVSE* installed in the parking space.
2. The electrical panel directory shall designate the branch circuit as “EV Ready” and the junction box or receptacle shall be labelled “EV Ready.”

R404.4.1.2 Construction documents. Construction documents shall graphically indicate and label all EV ready spaces and associated termination locations. For all Townhouses and one- and two-family dwellings with an electrical utility service 200 Amps or greater, a panelboard schedule shall be provided indicating the EV Ready circuit breaker space(s) and the circuit designation(s).

R404.4.2 Group R occupancies. Group-R occupancies (R-2, R-3, and R-4 buildings three stories and less) with three or more dwelling units and/or sleeping units shall be provided with electric vehicle

charging in accordance with Section 17.20.170 of the Louisville Municipal Code.

Electric vehicle charging shall be provided and installed in accordance with this section and the National Electrical Code (NFPA 70). When parking spaces are added or modified without an increase in building floor area, only the new parking spaces are subject to this requirement.

~~57.~~ **62.** A new *Section R404.5 Additional electric infrastructure*, is hereby added to read as follows:

R404.5 Additional electric infrastructure. *Combustion equipment* shall be installed in accordance with this section.

R404.5.1 Combustion equipment and end-uses. *Combustion equipment* shall be provided with a dedicated, appropriately phased circuit that shall have a minimum amperage requirement for a comparable electric appliance, equipment or end use, an electrical receptacle or junction box that is connected to the electric panel, and conductors of adequate capacity within 6 feet (1829 mm) of the appliance or equipment.

Each such circuit shall be accessible with no obstructions. A reserved circuit breaker space shall be installed in the electrical panel adjacent to the circuit breaker for the branch circuit and labeled for each circuit. Both ends of the unused conductor or conduit shall be labeled "For Future Electric Equipment" and be electrically isolated.

~~58.~~ **63.** *Section R405 Total building performance*, is deleted in its entirety.

~~59.~~ **64.** *Section R406.3 Building thermal envelope*, is hereby deleted and replaced with the following:

R406.3 Building thermal envelope. Building and portions thereof shall comply with Table R406.3.

Table R406.3
Average of the Insulation and Fenestration Requirements by Component

Roof	R-60
Above grade walls	R-21
Below grade walls	R-21
Floors	R-38
Non heated slab on grade	R-10 for 4ft

Heated slab on grade	R-15 for 4 ft + R-5 under full slab
Fenestration U-Factor	.30
Fenestration SHGC	.33
Skylight U-Factor	.50
Skylight SHGC	.40

~~60.~~ **65.** *Section R406.3.1 On-site renewables are not included,* is deleted in its entirety.

~~61.~~ **66.** *Section R406.3.2 On-site renewables are included,* is deleted in its entirety.

~~62.~~ **67.** *Section R406.3.2 Tropical Climate Region Compliance Path,* is deleted in its entirety.

~~63.~~ **68.** *Section R505.1 General,* is hereby amended to remove the exception.

~~64.~~ **69.** *Section R505.1.1 Unconditioned space,* is hereby deleted and replaced with the following:

R505.1.1 Unconditioned space. Any unconditioned or low-energy space that is altered to become a conditioned space shall comply with Section R503.

Sec.15.18.040. – Design criteria.

All new heated commercial and residential heated structures shall meet the following design criteria:

1. **Non-reducible Snow roof snow load:** 30 pounds per square foot.
2. Wind speed:
 - a. 145 miles per hour three second gust ASCE-7-10;
 - b. ASTM D3161 test with Class F Application.
3. Wind exposure: “C”, unless in the opinion of the Chief Building Official greater restrictions are needed to protect public safety.
4. Seismic zone: B.
5. Frost line depth: 36 inches below finished grade.

6. Weathering: Severe – Climate Zone 5B.
7. Termite: Slight.
8. Decay: Slight.
9. Winter design temperature: one degree.
10. Anticipated snow: six inches.
11. Ice and water shield: required on all shingled roofs – eaves only. Shields must extend from the lowest edges to a point at least 24 inches inside the exterior wall line of the building.
12. Drip edge: required on both eaves and rakes of roof.
13. Air freezing index: less than 1000.
14. Mean annual temperature: 47 degrees.
15. Elevation: 5,337 feet above sea level.
16. Sump pumps:
 - a. Cannot drain into sanitary or storm sewer;
 - b. Must daylight into lawn away from foundation;
 - c. Perimeter foundation systems must daylight or drain into sump pit and then sump pump, and sump pump must drain into lawn.
17. Drainage from house: slope at least six inches in the first ten feet.
18. Retaining walls:
 - a. Less than 48 inches from the bottom of the footing to the top of the retaining wall with no surcharge: no permit required.
 - b. More than 48 inches from bottom of footing to top of retaining wall, or any wall with surcharge: requires stamped engineering plans.
19. Backflow preventer: required on all residential irrigation systems (see cross connection control regulations).
20. Hot water heaters:

- a. Expansion tanks required for all hot water heaters;
- b. Drain pan required if placed on wood floor.

Sec.15.18.050. - Applicability.

Notwithstanding anything in the International Energy Conservation Code to the contrary, a developer/owner of a residential or commercial building may elect an inspection in accordance with the policies and procedures of the International Energy Conservation Code, as amended herein.

Sec. 15.18.060. - Copies available.

At least one copy of the International Energy Conservation Code, 2021 Edition, as amended herein, certified to be true and accurate, shall be available for public inspection at the office of the Building Safety Division, during business hours. The city clerk shall at all times maintain a reasonable supply of copies of the code available for purchase by the public at a moderate price. Electronic copies are available, without amendment, at <https://codes.iccsafe.org/public/collections/I-Codes>.

Sec. 15.18.070. - Violations and penalties.

It shall be unlawful for any person, firm, or corporation to erect, construct, enlarge, alter, repair, move, improve, remove, convert or demolish, equip, use, occupy or maintain any building or structure or cause or permit the work to be done, in violation of the provisions of this chapter or the terms of the code or standards adopted and incorporated in this chapter. Any person convicted of a violation of any provision of this chapter or of the provisions of the code or standards adopted and incorporated in this chapter shall be subject to the penalty provided in section 1.28.010.

Section 2. Chapter 15.60 of the Louisville Municipal Code is hereby repealed.

Section 3. Title 17 the Louisville Municipal Code is hereby amended by the addition of a new Section 17.20.170 to read as follows:

Sec. 17.20.170. – Electric vehicle charging infrastructure. ~~Vehicle-Charging Infrastructure.~~

A. Purpose and Intent. The purpose and intent of this section is to facilitate and encourage the use of electric vehicles, to expedite the establishment of convenient and cost-effective electric vehicle infrastructure, and establish the minimum requirements for such infrastructure to serve both short and long-term parking needs.

B. Definitions. The following definitions shall apply to this Section:

Electric vehicle charging stations (EVCS) means a public or private parking space that is served by battery charging station equipment that has as its primary purpose the transfer of electric energy (by conductive or inductive means) to a battery or other energy storage device in an electric vehicle.

Electric vehicle charging station – private restricted use means an electric vehicle charging station that is:

1. Privately owned and restricted access (e.g., single-family dwelling unit, executive parking, designated employee parking, assigned parking at multi-family residential building); or
2. Publicly owned and restricted (e.g., fleet parking with no access to the general public).

Electric vehicle charging station – public use means an electric vehicle charging station that is:

1. Publicly owned and publicly available (e.g., Park-n-ride, public library parking lot, Recreation and Senior Center lot, etc); or
2. Privately owned and available to visitors of the use (e.g., shopping center, hotel, office, etc.)

Electric vehicle parking space means any marked parking space that identifies the use to be exclusively for the parking of an electric vehicle.

C. Number of required electric vehicle charging stations. The following table sets forth the number of required charging stations for all new development or redevelopments as required in Chapter 15.18 of the Louisville Municipal Code. This list is not intended to be exhaustive of each use category, however is intended to establish general categories of use tiers. The Director of Planning and Building Safety shall determine the appropriate tier if the use is not identified in the table below.

1. Requirements will be rounded up to the nearest whole number.
2. Minimum electrical and hardware requirements for EVSE Installed, EV Ready, and EV Capable are set forth in Chapter 15.18 of the Louisville Municipal Code.

	EV Installed	EV- Ready	EV Capable
Residential Uses			
Single-Family unit		1 space	1 space

Multi-Family unit, with dedicated parking spaces or garages		1 space	1 space
Tier 1			
Multi-Family, without dedicated parking spaces or garages			
Hotel, Motel, Extended Stay Lodging Facility	10% of spaces	10% of spaces	50% of spaces
Tier 2 – Employment oriented uses			
Business and Professional Offices			
General research facilities, light industrial facilities including manufacturing, assembly, warehouse and fabrication	7% of spaces	10% of spaces	15% of spaces
Hospital			
Tier 3 – Service and Sales oriented uses			
Private and public recreational and social facilities, membership clubs, lodges, and fraternal organizations			
Religious institution			
Commercial amusement, indoor and outdoor			
Schools, including public, private, vocational or business	5% of spaces	10% of spaces	10% of spaces
Restaurant			
Retail			
Personal service			
Medical and dental clinics			

D. Permitted locations.

1. EVCS are permitted in every zoning district when accessory to a principal permitted use. Such stations located a single-family and designated multi-family units shall be private restricted use only.

2. If the primary use of the parcel is the retail electric charging of vehicles, then the use shall be considered an automotive fueling station for zoning purposes. Installation shall be located in zone districts which permit this use.

E. General requirements.

1. Accessible spaces. A charging station will be considered accessible if it is located adjacent to, and can serve, an accessible parking space as

defined and required by the ADA. It is not necessary to designate the EVSE exclusively for the use of vehicles parked in the accessible space.

2. EVCS – public use shall be subject to the following requirements.

a. The EVCSs shall be located in a manner that will be easily seen by the public for informational and security purposes.

b. The EVCSs shall be located in desirable and convenient parking locations will serve as an incentive for the use of electric vehicles.

c. The EVCSs must be operational during the normal business hours of the use(s) that it serves.

d. The EVSE shall be maintained in all respects, including the functioning of equipment. A phone number or other contact information shall be provided on the equipment for reporting problems with the equipment or access to it.

e. The property owner may collect a service fee for the use of EVSE.

F. The requirements of this section shall be implemented through the building permit process and shall apply to:

1. All new construction, expansion or modification projects for which a building permit has not been issued as of November 24, 2021; and

2. All planned unit developments for which a building permit has not been issued as of November 24, 2021, irrespective of whether such planned unit development was approved or approved and recorded prior to such date, unless a waiver was expressly granted through the planned unit development review process set forth in Chapter 17.28.

Section 4. If any article, section, paragraph, sentence, clause, or phrase of this ordinance is held to be unconstitutional or invalid for any reason, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The City Council hereby declares that it would have passed this ordinance and each part or parts hereof irrespective of the fact that any one part or parts be declared unconstitutional or invalid.

Section 5. The repeal or modification of any provision of any prior ordinance by this ordinance shall not release, extinguish, alter, modify, or change in whole or in part any penalty, forfeiture or liability, either civil or criminal, which shall have been incurred under such provision, and each provision shall be treated and held as still remaining in force for the purpose of sustaining

any judgment, decree, or order which can or may be rendered, entered, or made in such actions, suits, proceedings, or prosecutions.

Section 6. All other ordinances or portions thereof inconsistent or conflicting with this ordinance or any portion hereof are hereby repealed to the extent of such inconsistency or conflict.

INTRODUCED, READ, PASSED ON FIRST READING, AND ORDERED PUBLISHED this 21st day of September, 2021.

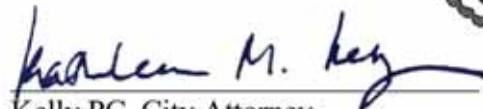

Ashley Stolzmann, Mayor

ATTEST:

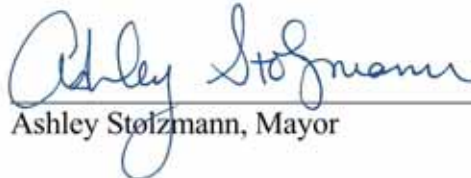

Meredyth Muth, City Clerk



APPROVED AS TO FORM:


Kelly PC, City Attorney

PASSED AND ADOPTED ON SECOND AND FINAL READING, this 19th day of October, 2021.


Ashley Stolzmann, Mayor

ATTEST:


Meredyth Muth, City Clerk



**ORDINANCE NO. 1845
SERIES 2022**

(Second reading amendments shown with deleted text in ~~**Bold Strikethrough**~~
and new text in **Bold Double Underline**.)

**AN ORDINANCE AMENDING CHAPTER 15.18.030 OF THE LOUISVILLE
MUNICIPAL CODE CONCERNING AMENDMENTS AND DELETIONS TO THE 2021
INTERNATIONAL ENERGY CONSERVATION CODE TO INCLUDE
REQUIREMENTS FOR COMMERCIAL ENERGY USE INTENSITY PERFORMANCE
TARGETS AND RESTRICTIONS OF FOSSIL FUEL SPACE AND WATER HEATING
EQUIPMENT**

WHEREAS, the City Council has adopted from time to time certain building and construction standards; and

WHEREAS, it is deemed to be in the interest of the public health, safety and general welfare to adopt by reference thereto the 2021 edition of the International Energy Conservation Code; and

WHEREAS, the City of Louisville remains committed to its adopted goals to reduce energy consumption, increase clean energy sources, and support the transition to a low-carbon community as outlined in the Sustainability Action Plan and Resolution 25, Series 2019, “A Resolution Setting Clean Energy and Carbon Reduction Goals”; and

WHEREAS, reducing building energy consumption is an effective strategy to reduce community-wide energy consumption and increase long-term cost savings for businesses; and

WHEREAS, the City Council desires to add requirements for energy use intensity performance standards and building electrification to build a more resilient building stock and support future building electrification efforts pursued and businesses; and

WHEREAS, the City Council, after proper notice as required by law, has held a public hearing on this ordinance providing for the adoption of said codes; and

WHEREAS, the 2021 edition of the International Energy Conservation Code, with amendments, has been submitted to the City Council in writing and the City Council has determined that such codes should be adopted as herein set forth.

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY
OF LOUISVILLE, COLORADO:**

Chapter, 15.18.030 of the Louisville Municipal Code, concerning amendments and deletions to the 2021 International Energy Conservation Code, is hereby amended to read as follows, with new text in underline:

1. Section C202 GENERAL DEFINITIONS is amended to add the following definitions in alphabetical order:

EMERGENCY POWER SYSTEM. A source of automatic electric power of a required capacity and duration to operate required life safety, fire alarm, detection, and ventilation systems in the event of a failure of the primary power. Emergency power systems are those required for electrical loads where interruption of the primary power could result in loss of human life or serious injuries.

ENERGY USE INTENSITY (EUI). The annual building site energy use per square foot of gross floor area in units of kBtu/sq ft.

STANDBY POWER SYSTEM. A source of automatic electric power of a required capacity and duration to operate required building, hazardous materials or ventilation systems in the event of a failure of the primary power. Standby power systems are those required for electrical loads where interruption of the primary power could create hazards or hamper rescue or fire-fighting operations.

2. Section C401.2 Application is deleted in its entirety and replaced as follows:

C401.2. Commercial *buildings* and their building site shall comply with one of the following, as applicable:

C401.2.1 Performance targets. New commercial *building* types included in the scope of Appendix PT shall comply with Appendix PT and Sections C403.2.4 and C404.10.

C401.2.2 Core and shell. Core and shell buildings shall comply with the provisions of Section C402.1.3 through C402.5. When mechanical systems are installed, core and shell buildings shall also meet the provisions in **C403.2.4, C404.10, and** Section C408.

C401.2.2.1 Core and shell buildings shall submit a letter of agreement to the City stating the tenant spaces included in the scope of Appendix PT shall meet the EUI target established in Table PT103, and shall include these requirements in their lease or purchase agreements.

C401.2.3 Tenant finish. Tenant finishes included in the scope of Appendix PT shall comply with Appendix PT **and C403.2.4 and C404.10**. All other tenant finishes shall comply with the Prescriptive Compliance option, which requires compliance with Sections C401.3, C401.4, C402 through C406, and C408.

C401.2.4 Other commercial building types. Commercial *building* types not included above shall comply with the Prescriptive Compliance option, which requires compliance with Sections C401.3, C401.4, C402 through C406, and C408.

Exception: Additions, alterations, repairs, and changes of occupancy to existing buildings complying with Chapter 5.

3. Section C403.2 System design is modified as follows:

C403.2 System design. Mechanical systems shall be designed to comply with Sections C403.2.1 through ~~C403.2.3~~ C403.2.4. Where elements of a building's mechanical systems are addressed in Sections C403 through C403.14, such elements shall comply with the applicable provisions of those sections.

4. Section C403.2.4 Space heating equipment is added as follows:

C403.2.4 Space heating equipment. Fossil-fuel ~~warm-air furnaces appliances~~ and electric resistance space heating equipment shall not be permitted for space heating.

Exceptions:

1. **Emergency backup.** Where it is required by an applicable law or regulation to provide space heating with an emergency power system or a standby power system.
2. ~~Where cfm/sq. ft. ventilation requirements result in conditions where the Building Official determines that space heating requirements cannot reasonably be met without combustion space heating systems.~~
2. **3. Certain make-up air systems.** Electric resistance in make-up air systems where energy recovery ventilation is prohibited by the International Mechanical Code.
3. **4. Supplementary heat.** Electric resistance heat used for supplementary heat in accordance with Section C403.4.1.1
4. **5. Electric resistance budget. In addition to any exceptions in this section, Up to 5 W of electric resistance space heating per square foot of conditioned floor area in the building, not including supplementary heat.**
Electric resistance heating elements integrated into heat pump equipment.
5. **6. Integrated units.** Electric resistance heating elements integrated into heat pump equipment.
6. **7. Heated plenums.** Electric resistance in heated plenums.
7. **Temporary systems. Temporary electric resistance heating systems are permitted where serving future tenant spaces that are unfinished and unoccupied, provided that the heating equipment is sized and controlled to**

achieve interior space temperatures no higher than needed to prevent freezing.

8. Freeze protection. Electric resistance for freeze protection elements. Electric resistance in heating systems intended for freeze protection.
9. Outdoor systems. Equipment used for outdoor heating.
10. Specific conditions. Portions of buildings that require fossil fuel or electric resistance space heating for specific conditions approved by the Building Official for research, health care, process or other specific needs that cannot practicably be served by heat pump or other space heating systems. This does not constitute a blanket exception for any occupancy type.
11. 10. Replacements. Replacement fuel-fired furnace equipment appliances.

5. Section C404.10 Water heating equipment is added as follows:

C404.10 Water heating equipment. Fossil fuel and electric resistance instantaneous and storage water heaters shall not be used to provide hot water.

Exceptions:

1. Emergency backup. Where it is required by an applicable law or regulation to provide water heating with an emergency power system or a standby power system.
2. 4. Integrated units. Resistance heating elements integrated into heat pump water heating equipment.
3. 2. Recirculation loops. Electric resistance elements used for recirculation loop temperature maintenance.
4. 3. Small systems. Electric storage water heaters with a rated water storage volume no greater than 20 gallons.
5. 4. Point-of-use systems. Instantaneous electric water heaters located within 10 feet of the point of use.
6. 5. Renewable electricity. Electric resistance equipment where not less than 100 percent of the annual service water-heating requirement is provided by an on-site renewable energy system not used to meet any other provision of this code.
7. 6. Renewable or waste thermal energy. Electric resistance storage water heating equipment in buildings where not less than 75% of the annual service water heating requirement is met by a solar thermal system or other renewable thermal system.
8. 7. High-temperature requirements. Water heating systems that serve end-uses or have a storage requirement that necessitates a water temperature of 141°F (55°C) or hotter.
9. Electric resistance budget. In addition to any exceptions in this section, a budget of 24 kW plus 0.1 watts per square foot of building area of electric resistance service water heating capacity per building.
10. Commercial kitchens. Electric booster-heaters serving commercial dishwashers, commercial food service equipment, and other approved

process equipment that require supply water temperatures of 120°F (49°C) or higher.

11. 8. Replacements. Replacement of gas-fired storage water heaters or instantaneous water heaters.

APPENDIX PT
MODELING TO A PERFORMANCE TARGET

PT101 Scope. This section establishes criteria for demonstrating compliance with a performance target, and is required for new multifamily (occupancy R-2), offices greater than 5,000 ft², primary and secondary schools, parking garages, and warehouses. All end use load components within and associated with the building and their building sites shall be modeled.

PT102 Mandatory requirements. The requirements in this section are mandatory requirements and shall be required in addition to the provisions of ASHRAE 90.1 Appendix G.

