Kansas City, Missouri City Council
Neighborhood Planning and Development Committee

June 7, 2022

Email Comment re. Ordinance #220364: Proposed Amendment - Adopt 2021 IECC With Decarbonization Overlay to Meet Community Needs and Act on Climate

Chair Barnes, Vice Chair Bough, Members of the Committee:

Thank you for the opportunity to provide comments on proposed Ordinance #220364. To help ensure Kansas City protects the health and well-being of all residents for years to come, we write to you as Kansas City residents and members of community organizations to ask that the committee adopt an amended version of Ordinance 220364 to ensure the Council adopts the unamended 2021 International Energy Efficiency Code with a Zero-Code Appendix and Decarbonization Overlay. A proposed revision of the ordinance achieving this is attached for your consideration.

As you know, residents from across the city of Kansas City, MO and the metro area have repeatedly called upon the City Council to take bold action to decarbonize our built environment and adopt strategies that will protect the health, both physical and financial, of their families, friends and neighbors while ensuring that our community is protected against impacts of climate change. This happened most recently on May 25 at a special hearing on building codes hosted by the Council where 24 people expressed the need for strong codes that address the climate crisis, 23 of whom explicitly called on the council to adopt the 2021 IECC with no weakening amendments to ensure the city seize this opportunity to advance its climate action goals.[1] Adopting the 2021 IECC with a decarbonization overlay[2] achieves just that.

The merits of the 2021 IECC and the need to evaluate and adopt it have been raised at numerous public meetings of the Kansas City Environmental Management Commission and the Climate Protection Plan Steering Committee over the last two years. Further, building codes are a critical component of local actions that reduce bills for residents while tackling climate change, and other government entities are mobilizing resources to support cities like Kansas City who take action.[3] As decisions about buildings impact the built environment for decades to come, this is an opportunity for Kansas City to lead the region that will support the health and well-being of Kansas Citians now and in the future.

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[1] In the forthcoming final draft of the Kansas City Climate Protection & Resiliency Plan, not yet publicly available but shared with the City Council, adopting strong building codes is identified as a critical priority for the short term to achieve Kansas City's goal of becoming climate neutral by 2040 and protecting residents.

[2] New Buildings Institute, Building Decarbonization Code (Accessed June 3, 2022), https://newbuildings.org/resource/building-decarbonization-code/#:~:text=The%20Building%20Decarbonization%20Code%20is,now%20compatible%20with%20ASHRAE%2090.1.

[3] The White House, *FACT SHEET: Biden-Harris Administration Launches Initiative to Modernize Building Codes* Press Release (June 1, 2022), Improve Climate Resilience, and Reduce Energy Costs
, available at
https://www.whitehouse.gov/briefing-room/statements-releases/2022/06/01/fact-sheet-biden-harris-administration-launches-initiative-to-modernize-building-codes-improve-climate-resilience-and-reduce-energy-costs/.

In addition to supporting healthy homes and climate action,[4] adopting the 2021 IECC as amended will protect the financial health of residents by helping lower utility bills as a result of vastly increased energy efficiency. Studies have repeatedly shown that the 2021 IECC will support lowering costs,[5] and many jurisdictions in the nation are taking advantage of this benefit by adopting unamended or strengthened versions of the 2021 IECC.[6] As Kansas Citians face some of the highest energy bills proportionate to income in the country,[7] the Council must enact strong energy codes now for new buildings. Doing so would have great benefit in the long term and have only minor impacts on the short term as new buildings account for a small portion of home sales.[8] This is critical for ensuring we conserve energy to avoid higher bills impacting residents and businesses in Kansas City.

Kansas City has been leading in climate action and over the last few years has taken major steps to lead the way in building thriving communities and enacting policies that protect its people–including zero-fare transit, a tenants' right to counsel, and a visionary climate plan, to name just a few. This is Kansas City's moment to lead once again in responding to community needs and centering human health and well-being. The community is behind you and will work across the city and metropolitan region to ensure the code is implemented and that we continue to build a healthier, more resilient, and thriving Kansas City.

Respectfully Submitted,

Joyce Raybuck
Frank Zilm
Don Wallace
Billy Davies
Jeremy Knoll
Eslun Tucker
James Baker

cc: City Council
Mayor Quinton Lucas
Brian Platt
Jeff Williams
Jeff Lee
Andy Savastino

Enclosures: Ord. 220364, Amended
KCMO Needs Strong Codes
Slide Deck 1: IECC 2021 Impacts
Slide Deck 2: Achieve Climate Goals
Organizational Support Flyer

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[4] *See* attachment, KCMO Needs Strong Codes_Support 2021 IECC.
[5] Victor R. Salcido et al., Cost effectiveness of the 2021 IECC for Residential Buildings in Missouri, US Dept. of Energy Report (2021), available at https://www.energycodes.gov/sites/default/files/2021-07/MissouriResidentialCostEffectiveness_2021_0.pdf; *see also* ICF, Checking the Math of NAHB on Residential Provisions of the 2021 IECC, Report (2022) https://energyefficientcodes.org/wp-content/uploads/ICF-2021-IECC-Cost-effectiveness-Analysis.pdf..
[6] The cities of Austin, TX, and Louisville, KY, as well as the state of Colorado, have all adopted the IECC 2021 with no amendments or strengthening amendments.
[7] American Council for an Energy Efficient Economy, *Report: "Energy Burden" on Low-Income, African American, & Latino Households up to Three Times as High as Other Homes, More Energy Efficiency Needed*, Press Release (April 20, 2016), https://www.aceee.org/press/2016/04/report-energy-burden-low-income#:~:text=Energy%20burdens%20were%20found%20to,%2C%20Philadelphia%20(8.8%20percent)%2C.
[8] *See* Attachment, Slide Deck 1.

ATTACHMENT 1

COMPARED VERSION
NEW ORDINANCE TO CODE BOOKS

ORDINANCE NO. 220364

Amending Chapter 18, Code of Ordinances, by repealing Article III, Section 18-57 entitled "Adoption of International Residential Code (2018); amendments" and Article XIV, Section 18-367 entitled "Adoption of International Energy Conservation Code (2012); amendments" and enacting, in lieu thereof, new sections of like number and subject matter that update the City's Energy Conservation Code.

WHEREAS, the City Council adopted an update to the Kansas City Building and Rehabilitation Code, Chapter 18 of the Code of Ordinances (the "Building Code") with Committee Substitute for Ordinance No. 120375, on May 24, 2012; and

WHEREAS, Ordinance No. 200418 was passed on June 18, 2020, to update the Building Code by adopting the latest editions of the currently adopted, nationally recognized model codes for use in building construction; and

WHEREAS, the KCMO 2008 Climate Protection Plan recognizes the large role of buildings and structures in the City as consumers of energy and the concomitant result in significant greenhouse gas emissions; and

WHEREAS, Kansas City is a signatory to the "We Are Still In" commitment supporting climate action to meet the goals of the Paris Climate Accord; and

WHEREAS, Kansas City passed Resolution No. 200005 updating its Climate Protection and Resiliency Plan with goals to reduce greenhouse gas emissions citywide 100% from the electricity sector by 2030, 100% greenhouse gas reduction from municipal operations by 2022, and to become climate neutral by 2040 in order to protect the health and welfare of all our residents, and adopting modern building codes is instrumental in meeting this goal; and

WHEREAS, energy codes play a key role in meeting carbon reductions because buildings account for nearly 45% of carbon emissions in the U.S.; and

WHEREAS, the 2021 International Energy Conservation Code ("IECC") with a Zero-Code Appendix was scheduled to be available by the International Code Council in the fall of 2020 to replace the 2018 IECC as the most up to date version of America's model energy code; and

WHEREAS, because implementing new code regulations results in costs for training and communication, the City would save money by moving directly to the 2021 IECC instead of first adopting the 2018 IECC and then later adopting the 2021 IECC; and

WHEREAS, the Council passed Resolution No. 200449 that expressed the Council's continued commitment to climate action and its desire to delay consideration of an update to the

City's energy efficiency code until the 2021 version of the IECC with a Zero-Code Appendix was released in the fall of 2020; and

WHEREAS, the adoption of Resolution No. 200449 allowed for further engagement of residents, stakeholders and City staff in the process of developing language associated with updating the City's energy efficiency code; NOW, THEREFORE,

BE IT ORDAINED BY THE COUNCIL OF KANSAS CITY:

Section 1. That Chapter 18, Article III, Code of Ordinances of the City of Kansas City, Missouri, is hereby amended by repealing Section 18-57 and enacting, in lieu thereof, a new section of like number and subject matter to read as follows:

Article III. RESIDENTIAL CODE FOR ONE- AND TWO FAMILY DWELLINGS

Sec. 18-57. Adoption of the International Residential Code (2018); amendments.

The International Residential Code (2018), promulgated by the International Code Council, is adopted and incorporated in this article by reference as if fully set forth, except as it is amended by the following provisions of this section. Provisions of this article are in addition to the provisions of the International Residential Code. The following provisions coinciding with provisions of the International Residential Code supersede, delete or add text where indicated, to the corresponding provisions of the International Residential Code:

All references within the model codes to any building, electrical, gas, mechanical, plumbing, sewage disposal, elevator, energy conservation, or existing building code shall be construed to be a reference to the respective building, electrical, gas, mechanical, plumbing, sewage disposal, elevator, energy conservation, or existing building code specifically adopted by reference in articles II through XIV of this chapter.

Chapter 1**,** Scope and Administration**,** is deleted. See article I of this chapter.

For temporary erosion and sediment control requirements see section 3307.2 of article II of this chapter.

R202 DEFINITIONS — The following definitions have been revised or added (remainder of section R202 unamended):

TOWNHOUSE. A single-family dwelling unit, in which each unit extends from foundation to roof and with a yard or public way on at least two sides, constructed:

In a group of three or more attached units; or,

In a group of two attached units where a property line exists between the units on the underlying parcels.

WATER SERVICE PIPE. The pipe from the water main or other source of potable water supply to the first shut-off valve downstream of all of the following (as applicable): 1. the point of entrance into the building; 2. the water meter; or 3. the service backflow prevention device.