PT103 Performance target. Projects of the types listed in Table PT103 shall demonstrate that the proposed design reaches a fixed energy use intensity (EUI) less than or equal to the values in Table PT103, calculated utilizing the energy modeling procedures of Appendix G of ASHRAE 90.1. For *buildings* with multiple occupancy types, the modeled performance target shall be a weighted average of the floor area of each occupancy type.

Exception: Energy used for electric vehicle charging, data centers, and process loads shall be excluded from compliance modeling.

TABLE PT103
PERFORMANCE TARGETS

BUILDING TYPE	PERFORMANCE TARGET (kBtu/ft²)
Multifamily (Occupancy R-2)	<u>32</u>
Office, small (>5,000 ft ²)	<u>19</u>
Office, medium (5,000 – 50,000 ft ²)	<u>23</u>
Office, large (>50,000 ft ²)	<u>28</u>
School, primary	<u>34</u>
School, secondary	<u>31</u>
Warehouse	<u>11</u>

PT104 Renewable Energy. On-site renewable energy generated by a system installed as part of this project that is used by the building shall be subtracted from the proposed design energy consumption prior to calculating the proposed building performance.

PT105 Performance documentation. Documentation to verify compliance with this section shall be provided to the code official.

PT105.1 Projected compliance report. Permit submittals shall include a report documenting the proposed design is projected to meet the EUI target. The compliance report shall include the following specific information beyond the information required in ASHRAE 90.1 Appendix G:

1. Address of the building.
2. An inspection checklist documenting the building component characteristics of the proposed design.
3. Name of individual completing the report.
4. Name and version of compliance software tool.
5. Documentation of the reduction in energy use associated with on-site energy.

PT105.2 Construction plan requirements. Construction plans shall depict all component characteristics of the proposed design utilized for the EUI in accordance with ASHRAE 90.1 Appendix G.

PT105.3 Measured performance report. Projects shall demonstrate compliance with this code by documenting that the building has achieved the EUI performance calculated based on 12 months of metered energy use after occupancy.

PT105.3.1 Demonstration of operating energy use. Metered energy data demonstrating compliance with the EUI target shall be reported to the building official using Energy Star Portfolio Manager and adjusted for the percentage of floor area occupied. While at least 75 percent occupied, the building shall operate at or below its assigned energy use target established in Section PT103 for any recording period of 12 consecutive months that is completed within three years of the date of the Certificate of Occupancy. The owner shall notify the building official when this 12-month period has been successfully completed.

PT106 Energy metering and monitoring. All projects must install submetering or monitoring capabilities to support building energy performance analysis. The project must include capabilities to store and access a 24-month continuous data set on an ongoing basis.

PT106.1 End-use monitoring. Measurement devices shall be installed in new buildings to monitor the electric energy use of each of the following separately:

1. Total electric energy.
2. HVAC systems energy use.
3. Interior lighting.
4. Exterior lighting.
5. Receptacle circuits.
6. Data centers representing over 10 percent of total building load or 5 percent of building floor area.
7. Other process loads that represent 10 percent or more of total building energy use based on building energy use modeling.

PT106.2 Independent metering. The following items shall be independently metered. Individual meters used to comply with this section may not serve multiple buildings.

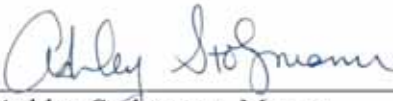
1. All fuel sources serving the building.
2. Energy production from on-site renewable energy systems.
3. Electric vehicle (EV) supply equipment.
4. Data centers representing over 10 percent of total building load or 5 percent of building floor area.
5. Other process loads that represent 10 percent or more of total building energy use based on building energy use modeling.
6. Individual tenant energy loads.

6. Section R202 GENERAL DEFINITIONS is amended as follows:

RESIDENTIAL BUILDING. For this code, includes detached one- and two-family dwellings and townhouses, as well as Group R-2 other than for multifamily, R-3, and R-4 buildings three stories or less in height above grade plane with separate means of egress.

MULTIFAMILY. Apartments, condominiums, and other similar-type buildings regardless of the number of stories.

INTRODUCED, READ, PASSED ON FIRST READING, AND ORDERED PUBLISHED
this 15th day of November, 2022.



Ashley Stolzmann, Mayor

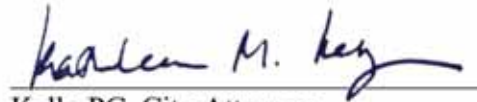
ATTEST:



Meredyth Muth, City Clerk

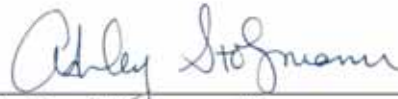


APPROVED AS TO FORM:



Kelly PC, City Attorney

PASSED AND ADOPTED ON SECOND AND FINAL READING, this 20th day of December, 2022.



Ashley Stolzmann, Mayor

ATTEST:



Meredyth Muth, City Clerk



ORDINANCE NO. ____, SERIES 2024

**AN ORDINANCE AMENDING CHAPTER 15.18.030 OF THE LOUISVILLE
MUNICIPAL CODE CONCERNING THE 2021 INTERNATIONAL ENERGY
CONSERVATION CODE**

WHEREAS, the City Council has adopted from time-to-time certain building and construction standards; and

WHEREAS, it is deemed to be in the interest of the public health, safety and general welfare to adopt by reference thereto the 2021 edition of the International Energy Conservation Code with amendments and additions to such code; and

WHEREAS, the City Council adopted Ordinance No. 1816, Series 2021 and Ordinance No. 1845, Series 2022, which included the adoption of Appendix RC to the 2021 edition of the International Energy Conservation Code, and provisions for electric space and water heating provisions for commercial development, and a new Appendix PT setting standards for energy ratings for certain commercial development; and

WHEREAS, following additional research and public input on the provisions adopted in Ordinance No. 1816, Series 2021 and Ordinance No. 1845, Series 2022, the City desires to make certain amendments to such codes to ensure the feasibility of implementation of the codes; and

WHEREAS, the City of Louisville remains committed to its adopted goals to reduce energy consumption, increase clean energy sources, and support the transition to a low-carbon community as outlined in the Sustainability Action Plan and Resolution 25, Series 2019, A Resolution Setting Clean Energy and Carbon Reduction Goals; and

WHEREAS, reducing building energy consumption is an effective strategy to reduce community-wide energy consumption and increase long-term cost savings for businesses; and

WHEREAS, the City Council is committed to environmental, economic and social sustainability, ensuring the International Energy Conservation Code is attainable for current and future business owners and tenants, supporting affordable housing and local businesses development; and

WHEREAS, the City Council, after proper notice as required by law, has held a public hearing on this ordinance providing for amendments to said codes.

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY
OF LOUISVILLE, COLORADO:**

Section 1. Section 15.18.030 of the Louisville Municipal Code, concerning amendments and deletions to the 2021 International Energy Conservation Code, is hereby amended as follows (deleted text in ~~striketrough~~ and new text underlined):

1. *Section C101.1 Title*, is amended to insert "the City of Louisville" so the section will read:

C101.1 Title. These regulations shall be known as the Energy Conservation Code of the City of Louisville, and shall be cited as such. It is referred to herein as "this code."

2. *Section C103.2 Information on construction documents*, is hereby amended to read as follows:

C103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment herein governed. Details shall include the following as applicable:

1. Energy compliance path.
2. Insulation materials and their *R*-values
3. Fenestration *U*-factor and solar heat gain coefficients (SHGCs).
4. Area-weighted *U*-factor and solar heat gain coefficient (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water heating systems and equipment types, sizes, fuel source and efficiencies.
7. Economizer description.
8. Equipment and system controls.
9. Fan motor horsepower (hp) and controls.
10. Duct sealing, duct and pipe insulation and location.
11. Lighting fixture schedule with wattage and control narrative.
12. Location and *daylight* zones on floor plans.
13. Air barrier and air sealing details, including the location of the air barrier.
14. Location of pathways for routing of raceways or cable from the solar ready zone to the electrical service panel.

3. *Section C202 General Definitions*, is hereby amended by adding, in alphabetical order, the following definitions:

All-Electric Building: A building that contains no combustion equipment, including piping or plumbing for combustion equipment, installed within the building or building site.

Combustion Equipment: Any equipment or appliance used for space heating, service water heating, cooking, clothes drying and/or lighting that uses fuel gas or fuel oil.

~~*Electric Vehicle (EV):* A vehicle registered for on-road use, primarily powered by an electric motor that draws current from a rechargeable storage source that is charged by being plugged into an electrical current source.~~

~~*Electric Vehicle Supply Equipment (EVSE):* The electrical conductors and associated equipment external to the electric vehicle that provide a connection between the premises wiring and the electric vehicle to provide electric vehicle charging.~~

~~*Electric Vehicle Capable Space:* A designated parking space that is provided with conduit sized and rated for a minimum 40-amp, 208/240 Volt dedicated branch circuit and shall be no less than 1" in size. Conduit must be continuous from the future or existing electrical panelboard or switchboard location(s) and end at a junction box or receptacle located within close proximity of the parking space. The electrical panel serving the parking space shall have sufficient capacity and physical space for a dual-pole, 40-amp breaker. The conduit shall be sealed at the junction or outlet box that is capped off, with the conduit sealed and the cap labeled as "For future electric vehicle charging".~~

~~*Electric Vehicle Ready Space:* A designated parking space that is provided with a dedicated branch circuit with wiring capable of supporting a minimum 40-ampere, 208/240 Volt circuit that terminates at a receptacle, plug, junction box, or an installed electric vehicle supply equipment within close proximity of the parking space. There shall be adequate reserved space in an electrical panelboard or switchboard to meet the electric vehicle requirements.~~

~~*Electric Vehicle Supply Equipment (EVSE) Installed Space:* A designated parking space with dedicated electric vehicle supply equipment capable of supplying a minimum 40-amp, dedicated circuit rated at 208/240 Volt from a building electrical panelboard.~~

Emergency Power System: A source of automatic electric power of a required capacity and duration to operate required life safety, fire alarm, detection, and ventilation systems in the event of a failure of the primary power. Emergency power systems are those required for electrical loads where interruption of the primary power could result in loss of human life or serious injuries.

Energy Use Intensity (EUI): The annual building site energy use per square foot of gross floor area in units of kBtu/sq ft.

Residential Building: I

Standby Power System: A source of automatic electric power of a required capacity and duration to operate required building, hazardous materials or ventilation systems in the event of a failure of the primary power. Standby power systems are those required for electrical loads where interruption of the primary power could create hazards or hamper rescue or fire-fighting operations.

Tenant Finish: The first tenant occupying a space(s) in a core and shell. Multiple tenants may be considered as a tenant finish until the entire space within the core and shell has had a tenant. Once a space within a core and shell has been occupied it becomes an existing building.

4. *C401.2. Commercial buildings shall comply with ~~Section C401.2.1~~ one of the following, as applicable*

C401.2.1 Performance targets. New commercial building types included in the scope of Appendix PT shall comply with Appendix PT and Sections C403.2.4 and C404.10.

C401.2.2 Core and shell. Core and shell buildings shall comply with the provisions of Section C402.1.3 through C402.5. When mechanical systems are installed, core and shell buildings shall also meet the provisions in C403.2.4, C404.10, and Section C408.

C401.2.2.1 Core and shell buildings shall submit a letter of agreement to the City stating the tenant spaces included in the scope of Appendix PT shall meet the EUI target established in Table PT103 and shall include these requirements in their lease or purchase agreements.

C401.2.3 Tenant finish. Tenant finishes included in the scope of Appendix PT shall comply with Appendix PT and C403.2.4 and C404.10. All other tenant finishes shall comply with the Prescriptive Compliance option, which requires compliance with Sections C401.3, C401.4, C402 through C406, and C408.

C401.2.4 Other commercial building types. Commercial building types not included above, including additions, shall comply with the Prescriptive Compliance option, which requires compliance with Sections C401.3, C401.4, C402 through C406, and C408.

Exception: ~~Additions, alterations,~~ Alterations, repairs, and changes of occupancy to existing buildings complying with Chapter 5.

5. *Section C401.2.1 International Energy Conservation Code*, is hereby deleted and replaced to read as follows:

C401.2.1 International Energy Conservation Code

Commercial buildings shall be built all-electric unless the fuel gas options of C403.3.2 and the additional electric infrastructure requirements of C405.14 are met. All buildings must comply with the following:

City of Louisville's Prescriptive Compliance. The Prescriptive Compliance option requires compliance with Sections C401.3, C401.4, C402 through C406, and Section C408.

Core and shell buildings shall be required to comply with the provisions of Section C402.1.3 through C402.5 of the 2021 International Energy Conservation Code.

6. *Section C401.2.2 ASHRAE 90.1*, is hereby deleted in its entirety.
7. *A new Section C401.4 Mandatory Requirements for Commercial Buildings*, is hereby added to read as follows:

C401.4 Mandatory Requirements for Commercial Buildings. Commercial buildings must comply with Table C401.4.

Table C401.4 (Mandatory)
Requirements for Commercial Buildings

Title	IECC Section
Air leakage	C402.5
Calculation of heating and cooling loads	C403.1.1
Data centers	C403.1.2
System Design	C403.2
Heating and cooling equipment efficiency	C403.3
Heating and cooling system controls	C403.4, except C403.4.3, C403.4.4, C403.4.5
Economizer fault detection and diagnostics	C403.5.5
Ventilation and exhaust systems	C403.7, except C403.7.4.1
Fan and fan controls	C403.8, except C403.8.6
Large diameter ceiling fans	C403.9
Refrigeration equipment performance	C403.11, except C403.11.3
Construction of HVAC system elements	C403.12
Mechanical systems located outside of the building thermal envelope	C403.13

Service water heating	C404
Electrical power and lighting systems	C405, except C405.3
Maintenance information and system commissioning	C408

8. *Table C402.1.3 Opaque Thermal Envelope Insulation Component Minimum Requirements, R-Value Method*, is hereby deleted and replaced with the following:

Table C402.1.3 (Mandatory)
Opaque Thermal Envelope Insulation Component of an Average Minimum Requirements, R-Value Method in following locations:

Roof C402.2.3	
Insulation entirely above roof deck	R-49
Metal buildings ^a	R-21 + R-11 LS
Attic and other	R-49
Walls. Above grade C402.2.2	
Mass ^d	R-21
Metal buildings	R-21 + <u>R-10ci</u>
Metal framed	R-21+ <u>R-10ci</u>
Wood framed and other	R-21
Walls, Below grade C402.2.5	
Below-grade wall ^b	R-10
Floors C402.2.3	
Mass ^c	R-21
Joist/framing	R-38
Slab-on-grade floors C402.2.4	
Unheated	R-20 for 24" below
Heated ^e	R-15 for 36" below + R-5 full slab

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 4.88 kg/m², 1 pound per cubic foot = 16 kg/m³.

NR = No Requirement, LS = Liner System.

a. Where using R-value compliance method, a thermal spacer block shall be provided,

b. Where heated slabs are below grade, below-grade walls shall comply with the exterior insulation requirements for heated slabs.

c. "Mass floors" shall be in accordance with Section C402.2.3.

d. "Mass walls" shall be in accordance with Section C402.2.2.

e. The first value is for perimeter insulation and the second value is for full, under-slab insulation.

9. *Section C402.1.4 Assembly U-factor, C-factor or F-factor-based method*, is hereby deleted in its entirety.

10. *Section C402.1.5 Component performance alternative*, is hereby deleted in its entirety.

11. *Table C402.4 Building Envelope Fenestration Maximum U-Factor and SHGC Requirements*, is hereby deleted and replaced with the following:

Table C402.4
Building Envelope Fenestration

Vertical Fenestration	
Maximum U-Factor	0.45
Maximum SHGC	0.33
Maximum air leakage rate for all fenestration except curtain walls and storefront glazing	.20 cfm/ft2
Maximum air leakage rate for curtain walls and storefront glazing	.06 cfm/ft2
Skylights	
Maximum U-Factor	0.50
Maximum SHGC	0.40
Maximum Air leakage rate	.20 cfm/ft2

12. ~~Section C402.4.1 Maximum area~~, is hereby deleted and replaced with the following:

~~C402.4.1 Minimum area of natural lighting. Not less than eight percent of the floor area shall be glazed.~~

13. ~~Section C402.4.2 Minimum skylight fenestration area~~, is hereby deleted and replaced with the following:

~~**C402.4.2 Minimum area of natural lighting.** A minimum skylight area of three percent of the roof area shall be provided for all roofs.~~

~~Exception: Roof areas designated for solar ready zones shall not be included in roof area calculation.~~

12. **C403.2 System design.** Mechanical systems shall be designed to comply with Sections C403.2.1 through ~~403.2.3~~ C403.2.4. Where elements of a building's mechanical systems are addressed in Sections C403 through C403.14, such elements shall comply with the applicable provisions of those sections.

13. Section C403.2.4 Space heating equipment is added as follows:

C403.2.4 Space heating equipment. Fossil-fuel warm air furnaces appliances and electric resistance space heating equipment shall not be permitted for space heating in new construction.

Exceptions:

1. *Emergency backup*. Where it is required by an applicable law or regulation to provide space heating with an emergency power system or a standby power system.
2. *Certain make-up air systems*. Electric resistance in make-up air systems where energy recovery ventilation is prohibited by the International Mechanical Code.
3. *Supplementary heat*. Electric resistance and natural gas/ propane heat used for supplementary heat in accordance with Section C403.4.1.1
4. *Electric resistance budget*. In addition to any exceptions in this section, Up to 5 W of electric resistance space heating per square foot of conditioned floor area in the building, not including supplementary heat.
5. *Integrated units*. Electric resistance heating elements, natural gas, propane supplemental heating integrated into heat pump equipment.
6. *Heated plenums*. Electric resistance in heated plenums.
7. *Temporary systems*. Temporary electric resistance heating systems are permitted where serving future tenant spaces that are unfinished and unoccupied, provided that the heating equipment is sized and controlled to achieve interior space temperatures no higher than needed to prevent freezing.
8. *Freeze protection*. Electric resistance in heating systems intended for freeze protection.
9. *Outdoor systems*. Equipment used for outdoor heating.
10. *Specific conditions*. Portions of buildings that require fossil fuel or electric resistance space heating for specific conditions approved by the Building Official for research, health care, process or other specific needs that cannot practicably be served by heat pump or other space heating systems. This does not constitute a blanket exception for any occupancy type.
11. *Replacements*. Replacement fuel-fired appliances.
12. *Backup heat*. For back up heat to operate when the heat pump cannot adequately heat the space/buildings due to extreme cold weather.
13. Where cfm/sq. ft. ventilation requirements result in conditions where the Building Official determines that space heating requirements cannot reasonably be met without combustion space heating systems.

14. Section C403.2.5 Heat pump efficiencies is added as follows:

C403.2.5. Heat pump efficiencies:

- a. Ductless System
 1. 14.3 SEER2;
 2. 7.5 HSPF2; or

3. EnergyStar Cold Climate certified
- b. Ducted System
 1. 15.2 SEER2;
 2. 9 HSPF2; or
 3. EnergyStar Cold Climate certified

14. *Section C403.3.2 HVAC equipment performance requirements*, is hereby ~~deleted in its entirety and replaced~~ amended by adding the following at the beginning of the section with remainder of section to remain to read as follows:

C403.3.2 When HVAC fuel fired equipment is permitted to be installed, equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.

~~HVAC/fuel fired equipment performance requirements. Unless built all electric, all new combustion equipment shall comply with the more efficient HVAC equipment performance of Sections C406.2, C406.2.3, and C406.2.4 and the additional electric infrastructure requirements in Section C405.14. A mechanical compliance certificate demonstrating compliance with section C406.2.3 and/or C406.2.4 shall be required for all HVAC, fuel fired and Service Water Heating equipment.~~

~~The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. (Tables C403.2.(1) through (16) are expressly retained and remain applicable to HVAC equipment performance.)~~

Exceptions:

1. ~~Factory, laboratory, and high hazard occupancy combustion equipment, except for HVAC and domestic water heating.~~
2. ~~Commercial Kitchens.~~

~~3. — Other combustion equipment approved by the Building Official based on demonstration by the applicant that compliance with this section is not feasible and the equipment proposed is the most efficient appliance reasonably available.~~

16. *Section C403.4.1 Thermostatic controls*, is hereby deleted and replaced with the following:

C403.4.1 Thermostatic controls. The supply of heating and cooling energy to each zone shall be controlled by individual thermostatic controls capable of responding to temperature within the zone. Where humidification or dehumidification or both is provided, no fewer than one humidity control device shall be provided for each humidity control system. Occupancy sensors shall be provided on the thermostat to setback in accordance with C403.4.2.1

Exception: Independent perimeter systems that are designed to offset only building envelope heat losses, gains or both serving one or more perimeter zones also served by an interior system provided that both of the following conditions are met:

1. The perimeter system includes not fewer than one thermostatic control zone for each building exposure having exterior walls facing only one orientation (within ± 45 degrees) (0.8 rad) for more than 50 contiguous feet (15 240 mm).
2. The perimeter system heating and cooling supply is controlled by thermostats located within the zones served by the system.

17. *Section C403.12.1 Duct and plenum insulation and sealing*, is hereby deleted and replaced with the following:

C403.12.1 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with not less than R-12. Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the International Mechanical Code.

18. *Section C403.12.3 Piping insulation*, is hereby amended to read as follows:

C403.12.3 Piping insulation. Piping serving as part of a heating or cooling system shall be thermally insulated to R-5.

19. *Section C404.4 Insulation of piping*, is hereby amended to read as follows:

C404.4 Insulation of piping. Piping from a water heater to the termination of the heated water fixture supply pipe shall be insulated to R-3. On both the inlet and outlet piping of a storage water heater or heated water storage tank, the piping to a heat trap or the first 8 feet (2438 mm) of piping, whichever is less, shall be insulated. Piping that is heat traced shall be insulated to R-3 or the heat trace manufacturer's instructions.

20. Section C404.10 Water heating equipment is added as follows:

C404.10 Water heating equipment. Fossil fuel and electric resistance instantaneous and storage water heaters shall not be used to provide hot water in new construction.

Exceptions:

1. *Emergency backup.* Where it is required by an applicable law or regulation to provide water heating with an emergency power system or a standby power system.
2. *Integrated units.* Resistance heating elements integrated into heat pump water heating equipment.
3. *Recirculation loops.* Electric resistance elements used for recirculation loop temperature maintenance.
4. *Small systems.* Electric storage water heaters with a rated water storage volume no greater than 20 gallons.
5. *Point-of-use systems.* Instantaneous electric water heaters located within 10 feet of the point of use.
6. *Renewable electricity.* Electric resistance equipment where not less than 100 percent of the annual service water-heating requirement is provided by an *on-site renewable energy system* not used to meet any other provision of this code.
7. *Renewable or waste thermal energy.* Electric resistance storage water heating equipment in *buildings* where not less than 75% of the annual service water heating requirement is met by a solar thermal system or other renewable thermal system.
8. *High-temperature requirements.* Water heating systems that serve end-uses or have a storage requirement that necessitates a water temperature of 141°F (55°C) or hotter.
9. *Electric resistance budget.* In addition to any exceptions in this section, a budget of 24 kW plus 0.1 watts per square foot of building area of electric resistance service water heating capacity per building.
10. *Commercial kitchens.* Electric booster-heaters serving commercial dishwashers, commercial food service equipment, and other approved process equipment that require supply water temperatures of 120°F (49°C) or higher.
11. *Replacements.* Replacement of gas-fired storage water heaters or instantaneous water heaters.

21. Section C405.2.1 Occupant sensor controls, is hereby amended to read as follows:

C405.2.1 Occupant sensor controls. Occupant *sensor controls* shall be installed to control lighting.

22. Section C405.2.2 Time-switch controls, is hereby deleted in its entirety.

23. *Section C405.2.2.1 Time-switch control function*, is hereby deleted in its entirety.
24. *Section C405.2.3 Light-reduction controls*, is renumbered to C405.2.2.
25. *Section C405.2.3.1 Light-reduction function*, is renumbered to C405.2.2.1.
26. *Section C405.2.4 Daylight-responsive controls*, is renumbered to C405.2.3.
27. *Section C405.2.4.1 Daylight-responsive control function*, is renumbered to C405.2.3.1.
28. *Section C405.2.4.2 Sidelit daylight zone*, is renumbered to C405.2.3.2.
29. *Section C405.2.4.3 Toplit daylight zone*, is renumbered to C405.2.3.3.
30. *Section C405.2.4.4 Atriums*, is renumbered to C405.2.3.4.
31. *Section C405.2.5 Specific application controls*, is renumbered to C405.2.4.
32. *Section C405.2.6 Manual controls*, is renumbered to C405.2.5.
33. *Section C405.2.7 Exterior lighting controls*, is renumber to C405.2.6.
34. *Section C405.2.7.1 Daylight shut off*, is renumbered to C405.2.6.1.
35. *Section C405.2.7.2 Building façade and landscape lighting*, is renumbered to C405.2.6.2.
36. *Section C405.2.7.3 Lighting setback*, is renumbered to C405.2.6.3.
37. *Section C405.2.7.4 Exterior time-switch control function*, is renumbered to C405.2.6.4.
38. *Section C405.2.8 Parking garage lighting control*, is renumbered to C405.2.7.
39. *Section C405.4.3 Gas lighting*, is hereby amended to read as follows:

C405.4.3 Gas lighting. Gas-fired lighting appliances shall not be permitted.

40. A new *Section C405.13 Electric vehicle charging infrastructure for new construction and building addition of 256 or more of original square footage*, is hereby added to read as follows:

Section C405.13.1 Electric vehicle charging infrastructure for new construction and building addition of 25% or more of original square footage. Electric vehicle charging shall be provided and installed in accordance with this section, National Electrical Code (NFPA 70), and Section 17.20.170 of the Louisville Municipal Code. ~~When parking spaces are added or modified without an increase in building floor area, only the new parking spaces are subject to this requirement.~~ All *EVSE Installed*, *EV Ready* and *EV Capable* spaces are to be included in the calculation for the number of minimum vehicle spaces required, as provided by the applicable article of the Louisville Zoning Code.

Section C405.13.2 Identification. The circuit breakers or circuit breaker spaces reserved for the *EVSE Installed*, *EV Ready*, and *EV Capable* spaces shall be clearly identified in the panelboard directory. The conduit for electric vehicle capable spaces shall be clearly identified at both the panelboard and the termination point at the parking space.

40. A new *Section C405.14 Additional electric infrastructure*, is hereby added to read as follows:

Section C405.14 Additional electric infrastructure. All *combustion equipment* and end-uses shall be installed in accordance with this section.

C405.14.1 Electric infrastructure for dwelling and sleeping units. *Combustion equipment* and end-uses serving individual dwelling units or sleeping units shall comply with Section R404.5.

C405.14.2 Combustion equipment. *Combustion equipment* shall be provided with conduit that is continuous between a junction box located within 3 feet (914 mm) of the appliance or equipment and an electrical panel. The junction box, conduit and bus bar in the electrical panel shall be rated and sized to accommodate a branch circuit with sufficient capacity for an equivalent electric appliance, equipment or end use with an equivalent equipment capacity. The electrical junction box and electrical panel shall have labels stating, "For Future Electric Equipment".

Exception: Industrial and manufacturing uses are exempt from Section C405.14.

41. Section C502.1.1 General, is hereby amended to read as follows:

Additions to an existing building, building system or portion thereof shall conform to the provisions of Section C401.2.4 as those provisions relate to new construction without requiring the unaltered portion of the existing building or building system to comply with this code. Additions shall not create unsafe or hazardous condition or overload existing building systems. An addition shall be deemed to comply with this code if the addition alone complies or if the existing building and addition comply with this code as a single building.

42. Section C503.1 General Exception 3 is deleted in its entirety.

43. Section C503.2 Building Envelope is amended with exception remaining to read as follows:

New building envelope assemblies that are part of the alteration shall comply with Sections C402.1 through C402.5. Existing ceilings, roofs, all wall types, or floors exposed during construction shall comply with Table C402.1.3.

44. *Section C505.1 General*, is hereby amended to read as follows:

C505.1 General. Where the use in a space changes from one use in Table C405.3.2(1) or C405.3.2(2) to another use in Table C405.3.2(1) or C405.3.2(2), the installed lighting wattage shall comply with Section C405.3. Where the space undergoing a change in occupancy or use is in a building with a fenestration area that exceeds the limitations of Section C402.4.1, the space is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.

Exception: Egress doors with fenestration are allowed to bring total fenestration percentages over the allowed maximum amount of vertical fenestration.

APPENDIX PT MODELING TO A PERFORMANCE TARGET

PT101 Scope. This section establishes criteria for demonstrating compliance with a performance target, and is required for new hotels (occupancy R-1), multifamily (occupancy R-2), offices, primary and secondary schools, and warehouses. All end use load components within and associated with the building and their building sites shall be modeled.

PT102 Mandatory requirements. The requirements in this section are mandatory requirements and shall be required in addition to the provisions of ASHRAE 90.1 Appendix G.

PT103 Performance target. Projects of the types listed in Table PT103 shall demonstrate that the proposed design reaches a fixed energy use intensity (EUI) less than or equal to the values in Table PT103, calculated utilizing the energy modeling procedures of Appendix G of ASHRAE 90.1. For *buildings* with multiple occupancy types, the modeled performance target shall be a weighted average of the floor area of each occupancy type.

Exception: Energy used for electric vehicle charging, data centers, and process loads shall be excluded from compliance modeling.

**TABLE PT103
PERFORMANCE TARGETS**

BUILDING TYPE	PERFORMANCE TARGET (kBTU/ft2)
<u>Hotel (Occupancy R-1)</u>	<u>32</u>
Multifamily (Occupancy R-2)	32
Office, small (> 0 - 5,000 ft2)	19
Office, medium (5,000 – 50,000 ft2)	23
Office, large (>50,000 ft2)	28
School, primary	34
School, secondary	31
Warehouse	11

PT104 Renewable Energy. On-site renewable energy generated by a system installed as part of this project that is used by the building shall be subtracted from the proposed design energy consumption prior to calculating the proposed building performance.

PT105 Performance documentation. Documentation to verify compliance with this section shall be provided to the code official.

PT105.1 Projected compliance report. Permit submittals shall include a report documenting the proposed design is projected to meet the EUI target. The compliance report shall include the following specific information beyond the information required in ASHRAE 90.1 Appendix G:

1. Address of the building.
2. An inspection checklist documenting the building component characteristics of the proposed design.
3. Name of individual completing the report.
4. Name and version of compliance software tool.
5. Documentation of the reduction in energy use associated with on-site energy.

PT105.2 Construction plan requirements. Construction plans shall depict all component characteristics of the proposed design utilized for the EUI in accordance with ASHRAE 90.1 Appendix G.

PT105.3 Measured performance report. Projects shall demonstrate compliance with this code by documenting that the building has achieved the EUI performance calculated based on 12 months of metered energy use after occupancy.

PT105.3.1 Demonstration of operating energy use. Metered energy data demonstrating compliance with the EUI target shall be reported to the building official using Energy Star Portfolio Manager and adjusted for the percentage of floor area occupied. While at least 75 percent occupied, the building shall operate at or below its assigned energy use target established in Section PT103 for any recording period of 12 consecutive months that is completed within three years of the date of the Certificate of Occupancy. The owner shall notify the building official when this 12-month period has been successfully completed.

PT106 Energy metering and monitoring. All projects must install submetering or monitoring capabilities to support building energy performance analysis. The project must include capabilities to store and access a 24-month continuous data set on an ongoing basis.

PT106.1 End-use monitoring. Measurement devices shall be installed in new buildings to monitor the electric energy use of each of the following separately:

1. Total electric energy.
2. HVAC systems energy use.
3. Interior lighting.
4. Exterior lighting.
5. Receptacle circuits.
6. Data centers representing over 10 percent of total building load or 5 percent of building floor area.
7. Other process loads that represent 10 percent or more of total building energy use based on building energy use modeling.

PT106.2 Independent metering. The following items shall be independently metered. Individual meters used to comply with this section may not serve multiple buildings.

1. All fuel sources serving the building.
2. Energy production from on-site renewable energy systems.
3. Electric vehicle (EV) supply equipment.

- ~~4. Data centers representing over 10 percent of total building load or 5 percent of building floor area.~~
- ~~5. Other process loads that represent 10 percent or more of total building energy use based on building energy use modeling.~~
- ~~6. Individual tenant energy loads.~~

45. *Section R101.1 Title*, is amended to insert "the City of Louisville" so the section will read:

R101.1 Title. These regulations shall be known as the Energy Conservation Code of the City of Louisville and shall be cited as such. It is referred to herein as "this code."

46. *Section R103.2 Information on construction documents*, is amended to read as follows:

R103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documented are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment herein governed. Details shall include the following as applicable:

1. Energy compliance path.
2. Insulation materials and their *R*-values
3. Fenestration *U*-factor and solar heat gain coefficients (SHGCs).
4. Area-weighted *U*-factor and solar heat gain coefficient (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water heating systems and equipment types, sizes, fuel source and efficiencies.
7. Equipment and system controls.
8. Duct sealing, duct and pipe insulation and location.
9. Air sealing detail.
10. Location of pathways for routing of raceways or cable from the solar ready zone to the electrical service panel.

47. *Section R202 General Definitions*, is hereby amended by adding, in alphabetical order, the following definitions:

All-Electric Building: A building that contains no combustion equipment, or plumbing or piping for combustion equipment, installed within the building or building site.

Combustion Equipment: Any equipment or appliance used for space heating, service water heating, cooking, clothes drying and/or lighting that uses fuel gas or fuel oil.

~~*Electric Vehicle (EV):* A vehicle registered for on-road use, primarily powered by an electric motor that draws current from a rechargeable storage source that is charged by being plugged into an electrical current source.~~

~~*Electric Vehicle Supply Equipment (EVSE):* The electrical conductors and associated equipment external to the electric vehicle that provide a connection between the premises wiring and the electric vehicle to provide electric vehicle charging.~~

~~*Electric Vehicle Capable Space:* A designated parking space that is provided with conduit sized and rated for a minimum 40 amp, 208/240 Volt dedicated branch circuit and shall be no less than 1" in size. Conduit must be continuous from the future or existing electrical panel board or switchboard location(s) and end at a junction box or receptacle located within close proximity of the parking space. The electrical panel serving the parking space shall have sufficient capacity and physical space for a dual pole, 40 amp breaker. The conduit shall be sealed at the junction or outlet box that is capped off, with the conduit sealed and the cap labeled as "For future electric vehicle charging".~~

~~*Electric Vehicle Ready Space:* A designated parking space that is provided with a dedicated branch circuit with wiring capable of supporting a minimum 40-ampere, 208/240 Volt circuit that terminates at a receptacle, plug, junction box, or an installed electric vehicle supply equipment within close proximity of the parking space. There shall be adequate reserved space in an electrical panel board or switchboard to meet the electric vehicle requirements.~~

Residential Building. For this code, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) and R-3 and R-4 buildings three stories or less in height above grade plane.

48. *Section R401.2 Application*, is hereby deleted and replaced with the following:

R401.2 Application. New Residential buildings shall be built using appendix RB and RC and shall be built all-electric unless the fuel gas options of R403.7 and additional electric infrastructure requirements of R404.5 are met. ~~All residential buildings shall comply with the R401.2.1 City of Louisville's Prescriptive Compliance or R406 Energy Rating Index with a maximum rating index of 50 before the installation of solar panels~~

Exceptions:

1. New residential buildings certified through the Passive House Institute US, Inc. (PHIUS) program
2. Additions shall comply with R401.2.1 and Chapter 5
3. ~~Additions, a~~Alterations, repairs and changes of occupancy to existing buildings complying with Chapter 5.

49. *Section R401.2.1 Prescriptive Compliance Option*, is hereby deleted and replaced with the following:

R401.2.1 City of Louisville’s Prescriptive Compliance. The City of Louisville’s Prescriptive compliance requires compliance with Sections R401 through R404.

50. *Section R401.2.2 Total Building Performance Option*, is hereby deleted in its entirety.

51. *Section R401.2.4 Tropical Climate Region*, is hereby deleted in its entirety.

52. *Section R401.2.5 Additional Energy Efficiency*, is hereby amended to read as follows:

Section R401.2.5 Additional Energy Efficiency. Building shall comply with one of the additional efficiency options and shall be installed in according to Section R408.2.

53. A new *Section R401.4 Mandatory requirements for residential buildings*, is hereby added to read as follows:

R401.4 Mandatory requirements for residential buildings. Residential building must comply with the following sections from the 2021 International Energy Conservation Code found in Table R401.4 and Section R401.2.

Table R401.34
Mandatory requirements for residential buildings

Title	IECC Section
Vapor retarder	R402.1.1
Eave baffle	R402.2.3
Access hatches and doors	R402.2.4.1
Crawl space wall insulation	R402.4.1.2
Maximum fenestration U-factor and SHGC	R402.5
Mechanical Controls	R403.1
Ducts	R403.3 except R403.3.2, R403.3.3, and R403.6
Mechanical system piping insulation	R403.4
Heated water circulation and temperature maintenance systems	R403.5.1
Drain Water heat recovery units	R403.5.3
Mechanical ventilation	R403.6 including E403.6.1

Equipment sizing and efficiency rating	R403.7
Systems serving multiple dwelling units	R403.8
Snow melt and ice systems	R403.9
Energy consumption of pools and spas	R403.10
Portable spas	R403.11
Residential pools and permanent residential spas	R403.12
Lighting equipment	R404.1
Interior lighting controls	R404.2

54. *Section R402.1 General*, is hereby amended to read as follows:

R402.1 General. The building thermal envelope shall comply with the requirements of Section R402.1.1 and R402.1.2.

55. *Section R402.1.2 Insulation and fenestration*, is hereby deleted and replaced with the following:

R402.1.2 Insulation and fenestration. ~~New and replacement Assemblies shall have R-value of insulation materials equal to or greater than that specified in Table R402.1.2 unless an alternative path is specified while using HERS energy rating index of 50.~~ New and replacement Assemblies shall have R-value of insulation materials equal to or greater than that specified in Table R402.1.2.

Exception: New Construction complying with exception 1 of R401.2

Table R402.1.2
Average Insulation and Fenestration Requirements by Component

Roof	R-60
Above grade walls	~~R-24~~ R-30 or R-20 & R-5 ci
Below grade walls	~~R-24~~ R-19
Floors	R-38
Non heated slab on grade	R-10 for 4ft
Heated slab on grade	R-15 for 4 ft + R-5 under full slab
Fenestration U-Factor	.30
Fenestration SHGC	.33
Skylight U-Factor	.50
Skylight SHGC	.40
Hot Water Pipes	<u>R-3</u>
Warm Air Ducts	<u>R-8</u>

55. Section R402.1.5 Total UA alternative, is hereby deleted in its entirety.
56. Section R402.3.3 Glazed fenestration exemption, is hereby amended to read as follows:

R402.3.3 Glazed fenestration exemption. Not greater than 15 square feet (1.4 m²) of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements in Section R402.1.2.

57. *Section R402.4.1.2 Testing*, is hereby deleted and replaced to read as follows:

Section R402.4.1.2 Testing. All new buildings or dwelling units that are heated or cooled, and additions over 500 square feet shall be tested for air leakage.

58. *Section R402.5 Maximum fenestration U-factor and SHGC*, is hereby deleted and replaced with the following:

Section R402.5 Maximum fenestration U-factor and SHGC. The maximum U-factor and solar heat gain coefficient (SHGC) for fenestration shall not be required in storm shelters complying with ICC 500.

59. *Section R403.3.1 Ducts located outside conditioned space*, is hereby deleted and replaced with the following:

R403.3.1 Ducts located outside conditioned space. All supply and return ducts shall be insulated to a minimum R-8 if located outside a conditioned space.

60. *Section R403.5.2 Hot water pipe insulation*, is hereby deleted and replaced with the following:

R403.5.2 Hot water pipe insulation. All service hot water piping shall be insulated to a minimum ~~R-5~~ R-3.

62. *Section R403.7 Equipment sizing and efficiency rating*, is hereby deleted and replaced with the following:

R403.7 Equipment sizing and efficiency rating. All new buildings and additions greater than 500 square feet with heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies. In addition to complying with Sec. R404.6 Additional Electric Infrastructure, new and replacement electrical heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is

installed. New gas heating equipment shall comply with the following efficiencies:

1. Gas furnaces shall have a minimum of ~~96%~~ 95% efficiency.
2. Gas boilers shall have a minimum of ~~90%~~ 95% AFUE.
3. On demand water heaters shall have a greater than .92 uniform energy factor.
4. Heat pump efficiencies:
 - a. Ductless System
 1. 14.3 SEER2;
 2. 7.5 HSPF2; or
 3. EnergyStar Cold Climate certified
 - b. Ducted System
 1. 15.2 SEER2;
 2. 9 HSPF2; or
 3. EnergyStar Cold Climate certified

Exception: Solid fuel stoves/gas fireplaces, outdoor fire pits, gas stoves and ovens.

63. *Section R404.1.1 Fuel gas lighting equipment, is hereby amended to read as follows:*

R404.1.1 Fuel gas lighting equipment. Fuel gas lighting systems shall not be installed.