The following table found in the referenced model code is amended as follows:

Table R301.2 (1)

CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

GROUND SNOW LOAD [o]	WIND DESIGN				SEISMIC DESIGN CATE-GORY [f]	SUBJECT TO DAMAGE FROM
	Speed [d] (MPH)	Topographic Effects [k]	Special wind Region [l]	Windborne Debris zone [m]		Weathering [a]
20 psf	115	No	No	No	A	Severe

WINTER DESIGN TEMP [e]	ICE BARRIER UNDERLAYMENT REQUIRED [h]	FLOOD HAZARDS [g]	AIR FREEZING INDEX [i]	MEAN ANNUAL TEMP [j]
6°F	Yes	See Ordinance Chapter 28	1000 F-days	54.2 F

MANUAL J DESIGN CRITERIA [n]

Elevation	Latitude	Winter heating	Summer cooling	Altitude correction factor
909	39° N	4° F	96° F	—

Indoor design temperature	Design temperature cooling	Heating temperature difference
72° F	75°	68° F

Cooling temperature difference	Wind velocity heating	Wind velocity cooling	Coincident web bulb
21° F	15	7.5	75° F

Daily range	Winter humidity	Summer Humidity
High	50%	30%

(See 2018 International Residential Code for footnotes.)

The following subsection found in the referenced model code is amended as follows:

R302.2.2 (Common Walls, Townhouses). Amend "Item 1" of this section as follows (remainder of this section is unchanged). [This amendment made pursuant to Missouri Statute RSMO 67.281.]

1. Where a fire sprinkler system in accordance with P2904 is provided, the common wall shall be not less than a 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.3 of the International Building Code.

R302.13 Fire protection of floors is deleted.

The following subsection found in the referenced model code is amended as follows:

R303.4 Mechanical ventilation. Where the air infiltration rate of a dwelling unit is 3 air changes per hour or less where tested with a blower door at a pressure of 0.2 inch w.c. (50 Pa) in accordance with Section N1102.4.1.2, the dwelling unit shall be provided with whole-house ventilation in accordance with Section M1505.4.

The following section found in the referenced model code is amended as follows:

R313 AUTOMATIC FIRE SPRINKLER SYSTEMS. A builder of a one- or two-family dwelling or townhouse shall offer to any purchaser on or before the time of entering into the purchase contract the option, at the purchaser's cost, to install or equip fire sprinklers in the dwelling or townhouse. The purchaser shall have the right to choose or decline to install a fire sprinkler system. [This notification requirement is provided in accordance with, and shall expire in conjunction with, Missouri Statute (RSMO 67.281).]

The following section found in the referenced model code is amended as follows:

R322 Flood-Resistant Construction**.** See Code of Ordinances, Chapter 28 - Floodplain Management.

The following section is added to the referenced model code:

R328 Moved Structures. See Article XIII of this Chapter.

The following section is added to the referenced model code:

R329 Physical Security

R329.1 Purpose. The purpose of this Section is to establish minimum standards that incorporate physical security to make dwelling units resistant to unlawful entry.

R329.1.1 Scope. This section shall apply to all dwelling unit exterior doors.

Exceptions:

1. Vehicle access doors.
2. Storm or screen doors.

R329.2 Doors. Doors shall comply with Sections R329.2.1 through R329.2.3.

R329.2.1 Wood doors. Wood doors shall be of solid core construction such as high- density particleboard, solid wood, or wood block core with a minimum nominal thickness of one and three-fourths inches (1 3/4") at any point.

Exception: Solid wood panels shall be a minimum of one inch (1") thick. The tapered portion of the panel that inserts into the groove of the door shall be a minimum of one-quarter inch (¼") thick. The groove shall be a dado groove or applied molding construction. The groove shall be a minimum of one-half inch (½") in depth.

R329.2.2 Steel doors. Steel doors shall be a minimum nominal thickness of one and three-fourths inches (1 ¾") and shall have a minimal skin thickness of 24 gauge.

R329.2.3 Fiberglass doors. Fiberglass doors shall be a minimum nominal thickness of one and three fourths inches (1 ¾") and shall have a minimum skin thickness of one- sixteenth inch (1/16").

R329.3 Door frames. Door frames shall comply with Sections R326.3.1 through R326.3.4 and shall be installed in accordance with the manufacturer's installation instructions. Door frames shall be installed prior to rough-in inspection.

R329.3.1 Wall framing at door openings. Door frames shall be set in openings constructed with double studs on each side. Doors with sidelights shall have double stud construction on each side of the door and on each side of the sidelight(s). Horizontal blocking shall be placed between studs at the door lock height for three (3) stud spaces on each side of the door opening.

Exception: Installations provided with alternative reinforcing methods as approved by the building official where it is determined that such alternative methods are at least the equivalent of that prescribed with respect to strength and safety.

R329.3.2 Wood frames. Door jambs shall be a minimum nominal thickness of three fourths inches (¾") and shall be installed with solid backing in a manner so no void exists between the strike side of the jamb and the frame opening for a vertical distance of twelve inches (12") each side of the strike. Filler material shall consist of solid wood blocking.

Exception: Installations provided with alternative reinforcing methods as approved by the building official where it is determined that such alternative methods are at least the equivalent of that prescribed with respect to strength and safety.

R329.3.3 Steel frames. Steel door frames shall be constructed of 18 gauge or heavier steel with reinforcement at the hinges and strikes. Steel frames shall be anchored to the wall in accordance with manufacturer specifications.

R329.3.4 Sliding doors. Sliding door assemblies shall be installed to prevent the removal of the panels and the glazing from the exterior. Shims or screws shall be installed in the upper track of doors that slide on the bottom track or doors shall be provided with equivalent protection as approved by the building official.

R329.4 Door hardware. Door hardware shall comply with Sections R326.4.1 through R326.4.7.

R329.4.1 Hinges. Hinges for swinging doors shall comply with the following:

A. A minimum of three (3) four inch (4") hinges shall be installed on each swinging door.
B. Each hinge shall be attached to the frame with at least two (2) screws, not less than three inches (3") in length and penetrating at least one inch (1") into the nearest stud. Solid wood fillers or shims shall be used to eliminate any space between the wall structure and door frame behind each hinge.

   Exception: Installations provided with alternative reinforcing methods as approved by the building official where it is determined that such alternative methods are at least the equivalent of that prescribed with respect to strength and safety.
C. Hinges for out-swinging doors shall be equipped with mechanical interlock to preclude the removal of the door from the exterior.

R329.4.2 Locks. Swinging doors shall be provided with a single-cylinder deadbolt locking device (keyed on exterior only) with a minimum projection of one inch (1"). The deadbolt shall penetrate at least three-fourths inch (3/4") into the strike receiving the projected bolt. The cylinder shall have a twist-resistant, tapered hardened steel cylinder guard. The cylinder shall have a minimum of five (5) pin tumblers, shall be connected to the inner portion of the lock by solid metal connecting screws at least one-fourth inch (1/4") in diameter and two and one-fourth inches (2-1/4") in length. The bolt assembly (bolt housing) unit shall be of single piece construction. All deadbolts shall meet ANSI grade 2 specifications.

Exception: Doors with integral multi-point locking devices.

R329.4.3 Strike plates. The deadbolt strike plate shall be a minimum of 18 gauge metal with four offset screw holes. The strike plate shall be attached to the door jamb with four screws not less than three inches (3") in length, and penetrating at least one inch (1") into the nearest stud.

Exception: Installations provided with alternative reinforcing methods as approved by the building official where it is determined that such alternative methods are at least the equivalent of that prescribed with respect to strength and safety.

R329.4.4 Door edge protector. A metal L-shaped or U-shaped door edge protector, or escutcheon plate, shall be installed around the bolt projection of the deadbolt to protect the door's edge.

R329.4.5 Double doors. The inactive leaf of a double swinging door shall be provided with flush bolts having an engagement of not less than one inch into the head and threshold of the door frame.

R329.4.6 Sliding doors. All sliding glass doors shall be equipped with a secondary locking device consisting of a metal pin, a surface mounted bolt assembly, or other equivalent device as approved by the building official. Where used, metal pins shall be installed at the intersection of the inner and outer panels of the inside door and shall not penetrate the frame's exterior surface.

R329.5 Entry vision and glazing. All main or front entry doors to dwelling units shall be arranged so that the occupant has a view of the area immediately outside the door without opening the door. The view may be provided by a door viewer having a field of view not less than 180 degrees or through windows or view ports.

R329.6 Exterior Lighting. In addition to the lighting outlet requirements of Section E3903, exterior lighting shall be provided in accordance with this section.

R329.6.1 Front and street side exterior lighting. All front and streetside door entrances shall be protected with a minimum of one lighting outlet providing a minimum of 60 watt lighting (or energy efficient equivalent).

R329.6.2 Rear exterior lighting. Dwelling units with windows or doors on the rear of the structure within eight feet (8') of grade or adjacent walking surface accessible from grade shall be equipped at the rear with a minimum of one lighting outlet of the flood light type providing a minimum of 65 watt lighting (or energy efficient equivalent) .

R329.6.3 Lighting protection. Lighting outlets required by this section shall be located a minimum of eight feet (8') above grade or adjacent walking surface accessible from grade, or shall be of a type manufactured such that the light bulb is not readily accessible.

The following subsection found in the referenced model code is amended as follows:

R404.4 Retaining Walls. Retaining walls that are not laterally supported at the top and that retain in excess of 48 inches (610 mm) of unbalanced fill, that support a surcharge, or are adjacent to a public right-of-way shall be designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. Retaining walls shall be designed for a safety factor of 1.5 against lateral sliding and overturning. This section shall not apply to foundation walls supporting buildings.

The following exception is added to the referenced model code:

R405.1, Exception 2. A filter membrane is not required where the gravel or crushed stone drain extends at least eighteen inches (18") above the top of the footing, or where the perforated pipe is covered with at least eighteen inches (18") of washed gravel or crushed stone.

The following subsection found in the referenced model code is amended as follows:

R602.6.1, Figure R602.6.1 Drilling and notching of top plate. Where piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie of not less than 0.054 inch thick (1.37 mm) (16 ga) and 1 1/2 inches (38 mm) wide shall be fastened across and to the plate at each side of the opening with not less than four 10d (0.148 inch diameter) nails having a minimum length of 1-1/2

inches (38 mm) at each side, or equivalent (or as required by the product listing, evaluation report, or manufacturer's instructions, where applicable). The metal tie must extend a minimum of 6 inches past the opening. See Figure R602.6.1.

Exception: When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing.

The following exception is added to the referenced model code:

R703.7.2 Plaster, Exception. Plaster installed per an approved listing or evaluation report.