64. *A new Section R404.4 Electric vehicle charging infrastructure for new construction and building addition of 50% or more of original square footage, is hereby added to read as follows:*

Section R404.4 Electric vehicle charging infrastructure for new construction and building addition of 50% or more of original square footage. Electric infrastructure for the current and future charging of *electric vehicles* shall be installed in accordance with this section per Section 17.20.170 of the Louisville Municipal Code. *EV ready spaces and EV capable spaces* are permitted to be counted toward meeting minimum parking requirements.

R404.4.1 One- and two- family dwellings and townhouses. One- and two-family dwellings and townhouses with a dedicated attached or detached garage or on-site parking spaces shall be provided with electric vehicle charging in accordance with Section 17.20.170 of the Louisville Municipal Code.

R404.4.1.1 Minimum EV Ready infrastructure. Minimum EV Ready Space infrastructure shall require the following:

1. Installation of conductors:
 - a. Conductors shall be installed of sufficient size to accommodate a minimum 240VAC 40Amp branch circuit to each parking space where required.

- b. Conductors shall terminate in either a receptacle, plug, junction or outlet box, or an *EVSE* installed in the parking space.
2. The electrical panel directory shall designate the branch circuit as “EV Ready” and the junction box or receptacle shall be labelled “EV Ready.”

R404.4.1.2 Construction documents. Construction documents shall graphically indicate and label all EV ready spaces and associated termination locations. For all Townhouses and one- and two-family dwellings with an electrical utility service of 200 Amps or greater, a panelboard schedule shall be provided indicating the EV Ready circuit breaker space(s) and the circuit designation(s).

R404.4.2 Group R occupancies. Group-R occupancies (~~R-2~~, R-3, and R-4 buildings three stories and less) with three or more dwelling units and/or sleeping units shall be provided with electric vehicle charging in accordance with Section 17.20.170 of the Louisville Municipal Code.

Electric vehicle charging shall be provided and installed in accordance with this section and the National Electrical Code (NFPA 70). When parking spaces are added or modified without an increase in building floor area, only the new parking spaces are subject to this requirement.

65. A new *Section R404.5 Additional electric infrastructure*, is hereby added to read as follows:

R404.5 Additional electric infrastructure. *Combustion equipment* shall be installed in accordance with this section.

R404.5.1 Combustion equipment and end-uses. *Combustion equipment* shall be provided with a dedicated, appropriately phased circuit that shall have a minimum amperage requirement for a comparable electric appliance, equipment or end use, an electrical receptacle or junction box that is connected to the electric panel, and conductors of adequate capacity within 6 feet (1829 mm) of the appliance or equipment.

Each such circuit shall be accessible with no obstructions. A reserved circuit breaker space shall be installed in the electrical panel adjacent to the circuit breaker for the branch circuit and labeled for each circuit. Both ends of the unused conductor or conduit shall be labeled “For Future Electric Equipment” and be electrically isolated.

66. *Section R405 Total building performance*, is deleted in its entirety.

67. Section R406.3 Building thermal envelope, is hereby deleted in its entirety and replaced with the following:

R406.3 Building thermal envelope. ~~Building and portions thereof shall comply with Table R406.3.~~ The building thermal envelope shall be greater or equal to the levels of efficiency and SHGC in Table R406.3.

Table R406.3
Average of the Minimum Insulation and Maximum Fenestration Requirements by Component

Roof	R-60
Above grade walls	R-21
Below grade walls	R-21
Floors	R-38
Non heated slab on grade	R-10 for 4ft
Heated slab on grade	R-15 for 4 ft + R-5 under full slab
Fenestration U-Factor	.30
Fenestration SHGC	.33
Skylight U-Factor	.50
Skylight SHGC	.40
<u>Heated Water Pipes</u>	<u>R-3</u>
<u>Heated air Ducts</u>	<u>R-8</u>

68. Section R406.3.1 On-site renewables are not included, is deleted in its entirety.

69. Section R406.3.2 On-site renewables are included, is deleted in its entirety.

70. Section ~~406.3.2~~ R407 Tropical Climate Region Compliance Path, is deleted in its entirety.

71. Section R502.1.1 General, is hereby amended to read as follows:

Additions to an existing building, building system or portion thereof shall conform to the provisions of R401.2.1 as those provisions relate to new construction without requiring the unaltered portion of the existing building or building system to comply with this code. Additions shall not create unsafe or hazardous conditions or overload existing building systems. An addition shall be deemed to comply with this code where the addition alone complies, where the existing building and addition comply with this code as a single building, or where

the building with the addition does not use more energy than the existing building. Additions shall be in accordance with Section R502.2 or R502.3.

72. Section R503.1.1 Building Envelope is amended to read as follows:

Building envelope assemblies that are part of the alteration shall comply with Section R401.2.1

Section R503.1.1 Building envelope Exception 2 is deleted in its entirety and replaced with the following.

2. Section R402.4.1.2 Testing

73. Section R505.1 General is hereby amended to remove the exception.

74. Section R505.1.1 Unconditioned space, is hereby deleted and replaced with the following:

R505.1.1 Unconditioned space. Any unconditioned or low-energy space that is altered to become a conditioned space shall comply with Section R503.

75. RC102.1 General is amended to read as follows.

RC102.1 General. New residential buildings shall comply with Sections RC102.2 through RC102.9.

76. RC102.2 Energy Rating Index zero energy score is amended to read as follows.

RC102.2 Energy Rating Index zero energy score.

Compliance with this section requires that the rated design be shown to have a Home Energy Rating System (HERS) score of 50 before solar and 0 with solar when compared to the Energy Rating Index (ERI) reference design determined in accordance with RESNET/ICC 301 for both of the following:

1. ERI value not including on-site power production (OPP) calculated in accordance with RESNET/ICC 301.
2. ERI value including on-site power production calculated in accordance with RESNET/ICC 301 with the OPP in Equation 4.1.2 of RESNET/ICC 301 adjusted in accordance with Equation RC-1.

Adjusted OPP = OPP + CREF + REPC (Equation RC-1)

where:

CREF = Community Renewable Energy Facility power production—the yearly energy, in kilowatt hour equivalent (kWheq), contracted from a community

renewable energy facility that is qualified under applicable state and local utility statutes and rules, and that allocates bill credits to the rated home.

REPC = Renewable Energy Purchase Contract power production—the yearly energy, in kilowatt hour equivalent (kWheq), contracted from an energy facility that generates energy with photovoltaic, solar thermal, geothermal energy or wind systems, and that is demonstrated by an energy purchase contract or lease with a duration of not less than 15 years.

RC102.2.1 HERS Score. Buildings shall comply with the scores in Table RC102.2.1.

Table RC102.2.1.

<u>HERS SCORE NOT INCLUDING OPP</u>	<u>HERS SCORE INCLUDING OPP</u>
<u>50</u>	<u>0</u>

76. RC102.3 through RC102.9 are added to Appendix RC to read as follows.

RC102.3 Mandatory Sections. All projects shall comply with all sections within Table RC102.3.

Table RC102.3

Mandatory requirements for residential buildings

<u>Title</u>	<u>IECC Section</u>
<u>Vapor retarder</u>	<u>R402.1.1</u>
<u>Eave baffle</u>	<u>R402.2.3</u>
<u>Access hatches and doors</u>	<u>R402.2.4.1</u>
<u>Crawl space wall insulation</u>	<u>R402.4.1.2</u>
<u>Maximum fenestration U-factor and SHGC</u>	<u>R402.5</u>
<u>Mechanical Controls</u>	<u>R403.1</u>
<u>Ducts</u>	<u>R403.3 except R403.3.2, R403.3.3, and R403.6</u>
<u>Mechanical system piping insulation</u>	<u>R403.4</u>
<u>Heated water circulation and temperature maintenance systems</u>	<u>R403.5.1</u>
<u>Drain Water heat recovery units</u>	<u>R403.5.3</u>
<u>Mechanical ventilation</u>	<u>R403.6 including E403.6.1</u>
<u>Equipment sizing and efficiency rating</u>	<u>R403.7</u>
<u>Systems serving multiple dwelling units</u>	<u>R403.8</u>

<u>Snow melt and ice systems</u>	<u>R403.9</u>
<u>Energy consumption of pools and spas</u>	<u>R403.10</u>
<u>Portable spas</u>	<u>R403.11</u>
<u>Residential pools and permanent residential spas</u>	<u>R403.12</u>
<u>Lighting equipment</u>	<u>R404.1</u>
<u>Interior lighting controls</u>	<u>R404.2</u>

RC102.4 Building Envelope. The building thermal envelope shall be greater or equal to the levels of efficiency and SHGC in Table RC102.4.

Table RC102.4
Average of the Minimum Insulation and Maximum Fenestration Requirements by Component

<u>Roof</u>	<u>R-60</u>
<u>Above grade walls</u>	<u>R-21</u>
<u>Below grade walls</u>	<u>R-21</u>
<u>Floors</u>	<u>R-38</u>
<u>Non heated slab on grade</u>	<u>R-10 for 4ft</u>
<u>Heated slab on grade</u>	<u>R-15 for 4 ft + R-5 under full slab</u>
<u>Fenestration U-Factor</u>	<u>.30</u>
<u>Fenestration SHGC</u>	<u>.33</u>
<u>Skylight U-Factor</u>	<u>.50</u>
<u>Skylight SHGC</u>	<u>.40</u>

RC102.5 Verification by approved agency.

Verification of compliance with Section R102.4 as outlined in Sections of this appendix shall be completed by an approved third party. Verification of compliance with Section R102.3 shall be completed by the authority having jurisdiction or an approved third-party inspection agency in accordance with Section R105.4.

RC102.6 Documentation.

Documentation of the software used to determine the ERI and the parameters for the residential building shall be in accordance with Sections RC102.6.1 through RC102.6.4

RC102.6.1 Compliance software tools.

Software tools used for determining HERS shall be Approved Software Rating Tools in accordance with RESNET/ICC 301.

RC102.6.2 Compliance report.

Compliance software tools shall generate a report that documents that the home and the HERS score of the rated design complies with RC102. Compliance documentation shall be created for the proposed design and shall be submitted with the application for the building permit. Confirmed compliance documents of the built dwelling unit shall be created and submitted to the code official for review before a certificate of occupancy is issued. Compliance reports shall include information in accordance with Sections RC102.6.3 and RC102.6.4.

RC102.7 Additional documentation.

The code official shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the ERI reference design.
2. A certification signed by the builder providing the building component characteristics of the rated design.
3. Documentation of the actual values used in the software calculations for the rated design.

RC102.8 Specific approval.

Performance analysis tools meeting the applicable subsections of Section RC102 shall be approved. Documentation demonstrating the approval of performance analysis tools in accordance with Section RC102 shall be provided.

RC102.9 Input values.

Where calculations require input values not specified by Sections RC 102, those input values shall be taken from RESNET/ICC 301.

Section 2. If any article, section, paragraph, sentence, clause, or phrase of this ordinance is held to be unconstitutional or invalid for any reason, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The City Council hereby declares that it would have passed this ordinance and each part or parts hereof irrespective of the fact that any one part or parts be declared unconstitutional or invalid.

Section 3. The repeal or modification of any provision of any prior ordinance by this ordinance shall not release, extinguish, alter, modify, or change in whole or in part any penalty, forfeiture or liability, either civil or criminal, which shall have been incurred under such provision, and each provision shall be treated and held as still remaining in force for the purpose of sustaining any judgment, decree, or order which can or may be rendered, entered, or made in such actions, suits, proceedings, or prosecutions.

Section 4. All other ordinances or portions thereof inconsistent or conflicting with this ordinance or any portion hereof are hereby repealed to the extent of such inconsistency or conflict.

INTRODUCED, READ, PASSED ON FIRST READING, AND ORDERED PUBLISHED this _____ day of _____, 2024.

Christopher M. Leh, Mayor

ATTEST:

Meredyth Muth, City Clerk

APPROVED AS TO FORM:

Kelly PC, City Attorney

PASSED AND ADOPTED ON SECOND AND FINAL READING, this _____ day of _____, 2024.

Christopher M. Leh, Mayor

ATTEST:

Meredyth Muth, City Clerk

Kim Bauer, Preservation Planner, reviewed the site and history of the building. It meets the criteria for landmark designation by age, architectural significance, cultural significance, and physical integrity. She reviewed the criteria for a preservation grant noting how this construction fits into the preservation, rehabilitation, and restoration areas.

The Historic Preservation Commission reviewed both requests and recommends approval; staff also recommends approval of both the landmark designation and grant resolution.

Public Comments - None

Mayor Stolzmann thanked the applicant for bringing this forward.

Mayor Pro Tem Maloney stated this is exactly the intention of the program and he supports it. Councilmember Fahey agreed.

Mayor Stolzmann closed the public hearing.

Motion: Mayor Pro Tem Maloney moved to approve Resolution No. 71; seconded by Councilmember Fahey

Vote: Motion passed by unanimous roll call vote.

Motion: Mayor Pro Tem Maloney moved to approved Resolution No. 72; seconded by Councilmember Dickinson

Vote: Motion passed by unanimous roll call vote

ORDINANCE NO. 1816, SERIES 2021 – AN ORDINANCE ADOPTING BY REFERENCE THE 2021 INTERNATIONAL ENERGY CONSERVATION CODE, WITH AMENDMENTS, REPEALING CHAPTER 15.60 OF THE LOUISVILLE MUNICIPAL CODE CONCERNING THE PRESCRIPTIVE ENERGY CODE AND DESIGN CRITERIA, AND AMENDING TITLE 17 OF THE LOUISVILLE MUNICIPAL CODE CONCERNING ELECTRIC VEHICLE CHARGING INFRASTRUCTURE – 2nd READING, PUBLIC HEARING (advertised *Daily Camera* 9/26/21)

Mayor Stolzmann introduced the item and asked for any disclosures; seeing none she opened the public hearing.

Katie Baum, Sustainability Coordinator, presented the IECC updates. The city is currently under the 2018 IECC with prescriptive energy and design criteria and solar readiness for residential and commercial buildings. The IECC is updated every three years, but this year is the first edition with significant efficiency gains since 2012. There are multiple changes from the 2018 IECC regarding residential structures in building insulation values,

HVAC systems and lighting and power. The changes to commercial buildings are in the building envelopes, HVAC, service water heating, lighting and power and renewables.

She advised Council there are some amendments to the ordinance since 1st reading. The ordinance presented tonight was updated to require fuel source and renewable systems pathways in construction documents. All residential and commercial new construction will be all-electric or be built with high efficiency HVAC equipment and with electric-ready infrastructure. EV charging will be enforced at the time of building permit, with a clarification that projects within a PUD approved prior to the ordinance, but which have not obtained a building permit, will be required to comply with the ordinance.

Solar readiness does not require that solar be installed on new construction, but space and capacity for installing such a system is required.

Electrical vehicle readiness requires the infrastructure for an EV ready parking space or EV charging station be included at time of construction for future buildout of EV charging. The ordinance details the requirements for EV readiness for each building type.

Council requested information on building electrification requirements in other Colorado municipalities and zero energy appendices. Those were included in the packet. Staff recommends approval of the ordinance as proposed this evening with the amendment to Table R402.1.2.

Councilmember Lipton asked what types of building permit actions would trigger the need to comply with the upgraded standards. Chad Root, Chief Building Official, responded the trigger would be adding over 50% of square footage to a home would require meeting the new requirements. Commercial permits would be set up in the same fashion.

Councilmember Lipton asked about gas fireplaces. Root stated those will be exempt.

Public Comments

Hazel Van Zale, a student at Louisville Elementary School, spoke in favor of adopting the 2021 IECC and appendix to reduce greenhouse gas emissions.

Weston Gano, a student at Louisville Elementary School, spoke in favor of adopting the 2021 IECC and appendix to reduce our energy footprint.

Baxter Case, a student at Louisville Elementary School, spoke in favor of adopting the IECC and appendix.

Peter Geise, 808 Spyglass Circle, stated he is hesitant on moving forward with some of the requirements of the IECC and appendix. He urged a more cautious approach.

Tess Weltzin, spoke in favor of adopting the IECC and the appendix to reduce greenhouse gas emissions for generations to come.

Sadie Gabriel, a student at Louisville Middle School, spoke in support of adopting the IECC and appendix to reduce greenhouse gas emissions and indoor air quality.

Evan Hiatt, a student at Louisville Elementary School, spoke in support of adopting the IECC and appendix as the building sector is a large polluter.

RJ Harrington, 457 East Raintree Court, spoke in support of approving the IECC and appendix.

Grady Gabriel, a student at Louisville Middle School, spoke in support of approving the IECC and appendix. New buildings need to be run by renewable energy and not fossil fuels.

Amelie Valliere, a student at Louisville Middle School, spoke in support of adopting the IECC and appendix to reduce greenhouse gas emissions.

Isabelle Valliere, a student at Louisville Middle School, spoke in support of adopting the IECC and appendix to reduce greenhouse gas emissions and improve indoor air quality.

Arthur Towber, a student at Louisville Middle School, spoke in support of adopting the IECC and appendix to stop global warming with stricter laws for building homes.

Caleb Forrester, a student at Louisville Middle School, spoke in support of adopting the IECC and appendix to make homes more energy efficient.

Andy Johnson, 920 Lincoln Avenue, spoke in support of adopting the IECC and appendix.

Tiffany Boyd, 550 Grant Avenue, spoke in support of adopting the IECC and appendix.

Tamar Krantz, 691 West Street, spoke in support of adopting the Zero Energy Homes appendix.

Mike Kranzdorf, spoke in support of some of the proposals, but stated he doesn't understand why EV chargers need to be installed in certain areas. He asked that consideration of the appendix be moved to phase 2 of adoption and expressed concern about raising costs for low income home owners.

Councilmember Fahey noted that when people spend more on these upgrades it can be long-term cost savings in other ways such as energy use.

Mayor Pro Tem Maloney stated he supports the ordinance.

Councilmember Dickinson stated he supports the ordinance and asked if any other cities in Colorado have adopted the 2021 IECC yet. Consultant Hope Medina stated many jurisdictions are working on adopting it but Louisville might be the first or one of the first if adopted this evening.

Mayor Stolzmann stated there is consensus on adopting the code this evening. She would like to do more than the proposal by adding Appendix CC. She also proposed striking out the alternatives for fuel gas options thereby requiring all new building be all electric.

Councilmember Brown expressed support for Mayor Stolzmann's proposals.

Councilmember Lipton asked what the practical impacts would be of these additions. He asked how long it would take to do further public engagement. Director Zuccaro stated it would likely take 3-6 months to do a full public process and research on the impacts.

Councilmember Lipton voiced support of the ordinance as presented by staff, but thinks that the appendices needs more research and deliberation.

Mayor Stolzmann stated there is clear support for this from the community and sustainability initiatives are a part of the Council's work plan. The minor proposals are a start but there is a lot more work to do.

Councilmember Leh stated he wants to move quickly but he also wants to avoid unintended consequences. He doesn't know the impact on affordable housing and would like additional public input.

Councilmember Brown stated he does not feel there is the need for additional public input; he feels residents support these moves.

Mayor Stolzmann noted there are unintended consequences of inaction. There is information in the packet about how switching to electric will lower costs in the long run.

Councilmember Brown reemphasized support of the appendices and striking the gas fuel option.

Mayor Pro Tem Maloney stated he doesn't hear disagreement about direction only timing. Staff has proposed a phase II which is part of Council's work plan. All electric is something Council supports, but there needs to be more information and discussion. Phase II might take a few months, but it's not years.

Public Comments

Mark Cathcart, 7017 Sweet Clover Lane, spoke in support of the ordinance and including the appendices.

RJ Harrington, 457 E Raintree Ct, spoke in support of passage of the ordinance and including the appendices.

Maxine Most, suggested Council consider a moratorium on new construction until this can be sorted out.

Tiffany Boyd, 550 Grant Ave, a member of the Louisville Sustainability Advisory Board read sections of the letter from the board included in the packet.

Mike Kranzdorf, noted his concerns that the business community is not being considered as part of the Louisville Community. He stated builders and property owners want to help and do the right thing, but asked Council to accept input and take some additional time.

Andy Johnson, encouraged adopting IECC, and stated the residential appendix is doable. He noted there are ways for residential construction to meet these requirements; commercial is going to be a harder switch to flip and there does need to be more time for the commercial appendices.

Councilmember Lipton stated his support for the ordinance as written and getting more public input on the appendices.

Mayor Stolzmann closed the public hearing.

Motion: Councilmember Lipton moved to approved Ordinance No. 1816 as presented tonight; Mayor Pro Tem Maloney seconded.

Substitute Motion: Mayor Stolzmann moved to approved Ordinance No. 1816 as presented, but also adding the zero energy residential and commercial appendices and striking fuel gas options for new commercial and new residential buildings; Councilmember Brown seconded.