The following subsection found in the referenced model code is amended as follows:

R801.3 Roof drainage. All dwellings shall have a controlled method of water disposal from roofs that will collect and discharge all roof drainage to the ground surface not less than 3 feet (1524 mm) from foundation walls or to an approved drainage system.

The following subsection is added to the referenced model code:

R901.2 Restrictive covenants. It shall be unlawful for any individual or organization to establish or enforce restrictive covenants which prohibit or effectively prevent the owner of a one- or two-family dwelling or townhouse from using any types of shingles for roof covering materials allowed by this code, including wood shingle, wood shake shingle, composition, slate, tile, clay, or concrete. Nothing in this ordinance shall prohibit a homes association, if it determines to do so, from adopting restrictive covenants or otherwise governing the use of such roofing materials only to the extent of regulating the colors, styles, or dimensions of roofing materials, or other aesthetic factors. Notwithstanding any existing procedural provisions governing the time period for consideration of amendments of restrictive covenants by home associations to the contrary, a home association, if it determines to do so, may amend their restrictive covenants to provide for such aesthetic regulations for a period of 180 days from the effective date of this ordinance. Any such amendments after that 180 day period of time shall be subject to any procedural requirements set forth in such covenants.

Chapter 11 is deleted. See Article XIV of this chapter for adoption of IECC 2021.

Part V, Chapter 12, Mechanical Administration, is deleted.

The following exception is added to the referenced model code:

M1602.2, Prohibited Sources (Return Air), Item #4, Exception #3. Closets with a minimum floor area of 24 square feet and minimum interior dimension 4 feet, and that are conditioned by a source of supply air.

Sections M2001, M2002, M2003, and G2452 (Boilers) are deleted.

Part VII, Chapter 25, Plumbing Administration, is deleted. The

following subsection is added to the referenced model code:

P2602.1.1. For the purpose of this section, available means located in a public way or easement abutting the subject property and within 200 feet of the proposed building.

The following subsection found in the referenced model code is amended as follows:

P2706.1.2 Standpipes. Standpipes for automatic clothes washers shall extend a minimum of 30 inches (762 mm) and a maximum of 48 inches (1219 mm) above the finished floor. The trap for a clothes washer standpipe shall be installed at a maximum of 12 inches (305 mm) above the finished floor. Access shall be provided to all standpipe traps and drains for rodding.

P2706.1.2.1 Laundry tray connection. A laundry tray waste line is permitted to connect into a standpipe for the automatic clothes washer drain. The standpipes shall not be less than 30 inches (762 mm) as measured from the crown weir. The outlet of the laundry tray shall be a maximum horizontal distance of 30 inches (762 mm) from the standpipe trap.

The following subsection is added to the referenced model code:

P2901.3. References in this code to water service piping shall apply only to water service piping connected to a private source of water supply. All water service piping connected to the public water supply is under the jurisdiction of the Department of Water Services.

The following subsection found in the referenced model code is amended as follows:

P2902.5.3 Lawn irrigation systems. The potable water supply to lawn irrigation systems shall be protected against backflow by a double check valve assembly or a reduced pressure principle backflow preventer. Where chemicals are introduced into the system, the potable water supply shall be protected against backflow by a reduced pressure principle backflow preventer.

The following subsection found in the referenced model code is amended as follows:

P2903.8.2 Minimum size. The minimum size of individual distribution lines shall be ½" (12.7 mm). Certain fixtures such as one-piece water closets and whirlpool bathtubs shall require a larger size where specified by the manufacturer. If a water heater is fed from one end of a cold water manifold, the manifold shall be one size larger than the water heater feed.

Table P3002.2 Building Sewer Pipe. Delete "PS 25, SDR 41 (PS 28), PS 35, SDR 35 (PS 46), PS 50, PS 100" from "Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters". (Remainder of Table unamended.)

The following exception is added to the referenced model code:

P3008.1 Sewage backflow, Exception. The backwater valve is not required unless the structure is connected to a combination storm/sanitary sewer, or the structure or the next downstream sewer manhole is located in the regulatory floodplain.

The following subsection is added to the referenced model code:

P3105.4 Floor drain. A floor drain (where used as such) need not be vented, provided it is within 25 feet of a three-inch stack or horizontal drain which has at least a three-inch- diameter vent extension through the roof.

The following subsection found in the referenced model code is amended as follows:

P3114.3 Where permitted. Vents may terminate to an air admittance valve under the following conditions:

(1) For sinks located where there is no wall accessible from the sink location (e.g. island sinks); or where access to the vent system would require notching or boring of studs in excess of the limitations of section R602.6.

(2) In existing construction, where the existing vent system is not accessible to the fixture location without the removal of finish materials or other existing construction.

E3901.12 HVAC outlet is deleted.

The following subsection found in the referenced model code is amended as follows:

E3902.2 (Garage and accessory building receptacles), Exception. Receptacles utilizing the provisions of this exception shall be permanently marked to indicate "[Type of equipment] Only - No GFCI Protection".

1. A dedicated receptacle supplying only a permanently installed fire alarm or burglar alarm system.

2. A dedicated receptacle supplying only a garage door opener.

3. A dedicated receptacle supplying only a refrigerator and/or freezer.

The following subsection found in the referenced model code is amended as follows:

E3902.5 (Unfinished basement receptacles), Exception. Receptacles utilizing the provisions of this exception shall be permanently marked to indicate "[Type of equipment] Only - No GFCI Protection".

1. A dedicated receptacle supplying only a permanently installed fire alarm or burglar alarm system.

2. A dedicated receptacle supplying only a sump pump.

3. A dedicated receptacle supplying a refrigerator and/or freezer.

The following subsection found in the referenced model code is amended as follows: **E3902.16 Arc-fault circuit-interrupter protection**. Branch circuits that supply 120- volt, single-phase, 15- and 20-ampere outlets installed in bedrooms shall be protected by any of the following: [The reminder of the section remains unamended.]

Part X, Appendices: The following appendix chapters are

hereby adopted: **Appendix I, Private Sewage**

Disposal. See Article VIII of this chapter. **Appendix**

Q, Tiny Houses

Section 2. That Chapter 18, Article XIV, Code of Ordinances of the City of Kansas City, Missouri, is hereby amended by repealing Section 18-367 and enacting, in lieu thereof, a new section of like number and subject matter to read as follows:

ARTICLE XIV. ENERGY CONSERVATION CODE

Sec. 18-367. Adoption of International Energy Conservation Code (2021); amendments.

The International Energy Conservation Code (2021), promulgated by the International Code Council, is adopted and incorporated in this article by reference as if fully set forth, except as it is amended by the following provisions of this section. Provisions of this article are in addition to the provisions of the International Energy Conservation Code. The following provisions coinciding with provisions of the International Energy Conservation Code supersede, or delete, when indicated, the corresponding provisions of the International Energy Conservation Code.

In addition, the IECC Appendix CC: Zero Energy Commercial Building Provisions is an option for builders to voluntarily implement.

All references within the model codes to any building, electrical, gas, mechanical, plumbing, sewage disposal, elevator, energy conservation, or existing building code shall be construed to be a reference to the respective building, electrical, gas, mechanical, plumbing, sewage disposal, elevator, energy conservation, or existing building code specifically adopted by reference in articles II through XIV of this chapter.

(a) *Referenced codes.* All references within the model codes to energy conservation code shall be construed to be a reference to the respective energy conservation code specifically adopted by reference in Articles II through XIV of this chapter.

(1) *Energy*. The provisions of the 2021 *International Energy Conservation Code* shall apply to all matters governing the design and construction of buildings for energy efficiency. See Article XIV of this chapter. The following amendments shall be adopted to modify the model code:

Amendments:
IECC - Residential Provisions

Chapter 1 – Scope and Application

R101 SCOPE AND GENERAL REQUIREMENTS

Revise text as follows:

R101.3 Intent. This code shall regulate the design, and construction of buildings for the ~~effective use and conservation~~ reduction of greenhouse gas emissions and for the efficient production, use and storage of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

R103 Construction documents

Revise text 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:

6. Mechanical and service water heating systems and equipment types, sizes, fuel sources and efficiencies.

Add new text as follows:

R103.2.3 Solar-ready system. The construction documents shall provide details for dedicated roof area, structural design for roof dead and live load, and routing of conduit or pre-wiring from *solar-ready zone* to electrical service panel or plumbing from *solar-ready zone* to *service water heating* system.

R103.2.4 Energy storage-ready system. The construction documents shall provide the location of pathways for routing of raceways or cable from the electrical service panel and energy storage system area and the location and layout of a designated area for electrical energy storage system.

Add new text as follows:

R103.2.5 Electrification system. The construction documents shall provide details for additional electric infrastructure, including branch circuits, conduit, or pre-wiring, and panel capacity in compliance with the provisions of this code.

R105 INSPECTIONS

Revise text as follows:

R105.2.3 Plumbing rough-in inspection. Inspections at plumbing rough-in shall verify compliance as required by the code and approved plans and specifications as to types of insulation and corresponding R-values and protection and required controls. Where the solar-ready zone is installed for solar water heating, inspections shall verify pathways for routing of plumbing from solar-ready zone to service water heating system.

Add new text as follows:

R105.2.5 Electrical rough-in inspection. Inspections at electrical rough-in shall verify compliance as required by the code and the approved plans and specifications as to the locations, distribution, and capacity of the electrical system. Where the solar-ready zone is installed for electricity generation, inspections shall verify conduit or pre-wiring from solar-ready zone to electrical panel. Where the energy storage system area is not in the same space as the electrical panel, inspections shall verify conduit or pre-wiring from the energy storage ready zone to the electrical panel.

Revise numbering as follows:

~~**R105.2.5**~~ **R105.2.6 Final inspection.**

Chapter 2 – Definitions

R202 GENERAL DEFINITIONS

Add new definitions as follows:

ALL-ELECTRIC BUILDING. A *building* that contains no *combustion equipment*, or plumbing

for *combustion equipment*, installed within the *building*, or *building site*.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

COMBUSTION EQUIPMENT. Any *equipment* or *appliance* used for space heating, *service water heating*, cooking, clothes drying, or lighting that uses *fuel gas* or *fuel oil*.
DEMAND RESPONSIVE CONTROL. An automatic control that can receive and automatically respond to demand response requests from a utility, electrical system operator, or third-party demand response program provider.
ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Plug-in hybrid electric vehicles are electric vehicles having a second source of motive power. Off-road, self-propelled electric mobile equipment, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not considered electric vehicles.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors and the *electric vehicle* connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the *electric vehicle*.
EQUIPMENT. Piping, ducts, vents, control devices and other components of systems other than appliances that are permanently installed and integrated to provide control of environmental conditions for buildings. This definition shall also include other systems specifically regulated in this code.