Councilmember Dickinson asked what striking fuel gas option impact would have regarding backup systems. Mayor Stolzmann responded that her intent is that there would be no fossil infrastructure to new buildings.

Vote on the substitute motion failed 4-3 with Mayor Stolzmann and Councilmembers Brown and Fahey voting yes.

Substitute Motion: Councilmember Dickinson made a substitute motion to approve Ordinance No. 1816 but adding the residential appendix. Mayor Stolzmann seconded.

Vote on the substitute motion by Councilmember Dickinson passed 4-3 with Councilmembers Leh and Lipton and Mayor Pro Tem Maloney voting no.

Councilmember Leh expressed his hope that Council will vote on adding the commercial appendices in three months.

Mayor Stolzmann reiterated the items coming forward in coming months, such as construction waste diversion, green roofs, amortization on retro fits, and all electric requirements, as well as EV capable requirements and insulation requirements.

**ORDINANCE NO. 1817, SERIES 2021 – AN ORDINANCE APPROVING THE
VACATION OF A 125-FOOT BY 30.60-FOOT WIDE RIGHT-OF-WAY LYING SOUTH
OF LOT 9, BLOCK 10, LOUISVILLE HEIGHTS SUBDIVISION IN THE CITY OF
LOUISVILLE (601 MCKINLEY AVENUE) – 2nd READING, PUBLIC HEARING
(advertised *Daily Camera* 10/10/21)**

Mayor Stolzmann introduced the item and asked if there are any disclosures; seeing none she opened the public hearing.

Interim Director Ritchie stated this is a request for a right of way vacation for property adjacent to 601 McKinley Avenue. She reviewed the site and history of this piece of property. She noted this piece of land was to be used for an alley that was never developed and in 1984 the previous homeowners had entered into a license agreement with the City to put in a fence. The applicant coordinated with City staff and Xcel and the ordinance establishes a 7.9' wide utility easement on the southern portion of the vacated area to allow access for Xcel to the utility line and to the City to maintain the sanitary line to the south of the property.

Staff finds that retention of the area for right of way is not needed for any current or future City purpose. Approval of the vacation request will also not result in loss of access to any property. Staff recommends approval of the ordinance.

Cody Thompson, applicant, spoke to his request for the additional land to accommodate the home he is proposing for the parcel.

Public Comments – None

Councilmember Brown asked what the value of the property is. City Attorney Kelly stated that State Statute does not allow the City to be compensated for loss of the right of way.

Public Comments

RJ Harrington stated this is another example of a home being scraped and rebuilt.

Mayor Stolzmann stated there is likely no public purpose for the property. Additionally it has been fenced in for private use since 1984, and she feels vacation makes sense in this circumstance.

City Council Meeting Minutes

**September 27, 2022
City Hall, Council Chambers
749 Main Street
7:00 PM**

Call to Order – Mayor Stolzmann called the meeting to order at 7:00 p.m. **Roll Call** was taken and the following members were present:

City Council: *Mayor Ashley Stolzmann
Mayor Pro Tem Dennis Maloney
Councilmember Kyle Brown
Councilmember J. Caleb Dickinson
Councilmember Deborah Fahey
Councilmember Chris Leh (arrived 7:02 pm)
Councilmember Maxine Most*

Staff Present: *Jeff Durbin, City Manager
Megan Davis, Deputy City Manager
Rob Zuccaro, Planning and Building Safety Director
Chad Root, Chief Building Official
Kayla Betzold, Sustainability Coordinator
Meredyth Muth, City Clerk*

Others Present: *Anne McCullough, Group 14 Engineering
Kim Schlaepfer, Lotus Engineering & Sustainability
Claire Kantor, Lotus Engineering & Sustainability*

DISCUSSION/DIRECTION – COMMERCIAL ENERGY CODE UPDATE OPTIONS

Planning Director Zuccaro noted this item has been on the City Council work plan for two years. Council asked for a review of the commercial code specifically after last year's update to energy efficiency building codes. Council asked that the IECC Net Zero Commercial Appendix or other net zero goals and strategic implementation of all-electric construction be reviewed.

Consultants Lotus Engineering & Sustainability and Group 14 helped the City through the Marshall Fire and is currently assisting with building code review.

Director Zuccaro stated staff is seeking feedback on four questions. First, there will be three pathways under consideration this evening and staff would like Council's preferred

option among those three pathways. Second, Council will be asked for direction on potential exemptions by building/industry types and if those will be full exemptions or by exemptions by process loads. Third, if the codes will be applicable to new construction only or will additions and renovations will also be included. Finally, feedback on an all-electric new construction requirement and any consideration of exemptions.

Kim Schlaepfer, Senior Associate with Lotus Engineering and Sustainability, presented the results of the report which were oriented around the City's sustainability goals of meeting electrical needs with carbon free sources and reducing annual greenhouse gas emission from the baseline set in 2016.

Tonight's presentation will focus on new construction of multi-family and commercial code options that will encourage higher efficiency, net zero and/or all-electric. There is currently a regional code effort to collectively adopt the 2021 IECC and supporting amendments as well as developing a regional roadmap to reach net zero for new construction by 2030.

The consultants looked at building codes and policies around the state and the US. They modeled four different building types that are typical of new construction in the city to see the upfront costs of building to the 2021 code, the operational cost to run the buildings, and the greenhouse gas emissions of those options.

Policy options are net zero with renewable energy, enhanced energy efficiency, and all-electric. It is important to remember that all of these would be in addition to the 2021 code and the amendments that Louisville already has in place.

Policy option 1 is an energy performance standard and policy option 2 is a net zero standard. Policy option 2 has two parts, net zero standard and net zero plus all-electric standard.

Public feedback was obtained through two community meetings and one survey, as well as meetings with the Sustainability Advisory Board and the Building Code Board of Appeals. Ms. Schlaepfer reviewed the public feedback. Balancing the climate emergency with economic development came out on top. Write in comments trended toward a less favorable view of new energy codes. The community does not feel ready for an aggressive approve to energy code updates citing financial concerns, rising home costs, costs to builders and tenants and the potential to drive away businesses.

Survey responses indicated there was support for reducing greenhouse gas emissions, improved air quality, and curiosity around a regional code. Responses also favored taking time with the building code, considering impacts in existing buildings, concerns with procuring offsite solar, feasibility of meeting code standards and the ability of the grid to handle all-electric new construction.

The policy considerations for tonight were reviewed:

1. Setting Energy Performance Standards for Different Building Types – projects would be required to meet a maximum energy use allowed per square foot also called Site EUI (Energy Use Intensity).
2. Implementation of Appendix CC – Zero Energy Appendix for Commercial Buildings
 - a. Enforcing Appendix CC only
 - b. Enforcing Appendix CC and all-electric building requirement

Council could look for exemptions for carbon offset and all-electric requirements. Appendix CC penalizes businesses that would need to go offsite to procure renewable energy.

Ms. Schlaepfer went through calculations for multi-family and office buildings to meet the requirements.

The consulting team recommends the City move forward with policy option 1. This option provides flexibility in fuel sources, doesn't require solar, EUI targets are easier to achieve, and doesn't require exemptions. While this doesn't align with the regional goals, it does align with the City of Boulder codes.

Mayor Stolzmann asked for clarification on the statement that all-electric and offsite solar might not be feasible for some building types. The consultant gave hospitals, restaurants and manufacturing as examples.

Mayor Pro Tem Maloney asked what phase 2 of the regional code cohort what would look like. The discussions just started but they are looking at the codes for the City of Boulder, City of Louisville, City of Denver, State of Massachusetts and other net zero code standards. Crested Butte just enacted all-electric code with the exception of restaurants. They also require all commercial buildings over 5000 sf to install renewable energy onsite.

Councilmember Dickinson asked what other cities in the cohort have passed the IECC 2021. Superior, Longmont, and Louisville. Erie, Lafayette, Broomfield and Northglenn are moving forward with adoption.

Public Comments

Mark Oberholzer, Louisville resident and business owner, stated the business community is not ready for a code change and the infrastructure isn't ready. Businesses are still trying to recover from the Marshall Fire, supply chain issues, there are still a lot of empty commercial buildings in the city. This is just not the time to add a new stress to the business community. As for infrastructure, it's hard to know what Xcel's current make up of energy supply is and it would be irresponsible to get ahead of the curve. He

prefers we act with the cohort and not unilaterally. The cost of improvements to vacant buildings would most likely cause those buildings to remain vacant.

Iona Kearney, Louisville Chamber of Commerce Board of Directors, stated that as a board we are not against the desire for greener infrastructure, but on behalf of some of the membership we have discovered some unanswered questions regarding existing businesses, and the vacant buildings.

Mike Deborski, Louisville, stated he attended one of the meetings and was the only business operator in the room. More outreach to businesses may be required. He would like to see more of a "carrot" approach rather than a "hammer" approach.

Rick Kron, Louisville DBA and resident, stated he would like to see participation in the cohort and to act with the cohort not before it does, adopt a "carrot" approach. This is a new construction only discussion and should not be applied to existing businesses.

Tiffany Boyd, Louisville, encouraged the Council to vote yes and include the energy performance standards. The cohort will bring a lot of municipalities together but Louisville will have a jump start on future standards.

Josh Cooperman, Louisville supports the efforts to mitigate climate change and favors the performance standards. This system is used in Boulder. He supports the City's participation in cohort. If Louisville pushes ahead they could inform the cohort.

Mayor Stolzmann stated there is an urgency to respond to the climate emergency and the longer we defer and delay the worse it will get. We can't just wait for other people to address the problems. She stated the highest emissions we have are from transportation and building. Xcel will be at 87% carbon free by 2030 and possibly fully carbon free by 2050. The way to address new building is to address building codes.

She stated the majority of the comments she has received are based on inaccurate information. She noted that building new buildings with old measures will only cost more to retrofit in the future. She added incentives would be great if we could afford them.

Mayor Stolzmann suggested going with Option 1 or 2 with modifications. With option 1 she would like to see an all-electric requirement and for Option 2 to modify the net zero code calculations. She is in favor of adding in all-electric requirements. She is interested to hear what exemptions people would like to see and the details for those.

Mayor Stolzmann stated she hears a lot about incentives but they are not really set up to benefit commercial property owners as they are putting out the capital to upgrade and the tenant gets the benefit of a lower energy bill.

Councilmember Dickinson stated we have a shared goal as a community, Council, and staff. Our community believes we are in a climate crisis and we have to do something.

He stated he is confident we are moving in the right direction and he likes some of the cohort goals. How we move from here is the question. The concern is we could act independently without the entire cohort then things will be built in other communities to a lower standard. Anything being built in 2022 should be built to the highest environmental standards. We have a shared goal of getting to net zero we need to find the best path to get there. It is a matter of how and how fast.

Councilmember Most stated we have to act now to address the climate crisis; it is a clear and present danger. In 2022, you have to build to the highest standards. If a business can't afford to do that, they probably couldn't afford to run the business. We want the greenest businesses to come to Louisville and we should go out to attract them. Our vacancy rates are not as bad as people seem to think and we need to make decisions based on real data.

Councilmember Brown stated he favors option 2 with all-electric requirements. It's nice to believe in incentives but at the end of the day requirements are important. He is interested in talking about exemptions if there is more information. It is a false choice that we can't have new businesses and these regulations. We won't get to the highest levels without pushing the discussion.

Councilmember Fahey agreed the climate crisis is real, it needs to be addressed and we all need to act. This discussion is only related to new construction. She would support all-electric for new construction with an exemption for hospitals and possibly a couple of other industrial uses.

Mayor Pro Tem Maloney stated we will want to move forward, it is a matter of how quickly we move forward. He stated he likes the cohort idea and wishes it was state wide so we aren't creating competition between communities. He stated he is concerned about getting so far ahead of the curve that we don't any new building at all. We may want to move quicker than the cohort if it makes sense to us and we can remain business friendly. He stated there should be further discussion about any exemptions and what the trigger point would be for renovations. Sustainability goals should balance with the economic vitality of the city.

Councilmember Leh agreed this is an important topic to almost everyone in town. He noted the three pillars of sustainability are economy, environment, and equity. He reviewed the sustainability goals of the city noting it is a question of how fast we do it. It is important to recognize we have already made some big strides in this area with the adoption of the 2021 IECC. He would like more answers to some of the questions before moving forward. We don't need to be the leader on all of these efforts given the crisis we have had this year in this community. He would prefer to hold tight until we see results from the other communities. He is concerned what it would mean to businesses trying to expand. He wants to be able to give flexibility to those businesses that need other sorts of energy such as hospitals, etc.

Mayor Stolzmann stated the City is not leading the way on building codes, we are right in the middle of the pack and there are many places are ahead of us. She stated her frustration that this keeps getting put off and is being addressed in political terms. She would like to see what other incentives people can bring forward.

Councilmember Most stated business needs cannot be put ahead of the environment; it doesn't have to be one or the other. We have a responsibility to address climate change.

Councilmember Brown stated he would consider exemptions if there is evidence something is actually prohibitive, not just difficult to do. There are many issues that have been first addressed by municipalities and building codes can be one of those.

Mayor Stolzmann stated there is general agreement for staying with the cohort and having staff bring back an ordinance for new construction to have all-electric heating and cooling systems. Flesh out Policy Option 1 which would require more efficient buildings with onsite solar offsets. These would apply to new building only.

Mayor Pro Tem Maloney stated while he is interested in the cohort he is not interested in waiting for them forever. He would be in favor of quarterly reporting so see if a course change is needed at the local level.

ADJOURN

Members adjourned at 9:48 pm.


Dennis Maloney, Mayor Pro Tem


Meredyth Muth, City Clerk



MOTION: Councilmember Dickinson moved to approve Resolution No. 54, Series 2022; seconded by Councilmember Most.

VOTE: Motion passed by unanimous roll call vote.

ORDINANCE NO. 1845, SERIES 2022 – AN ORDINANCE AMENDING CHAPTER 15.18.030 OF THE LOUISVILLE MUNICIPAL CODE CONCERNING AMENDMENTS AND DELETIONS TO THE 2021 INTERNATIONAL ENERGY CONSERVATION CODE TO INCLUDE REQUIREMENTS FOR COMMERCIAL ENERGY USE INTENSITY PERFORMANCE TARGETS AND RESTRICTIONS OF FOSSIL FUEL SPACE AND WATER HEATING EQUIPMENT – 2nd READING, PUBLIC HEARING (advertised *Daily Camera* 12/2/22) continued from 12/6/22

Mayor Stolzmann introduced the item and opened the public hearing.

Community Development Director Zuccaro stated this ordinance would amend chapter 15.18.030 of the Louisville Municipal Code concerning amendments and deletions to the 2021 International Energy Conservation Code. It includes requirements for commercial energy use intensity (EUI) performance targets for specific building types; restricts fossil fuel space and water heating equipment; and applies only to new commercial construction.

This item is a part of the City's Sustainability Action Plan and the City Council's 2023 work plan. He reviewed the work done on energy modeling, policy research, and reviewed the public engagement process.

Director Zuccaro reviewed the proposed ordinance noting it includes energy use intensity (EUI) performance based targets for seven building types; other building types would be required to meet a prescriptive commercial base energy code (IECC 2021 + strengthening amendments); and all building types must meet space and water heating equipment requirements (all-electric). He reviewed the energy use performance targets and the space and water heating exemptions. He reviewed cost comparisons for electric versus mixed fuel uses.

Sustainability Coordinator Kayla Betzold reported on the regional building code cohort (which includes municipalities from across the region) which has completed its phase 2 planning meetings to develop the net zero new construction roadmap. A draft roadmap is currently under review with a final roadmap to be published in early 2023. Plans include stricter EUI targets and demand response capability by 2027 as well as stricter EUI targets and energy storage required by 2030.

Councilmember Dickinson asked if upgrades would be required for remodels. Chad Root, Chief Building Official, stated if the existing systems can meet the needs of the remodel they can be maintained. If they can't meet those needs, new equipment that meets the current code would be required.

Councilmember Dickinson asked why Louisville is not a part of the Cohort. Christine Brinker, SWEEP, stated a group applied to DOLA for a grant for this project and during the time it took the grant to come through Louisville decided to move forward more quickly on its own. It will be a part of the cohort for the phase 2 process.

Public Comments

Christian Dino, Louisville, (pooled time with Peter Geise) stated he was concerned about the costs of these new requirements. He stated he has done a case study on his own home and has found the costs to be much higher than the current code. He stated the metering equipment is costly and hard to get. He added this code requires equipment that has not been proven and may have a long lead time to get. This will keep people from building here or renting vacant spaces if they can build more quickly and cheaper in neighboring communities. He urged a no vote.

Eric Lund, Louisville Chamber of Commerce, stated his restaurant members have many concerns about the cost of refurbishing properties and they have said that clarification on the rules would be helpful. He suggested postponing a decision until clarification can be made. He stated that for Louisville to be competitive with neighbors, our rules should align with the cohort and not be too far ahead.

Matt Berry, Louisville, stated this code is too far in advance to the current technology and will create waste as new technology arrives in just a couple of years. He does not want to have to dispose of technology when something better and easier to use arrives on the market in a few years. He urged a no vote.

Rick Kron, Downtown Business Association, urged a no vote on this ordinance. Louisville should not get ahead of the cohort but rather should act in line with the cohort so we are not ahead of them and businesses then choose to go elsewhere. We don't yet know the real costs or benefits of this change. This ordinance it is not clear what it does in some places and needs additional work.

Jeff Sheets, Koelbel and Company, stated in his other developments there are serious delays in getting equipment and asking for this type of specific equipment will make it even worse. We need to better understand what this ordinance does. It has flaws in how it calculates costs for owners and tenants. This ordinance will make Louisville less competitive for businesses. He urged a no vote.

Tiffany Boyd, Louisville, urged Council to approve this ordinance. She suggested waiting for the cohort is just waiting for the inevitable and Louisville should be at the forefront. We should not kick the can down the road. We need stringent greenhouse gas limits to be put in place.

Tess Weltzin, Lafayette, urged Council to approve the ordinance to address the climate crisis for the next generation. This ordinance will help drive the path for energy efficiency. She stated local action is what is needed.

Ilana Diddams, Louisville, urged a yes vote to support the goals of the City's Sustainability Plan. She stated voting against the ordinance would not be addressing the climate crisis and the sustainability goals.

Mayor Stolzmann ended the first round of public comments noting that she would not take online comments given earlier problems with the system. She noted that she already asked people to attend in person and as presiding officer she can make that determination. She asked the City Attorney to review the Rules of Procedure for this process.

City Attorney Kelly reviewed the Rules of Procedure noting the rules state that if there are technical problems that preclude electronic participation, the in person meeting shall continue if a quorum is present in the room. She added that the Rules state the chair has reasonable discretion to apply the meeting procedures subject to the right of any member of Council to appeal to the Council in which case the matter shall be resolved by a vote of the members.

MOTION: Councilmember Leh moved to override the Mayor's decision to not take electronic comments. He stated he wants to be sure to hear from those online if it is possible. Seconded by Mayor Pro Tem Maloney.

VOTE: Motion passed by 4-3 vote with Mayor Pro Tem Maloney and Councilmembers Fahey, Leh, and Dickinson voting yes.

Larry Donner, Louisville, stated he does not support this ordinance. He feels this ordinance will ensure vacant buildings won't get repurposed and more businesses will leave town. The codes are premature and we don't fully understand the impacts.

Susan Loo, Louisville, stated the previous cost estimates on residential net zero were not accurate and it is likely these estimates for commercial are not accurate as well. There hasn't been a full look at the details of what this ordinance will do.

Councilmember Brown stated this ordinance applies to new construction only. He noted that staff did a great deal of public outreach on this and people were able to give input.

Councilmember Leh asked if the business community was specifically asked for input on this ordinance as presented here. Director Zuccaro stated there was no specific outreach to the business community about the code as drafted and presented here.

Councilmember Leh reviewed the City's sustainability goals as set out in Resolution No. 25, Series 2019 and noted everyone on Council wants to meet those goals. It is just a matter of how we get there and the timing.

Public Comments

Jeff Sheets, Koelbel and Company, stated developers aren't opposed to this but would be looking for very specific costs to build. He suggested taking more time and meeting with developers to look at real costs and understand what this looks like to see it if achievable. He suggested that could be done quickly and brought back in first quarter of next year. He asked Council to delay this a bit.

Tamar Krantz, Louisville, stated she is happy Louisville is on the forefront of this issue. She urged approval to help meet the City's sustainability goals. She does not think it will prevent businesses from coming here. She urged approval.

Josh Cooperman, Louisville, urged approval as a way to reduce greenhouse gases. He stated he wants this in place for new construction, particularly any large projects that are coming through. This code is not a stretch and should be approved.