EV-READY SPACE. A parking space that is provided with an electrical circuit capable of supporting an installed *EVSE*.

FUEL GAS. A natural gas, manufactured gas, liquified petroleum gas or a mixture of these.
FUEL OIL. Kerosene or any hydrocarbon oil having a flash point not less than 100°F (38°C).
MIXED-FUEL BUILDING. A *building* that contains *combustion equipment* or includes piping for *combustion equipment*.
SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

Chapter 4 – Residential Energy Efficiency

R401 GENERAL

Revise text as follows:

R401.2 Application. Residential buildings shall comply with Section R401.2.~~5~~4 and either Sections R401.2.1, R401.2.2, or R401.2.3 ~~or R401.2.4~~.

Delete section without substitution:

~~**R401.2.2 Total Building Performance Option.** The Total Building Performance Option requires compliance with Section R405.~~

Revise numbering as follows:

R401.2.~~3~~2 Energy Rating Index Option.
R401.2.4~~3~~ Tropical Climate Zone Option.

R401.2.5~~4~~ Additional energy efficiency.

Revise text as follows:

R401.2.5 Additional energy efficiency. This section establishes additional requirements applicable to all compliance approaches to achieve additional energy efficiency.

1. For *all-electric buildings* ~~buildings~~ complying with Section R401.2.1, one of the additional efficiency package options shall be installed according to Section R408.2.

2. For mixed-fuel buildings complying with Section R401.2.1, the building shall be required to install either R408.2.1 or R408.2.5 of the additional efficiency package options, and any two of R408.2.2, R408.2.3, or R408.2.4 of the additional efficiency package options. ~~For buildings complying with Section R401.2.2, the building shall meet one of the following:~~

~~2.1. One of the additional efficiency package Options in Section R408.2 shall installed without including such measures in the proposed design under Section R405; or~~

~~2.2. The proposed design of the building under Section R405.3 shall have an annual energy cost that is less than or equal to the 95 percent of the annual energy cost of the standard reference design.~~

3. For buildings complying with the Energy Rating Index alternative Section R401.2.3, the Energy Rating Index value shall be at least 5 percent less than the Energy Rating Index target specified in Table R406.5.

The option~~s~~ selected for compliance shall be identified in the certificate required by Section R401.3.

Revise text as follows:

R401.3 Certificate. A permanent certificate shall be completed by the builder or other approved party and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certification shall indicate the following:

4. The types, sizes, fuel sources, and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace or baseboard electric heater is installed in the residence, the certificate shall indicate "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be indicated for gas-fired unvented room heaters, electric furnaces and electric baseboard heaters.

8. The fuel sources for cooking and clothes drying equipment.

9. Where combustion equipment is installed, the certificate shall indicate information on the installation of additional electric infrastructure including which *equipment* and/or *appliances* include additional electric infrastructure, capacity reserved on the electrical service panel for replacement of each piece of combustion *equipment* and/or *appliance*

10. Where a *solar-ready zone* is provided, the certificate shall indicate the location, dimensions, and capacity reserved on the electrical service panel.

R403 SYSTEMS

Revise text as follows:

R403.1.1 Thermostat ~~Programmable thermostat~~. The thermostat controlling the primary heating or cooling system of the dwelling unit shall be capable of controlling the

heating and cooling system on a daily schedule to maintain different temperature setpoints at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures of not less than 55°F (13°C) to not greater than 85°F (29°C). The thermostat shall be programmed initially by the manufacturer with a heating temperature setpoint of not greater than 70°F (21°C) and a cooling temperature setpoint of not less than 78°F (26°C). The thermostat shall be provided with a d*emand responsive control* capable of increasing the cooling setpoint by no less than 4°F (2.2°C) and decreasing the heating setpoint by no less than 4°F (2.2°C) in response to a demand response request.

Add new text as follows:

R403.5.4 Demand responsive water heating. All electric storage water heaters with a storage tank capacity greater than 20 gallons (76 L) shall be provided with *demand responsive controls* that comply with ANSI/CTA-2045-B or another *approved demand responsive control*.

R404 ELECTRICAL POWER AND LIGHTING SYSTEMS

Add new text as follows:

R404.4 Renewable energy infrastructure. The building shall comply with the requirements of R404.4.1 or R404.4.2

R404.4.1 One- and two- family dwellings and townhouses. One- and two-family dwellings and townhouses shall comply with Sections R404.4.1.1 through R404.4.1.4.

Exceptions:

1. A *building* with a permanently installed on-site renewable energy system.
2. A *building* with less than 600 square feet (55 m^2) of roof area oriented between 110 degrees and 270 degrees of true north.
3. A *building* where all areas of the roof that would otherwise meet the requirements for a *solar-ready zone* are in full or partial shade for more than 70 percent of daylight hours annually.

R404.4.1.1 Solar-ready zone area. The total area of the *solar-ready zone* shall not be less than 300 square feet (28 m^2) and shall be composed of areas not less than 5.5 feet (1676 mm) in width and not less than 80 square feet (7.4 m^2) exclusive of access or set back areas as required by the International Fire Code.

Exception: Townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (186 m^2) per dwelling shall be permitted to have a solar-ready zone area of not less than 150 square feet (14 m^2).

R404.4.1.2 Obstructions. Solar-ready zones shall be free from obstructions, including but not limited to vents, chimneys, and roof-mounted equipment.

R404.4.1.3 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

R404.4.1.4 Electrical interconnection. An electrical junction box shall be installed within 24 inches (610 mm) of the main electrical service panel and shall be connected to a capped roof penetration sleeve or a location in the attic that is within 3 feet (914 mm) of the *solar ready zone* by one of the following:

1. Minimum ¾-inch nonflexible conduit

2. Minimum #10 Metal copper 3-wire

Where the interconnection terminates in the attic, location shall be no less than 12" (35 mm) above ceiling insulation. Both ends of the interconnection shall be labeled "For Future Solar Electric".

R404.4.2 Group R occupancies. Buildings in Group R-2, R-3 and R-4 shall comply with Section C405.13.

Add new text as follows:

R404.5 Electric vehicle charging infrastructure. Electric infrastructure for the current and future charging of *electric vehicles* shall be installed in accordance with this section. *EV ready spaces* are permitted to be counted toward meeting minimum parking requirements.

R404.5.1 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 and new detached garages shall be provided with one *EV-ready space* per *dwelling unit.* The branch circuit shall meet the following requirements:

1. A minimum capacity of 9.6 kVA
2. Terminates at a junction box or receptacle located within 3 feet (914 mm) of the parking space and labelled "For electric vehicle charging", and
3. The electrical panel directory shall designate the branch circuit as "For electric vehicle charging".

R404.5.2 Group R occupancies. Parking facilities serving Group R-2, R-3 and R-4 occupancies shall comply with Section C405.14.

Add new text as follows:

R404.6 Energy storage infrastructure. Each *building site* shall have a dedicated location for the installation of future on-site energy storage in accordance with this section.

Exception: Where an onsite electrical energy system storage system is installed.

R404.6.1 One- and two- family dwellings and townhouses. One- and two-family dwellings and townhouses shall be provided with an energy storage ready area in accordance with the following:

1. Floor area not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in accordance with Section 1207 of the International Fire Code and Section 110.26 of the NFPA 70.
2. The main electrical service panel shall have a reserved space to allow installation of a two-pole circuit breaker for future electrical energy storage system installation. This space shall be labeled "For Future Electric Storage." The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

R404.6.2 Group R occupancies. Buildings with Group R-2, R-3 and R-4 occupancies shall comply with Section C405.15.

Add new text as follows:

R404.7 Additional electric infrastructure. *Combustion equipment* shall be installed in accordance with this section.

R404.7.1 Equipment serving multiple units. *Combustion equipment* that serves multiple *dwelling units* shall comply with Section C405.13.

R404.7.2 Combustion water heating. Water heaters shall be installed in accordance with the following:

1. A dedicated 240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 3 feet (914 mm) from the water heater and be accessible to the water heater with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Heat Pump Water Heater" and be electrically isolated.
2. A condensate drain that is no more than 2 inches (51 mm) higher than the base of the installed water heater and allows natural draining without pump assistance shall be installed within 3 feet (914 mm) of the water heater.
3. The water heater shall be installed in a space with minimum dimensions of 3 feet (914 mm) by 3 feet (914 mm) by 7 feet (2134 mm) high.
4. The water heater shall be installed in a space with a minimum volume of 700 cubic feet (20,000 L) or the equivalent of one 16-inch (406 mm) by 24-inch (610 mm) grill to a heated space and one 8-inch (203 mm) duct of no more than 10 feet (3048 mm) in length for cool exhaust air.

R404.7.3 Combustion space heating. Where a building has combustion equipment for space heating, the building shall be provided with a designated exterior location(s) in accordance with the following:

1. Natural drainage for condensate from cooling equipment operation or a condensate drain located within 3 feet (914 mm), and
2. A dedicated branch circuit in compliance with IRC Section E3702.11 based on heat pump space heating equipment sized in accordance with R403.7 and terminating within 3 feet (914 mm) of the location with no obstructions. Both ends of the branch circuit shall be labeled "For Future Heat Pump Space Heater."

Exception: Where an electrical circuit in compliance with IRC Section E3702.11 exists for space cooling equipment.

R404.7.4 Combustion clothes drying. A dedicated 240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 6 feet (1829 mm) of natural gas clothes dryers and shall be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Clothes Drying" and be electrically isolated.

R404.7.5 Combustion cooking. A dedicated 240-Volt, 40A branch circuit shall terminate within 6 feet (1829 mm) of natural gas ranges, cooktops and ovens and be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Range" and be electrically isolated.

R404.7.6 Other combustion equipment. *Combustion equipment* and end-uses not covered by Sections R404.6.2-5 shall be provided with a branch circuit sized for an electric *appliance*, *equipment* or end use with an equivalent capacity that terminates within 6 feet (1829 mm) of the *appliance* or *equipment*.

Section 405 Total building Performance

Delete without substitution:

~~**R405 Total Building Performance**~~

Section 406 ENERgy rating index compliance alternative

Revise table as follows:

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION	TITLE
Mechanical	
R403.5 except Section R403.5.2	Service hot water systems

~~R403.5.1~~	~~Heated water circulation and temperature maintenance systems~~
~~R403.5.3~~	~~Drain water heat recovery units~~

Revise table as follows:

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION [a]	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.4	Renewable energy infrastructure
R404.5	Electric vehicle charging infrastructure
R404.6	Energy storage infrastructure
R404.7	Additional electric infrastructure
R406.3	Building thermal envelope

Revise text as follows:

R406.5 ERI-based compliance. Compliance based on an ERI analysis requires that the rated *proposed* design and confirmed built dwelling be shown to have an ERI less than or equal to the appropriate value for the proposed *mixed-fuel building* or the proposed *all-electric building* as indicated in Table R406.4 when compared to the *ERI reference design*.

TABLE R406.4 MAXIMUM ENERGY RATING INDEX

Climate Zone	~~Energy Rating Index~~ All-Electric Building	Mixed Fuel Building
0-1	52	43
2	52	45
3	51	47
4	54	47
5	55	47
6	54	46
7	53	46
8	53	45

R408 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

Add new text as follows:

R408.2.3 Reduced energy use in service water-heating option. The hot water system shall meet one of the following efficiencies:

1. Greater than or equal to 82 EF fossil fuel service water-heating system.
2. Greater than or equal to 2.0 EF electric service water-heating system.
3. Greater than or equal to 0.4 solar fraction solar water-heating system.
4. Greater than or equal to 82 EF instantaneous fossil fuel service water-heating system and drain water heat recovery unit meeting the requirements of Section R403.5.3 installed on at least one shower.

Chapter 6 – Referenced Standards

(Both) Add new standard as follows:

CTA

Consumer Technology Association
1919 S. Eads Street
Arlington, VA 22202

Standard reference number	*Title*	*Referenced in code section number*
ANSI/CTA-2045-B	*Modular Communications Interface for Energy Management*	*R403.5.4*

IECC - Commercial Provisions

Chapter 1 – Scope and Application

C101 SCOPE AND GENERAL REQUIREMENTS

Revise as follows:

C101.3 Intent. This code shall regulate the design, and construction of buildings for the ~~effective use and conservation~~ reduction of greenhouse gas emissions and for the efficient production, use and storage of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

C103 Construction documents

Revise 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:

6. Mechanical and service water heating systems and equipment types, sizes, fuel source and efficiencies.
14. Location of pathways for routing of raceways or cable from the renewable energy system to the electrical service panel and electrical energy storage system area.
15. Location and layout of a designated area for electrical energy storage system.
16. Location of designated *EVSE spaces*, *EV-Ready spaces*, and *EV-Capable spaces* in parking facilities.

Add new text as follows:

C103.2.2 Electrification system. The construction documents shall provide details for additional electric infrastructure, including branch circuits, conduit, or pre-wiring, and panel capacity in compliance with the provisions of this code.

C105 INSPECTIONS

Revise as follows:

C105.2.5 Electrical system. Inspection shall verify lighting system controls, components, ~~and~~ meters, and additional electric infrastructure as required by the code, approved plans and specifications. Where a storage-ready zone is required, inspections shall verify space availability and pathways to electrical service.

Chapter 2 – Definitions

C202 GENERAL DEFINITIONS

Add new definitions as follows:

ALL-ELECTRIC BUILDING. A *building* that contains no *combustion equipment*, or plumbing for *combustion equipment*, installed within the *building* or *building site*.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

AUTOMATIC LOAD MANAGEMENT SYSTEMS (ALMS). A control system that allows multiple connected *EVSE* to share a circuit or panel and automatically reduce power at each charger, reducing the total connected electrical capacity of all *EVSE*.

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*.

COMMERCIAL COOKING APPLIANCES. Appliances used in a commercial food service establishment for heating or cooking food and which produce grease vapors, steam, fumes, smoke or odors that are required to be removed through a local exhaust ventilation system. Such appliances include deep fat fryers, upright broilers, griddles, broilers, steam-jacketed kettles, hot-top ranges, under-fired broilers (charbroilers), ovens, barbecues, rotisseries, and similar appliances. For the purpose of this definition, a food service establishment shall include any building or a portion thereof used for the preparation and serving of food.

DEMAND RESPONSIVE CONTROL. An automatic control that can receive and automatically respond to demand response requests from a utility, electrical system operator, or third-party demand response program provider.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Plug-in hybrid electric vehicles are electric vehicles having a second source of motive power. Off-road, self-propelled electric mobile equipment, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not considered electric vehicles.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors and the *electric vehicle* connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the *electric vehicle*.

EQUIPMENT. Piping, ducts, vents, control devices and other components of systems other than appliances that are permanently installed and integrated to provide control of environmental conditions for buildings. This definition shall also include other systems specifically regulated in this code.

EV-CAPABLE SPACE. An automotive parking space that is reserved for the future installation of an *EVSE*.

EV-READY SPACE. An automotive parking space that is provided with an electrical circuit capable of supporting an installed *EVSE*.

EVSE SPACE. An automotive parking space that is provided with a dedicated *EVSE*.

FUEL GAS. A natural gas, manufactured gas, liquified petroleum gas or a mixture of these.

FUEL OIL. Kerosene or any hydrocarbon oil having a flash point not less than 100°F (38°C).

MIXED-FUEL BUILDING. A *building* that contains *combustion equipment* or includes piping for such *equipment*.

RENEWABLE ENERGY CERTIFICATE (REC). An instrument that represents the environmental attributes of one megawatt-hour of renewable electricity; also known as an energy attribute certificate (EAC).

Chapter 4 – Commercial Energy Efficiency

C403 BUILDING MECHANICAL SYSTEMS

Add new text as follows:

C403.4.1.6 Demand responsive controls. All thermostatic controls shall be provided with *demand responsive controls* capable of the following:

1. *Automatically increasing the zone operating cooling set points by a minimum of* 4°F (2.2°C)
2. *Automatically decreasing the zone operating heating set points by a minimum of* 4°F (2.2°C)
3. *Automatically decreasing the zone operating cooling set points by a minimum of* 2°F (1.1°C).
4. *Both ramp-up and ramp-down logic to prevent the building peak demand from exceeding that expected without the DR implementation.*

The thermostatic controls shall be capable of performing all other functions provided by the control when the *demand responsive controls* are not available. Systems with direct digital control of individual zones reporting to a central control panel shall be capable of remotely complying

Exception: Health care and assisted living facilities.

C404 SERVICE WATER HEATING

Revise text as follows:

C404.2.1 High input service water-heating systems. Gas-fired water-heating equipment installed in new buildings shall be in compliance with this section. Where a singular piece of water-heating equipment serves the entire building and the input rating of the equipment is 1,000,000 Btu/h (293 kW) or greater, such equipment shall have a thermal efficiency, Et, of not less than 92 percent or a UEF of not less than 0.92 UEF. Where multiple pieces of water-heating equipment serve the building and the combined input rating of the water-heating equipment is 1,000,000 Btu/h (293 kW) or greater, the combined input-capacity-weighted-average thermal efficiency, Et, of not less than ~~90~~92 percent or a UEF of not less than 0.92 UEF.

Exceptions:

1. Where not less than ~~25~~50 percent of the annual *service water heating* requirement is provided by *on-site renewable energy* or site-recovered energy not including any capacity used for compliance with Section C405.13 or C406 of this code, the minimum thermal efficiency requirements of this section shall not apply.
2. The input rating of water heaters installed in individual dwelling units shall not be required to be included in the total input rating of *service water-heating* equipment for a building.
3. ~~The input rating of water heaters with an input rating of not greater than 100,000 Btu/h (29.3 kW) shall not be required to be included in the total input rating of *service water-heating* equipment for a building.~~

Add new text as follows:

C404.11 Demand responsive water heating. All electric storage water heaters, or a group of

water heaters, in a building with a total storage tank capacity greater than 37 gallons (140 L) shall be provided with *demand responsive controls* that comply with ANSI/CTA-2045-B or another *approved demand responsive control*.

Exception: Health care facilities.

C405 Electrical power and lighting systems

Add new text as follows:

C405.2 Lighting controls. Lighting systems shall be provided with controls that comply with one of the following.

2. Luminaire level lighting controls (LLLC) and lighting controls as specified in Sections C405.2.1, C405.2.4 and C405.2.5. The LLLC luminaire shall be independently capable of:

2.4 Reducing lighting power in a uniform manner by no less than 10 percent when signaled by a *demand responsive control*.

Revise table as follows:

TABLE C405.12.2 ENERGY USE CATEGORIES

LOAD CATEGORY	DESCRIPTION OF ENERGY CUSE
Total HVAC system	Heating, cooling and ventilation, including but not limited to fans, pumps, boilers, chillers, and water heating. Energy used by 120-volt equipment, or by 208/120-volt equipment that is located in a building where the main service is 480/277-volt power, is permitted to be excluded from total HVAC system energy use.
Interior lighting	Lighting systems located within the building.
Exterior lighting	Lighting systems located on the building site but not within the building.
Plug loads	Devices, appliances and equipment connected to convenience receptacle outlets.
Process load	Any single load that is not included in HVAC, lighting or plug load category and that exceeds 5 percent of the peak connected load of the whole building, including but not limited to data centers, manufacturing equipment, and commercial kitchens.
Electric vehicle charging	*Electric vehicle* charging loads.
Building operations and other miscellaneous	The remaining loads not included in this table, including but not limited to vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains, ornamental fireplaces, swimming pools, in-ground spas and snow-melt systems.

Add new text as follows:

C405.13 On site renewable energy. Each building site shall have equipment for on-site renewable energy with a rated capacity of not less than 0.25 W/ft² (2.7 W/m²) multiplied by the

sum of the gross conditioned floor area of the three largest floors.

Exceptions:

1. Any building located where an unshaded flat plate collector oriented towards the equator and tilted at an angle from horizontal equal to the latitude receives an annual daily average incident solar radiation less than 3.5 kWh/m²·day (1.1 kBtu/ft²·day).

2. Any building where more than 80 percent of the roof area is covered by any combination of equipment other than for on-site renewable energy systems, planters, vegetated space, skylights, or occupied roof deck.