Rick Kron, Downtown Business Association, stated he is not convinced the cost estimates in the report are not accurate and the ROI on some items are very long. He stated he would have liked the draft ordinance available earlier so that people could have more time to read and understand it before this Council meeting. He stated there are some types of businesses could build here under this ordinance.

Tiffany Boyd, Louisville, stated these changes are inevitable to address the climate crisis. All buildings will need to retrofit when this becomes required so it makes sense to approve this now.

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Councilmember Fahey stated she thinks this is a good compromise and will promote sustainable building in new construction. It does apply only to new construction and has exemptions for hospitals and restaurants. The State is going to be putting very similar regulations in place in a few months and the cohort will be considering even stricter regulations for surrounding communities.

MOTION: Councilmember Fahey moved to approve the ordinance; Councilmember Most seconded the motion.

Mayor Pro Tem Maloney stated he wants more information on the ordinance. He noted all members of council support the sustainability goals, however he has concerns about process and timing. There is a sense of urgency to do this we have to do it soon, however we need to know what is happening at the State and with the cohort.

SUBSTITUTE MOTION: Mayor Pro Tem Maloney moved to table the ordinance to a date uncertain but take action in Q1 or Q2 of 2023 when we have more information. Councilmember Leh seconded the motion.

Councilmember Leh stated everyone agrees we have a serious and urgent climate problem that needs to be addressed. We all agree on our sustainability goals. We all agree on the cohort process that will establish regional standards. He would like staff to get additional public input on this version of the ordinance given there have been so many changes since first reading. He would rather table this until staff could get additional public input and bring it back in first quarter of 2023.

Councilmember Leh made a friendly amendment to table the ordinance to February 21 to allow time for a roundtable with the business community to take input on the ordinance. Mayor Pro Tem Maloney accepted the amendment.

Councilmember Most stated she thinks there has been reasonable public input and additional time is not likely to change any minds or garner more support. She stated this is a good compromise so continuing to keep this open is not an effective use of everyone's time. She understands the desire for more engagement but there is a point we need take action and we can address problems if they arise.

Councilmember Fahey stated she is comfortable the Council took enough input from the two public meetings. Staff did incorporate comments from the business community to get to where we are and allowing specific exceptions. The Council can amend this if we need to and we can look at incentives for new buildings if we want to.

Councilmember Dickinson stated the City has been leading the way in code adoption. He is excited about the cohort bringing this to all communities. This will happen sooner than later regionally. He would prefer moving with the cohort rather than ahead of them. He stated he likes this code as presented but would prefer to do this in conjunction with the cohort or doing it in Q1.

Mayor Stolzmann closed the public hearing.

VOTE ON SUBSTITUTE MOTION: Motion failed on a 4-3 vote with Mayor Stolzmann, and Councilmembers Brown, Councilmember Fahey, Councilmember Most voting no.

VOTE ON ORIGINAL MOTION: Motion carried by unanimous roll call vote.

RESOLUTION NO. 55, SERIES 2022 – A RESOLUTION AMENDING THE 2022 BUDGET BY AMENDING APPROPRIATIONS IN THE SOLID WASTE & RECYCLING FUND AND GOLF COURSE FUND FOR ADDITIONAL APPROPRIATIONS WITHIN SUCH FUNDS – PUBLIC HEARING (advertised *Daily Camera* 12/16/2022)

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ORDINANCE NO. _____, SERIES 2024

**AN ORDINANCE AMENDING CHAPTER 15.18.030 OF THE LOUISVILLE
MUNICIPAL CODE CONCERNING THE
2021 INTERNATIONAL ENERGY CONSERVATION**

WHEREAS, the City Council has adopted from time-to-time certain building and construction standards; and

WHEREAS, it is deemed to be in the interest of the public health, safety and general welfare to adopt by reference thereto the 2021 edition of the International Energy Conservation Code; and

WHEREAS, the City of Louisville remains committed to its adopted goals to reduce energy consumption, increase clean energy sources, and support the transition to a low-carbon community as outlined in the Sustainability Action Plan and Resolution 25, Series 2019, "A Resolution Setting Clean Energy and Carbon Reduction Goals"; and

WHEREAS, reducing building energy consumption is an effective strategy to reduce community-wide energy consumption and increase long-term cost savings for businesses; and

WHEREAS, the City Council is committed to environmental, economic and social sustainability, ensuring the International Energy Conservation Code is attainable for current and future business owners and tenants, supporting affordable housing and local businesses development.

WHEREAS, the City Council, after proper notice as required by law, has held a public hearing on this ordinance providing for the adoption of said codes; and

WHEREAS, the 2021 edition of the International Energy Conservation Code, with amendments, has been submitted to the City Council in writing and the City Council has determined that such codes should be adopted as herein set forth.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO:

Section 15.18.030 of the Louisville Municipal Code, concerning amendments and deletions to the 2021 International Energy Conservation Code, is hereby amended as follows (deleted text in ~~strike through~~ and new text underlined):

1. *Section C101.1 Title*, is amended to insert "the City of Louisville" so the section will read:

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C101.1 Title. These regulations shall be known as the Energy Conservation Code of the City of Louisville, and shall be cited as such. It is referred to herein as "this code."

2. *Section C103.2 Information on construction documents*, is hereby amended to read as follows:

C103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documented are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment herein governed. Details shall include the following as applicable:

1. Energy compliance path.
2. Insulation materials and their *R*-values
3. Fenestration *U*-factor and solar heat gain coefficients (SHGCs).
4. Area-weighted *U*-factor and solar heat gain coefficient (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water heating systems and equipment types, sizes, fuel source and efficiencies.
7. Economizer description.
8. Equipment and system controls.
9. Fan motor horsepower (hp) and controls.
10. Duct sealing, duct and pipe insulation and location.
11. Lighting fixture schedule with wattage and control narrative.
12. Location and *daylight* zones on floor plans.
13. Air barrier and air sealing details, including the location of the air barrier.
14. Location of pathways for routing of raceways or cable from the solar ready zone to the electrical service panel.

3. *Section C202 General Definitions*, is hereby amended by adding, in alphabetical order, the following definitions:

All-Electric Building: A building that contains no combustion equipment for primary heating, or piping or plumbing for combustion equipment, installed within the building or building site.

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Combustion Equipment: Any equipment or appliance used for space heating, service water heating, cooking, clothes drying and/or lighting that uses fuel gas or fuel oil.

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Electric Vehicle (EV): A vehicle registered for on-road use, primarily powered by an electric motor that draws current from a rechargeable storage source that is charged by being plugged into an electrical current source.

Electric Vehicle Supply Equipment (EVSE): The electrical conductors and associated equipment external to the electric vehicle that provide a connection between the premises wiring and the electric vehicle to provide electric vehicle charging.

Electric Vehicle Capable Space: A designated parking space that is provided with conduit sized and rated for a minimum 40 amp, 208/240 Volt dedicated branch circuit and shall be no less than 1" in size. Conduit must be continuous from the future or existing electrical panelboard or switchboard location(s) and end at a junction box or receptacle located within close proximity of the parking space. The electrical panel serving the parking space shall have sufficient capacity and physical space for a dual pole, 40 amp breaker. The conduit shall be sealed at the junction or outlet box that is capped off, with the conduit sealed and the cap labeled as "For future electric vehicle charging".

Electric Vehicle Ready Space: A designated parking space that is provided with a dedicated branch circuit with wiring capable of supporting a minimum 40-ampere, 208/240 Volt circuit that terminates at a receptacle, plug, junction box, or an installed electric vehicle supply equipment within close proximity of the parking space. There shall be adequate reserved space in an electrical panelboard or switchboard to meet the electric vehicle requirements.

Electric Vehicle Supply Equipment (EVSE) Installed Space: A designated parking space with dedicated electric vehicle supply equipment capable of supplying a minimum 40 amp, dedicated circuit rated at 208/240 Volt from a building electrical panelboard.

Emergency Power System: A source of automatic electric power of a required capacity and duration to operate required life safety, fire alarm, detection, and ventilation systems in the event of a failure of the primary power. Emergency power systems are those required for electrical loads where interruption of the primary power could result in loss of human life or serious injuries.

Energy Use Intensity (EUI): The annual building site energy use per square foot of gross floor area in units of kBtu/sq ft.

Residential Building: For this code, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) R-3 and R-4 buildings three stories or less in height above grade plane.

Standby Power System: A source of automatic electric power of a required capacity and duration to operate required building, hazardous materials or

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ventilation systems in the event of a failure of the primary power. Standby power systems are those required for electrical loads where interruption of the primary power could create hazards or hamper rescue or fire-fighting operations.

Tenant Finish: The first tenant occupying a space(s) in a core and shell. Multiple tenants may be considered as a tenant finish until the entire space within the core and shell has had a tenant. Once a space within a core and shell has been occupied it becomes an existing building.

4. C401.2. Commercial buildings shall comply with ~~Section C401.2.1~~ one of the following, as applicable

C401.2.1 Performance targets. New commercial building types included in the scope of Appendix PT shall comply with Appendix PT and or Sections C403.2.4 and C404.10.

C401.2.2 Core and shell. Core and shell buildings shall comply with the provisions of Section C402.1.3 through C402.5. When mechanical systems are installed, core and shell buildings shall also meet the provisions in C403.2.4, C404.10, and Section C408.

C401.2.2.1 Core and shell buildings shall submit a letter of agreement to the City stating the tenant spaces included in the scope of Appendix PT shall meet the EUI target established in Table PT103 and shall include these requirements in their lease or purchase agreements.

C401.2.3 Tenant finish. Tenant finishes included in the scope of Appendix PT shall comply with Appendix PT and or C403.2.4 and C404.10. All other tenant finishes shall comply with the Prescriptive Compliance option, which requires compliance with Sections C401.3, C401.4, C402 through C406, and C408.

C401.2.4 ~~Other commercial building types.~~ Commercial building types not included above, including additions, shall comply with the Prescriptive Compliance option, which requires compliance with Sections C401.3, C401.4, C402 through C406, and C408.

Exception: ~~Additions, alterations,~~ Alterations, repairs, and changes of occupancy to existing buildings complying with Chapter 5.

5. *Section C401.2.1 International Energy Conservation Code*, is hereby deleted and replaced to read as follows:

C401.2.1 International Energy Conservation Code

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Commercial buildings shall be built all-electric unless the fuel gas options of C403.3.2 and the additional electric infrastructure requirements of C405.14 are met. All buildings must comply with the following:

City of Louisville's Prescriptive Compliance. The Prescriptive Compliance option requires compliance with Sections C401.3, C401.4, C402 through C406, and Section C408.

Core and shell buildings shall be required to comply with the provisions of Section C402.1.3 through C402.5 of the 2021 International Energy Conservation Code.

6. *Section C401.2.2 ASHRAE 90.1*, is hereby deleted in its entirety.
7. A new *Section C401.4 Mandatory Requirements for Commercial Buildings*, is hereby added to read as follows:

C401.4 Mandatory Requirements for Commercial Buildings. Commercial buildings must comply with Table C401.4.

Table C401.4 (Mandatory)
Requirements for Commercial Buildings

Title	IECC Section
Air leakage	C402.5
Calculation of heating and cooling loads	C403.1.1
Data centers	C403.1.2
System Design	C403.2
Heating and cooling equipment efficiency	C403.3
Heating and cooling system controls	C403.4, except C403.4.3, C403.4.4, C403.4.5
Economizer fault detection and diagnostics	C403.5.5
Ventilation and exhaust systems	C403.7, except C403.7.4.1
Fan and fan controls	C403.8, except C403.8.6
Large diameter ceiling fans	C403.9
Refrigeration equipment performance	C403.11, except C403.11.3
Construction of HVAC system elements	C403.12
Mechanical systems located outside of the building thermal envelope	C403.13
Service water heating	C404
Electrical power and lighting systems	C405, except C405.3

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Maintenance information and system commissioning	C408
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8. *Table C402.1.3 Opaque Thermal Envelope Insulation Component Minimum Requirements, R-Value Method*, is hereby deleted and replaced with the following:

Table C402.1.3 (Mandatory)
Opaque Thermal Envelope Insulation Component of an Average Minimum Requirements, R-Value Method in following locations:

Roof C402.2.1	
Insulation entirely above roof deck	R-49
Metal buildings ^a	R-21 + R-11 LS
Attic and other	R-49
Walls. Above grade C402.2.2	
Mass ^d	R-21
Metal buildings	R-21 + R-10ci
Metal framed	R-21+ R-10ci
Wood framed and other	R-21
Walls, Below grade C402.2.5	
Below-grade wall ^b	R-10
Floors C402.2.3	
Mass ^c	R-21
Joist/framing	R-38
Slab-on-grade floors C402.2.4	
Unheated	R-20 for 24" below
Heated ^e	R-15 for 36" below + R-5 full slab

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 4.88 kg/m², 1 pound per cubic foot = 16 kg/m³.
NR = No Requirement, LS = Liner System.

- a. Where using R-value compliance method, a thermal spacer block shall be provided.
b. Where heated slabs are below grade, below-grade walls shall comply with the exterior insulation requirements for heated slabs.
c. "Mass floors" shall be in accordance with Section C402.2.3.
d. "Mass walls" shall be in accordance with Section C402.2.2.
e. The first value is for perimeter insulation and the second value is for full, under-slab insulation.

9. *Section C402.1.4 Assembly U-factor, C-factor or F-factor-based method*, is hereby deleted in its entirety.
10. *Section C402.1.5 Component performance alternative*, is hereby deleted in its entirety.
11. *Table C402.4 Building Envelope Fenestration Maximum U-Factor and SHGC Requirements*, is hereby deleted and replaced with the following:

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Table C402.4
Building Envelope Fenestration

Vertical Fenestration	
Maximum U-Factor	0.45
Maximum SHGC	0.33
Maximum Air leakage rate for all fenestration except curtain walls and storefront glazing	.20 cfm/ft ²
Maximum air leakage rate for curtain walls and storefront glazing	.06 cfm/ft
Skylights	
Maximum U-Factor	0.50
Maximum SHGC	0.40
Maximum Air leakage rate	.20 cfm/ft ²

12. ~~Section C402.4.1 Maximum area~~, is hereby deleted and replaced with the following:

~~C402.4.1 Minimum area of natural lighting. Not less than eight percent of the floor area shall be glazed.~~

12. ~~Section C402.4.1.2~~ is deleted and replaced with the following:

~~C402.4.1 Minimum area of natural lighting. Not less than 8% of wall area for warehouses, and industrial shall be glazed.~~

13. ~~Section C402.4.2 Minimum skylight fenestration area~~, is hereby deleted and replaced with the following:

~~C402.4.2 Minimum area of natural lighting. A minimum skylight area of three percent of the roof area shall be provided for all roofs.~~

~~Exception: Roof areas designated for solar ready zones shall not be included in roof area calculation.~~

13. **C403.2 System design.** Mechanical systems shall be designed to comply with Sections C403.2.1 through ~~403.2.3~~ C403.2.4. Where elements of a building's mechanical systems are addressed in Sections C403 through C403.14, such elements shall comply with the applicable provisions of those sections.

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14. Section C403.2.4 Space heating equipment is added as follows:

~~C403.2.4 Space heating equipment. Fossil fuel warm air furnaces appliances and electric resistance space heating equipment shall not be permitted for space heating in new construction.~~

C403.2.4. Heat pump efficiencies:

- a. Ductless System
 - 1. 14.3 SEER2
 - 2. 7.5 HSPF2
 - 3. Or EnergyStar Cold Climate certified
- b. Ducted System
 - 1. 15.2 SEER2
 - 2. 9 HSPF2
 - 3. Or EnergyStar Cold Climate certified

Exceptions:

- 1. ~~Emergency backup.~~ Where it is required by an applicable law or regulation to provide space heating with an emergency power system or a standby power system.
- 2. ~~Certain make-up air systems.~~ Electric resistance in make-up air systems where energy recovery ventilation is prohibited by the International Mechanical Code.
- 3. ~~Supplementary heat.~~ Electric resistance and natural gas/propane heat used for supplementary heat in accordance with Section C403.4.1.1
- 4. ~~Electric resistance budget.~~ In addition to any exceptions in this section, Up to 5 W of electric resistance space heating per square foot of conditioned floor area in the building, not including supplementary heat.
- 5. ~~Integrated units.~~ Electric resistance heating elements, natural gas, propane supplemental heating integrated into heat pump equipment.
- 6. ~~Heated plenums.~~ Electric resistance in heated plenums.
- 7. ~~Temporary systems.~~ Temporary electric resistance heating systems are permitted where serving future tenant spaces that are unfinished and unoccupied, provided that the heating equipment is sized and controlled to achieve interior space temperatures no higher than needed to prevent freezing.
- 8. ~~Freeze protection.~~ Electric resistance in heating systems intended for freeze protection.
- 9. ~~Outdoor systems.~~ Equipment used for outdoor heating.
- 10. ~~Specific conditions.~~ Portions of buildings that require fossil fuel or electric resistance space heating for specific conditions approved by the Building Official for research, health care, process or other specific needs that cannot practicably be served by heat pump or other space heating systems. This does not constitute a blanket exception for any occupancy type.
- 11. ~~Replacements.~~ Replacement fuel fired appliances.

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- ~~12. Backup heat. For back up heat to operate when the heat pump cannot adequately heat the space/buildings due to extreme cold weather.~~
- ~~13. Where cfm/sq. ft. ventilation requirements result in conditions where the Building Official determines that space heating requirements cannot reasonably be met without combustion space heating systems.~~

~~14.1. Section C403.3.2 HVAC equipment performance requirements, is hereby deleted in its entirety and replaced~~ amended by adding the following at the beginning of the section with remainder of section to remain ~~to read as follows:~~

C403.3.2 When HVAC fuel fired equipment is permitted to be installed, equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.

~~HVAC/fuel fired equipment performance requirements. Unless built all electric, all new combustion equipment shall comply with the more efficient HVAC equipment performance of Sections C406.2, C406.2.3, and C406.2.4 and the additional electric infrastructure requirements in Section C405.14. A mechanical compliance certificate demonstrating compliance with section C406.2.3 and/or C406.2.4 shall be required for all HVAC, fuel fired and Service Water Heating equipment.~~

~~The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein. (Tables C403.2.(1) through (16) are expressly retained and remain applicable to HVAC equipment performance.)~~

~~Exceptions:~~

- ~~1. Factory, laboratory, and high hazard occupancy combustion equipment, except for HVAC and domestic water heating.~~
- ~~2. Commercial Kitchens.~~
- ~~3. Other combustion equipment approved by the Building Official based on demonstration by the applicant that compliance with this section~~

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~~is not feasible and the equipment proposed is the most efficient appliance reasonably available.~~

16. *Section C403.4.1 Thermostatic controls*, is hereby deleted and replaced with the following:

C403.4.1 Thermostatic controls. The supply of heating and cooling energy to each *zone* shall be controlled by individual thermostatic controls capable of responding to temperature within the *zone*. Where humidification or dehumidification or both is provided, no fewer than one humidity control device shall be provided for each humidity control system. Occupancy sensors shall be provided on the thermostat to setback in accordance with C403.4.2.1

Exception: Independent perimeter systems that are designed to offset only building envelope heat losses, gains or both serving one or more perimeter *zones* also served by an interior system provided that both of the following conditions are met:

1. The perimeter system includes not fewer than one thermostatic control *zone* for each building exposure having exterior walls facing only one orientation (within ± 45 degrees) (0.8 rad) for more than 50 contiguous feet (15 240 mm).
2. The perimeter system heating and cooling supply is controlled by thermostats located within the *zones* served by the system.

17. *Section C403.12.1 Duct and plenum insulation and sealing*, is hereby deleted and replaced with the following:

C403.12.1 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with not less than R-12. Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the International Mechanical Code.

18. *Section C403.12.3 Piping insulation*, is hereby amended to read as follows:

C403.12.3 Piping insulation. Piping serving as part of a heating or cooling system shall be thermally insulated to R-3.

19. *Section C404.4 Insulation of piping*, is hereby amended to read as follows:

C404.4 Insulation of piping. Piping from a water heater to the termination of the heated water fixture supply pipe shall be insulated to R-3. On both the inlet and outlet piping of a storage water heater or heated water storage tank, the piping to a heat trap or the first 8 feet (2438 mm) of piping, whichever is less, shall be insulated. Piping that is heat traced shall be insulated to R-3 or the heat trace manufacturer's instructions.

~~20. *Section C404.10 Water heating equipment* is added as follows:~~

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~~C404.10 Water heating equipment.~~ Fossil fuel and electric resistance instantaneous and storage water heaters shall not be used to provide hot water in new construction.