3. Any building where more than 50 percent of roof area is shaded from direct-beam sunlight by natural objects or by structures that are not part of the building for more than 2,500 annual hours between 8:00 AM and 4:00 PM.

C405.13.1 Renewable energy certificate documentation. Documentation shall be provided to the code official that indicates that renewable energy certificates (RECs) associated with the on-site renewable energy will be retained and retired by or on behalf of the owner or tenant.

Add new text as follows:

C405.14 Electric vehicle charging infrastructure. Parking facilities shall be provided with electric vehicle charging infrastructure in accordance with this section and Table C405.14 based on the total number of parking spaces and rounded up to the nearest whole number. EVSE, EV ready spaces and EV capable spaces may be counted toward meeting minimum parking requirements. EVSE spaces may be used to meet requirements for EV ready spaces and EV capable spaces. EV ready spaces may be used to meet requirements for EV capable spaces. Where more than one parking facility is provided on a building site, the number of parking spaces required shall be calculated separately for each parking facility. EV spaces shall be uniformly distributed in the parking facility.

Exception: In parking garages, the conduit required for *EV capable spaces* may be omitted provided the parking garage electrical service has no less than 1.8 kVA of additional reserved capacity per *EV capable space.*

TABLE C405.14
ELECTRIC VEHICLE CHARGING INFRASTRUCTURE REQUIREMENTS

OCCUPANCY	***EVSE SPACES***	***EV READY SPACES***	***EV CAPABLE SPACES***
Group B Occupancies	15%	NA	40%
Group M Occupancies	25%	NA	40%
R-2 Occupancy	NA	100%[a]	NA
All other Occupancies	10%	NA	40%

a. Or one *EV ready space* per *dwelling unit.*

C405.14.1 EV Capable Spaces. *EV Capable Spaces* shall be provided with electrical infrastructure that meets the following requirements:

1. Conduit that is continuous between a junction box or outlet located within 3 feet (914 mm) of the parking space and an electrical panel serving the area of the parking space.

2. The electrical panel to which the conduit connects shall have sufficient dedicated physical space for a dedicated dual-pole, 40-amp breaker.

3. The conduit shall be sized and rated to accommodate a 40-amp, 208/240-volt branch circuit and have a minimum nominal trade size of 1 inch.

4. The electrical junction box and the electrical panel directory entry for the dedicated space in the electrical panel shall have labels stating "For future *electric vehicle* charging".

C405.14.2 EV Ready Spaces. The branch circuit serving *EV Ready Spaces* shall meet the following requirements:

1. Wiring capable of supporting a 40-amp, 208/240-volt circuit.

1. Terminates at an outlet or junction box located within 3 feet (914 mm) of the parking space.

3. A minimum capacity of 1.8 kVA.

4. The electrical panel directory shall designate the branch circuit as "For electric vehicle charging" and the junction box or receptacle shall be labelled "For electric vehicle charging."

C405.14.2 EVSE Spaces. The *EVSE* serving *EVSE spaces* shall meet the following requirements:

1. Capable of supplying not less than 6.2 kW to an electric vehicle.

   Exception: An ALMS may be used to reduce the total electrical capacity required by EVSE spaces provided that all EVSE spaces are capable of simultaneously charging at a minimum rate of 1.4 kW.

2. Located within 3 feet (914 mm) of the *EVSE space*.

Add new text as follows:

C405.15 Energy storage infrastructure. Each building site shall have equipment for on-site energy storage not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in accordance with Section 1206.2.8 of the International Fire Code and Section110.26 of the NFPA 70.

Exception: Where an onsite electrical energy system storage system is installed.

C405.15.1 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a two-pole circuit breaker for future electrical energy storage system installation This space shall be labeled "For Future Electric Storage." The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

Add new text as follows:

C405.16 Additional electric infrastructure. Buildings that contain *combustion equipment* and end-uses shall be required to install electric infrastructure in accordance with this section.

C405.16.1 Electric infrastructure for dwelling and sleeping units. *Combustion equipment* and end-uses serving individual *dwelling units* or *sleeping units* shall comply with Section R404.6.

C405.16.2 Combustion space heating. Space heating *equipment* that uses *fossil fuels* shall comply with either C405.16.2.1 or C405.16.2.2

C405.16.2.1 Low-capacity heating. Warm-air furnaces with a capacity less than 225,000 Btu/h and gas- and oil-fired boilers with a capacity less than 400,000 Btu/h shall be provided with a designated exterior location(s) in accordance with the following:

a. Natural drainage for condensate from cooling equipment operation or a condensate drain located within 3 feet (914 mm) of the location of the space heating equipment.

b. A dedicated branch circuit in compliance with NFPA70 Section 424.4 based on heat pump space heating equipment sized in accordance with the requirements of C403.1.1 and terminating within 3 feet (914 mm) of the location of the space heating equipment with no obstructions. Both ends of the branch circuit shall be labeled "For Future Heat Pump Space Heater."

Exception: Where an electrical circuit in compliance with NFPA70 Sections 440.4(B) and 440.35 exists for space cooling equipment.

C405.16.2.2 High-capacity heating. All other space heating *equipment* shall be provided with conduit that is continuous between a junction box located within 3 feet (914 mm) of the *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 *equipment* with an equivalent equipment capacity. The electrical junction box and electrical panel shall have labels stating, "For Future Electric Space Heating Equipment".

C405.16.3 Combustion water heating. Water heating *equipment* that uses *fossil fuels* shall comply with either C405.16.3.1 or C405.16.3.2

C405.16.3.1 Low-capacity water heating. Water heaters with a capacity less than 300,000 Btu/h (88 kW) shall be installed in accordance with the following:

1. A dedicated 208/240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 3 feet (914 mm) from the water heater and be accessible to the water heater with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Heat Pump Water Heater" and be electrically isolated.

2. A condensate drain that is no more than 2 inches (51 mm) higher than the base of the installed water heater and allows natural draining without pump assistance shall be installed within 3 feet (914 mm) of the water heater.

3. The water heater shall be installed in a space with minimum dimensions of 3 feet (914 mm) by 3 feet (914 mm) by 7 feet (2134 mm) high.

4. The water heater shall be installed in a space with a minimum volume of 700 cubic feet (20,000 L) or the equivalent of one 16-inch (406 mm) by 24-inch (610 mm) grill to a heated space and one 8-

inch (203 mm) duct of no more than 10 feet (3048 mm) in length for cool exhaust air.

C405.16.3.2 High-capacity water heating. Water heaters with a capacity greater than or equal to 300,000 Btu/h (88 kW) shall be provided with the following:

1. Conduit that is continuous between a junction box located within 3 feet (914 mm) of the *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 *equipment* with an equivalent equipment capacity. The electrical junction box and electrical panel shall have labels stating, "For Future Electric Water Heating Equipment".
2. A condensate drain that is no more than 2 inches (51 mm) higher than the base of the installed water heater and allows natural draining without pump assistance shall be installed within 3 feet (914 mm) of the water heater.

C405.16.4 Combustion cooking. Cooking *equipment* that use *fossil fuel* shall comply with either C405.16.4.1 or C405.16.4.2.

C405.16.4.1 Commercial cooking. *Commercial cooking appliances* shall be provided with a dedicated branch circuit with a minimum capacity of 12 kVA per 1 kBtu of appliance input capacity. The branch circuit shall terminate within 3 feet (914 mm) of the appliance with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Cooking Equipment" and be electrically isolated.

C405.16.4.2 Light and medium duty cooking. Light- and medium duty cooking *equipment* not designated as *commercial cooking appliances* shall be provided with a dedicated branch circuit in compliance with NFPA 70 Section 422.10. The branch circuit shall terminate within 6 feet (1829 mm) of *fossil fuel* ranges, cooktops and ovens and be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Cooking Equipment" and be electrically isolated.

C405.16.5 Combustion clothes drying. Clothes drying *equipment* that use *fossil fuels* shall comply with either C405.16.5.1 or C405.16.5.2

C405.16.5.1 Commercial drying. Clothes drying *equipment*, and end-uses for commercial laundry applications shall be provided with conduit that is continuous between a junction box located within 3 feet (914 mm) of the *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 *equipment* with an equivalent equipment capacity. The electrical junction box and electrical panel shall have labels stating, "For Future Electric Clothes Drying Equipment".

C405.16.5.2 Residential drying. Clothes drying *equipment*, *appliances*, and end-uses serving multiple *dwelling units* or sleeping areas with a capacity less than or

equal to 9.2 cubic feet shall be provided with a dedicated 240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 6 feet (1829 mm) of *fossil fuel* clothes dryers and shall be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Clothes Drying Equipment" and be electrically isolated.

C405.16.6 Other combustion equipment. *Combustion equipment* not covered by Sections C405.16.2-3 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".

C406 Additional efficiency requirements

Revise text as follows:

C406.1 Additional energy efficiency credit requirements. New *all-electric buildings* shall achieve a total of 10 credits and new *mixed-fuel buildings* shall achieve a total of 15 credits from Tables C406.1(1) through C406.1(5) where the table is selected based on the use group of the building and from credit calculations as specified in relevant subsections of C406. Where a building contains multiple use groups, credits from each use group shall be weighted by floor area of each group to determine the weighted average building credit. Credits from the tables or calculation shall be achieved where a building complies with one or more of the following:

Revise text as follows:

C406.5 Onsite renewable energy. The total minimum ratings of on-site renewable energy systems, not including onsite renewable energy system capacity used for compliance with Section C405.13, shall be one of the following:

Chapter 6 – Referenced Standards

(Both) Add new standard as follows:

CTA

Consumer Technology Association
1919 S. Eads Street
Arlington, VA 22202

Standard reference number	*Title*	*Referenced in code section number*
ANSI/CTA-2045-B	*Modular Communications Interface for Energy Management*	*C404.11*

Amendments for ASHRAE Standard 90.1

Chapter 1 – Purpose

1.1

Revise text as follows:

To reduce building greenhouse gas emissions by establishing ~~the~~ minimum ~~*energy efficiency*~~ requirements of *buildings* other than low-rise residential buildings for

a. design, *construction*, and a plan for operation and maintenance; and
b. utilization of *energy efficiency*, energy storage, and on-site, renewable *energy* resources.