Exceptions:

- ~~1. Emergency backup.~~ Where it is required by an applicable law or regulation to provide water heating with an emergency power system or a standby power system.
- ~~2. Integrated units.~~ Resistance heating elements integrated into heat pump water heating equipment.
- ~~3. Recirculation loops.~~ Electric resistance elements used for recirculation loop temperature maintenance.
- ~~4. Small systems.~~ Electric storage water heaters with a rated water storage volume no greater than 20 gallons.
- ~~5. Point of use systems.~~ Instantaneous electric water heaters located within 10 feet of the point of use.
- ~~6. Renewable electricity.~~ Electric resistance equipment where not less than 100 percent of the annual service water heating requirement is provided by an *on-site renewable energy system* not used to meet any other provision of this code.
- ~~7. Renewable or waste thermal energy.~~ Electric resistance storage water heating equipment in *buildings* where not less than 75% of the annual service water heating requirement is met by a solar thermal system or other renewable thermal system.
- ~~8. High temperature requirements.~~ Water heating systems that serve end-uses or have a storage requirement that necessitates a water temperature of 141°F (55°C) or hotter.
- ~~9. Electric resistance budget.~~ In addition to any exceptions in this section, a budget of 24 kW plus 0.1 watts per square foot of building area of electric resistance service water heating capacity per building.
- ~~10. Commercial kitchens.~~ Electric booster heaters serving commercial dishwashers, commercial food service equipment, and other approved process equipment that require supply water temperatures of 120°F (49°C) or higher.
- ~~11. Replacements.~~ Replacement of gas-fired storage water heaters or instantaneous water heaters.

~~21. Section C405.2.1 Occupant sensor controls, is hereby amended to read as follows:~~

~~C405.2.1 Occupant sensor controls.~~ *Occupant sensor controls* shall be installed to control lighting.

~~22. Section C405.2.2 Time switch controls, is hereby deleted in its entirety.~~

~~23. Section C405.2.2.1 Time switch control function, is hereby deleted in its entirety.~~

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39. *Section C405.4.3 Gas lighting, is hereby amended to read as follows:*

C405.4.3 Gas lighting. Gas-fired lighting appliances shall not be permitted.

40. A new *Section C405.14 Additional electric infrastructure*, is hereby added to read as follows:

Section C405.14 Additional electric infrastructure. All *combustion equipment* and end-uses shall be installed in accordance with this section.

C405.14.1 Electric infrastructure for dwelling and sleeping units. *Combustion equipment* and end-uses serving individual dwelling units or sleeping units shall comply with Section R404.5.

C405.14.2 Combustion equipment. *Combustion equipment* shall be provided with conduit that is continuous between a junction box located within 3 feet (914 mm) of the appliance or equipment and an electrical panel. The junction box, conduit and bus bar in the electrical panel shall be rated and sized to accommodate a branch circuit with sufficient capacity for an equivalent electric appliance, equipment or end use with an equivalent equipment capacity. The electrical junction box and electrical panel shall have labels stating, "For Future Electric Equipment".

Exception: Industrial and manufacturing uses are exempt from Section C405.14.

41. *Section C502.1.1 General, is hereby amended to read as follows:*

Additions to an existing building, building system or portion thereof shall conform to the provisions of Section C401.2.4 as those provisions relate to new construction without requiring the unaltered portion of the existing building or building system to comply with this code. Additions shall not create unsafe or hazardous condition or overload existing building systems. An addition shall be deemed to comply with this code if the addition alone complies or if the existing building and addition comply with this code as a single building.

43. *Section C503.2 Building Envelope is amended with exception remaining to read as follows:*

New building envelope assemblies that are part of the alteration shall comply with Sections C402.1 through C402.5. Existing ceilings, roofs, all wall types, or floors exposed during construction shall comply with Table C402.1.3.

44. *Section C505.1 General, is hereby amended to read as follows:*

C505.1 General. Where the use in a space changes from one use in Table C405.3.2(1) or C405.3.2(2) to another use in Table C405.3.2(1) or C405.3.2(2), the installed lighting wattage shall comply with Section C405.3. Where the space

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undergoing a change in occupancy or use is in a building with a fenestration area that exceeds the limitations of Section C402.4.1, the space is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.

Exception: Egress doors with fenestration are allowed to bring total fenestration percentages over the allowed maximum amount of vertical fenestration.

APPENDIX PT MODELING TO A PERFORMANCE TARGET

PT101 Scope. This section establishes criteria for demonstrating compliance with a performance target, and is required for new hotels (occupancy R-1), multifamily (occupancy R-2), offices, primary and secondary schools, and warehouses. All end use load components within and associated with the building and their building sites shall be modeled.

PT102 Mandatory requirements. The requirements in this section are mandatory requirements and shall be required in addition to the provisions of ASHRAE 90.1 Appendix G.

PT103 Performance target. Projects of the types listed in Table PT103 shall demonstrate that the proposed design reaches a fixed energy use intensity (EUI) less than or equal to the values in Table PT103, calculated utilizing the energy modeling procedures of Appendix G of ASHRAE 90.1. For *buildings* with multiple occupancy types, the modeled performance target shall be a weighted average of the floor area of each occupancy type.

Exception: Energy used for electric vehicle charging, data centers, and process loads shall be excluded from compliance modeling.

**TABLE PT103
PERFORMANCE TARGETS**

BUILDING TYPE	PERFORMANCE TARGET (kBTU/ft ²)
<u>Hotel (Occupancy R-1)</u>	<u>32</u>
Multifamily (Occupancy R-2)	32
Office, small (≥ 0 - 5,000 ft ²)	19

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Office, medium (5,000 – 50,000 ft ²)	23
Office, large (>50,000 ft ²)	28
School, primary	34
School, secondary	31
Warehouse	11

PT104 Renewable Energy. On-site renewable energy generated by a system installed as part of this project that is used by the building shall be subtracted from the proposed design energy consumption prior to calculating the proposed building performance.

PT105 Performance documentation. Documentation to verify compliance with this section shall be provided to the code official.

PT105.1 Projected compliance report. Permit submittals shall include a report documenting the proposed design is projected to meet the EUI target. The compliance report shall include the following specific information beyond the information required in ASHRAE 90.1 Appendix G:

1. Address of the building.
2. An inspection checklist documenting the building component characteristics of the proposed design.
3. Name of individual completing the report.
4. Name and version of compliance software tool.
5. Documentation of the reduction in energy use associated with on-site energy.

PT105.2 Construction plan requirements. Construction plans shall depict all component characteristics of the proposed design utilized for the EUI in accordance with ASHRAE 90.1 Appendix G.

~~**PT105.3 Measured performance report.** Projects shall demonstrate compliance with this code by documenting that the building has achieved the EUI performance calculated based on 12 months of metered energy use after occupancy.~~

~~**PT105.3.1 Demonstration of operating energy use.** Metered energy data demonstrating compliance with the EUI target shall be reported to the building official using Energy Star Portfolio Manager and adjusted for the percentage of floor area occupied. While at least 75 percent occupied, the building shall operate at or below its assigned energy use target established in Section PT103 for any recording period of 12 consecutive months that is~~

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~~completed within three years of the date of the Certificate of Occupancy. The owner shall notify the building official when this 12-month period has been successfully completed.~~

PT106 Energy metering and monitoring. ~~All projects must install submetering or monitoring capabilities to support building energy performance analysis. The project must include capabilities to store and access a 24-month continuous data set on an ongoing basis.~~

PT106.1 End-use monitoring. ~~Measurement devices shall be installed in new buildings to monitor the electric energy use of each of the following separately:~~

- ~~1. Total electric energy.~~
- ~~2. HVAC systems energy use.~~
- ~~3. Interior lighting.~~
- ~~4. Exterior lighting.~~
- ~~5. Receptacle circuits.~~
- ~~6. Data centers representing over 10 percent of total building load or 5 percent of building floor area.~~
- ~~7. Other process loads that represent 10 percent or more of total building energy use based on building energy use modeling.~~

PT106.2 Independent metering. ~~The following items shall be independently metered. Individual meters used to comply with this section may not serve multiple buildings.~~

- ~~1. All fuel sources serving the building.~~
- ~~2. Energy production from on-site renewable energy systems.~~
- ~~3. Electric vehicle (EV) supply equipment.~~
- ~~4. Data centers representing over 10 percent of total building load or 5 percent of building floor area.~~
- ~~5. Other process loads that represent 10 percent or more of total building energy use based on building energy use modeling.~~
- ~~6. Individual tenant energy loads.~~

45. *Section R101.1 Title*, is amended to insert "the City of Louisville" so the section will read:

R101.1 Title. These regulations shall be known as the Energy Conservation Code of the City of Louisville and shall be cited as such. It is referred to herein as "this code."

46. *Section R103.2 Information on construction documents*, is amended to read as follows:

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R103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documented are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment herein governed. Details shall include the following as applicable:

1. Energy compliance path.
2. Insulation materials and their *R*-values
3. Fenestration *U*-factor and solar heat gain coefficients (SHGCs).
4. Area-weighted *U*-factor and solar heat gain coefficient (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water heating systems and equipment types, sizes, fuel source and efficiencies.
7. Equipment and system controls.
8. Duct sealing, duct and pipe insulation and location.
9. Air sealing detail.
10. Location of pathways for routing of raceways or cable from the solar ready zone to the electrical service panel.

47. *Section R202 General Definitions*, is hereby amended by adding, in alphabetical order, the following definitions:

All-Electric Building: A building that contains no combustion equipment for primary heating, or plumbing or piping for combustion equipment, installed within the building or building site.

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Combustion Equipment: Any equipment or appliance used for space heating, service water heating, cooking, clothes drying and/or lighting that uses fuel gas or fuel oil.

Electric Vehicle (EV): A vehicle registered for on-road use, primarily powered by an electric motor that draws current from a rechargeable storage source that is charged by being plugged into an electrical current source.

Electric Vehicle Supply Equipment (EVSE): The electrical conductors and associated equipment external to the electric vehicle that provide a connection between the premises wiring and the electric vehicle to provide electric vehicle charging.

Electric Vehicle Capable Space: A designated parking space that is provided with conduit sized and rated for a minimum 40 amp, 208/240 Volt dedicated branch circuit and shall be no less than 1" in size. Conduit must be continuous from the future or existing electrical panel board or switchboard location(s) and end at a junction box or receptacle located within close proximity of the parking space.

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The electrical panel serving the parking space shall have sufficient capacity and physical space for a dual pole, 40-amp breaker. The conduit shall be sealed at the junction or outlet box that is capped off, with the conduit sealed and the cap labeled as "For future electric vehicle charging".

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Electric Vehicle Ready Space: A designated parking space that is provided with a dedicated branch circuit with wiring capable of supporting a minimum 40-ampere, 208/240-Volt circuit that terminates at a receptacle, plug, junction box, or an installed electric vehicle supply equipment within close proximity of the parking space. There shall be adequate reserved space in an electrical panel board or switchboard to meet the electric vehicle requirements.

Residential Building. For this code, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) and R-3 and R-4 buildings three stories or less in height above grade plane.

48. Section R401.2 Application, is hereby deleted and replaced with the following:

R401.2 Application. New Residential buildings shall be built using appendix RB or RC and shall be built all-electric unless the fuel gas options of R403.7 and additional electric infrastructure requirements of R404.5 are met. All residential buildings shall comply with the R401.2.1 City of Louisville's Prescriptive Compliance or R406 Energy Rating Index with a maximum rating index of 50 before the installation of solar panels

Exceptions:

1. New residential buildings certified through the Passive House Institute US, Inc. (PHIUS) program
2. Additions shall comply with R401.2.1 and Chapter 5
3. Additions, alterations, repairs and changes of occupancy to existing buildings complying with Chapter 5.

49. Section R401.2.1 Prescriptive Compliance Option, is hereby deleted and replaced with the following:

R401.2.1 City of Louisville's Prescriptive Compliance. The City of Louisville's Prescriptive compliance requires compliance with Sections R401 through R404.

50. Section R401.2.2 Total Building Performance Option, is hereby deleted in its entirety.

51. Section R401.2.4 Tropical Climate Region, is hereby deleted in its entirety.

52. Section R401.2.5 Additional Energy Efficiency, is hereby amended to read as follows:

Section R401.2.5 Additional Energy Efficiency. Building shall comply with one of the additional efficiency options and shall be installed in according to Section R408.2.

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53. A new *Section R401.4 Mandatory requirements for residential buildings*, is hereby added to read as follows:

R401.4 Mandatory requirements for residential buildings. Residential building must comply with the following sections from the 2021 International Energy Conservation Code found in Table R401.4 and Section R401.2.

Table R401.34
Mandatory requirements for residential buildings

Title	IECC Section
Vapor retarder	R402.1.1
Eave baffle	R402.2.3
Access hatches and doors	R402.2.4.1
Crawl space wall insulation	R402.4.1.2
Maximum fenestration U-factor and SHGC	R402.5
Mechanical Controls	R403.1
Ducts	R403.3 except R403.3.2, R403.3.3, and R403.6
Mechanical system piping insulation	R403.4
Heated water circulation and temperature maintenance systems	R403.5.1
Drain Water heat recovery units	R403.5.3
Mechanical ventilation	R403.6 including E403.6.1
Equipment sizing and efficiency rating	R403.7
Systems serving multiple dwelling units	R403.8
Snow melt and ice systems	R403.9
Energy consumption of pools and spas	R403.10
Portable spas	R403.11
Residential pools and permanent residential spas	R403.12
Lighting equipment	R404.1
Interior lighting controls	R404.2

54. *Section R402.1 General*, is hereby amended to read as follows:

R402.1 General. The building thermal envelope shall comply with the requirements of Section R402.1.1 and R402.1.2.

55. *Section R402.1.2 Insulation and fenestration*, is hereby deleted and replaced with the following:

R402.1.2 Insulation and fenestration. New and replacement Assemblies shall have R-value of insulation materials equal to or greater than that specified in Table

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R402.1.2 unless an alternative path is specified while using HERS energy rating index of 50.

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Exception: New Construction complying with R401.2 or exception 1

56. Section R402.1.2.1 Fenestration is hereby added to read as following:

R402.1.2.1 Fenestration. New and replacement assemblies shall not exceed the value specified in Table R402.1.2.

Exception: New Construction complying with R401.2 or exception 1

Table R402.1.2 Average Insulation and Fenestration Requirements by Component	
Roof	R-60
Above grade walls	R-21
Below grade walls	R-19
Floors	R-38
Non heated slab on grade	R-10 for 4ft
Heated slab on grade	R-15 for 4 ft + R-5 under full slab
Fenestration U-Factor	.30
Fenestration SHGC	.33
Skylight U-Factor	.50
Skylight SHGC	.40
Hot Water Pipes	<u>R-3</u>
Warm Air Ducts	<u>R-8</u>

55. Section R402.1.5 Total UA alternative, is hereby deleted in its entirety.

56. Section R402.3.3 Glazed fenestration exemption, is hereby amended to read as follows:

R402.3.3 Glazed fenestration exemption. Not greater than 15 square feet (1.4 m²) of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements in Section R402.1.2.

57. Section R402.4.1.2 Testing, is hereby deleted and replaced to read as follows:

Section R402.4.1.2 Testing. All new buildings or dwelling units that are heated or cooled, and additions over 500 square feet shall be tested for air leakage.

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58. *Section R402.5 Maximum fenestration U-factor and SHGC*, is hereby deleted and replaced with the following:

Section R402.5 Maximum fenestration U-factor and SHGC. The maximum U-factor and solar heat gain coefficient (SHGC) for fenestration shall not be required in storm shelters complying with ICC 500.

59. *Section R403.3.1 Ducts located outside conditioned space*, is hereby deleted and replaced with the following:

R403.3.1 Ducts located outside conditioned space. All supply and return ducts shall be insulated to a minimum R-8 if located outside a conditioned space.

60. *Section R403.5.2 Hot water pipe insulation*, is hereby deleted and replaced with the following:

R403.5.2 Hot water pipe insulation. All service hot water piping shall be insulated to a minimum R-3.

- ~~61. *Section R403.6.1 Heat and recovery ventilation*, is hereby deleted and replaced in its entirety and the following is hereby added in lieu thereof:~~

~~**R403.5.2 Heat and recovery ventilation.** All new buildings and additions over 500 square feet shall be provided with a heat recovery or energy recovery ventilation system. The system shall be balanced with a minimum sensible heat recovery efficiency of 65 percent at 32°F (0°C) at a flow greater than or equal to the design airflow.~~

62. *Section R403.7 Equipment sizing and efficiency rating*, is hereby deleted and replaced with the following:

R403.7 Equipment sizing and efficiency rating. All new buildings and additions greater than 500 square feet with heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies. In addition to complying with Sec. R404.6 Additional Electric Infrastructure, new and replacement electrical heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed. New gas heating equipment shall comply with the following efficiencies:

1. Gas furnaces shall have a minimum of 95% efficiency.
2. Gas boilers shall have a minimum of 95% AFUE.
3. On demand water heaters shall have a greater than .92 uniform energy factor.
4. Heat pump efficiencies:

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a.c. Ductless System

1. 14.3 SEER2
2. 7.5 HSPF2
3. Or EnergyStar Cold Climate certified

b.d. Ducted System

1. 15.2 SEER2
2. 9 HSPF2
3. Or EnergyStar Cold Climate certified

Exception: Solid fuel stoves/gas fireplaces, outdoor fire pits, gas stoves and ovens.

63. *Section R404.1.1 Fuel gas lighting equipment, is hereby amended to read as follows:*

R404.1.1 Fuel gas lighting equipment. Fuel gas lighting systems shall not be installed.

64. *A new Section R404.4 Electric vehicle charging infrastructure for new construction and building addition of 50% or more of original square footage, is hereby added to read as follows:*

~~Section R404.4 Electric vehicle charging infrastructure for new construction and building addition of 50% or more of original square footage.~~ Electric infrastructure for the current and future charging of ~~electric vehicles~~ shall be installed in accordance with this section per Section 17.20.170 of the Louisville Municipal Code. ~~EV ready spaces and EV capable spaces~~ are permitted to be counted toward meeting minimum parking requirements.

~~R404.4.1 One and two family dwellings and townhouses. One and two family dwellings and townhouses with a dedicated attached or detached garage or on site parking spaces shall be provided with electric vehicle charging in accordance with Section 17.20.170 of the Louisville Municipal Code.~~

~~R404.4.1.1 Minimum EV Ready infrastructure. Minimum EV Ready Space infrastructure shall require the following:~~

- ~~1. Installation of conductors:
 - ~~a. Conductors shall be installed of sufficient size to accommodate a minimum 240VAC 40Amp branch circuit to each parking space where required.~~
 - ~~b. Conductors shall terminate in either a receptacle, plug, junction or outlet box, or an EVSE installed in the parking space.~~~~
- ~~2. The electrical panel directory shall designate the branch circuit as "EV Ready" and the junction box or receptacle shall be labelled "EV Ready."~~

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~~R404.4.1.2 Construction documents. Construction documents shall graphically indicate and label all EV ready spaces and associated termination locations. For all Townhouses and one and two family dwellings with an electrical utility service of 200 Amps or greater, a panelboard schedule shall be provided indicating the EV Ready circuit breaker space(s) and the circuit designation(s).~~

~~R404.4.2 Group R occupancies. Group R occupancies (R-2, R-3, and R-4 buildings three stories and less) with three or more dwelling units and/or sleeping units shall be provided with electric vehicle charging in accordance with Section 17.20.170 of the Louisville Municipal Code.~~

~~Electric vehicle charging shall be provided and installed in accordance with this section and the National Electrical Code (NEPA 70). When parking spaces are added or modified without an increase in building floor area, only the new parking spaces are subject to this requirement.~~

65. A new Section R404.5 Additional electric infrastructure, is hereby added to read as follows:

R404.5 Additional electric infrastructure. *Combustion equipment* shall be installed in accordance with this section.

R404.5.1 Combustion equipment and end-uses. *Combustion equipment* shall be provided with a dedicated, appropriately phased circuit that shall have a minimum amperage requirement for a comparable electric appliance, equipment or end use, an electrical receptacle or junction box that is connected to the electric panel, and conductors of adequate capacity within 6 feet (1829 mm) of the appliance or equipment.

Each such circuit shall be accessible with no obstructions. A reserved circuit breaker space shall be installed in the electrical panel adjacent to the circuit breaker for the branch circuit and labeled for each circuit. Both ends of the unused conductor or conduit shall be labeled "For Future Electric Equipment" and be electrically isolated.