Chapter 2 – Scope

2.1

Revise text as follows:

This standard provides minimum requirements that

a. apply to the greenhouse gas performance ~~minimum *energy* efficient requirements~~ for the design and construction, ~~and a plan for operation and maintenance~~ of
   1. new *buildings* and their *systems*,
   2. new portions of *buildings* and their *systems*,
   3. new *systems* and *equipment* in *existing buildings*, and
   4. new *equipment* or *building systems* specifically identified in the standard that are part of industrial or manufacturing processes
b. address the reduction of greenhouse gas emissions and the efficient production, use, and storage of energy

and

c. criteria for determining compliance with these requirements.

Chapter 3 – Definitions

3.2 Definitions

Revise and add new definitions as follows:

all-electric building: A *building* that contains no *fossil fuel* using *equipment*, or plumbing for *fossil fuels*, installed within the *building* or *building* site.

automatic load management systems (ALMS): A control system that allows multiple connected *EVSE* to share a circuit or panel and automatically reduce power at each charger, reducing the total connected electrical capacity of all *EVSE*.

***commercial cooking appliances*:** see ANSI/ASHRAE Standard 154

demand responsive control: An automatic control device that can receive and automatically respond to demand response requests from a utility, electrical system operator, or third-party demand response program provider.

electric vehicle (EV): An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Plug-in hybrid electric vehicles are electric vehicles having a second source of motive power. Off-road, self-propelled electric mobile equipment, such as industrial trucks, hoists, lifts, transports, golf carts,

airline ground support equipment, tractors, boats and the like, are not considered electric vehicles.

electric vehicle supply equipment (EVSE): The conductors, including the ungrounded, grounded, and equipment grounding conductors and the *electric vehicle* connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the *electric vehicle*.

equipment: see ANSI/ASHRAE/IES Standard 90.1.

***EV-ready space*:** A parking space that is provided with an electrical circuit capable of supporting an installed *EVSE*.

fuel: see ANSI/ASHRAE/IES Standard 90.1.

fossil fuel: see ANSI/ASHRAE/IES Standard 90.1.

mixed-fuel building: A *building* that contains *equipment* using *fossil fuels*, or includes piping for *fossil fuels*.

Revise text as follows:

on-site renewable energy: *energy* ~~generated~~ from *renewable energy resources* ~~produced~~ harvested at the *building* site.

~~***site-solar energy:*** thermal, chemical, or electrical *energy* derived from direct conversion of incident solar radiation at the *building* site and used to offset consumption of purchased *fuel* or electrical *energy* supplies. For the purposes of applying this standard, *site-solar energy* shall not include passive heat gain through *fenestration systems*.~~

Add new definitions as follows:

renewable energy certificate (REC): An instrument that represents the environmental attributes of one megawatt-hour of renewable electricity; also known as an energy attribute certificate (EAC).

renewable energy resources: *energy* from solar, wind, biomass or hydro, or extracted from hot fluid or steam heated within the earth.

Chapter 4 – Administration and Enforcement

4.2 Compliance

Revise text as follows:

4.2.1.1 New Buildings

New *buildings* shall comply with Sections 4.2.2 through 4.2.5 and either the provisions of

a. Section 5, "*Building Envelope*"; Section 6, "Heating, Ventilating, and Air Conditioning"; Section 7, "*Service Water Heating*"; Section 8, "Power"; Section 9, "Lighting"; and Section 10, "Other *Equipment*," or
b. Section 11, "*Energy Cost Budget* Method," or
c. Normative Appendix G, "*Performance Rating Method*."

When using Normative Appendix G, the Performance Cost Index (PCI) of new *buildings*, *additions* to *existing buildings*, and/or *alterations* to *existing buildings* shall be less than or equal to the Performance Cost Index target (PCI*t*) when calculated in accordance with the following:

$$PCIt = [BBUEC + (BPF \times BBREC) - PRE]/BBP$$

where

PCI = Performance Cost Index calculated in accordance with Section G1.2.

BBUEC = baseline *building* unregulated *energy* cost, the portion of the annual *energy* cost of a *baseline building design* that is due to *unregulated*

energy use.

BBREC = baseline *building* regulated *energy* cost, the portion of the annual *energy* cost of a *baseline building design* that is due to *regulated energy use*.

BPF = *building* performance factor from Table 4.2.1.1. For *building* area types not listed in Table 4.2.1.1 use "All others." Where a *building* has multiple *building* area types, the required BPF shall be equal to the area-weighted average of the *building* area types.

BBP = *baseline building performance*.

PBP = *proposed building performance*, including the reduced, annual purchased energy cost associated with all *on-site renewable energy* generation systems.

PBP*nre* = *proposed building performance* without any credit for reduced annual energy costs from on-site renewable energy generation systems.

PBP*pre* = *proposed building performance*, excluding any renewable energy system in the proposed design and including an *on-site renewable energy system* that meets but does not exceed the requirements of Section 10.5.1.1 modeled following the requirements for a *budget building design* in Table 11.5.1.

PRE = PBP*nre* – PBP*pre*.

When (PBP*pre* – PBP)/BBP > 0.05, new *buildings*, *additions* to *existing buildings*, and/or *alterations* to *existing buildings* shall comply with the following:

$$PCI + [(PBP_{pre} - PBP)/BBP] - 0.05 < PCI_t$$

Informative Notes:

1. PBP*nre* = *proposed building performance*, no renewable energy
2. PBP*pre* = *proposed building performance*, prescriptive renewable energy
3. PRE = prescriptive renewable energy

4.2.4 Inspections

All *building construction*, additions, or *alterations* work subject to the provisions of this standard shall remain accessible and exposed for inspection purposes until approved in accordance with the procedures specified by the *building official*. Items for inspection include at least the following:

a. additional electric infrastructure for *fossil fuel* equipment
b. energy storage ready space and pathways to electrical service
c. electric vehicle infrastructure

Chapter 6 – Heating, Ventilating, and Air Conditioning

6.4 Mandatory Provisions

Add text as follows:

6.4.3.1.3 Demand Response.

All *thermostatic controls* shall be capable of the following base on a command from a demand responsive control:

a. The controls shall be programmed to automatically adjust upward the zone operating cooling set points by a minimum of 4°F (2.2°C)

b. The controls shall be programmed to automatically adjust downward the zone operating heating set points by a minimum of 4°F (2.2°C)

c. The controls shall be programmed to automatically adjust downward the zone operating cooling set points by a minimum of 2°F (1.1°C).

d. The automated DR strategy shall include both ramp-up and ramp-down logic to prevent the building peak demand from exceeding that expected without the DR implementation.

Exception to 6.4.3.1.3
Special occupancy or special applications where wide temperature ranges are not acceptable (such as retirement homes, process applications, museums, some areas of hospitals) and are approved by the authority having jurisdiction.

6.5 Prescriptive Compliance Path

Revise text as follows:

Exceptions to 6.5.2.1

4. Zones where at least 75% of the *energy* for *reheating* or for providing warm air in mixing *systems* is provided from *site-recovered energy* (including condenser heat) or ~~*site-solar energy*~~ *on-site renewable energy*.

Exceptions to 6.5.2.3

4. *Systems* serving *spaces* where specific humidity levels are required to satisfy process needs, such as a vivarium; museum; surgical suite; pharmacy; and *buildings* with refrigerating *systems*, such as supermarkets, refrigerated warehouses, and ice arenas, and where the *building* includes *site-recovered energy* or ~~*site-solar energy*~~ *on-site renewable energy* that provide *energy* equal to at least 75% of the annual *energy* for *reheating* or for providing warm air in mixing *systems*. This exception does not apply to *computer rooms*.
5. At least 90% of the annual *energy* for *reheating* or for providing warm air in mixing *systems* is provided from *site-recovered energy* (including condenser heat) or ~~*sitesolar energy*~~ *on-site renewable energy.*

Exceptions to 6.5.3.5

5. *Systems* in which at least 75% of the *energy* for *reheating* (on an annual basis) is from *site recovered energy* or ~~*site-solar energy*~~ *on-site renewable energy*.

Exceptions to 6.5.6.1.2

3. Heating energy recovery where more than 60% of the *outdoor air* heating *energy* is provided from *site-recovered energy* or ~~*site-solar energy*~~ *on-site renewable energy.*

Exceptions to 6.5.6.2.2

2. Facilities that provide 60% of their *service water heating* from ~~*site-solar energy*~~ *onsite renewable energy* or *site-recovered energy* or from other sources

6.7 SUBMITTALS

Revise text as follows:

6.7.3.2 Manuals

Construction documents shall require that an operating manual and a maintenance manual be provided to the building owner or the designated representative of the building owner within 90 days after the date of system acceptance. These manuals shall be in accordance with industry accepted standards (see Informative Appendix E) and shall

include, at a minimum, the following:

a. Submittal data stating equipment size and fuel type, and selected options for each piece of *equipment* requiring maintenance.

d. HVAC *controls system* maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined *set points* and demand response *set points* shall be permanently recorded on *control* drawings at *control devices* or, for digital *control systems*, in programming comments.

e. A complete narrative of how each system is intended to operate, including suggested *set points* and demand response *set points*.

Chapter 7 – Service Water Heating

7.4 Mandatory Provisions

Add new text as follows:

7.4.4.5 Demand Responsive Controls.

Electric storage water heaters with a storage tank capacity greater than 20 gallons (76 L) shall be provided with *demand responsive controls* that comply with ANSI/CTA-2045-B or another *approved demand responsive control*.

Exception to 7.4.4.5

Special occupancy or special applications where water temperature ranges are not acceptable (such as retirement homes, process applications, some areas of hospitals or other health care facilities) and are approved by the authority having jurisdiction.

Revise text as follows:

Exception to 7.4.5.2

Pools that do not use *fossil fuels* for heat and ~~deriving~~ derive over 60% of the *energy* for heating from *site-recovered energy* or ~~*site-solar energy*~~ *on-site renewable energy*.

7.7 SUBMITTALS

Revise text as follows:

7.7.3.2 Manuals

Construction documents shall require that an operating manual and a maintenance manual be provided to the building owner or the designated representative of the building owner within 90 days after the date of system acceptance. These manuals shall be in accordance with industry accepted standards and shall include, at a minimum, information on water heating fuel type, operation manuals and maintenance manual for each component of the system requiring maintenance, except components not furnished as part of the project. Required routine maintenance actions shall be clearly identified. Automated demand response sequences and controls shall be clearly identified.