66. Section R405 Total building performance, is deleted in its entirety.

67. Section R406.3 Building thermal envelope, is hereby deleted in its entirety and replaced with the following:

R406.3 Building thermal envelope. ~~Building and portions thereof shall comply with Table R406.3. The building thermal envelope shall be greater or equal to the levels of efficiency and SHGC in Table R402.1.206.3.~~

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Table R406.3
Average of the Minimum Insulation and Maximum Fenestration Requirements by
Component

Roof	~~R-60~~
Above grade walls	~~R-21~~
Below grade walls	~~R-21~~
Floors	~~R-38~~
Non-heated slab on grade	~~R-10 for 4ft~~
Heated slab on grade	~~R-15 for 4 ft + R-5 under full slab~~
Fenestration U-Factor	~~.30~~
Fenestration SHGC	~~.33~~
Skylight U-Factor	~~.50~~
Skylight SHGC	~~.40~~
Heated Water Pipes	~~R-5~~
Heated air Ducts	~~R-8~~

68. Section R406.3.1 On-site renewables are not included, is deleted in its entirety.

69. Section R406.3.2 On-site renewables are included, is deleted in its entirety.

70. Section ~~406.3.2~~ R407 Tropical Climate Region Compliance Path, is deleted in its entirety.

71. Section R502.1.1 General, is hereby amended to read as follows:

Additions to an existing building, building system or portion thereof shall conform to the provisions of R401.2.1 as those provisions relate to new construction without requiring the unaltered portion of the existing building or building system to comply with this code. Additions shall not create unsafe or hazardous condition or overload existing building systems. An addition shall be

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deemed to comply with this code where the addition alone complies, where the existing building and addition comply with this code as a single building, or where the building with the addition does not use more energy than the existing building. Additions shall be in accordance with Section R502.2 or R502.3.

72. Section R503.1.1 Building Envelope is amended to read as follows:

Building envelope assemblies that are part of the alteration shall comply with Section R401.2.1

Section R503.1.1 Building envelope Exception 2 is deleted in its entirety and replaced with the following.

2. Section R402.4.1.2 Testing

73. Section R505.1 General is hereby amended to remove the exception.

74. Section R505.1.1 Unconditioned space, is hereby deleted and replaced with the following:

R505.1.1 Unconditioned space. Any unconditioned or low-energy space that is altered to become a conditioned space shall comply with Section R503.

75. RC102.1 General is amended to read as follows.

RC102.1 General. New residential buildings shall comply with Sections RC102.2 through RC102.9.

76. RC102.2 Energy Rating Index zero energy score is amended to read as follows.

RC102.2 Energy Rating Index zero energy score.

Compliance with this section requires that the rated design be shown to have a Home Energy Rating System (HERS) score of 5047 before solar and 0 with solar when compared to the Energy Rating Index (ERI) reference design determined in accordance with RESNET/ICC 301 for both of the following:

1. ERI value not including on-site power production (OPP) calculated in accordance with RESNET/ICC 301 HERS.
2. ERI value including on-site power production calculated in accordance with RESNET/ICC 301 HERS with the OPP in Equation 4.1.2 of RESNET/ICC 301 HERS adjusted in accordance with Equation RC-1.

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Adjusted OPP = OPP + CREF + REPC (Equation RC-1)

where:

CREF = Community Renewable Energy Facility power production—the yearly energy, in kilowatt hour equivalent (kWheq), contracted from a community

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renewable energy facility that is qualified under applicable state and local utility statutes and rules, and that allocates bill credits to the rated home.

REPC = Renewable Energy Purchase Contract power production—the yearly energy, in kilowatt hour equivalent (kWh_{eq}), contracted from an energy facility that generates energy with photovoltaic, solar thermal, geothermal energy or wind systems, and that is demonstrated by an energy purchase contract or lease with a duration of not less than 15 years.

RC102.2.1 HERS Score. Buildings shall comply with the scores in Table RC102.2.1.

Table RC102.2.1.

<u>HERS SCORE NOT INCLUDING OPP</u>	<u>HERS SCORE INCLUDING OPP</u>
<u>5047</u>	<u>0</u>

76. RC102.3 through RC102.9 are added to Appendix RC to read as follows.

RC102.3 Mandatory Sections. All projects shall comply with all sections within Table RC102.3.

Table RC102.3

Mandatory requirements for residential buildings

<u>Title</u>	<u>IECC Section</u>
<u>Vapor retarder</u>	<u>R402.1.1</u>
<u>Eave baffle</u>	<u>R402.2.3</u>
<u>Access hatches and doors</u>	<u>R402.2.4.1</u>
<u>Crawl space wall insulation</u>	<u>R402.4.1.2</u>
<u>Maximum fenestration U-factor and SHGC</u>	<u>R402.5</u>
<u>Mechanical Controls</u>	<u>R403.1</u>
<u>Ducts</u>	<u>R403.3 except R403.3.2, R403.3.3, and R403.6</u>
<u>Mechanical system piping insulation</u>	<u>R403.4</u>
<u>Heated water circulation and temperature maintenance systems</u>	<u>R403.5.1</u>
<u>Drain Water heat recovery units</u>	<u>R403.5.3</u>
<u>Mechanical ventilation</u>	<u>R403.6 including E403.6.1</u>
<u>Equipment sizing and efficiency rating</u>	<u>R403.7</u>
<u>Systems serving multiple dwelling units</u>	<u>R403.8</u>
<u>Snow melt and ice systems</u>	<u>R403.9</u>

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<u>Energy consumption of pools and spas</u>	<u>R403.10</u>
<u>Portable spas</u>	<u>R403.11</u>
<u>Residential pools and permanent residential spas</u>	<u>R403.12</u>
<u>Lighting equipment</u>	<u>R404.1</u>
<u>Interior lighting controls</u>	<u>R404.2</u>

RC102.4 Building Envelope. The building thermal envelope shall be greater or equal to the levels of efficiency and SHGC in Table R402.1.2C102.4.

Table RC102.4
Average of the Minimum Insulation and Maximum Fenestration Requirements by Component

<u>Roof</u>	<u>R-60</u>
<u>Above grade walls</u>	<u>R-21</u>
<u>Below grade walls</u>	<u>R-21</u>
<u>Floors</u>	<u>R-38</u>
<u>Non heated slab on grade</u>	<u>R-10 for 4ft</u>
<u>Heated slab on grade</u>	<u>R-15 for 4 ft + R-5 under full slab</u>
<u>Fenestration U-Factor</u>	<u>.30</u>
<u>Fenestration SHGC</u>	<u>.33</u>
<u>Skylight U-Factor</u>	<u>.50</u>
<u>Skylight SHGC</u>	<u>.40</u>

RC102.5 Verification by approved agency.

Verification of compliance with Section R102.4 as outlined in Sections of this appendix shall be completed by an approved third party. Verification of compliance with Section R102.3 shall be completed by the authority having jurisdiction or an approved third-party inspection agency in accordance with Section R105.4.

RC102.6 Documentation.

Documentation of the software used to determine the ERI and the parameters for the residential building shall be in accordance with Sections RC102.6.1 through RC102.6.4

RC102.6.1 Compliance software tools.

Software tools used for determining HERS shall be Approved Software Rating Tools in accordance with RESNET/ICC 301.

RC102.6.2 Compliance report.

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Compliance software tools shall generate a report that documents that the home and the HERS score of the rated design complies with RC102. Compliance documentation shall be created for the proposed design and shall be submitted with the application for the building permit. Confirmed compliance documents of the built dwelling unit shall be created and submitted to the code official for review before a certificate of occupancy is issued. Compliance reports shall include information in accordance with Sections RC102.6.3 and RC102.6.4.

RC102.7 Additional documentation.

The code official shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the ERI reference design.
2. A certification signed by the builder providing the building component characteristics of the rated design.
3. Documentation of the actual values used in the software calculations for the rated design.

RC102.8 Specific approval.

Performance analysis tools meeting the applicable subsections of Section RC102 shall be approved. Documentation demonstrating the approval of performance analysis tools in accordance with Section RC102 shall be provided.

RC102.9 Input values.

Where calculations require input values not specified by Sections RC 102, those input values shall be taken from **HERS** RESNET/ICC 301.

INTRODUCED, READ, PASSED ON FIRST READING, AND ORDERED PUBLISHED this _____ day of _____, 2024.

Chris Leh, Mayor

ATTEST:

Meredyth Muth, City Clerk

APPROVED AS TO FORM:

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Kelly PC, City Attorney

PASSED AND ADOPTED ON SECOND AND FINAL READING, this _____ day of _____, 2024.

Chris Leh, Mayor

ATTEST:

Meredyth Muth, City Clerk

Building Code Board of Appeals

Meeting Minutes

**May 2, 2024
City Hall, Spruce Room
749 Main Street
6:30pm**

Call to Order – Chairperson Christian Dino called the meeting to order at 6:40pm.

Roll Call was taken and the following members were present:

Board Members Present:

Matt Berry
Christian Dino
Mason Gatto
Peter Geise

Board Members Absent:

Steve Knapp

Staff Members Present:

Jenny Lane, Permit Technician

Approval of Agenda –

The agenda was approved by all members present.

Approval of Meeting Minutes from 3/20/24 and 4/18/24

Approved by all members present.

Public Comments on Items Not on the Agenda –

None

Discussion and voting of changes to the proposed 2021 IECC ordinance

The Board discussed changes to the proposed 2021 IECC ordinance.

Top discussion items:

- a. Definition of All-electric building; consolidating definitions

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- b. Tenant finish: what constitutes a “change” that would be subject to energy code compliance.
- c. Discussed going back to code discussion and adoption from 2021 time period and striking the subsequent ordinances, and making some changes as well.
- d. Should EV charging be part of the energy code?
- e. Performance Targets: What are they and is this a good idea? What does City and County of Denver do?
- f. Discussion of ERI ratings and what is net zero; what should the rating be before solar is added? Discussion of Andy Johnson’s email suggesting somewhere between 48-50 instead of 47 and cost savings implications.
- g. Furnace change to 95%, boilers up to 92% efficient.

Discussion Items for Next Meeting –

Continue discussion of changes proposed to the 2021 IECC ordinance.

Next meeting on May 16, 2024

Adjourn – The meeting was adjourned at 9:15pm.

Building Code Board of Appeals

Meeting Minutes

**May 16, 2024
City Hall, Spruce Room
749 Main Street
6:30pm**

Call to Order – Chairperson Christian Dino called the meeting to order at 6:45pm.

Roll Call was taken and the following members were present:

Board Members Present:

Matt Berry
Christian Dino
Mason Gatto
Peter Geise

Board Members Absent:

Steve Knapp

Staff Members Present:

Jenny Lane, Permit Technician
Chad Root, Chief Building Official

Approval of Agenda –

The agenda was approved by all members present.

Public Comments on Items Not on the Agenda –

None

Discussion of changes to the proposed 2021 IECC ordinance

The Board discussed changes to the proposed 2021 IECC ordinance.

Top discussion items:

- a. Intention of new proposed IECC ordinance is to replace all prior IECC amendments.

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- b. Appendix PT (Performance Target): the one we are proposing came from the City of Boulder since Denver's was too extensive and the Code Consultants proposed using Boulder's PT program.
 - a. PT is adopted differently with different municipalities.
 - b. Denver has five PT (PT 103) categories: apartment/multi-family=38, hotel/motel=55, office=43, retail=39, restaurant/bar=175
 - c. Question by Board of how hard is it to meet these numbers?
 - d. Root discussed that he does not know how to meet the numbers or how the numbers were decided.
 - e. Geise pointed out that there are consultant groups that could be hired to do an evaluation for PT compliance and this is what Boulder does; Root agreed that Louisville would need to contract for this work since we do not have the staff or training to check compliance.
 - f. If Board removes the PT compliance then multi-family would need to fall under the IECC code instead of the IBC code.
 - g. Chad explained that the PT is more of an energy auditing system and that City of Boulder has a monitor and escrow that developers and owners have to put in to modify the buildings.
 - h. Board is ok having the PT table be an option, not a requirement.
- c. Discussed insulation minimums; R-3 for pipes
- d. Berry brought up that the code is being manipulated but not necessarily for the better. He proposed for the record that the changes being proposed are not necessarily blessed by the Board nor it is making any significant change or improvement.
- e. EV has been removed from the proposed changes to the 2021 IECC. Not part of energy code and was above the state requirement, so will bring it down to the state code. It was moved to the Land Use code since the charging stations are in the parking lot for commercial/multi-family buildings.
- f. Berry mentioned that structural changes with roof insulation are increasing snow load on existing buildings. SEAC has a committee studying the effect of added insulation on snow load. Berry suggested to wait until the study is complete before making changes to the insulation values.
- g. Occupancy R-2 was requested to be part of the Commercial IBC code instead by multi-family developer.
- h. Commercial buildings can have gas lines and gas appliances installed for heating water and heating spaces; but the electrical conduit must be in place as well so that a building can be all-electric. Board discussed

striking the all-electric requirements since the equipment is either still not available or is too far out to order. Suggested having gas appliances as an option and specifying that the gas appliance would need to be at least 92% efficient.

- i. Exceptions would be fossil fuel for MAU systems or supplementary heat systems.
- j. Commercial gas: electric resistance and storage is currently not allowed. Board would like to change to allow more options.

Discussion Items for Next Meeting –

None at this time.

Next meeting has not been determined.

Adjourn – The meeting was adjourned at 8:45pm.

DRAFT Memorandum

To: Louisville City Council Members
From: Louisville Sustainability Advisory Board
Date: May 15, 2024
Re: Energy Code Amendments

Dear Louisville City Councillors,

The Louisville Sustainability Advisory Board understands that City Council will consider several amendments to the City's building codes at its meeting on 4 June 2024. The Board reviewed and discussed these amendments at its March, April, and May meetings. While City staff provided a thorough report, the Board would have appreciated more information concerning the genesis of the proposed amendments.

We offer some advice on these amendments just below. To frame our advice, we remind City Council that climate change presents humanity with a crisis of unparalleled proportions to which humanity has so far responded inadequately, that the City has set decarbonization goals in an attempt to respond to this crisis, and that the City's latest residential and commercial building codes are integral to achieving these goals. We further remind City Council that the City's latest building codes are not exceptional: several municipalities in Colorado have adopted the 2021 International Energy Conservation Code, and the State of Colorado has essentially mandated widespread adoption; Lafayette and Crested Butte recently adopted building codes with electrification mandates (allowing for certain exemptions), and Boulder is currently considering similar legislation; and the City's commercial building codes were modeled on those of other municipalities including Boulder. We finally remind City Council that the Board wholeheartedly supported adoption of the City's latest building codes, and we again thank City Council for authorizing their adoption.

First, we address the proposed amendments to the City's electric vehicle infrastructure code. City staff have proposed that the City replace its current code with the State of Colorado's

recommendations. While the City's code and the State's recommendations are very similar in many respects, and while the Board generally supports regional alignment on such legislation as building codes, we also recognize that Louisville differs from other communities across Colorado and that Louisville has a celebrated history of sustainability leadership. Of relevance in this case, Louisville has higher rates of adoption of electric vehicles than many other communities across Colorado, and Louisville has more aggressive decarbonization goals than the State and many of its other communities. Accordingly, the Board advises City Council to consider a compromise between the City's electric vehicle infrastructure code and the State's recommendations. Specifically, the Board endorses the Planning Commission's recommendations.

Next, we address the proposed amendments to the City's residential and commercial building codes. Several of these amendments are essentially clarifications or corrections; the Board most certainly supports these amendments. The remaining amendments represent weakenings of the City's building codes as far as efficiency and electrification are concerned; the Board recommends that City Council consider compromises between the City's current building codes and the proposed amendments. We provide brief recommendations for each such amendment.

- *All-electric requirements for commercial space and water heating:* The Board recommends retaining the all-electric space and water heating requirements for alterations and additions if existing equipment is replaced or if additional heating units are installed. Accordingly, existing equipment, no matter its power source, may continue to be used for the extent of its useful lifetime.
- *Natural gas backup for commercial space heating:* The Board recommends that natural gas backups for commercial space heating only be permitted if existing natural gas space heating equipment is being retained to serve this function.
- *Post-construction compliance and documentation for new commercial construction:* The Board supports post-construction compliance and documentation, through monitoring and metering, of the energy use intensity standards for new commercial buildings, but we appreciate the burden that such compliance and documentation places on building owners and City staff. Accordingly, we endorse removal of these requirements, but we strongly believe that legislation will mandate monitoring and metering of greenhouse gas emissions in the relatively near future.
- *Minimum heat pump standards:* The Board supports the amended minimum heat pump standards.



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- *Furnace efficiency standards:* The Board recommends maintaining furnace efficiency standards but creating a simple waiver for cases in which products meeting these standards are not readily available.
- *Commercial door U-value standards:* The Board recommends maintaining commercial door U-value standards but creating a simple waiver for cases in which products meeting these standards are not readily available.
- *Electric vehicle infrastructure for altered parking:* The Board recommends that electric vehicle charging standards apply to any added parking but not to any reconfigured parking.
- *Passive house certification:* The Board recommends that the City allow passive house certification from both PHI and PHIUS as an alternative to Appendix RC of the 2021 IECC.

The Board strongly believes that legislation will mandate electrification retrofits of existing residential and commercial buildings in the relatively near future. By electrifying their buildings during construction, alteration, or addition, building owners will likely bear lower costs in the long term.

If the City can offer any assistance to meet or incentives to exceed the current building codes, then the Board would be most supportive of such efforts. The Board has recommended to City staff that the City provide incentives for commercial and residential efficiency and electrification upgrades in the next biennial budget.

Thank you for considering our advice.

Sincerely,
The Louisville Sustainability Advisory Board

CITY COUNCIL DISCUSSION/DIRECTION

2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC) AMENDMENTS

September 17, 2024

Three Primary Strengthening Amendments

1. Appendix RC – Zero Energy Residential Building Provisions
 - Energy Rating Index (ERI) for Building of 47 or Below and Renewable Offsets to Achieve ERI of 0.
2. All-Electric Heat Pump Systems for Commercial Space and Water Heating
 - Exemptions for Commercial and Industrial Processing and Commercial Kitchens
3. Appendix PT – Modeling Performance Targets
 - Office, Warehouse, Hotels, and Multi-Family Development
 - Energy Use Index Modeling and Compliance Verification

Policy Framework

- Res. No. 18, Series 2024
 - ✓ Sets GHG Emission and Carbon Free Electric Goals
- Overlapping Council Priorities That May be Influenced by Cost and Feasibility Issues of Building Code
 - ✓ Sustainability
 - ✓ Economic Vitality/ Business Development
 - ✓ Affordable Housing



NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO:

Section 1. The City of Louisville hereby updates the following clean energy and carbon emission reduction goals:

1. Meet all of Louisville's municipal electric needs with 100% carbon-free sources by 2025.
2. Reduce energy-related municipal greenhouse gas emissions 60% below the 2016 baseline by 2030 and achieve carbon-neutrality by 2050.
3. Generate 75% of Louisville's residential and commercial/industrial electric needs from carbon-free sources by 2030.
4. Reduce energy-related residential and commercial/industrial GHG emissions 60% below the 2016 baseline by 2030 and achieve carbon-neutrality by 2050.

Background

- 2021 – Ord. 1816
 - ✓ Adoption of 2021 IECC
 - ✓ Appendix RC Added to Code through Adoption Motion
- 2022 – Ord. 1845
 - ✓ Group 14 Engineering/Lotus Engineering Study – Recommend Adoption of EUI Targets (Appendix PT)
 - ✓ Discussion/Direction – Council Direction to Draft Code with EUI Targets and All-Electric Commercial Space and Water Heating
- 2023 – City Hosted Stakeholder Open House
 - ✓ Result of Input is Current Package of Amendments



Concerns Raised With Codes

- Premium cost for equipment
- Supply chain issues and lack of compliant equipment
- Lack of qualified designers and labor for installation and maintenance
- More maintenance issues with newer technology
- Lack of consultants to conduct ERI ratings
- Limited solar farms for energy offsets
- Limitations on electrical infrastructure and costs to upgrade

Advisory Board Recommendations

- Building Code Board of Appeals (BCBOA)
 - ✓ Reviewed Draft Code Amendments and provided Alternate Draft that Eliminates Appendix RC, Appendix PT, and Commercial All-Electric Heat Pump Space and Water Heating Requirements as Mandatory Standards
- Louisville Sustainability Advisory Board (LSAB)
 - ✓ Initiated Review of Code Amendments and Provided Specific Recommendations and Certain Code Provisions and Recommends Maintaining Appendix RC, Appendix PT, and Commercial All-Electric Heat Pump Space and Water Heating Requirements as Mandatory Standards

Potential Paths Forward

- Maintain the current strengthening amendments with updates to code to help address feasibility concerns
- Eliminate one or more of the current strengthening amendments

Based on Council Direction to Staff and the BCBOA on Desired Policy Direction, Staff Will Work with BCBOA to Draft a Code Update for Council Consideration

Three Primary Strengthening Amendments

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