7.9 verification, testing, and commissioning

Revise text as follows:

7.9.1 Verification and Testing

Service hot-water controls shall be verified and tested in accordance with this section and

provisions of Section 4.2.5.1. Testing shall verify that systems and controls are configured and operating in accordance with applicable requirements of

a. service water heating system temperature controls (Sections 7.4.4.1, ~~and~~ 7.4.4.3, and 7.4.4.5)

Chapter 8 – Power

8.4 Mandatory Provisions

Revise text as follows:

8.4.3.1 Monitoring

Measurement devices shall be installed in new buildings to monitor the electrical energy use for each of the following separately:

f. *Electric vehicle* charging

Add new text as follows:

8.4.5 Additional electric infrastructure.

Buildings that contain *combustion equipment* and end-uses shall be required to install electric infrastructure in accordance with this section.

8.4.5.1 Combustion space heating.

Space heating *equipment* that uses *fossil fuels* shall comply with either 8.4.5.1.1 or 8.4.5.1.2

8.4.5.1.1 Low-capacity heating.

Warm-air furnaces with a capacity less than 225,000 Btu/h and gas- and oil-fired boilers with a capacity less than 400,000 Btu/h shall be provided with a designated exterior location(s) in accordance with the following:

1. Natural drainage for condensate from cooling equipment operation or a condensate drain located within 3 feet (914 mm) of the location of the space heating equipment.

2. A dedicated branch circuit in compliance with NFPA70 Section 424.4 based on heat pump space heating equipment sized in accordance with the requirements of Section 6.4.2.1 and terminating within 3 feet (914 mm) of the location of the space heating equipment with no obstructions. Both ends of the branch circuit shall be labeled "For Future Heat Pump Space Heater."

   Exception: Where an electrical circuit in compliance with NFPA70 Sections 440.4(B) and 440.35 exists for space cooling equipment.

8.4.5.1.2 High-capacity heating.

All other space heating *equipment* shall be provided with conduit that is continuous between a junction box located within 3 feet (914 mm) of the *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 *equipment* with an equivalent equipment capacity. The electrical junction box and electrical panel shall have labels stating, "For Future Electric Space Heating Equipment".

8.4.5.2 Combustion water heating.

Water heating *equipment* that uses *fossil fuels* shall comply with either 8.4.5.2.1 or 8.4.5.2.2

8.4.5.2.1 Low-capacity water heating.

Water heaters with a capacity less than 300,000 Btu/h (88 kW) shall be installed in accordance with the following:

1. A dedicated 208/240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 3 feet (914 mm) from the water heater and be accessible to the water heater with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Heat Pump Water Heater" and be electrically isolated.
2. A condensate drain that is no more than 2 inches (51 mm) higher than the base of the installed water heater and allows natural draining without pump assistance shall be installed within 3 feet (914 mm) of the water heater.
3. The water heater shall be installed in a space with minimum dimensions of 3 feet (914 mm) by 3 feet (914 mm) by 7 feet (2134 mm) high.
4. The water heater shall be installed in a space with a minimum volume of 700 cubic feet (20,000 L) or the equivalent of one 16-inch (406 mm) by 24-inch (610 mm) grill to a heated space and one 8-inch (203 mm) duct of no more than 10 feet (3048 mm) in length for cool exhaust air.

8.4.5.2.2 High-capacity water heating.
Water heaters with a capacity greater than or equal to 300,000 Btu/h (88 kW) shall be provided with the following:

1. Conduit that is continuous between a junction box located within 3 feet (914 mm) of the *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 *equipment* with an equivalent equipment capacity. The electrical junction box and electrical panel shall have labels stating, “For Future Electric Water Heating Equipment”.
2. A condensate drain that is no more than 2 inches (51 mm) higher than the base of the installed water heater and allows natural draining without pump assistance shall be installed within 3 feet (914 mm) of the water heater.

8.4.5.3 Combustion cooking.
Cooking *equipment* that use *fossil fuel* shall comply with either 8.4.5.3.1 or 8.4.5.3.2.

8.4.5.3.1 Commercial cooking.
Commercial cooking appliances shall be provided with a dedicated branch circuit with a minimum capacity of 12 kVA per 1 kBtu of appliance input capacity. The branch circuit shall terminate within 3 feet (914 mm) of the appliance with no obstructions. Both ends of the branch circuit shall be labeled with the words “For Future Electric Cooking Equipment” and be electrically isolated.

8.4.5.3.2 Light and medium duty cooking.
Light- and medium duty cooking *equipment* not designated as *commercial cooking appliances* shall be provided with a dedicated branch circuit in compliance with NFPA 70 Section 422.10. The branch circuit shall terminate within 6 feet (1829 mm) of *fossil fuel* ranges, cooktops and ovens and be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words “For Future Electric Cooking Equipment” and be electrically isolated.

8.4.5.4 Combustion clothes drying.

Clothes drying *equipment* that use *fossil fuels* shall comply with either 8.4.5.4.1 or 8.4.5.4.2

8.4.5.4.1 Commercial drying.

Clothes drying *equipment*, and end-uses for commercial laundry applications shall be provided with conduit that is continuous between a junction box located within 3 feet (914 mm) of the *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 *equipment* with an equivalent equipment capacity. The electrical junction box and electrical panel shall have labels stating, "For Future Electric Clothes Drying Equipment".

8.4.5.4.2 Residential drying.

Clothes drying *equipment*, *appliances*, and end-uses serving *dwelling units* or sleeping areas with a capacity less than or equal to 9.2 cubic feet shall be provided with a dedicated 240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 6 feet (1829 mm) of *fossil fuel* clothes dryers and shall be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Clothes Drying Equipment" and be electrically isolated.

8.4.5.5 Other combustion equipment.

Combustion equipment not covered by Sections 8.4.5.1-4 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".

8.7 General

Add text as follows:

8.7.3.1 Record Documents

Construction documents shall require that within 90 days after the date of system acceptance, record documents shall be provided to the building owner, including

b. location of additional electric infrastructure for heating, water heating, cooking and clothes drying equipment.

Chapter 9 – Lighting

9.4 Mandatory PRovisions

Revise text as follows:

9.4.1 Lighting Control

Building lighting *controls* shall be installed to meet the provisions of Sections 9.4.1.1, 9.4.1.2, 9.4.1.3, ~~and~~ 9.4.1.4, and 9.4.1.5.

Add new text as follows:

9.4.1.5 Demand Responsive Lighting Controls

Building lighting *controls* shall be programmed to allow automated DR. The programming shall be capable of reducing the total connected lighting power in a

uniform manner by no less than 15 percent but no more than 50% of the baseline power level when signaled by a *demand responsive control*. The baseline lighting power shall be determined in accordance with either Section 9.5 or 9.6.

Chapter 10 – Other Equipment

10.2 Compliance Paths

Revise text as follows:

10.2.1 Requirements for All Compliance Paths

Other equipment shall comply with Section 10.1, "General"; Section 10.4, "Mandatory Provisions"; Section 10.5, "Prescriptive Path" and Section 10.8, "Product Information."

Add new text as follows:

10.4.8 Electric Vehicle Charging Infrastructure

Parking facilities shall be provided with electric vehicle charging infrastructure in accordance with this section and Table 10.4.8 based on the total number of parking spaces and rounded up to the nearest whole number. EVSE, EV ready spaces and EV capable spaces may be counted toward meeting minimum parking requirements. EVSE spaces may be used to meet requirements for EV ready spaces and EV capable spaces. EV ready spaces may be used to meet requirements for EV capable spaces. Where more than one parking facility is provided on a building site, the number of parking spaces required shall be calculated separately for each parking facility. EV spaces shall be uniformly distributed in the parking facility.

Exception to 10.4.8

In parking garages, the conduit required for *EV capable spaces* may be omitted provided the parking garage electrical service has no less than 1.8 kVA of additional reserved capacity per *EV capable space*.

Add new table as follows:

Table 10.4.8 Electric Vehicle Charging Infrastructure Requirements

Occupancy	*EVSE Spaces*	*EV Ready Spaces*	*EV Capable Spaces*
Group B Occupancies	15%	NA	40%
Group M Occupancies	25%	NA	40%
R-2 Occupancy	NA	100%[a]	NA
All other Occupancies	10%	NA	40%

a. Or one *EV ready space* per *dwelling unit.*

Add new text as follows:

10.4.8.1 EV Capable Spaces. *EV Capable Spaces* shall be provided with electrical infrastructure that meets the following requirements:

1. Conduit that is continuous between a junction box or outlet located within 3 feet (914 mm) of the parking space and an electrical panel serving the area of the parking space.

2. The electrical panel to which the conduit connects shall have sufficient dedicated physical space for a dedicated dual-pole, 40-amp breaker.

3. The conduit shall be sized and rated to accommodate a 40-amp, 208/240-volt branch circuit and have a minimum nominal trade size of 1 inch.

4. The electrical junction box and the electrical panel directory entry for the dedicated space in the electrical panel shall have labels stating "For future *electric vehicle* charging".

Add new text as follows:

10.4.8.2 EV Ready Spaces. The branch circuit serving *EV Ready Spaces* shall meet the following requirements:

1. Wiring capable of supporting a 40-amp, 208/240-volt circuit.

2. Terminates at an outlet or junction box located within 3 feet (914 mm) of the parking space.

4. A minimum capacity of 1.8 kVA.

5. The electrical panel directory shall designate the branch circuit as "For electric vehicle charging" and the junction box or receptacle shall be labelled "For electric vehicle charging."

Add new text as follows:

C405.14.2 EVSE Spaces. The *EVSE* serving *EVSE spaces* shall meet the following requirements:

3. Capable of supplying not less than 6.2 kW to an electric vehicle.

   Exception: An ALMS may be used to reduce the total electrical capacity required by EVSE spaces provided that all EVSE spaces are capable of simultaneously charging at a minimum rate of 1.4 kW.

4. Located within 3 feet (914 mm) of the *EVSE space*.

Add new text as follows:

10.4.9 Electric infrastructure for energy storage

Each building site shall have space for on-site energy storage not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in accordance with Section 1206.2.8 of the International Fire Code and Section110.26 of the NFPA 70.

Exception to 10.4.9

Where an onsite electrical energy system storage system is installed.

10.4.9.1 Electrical service reserved space

The main electrical service panel shall have a reserved space to allow installation of a two-pole circuit breaker for future electrical energy storage system installation This space shall be labeled "For Future Electric Storage." The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

10.5 Prescriptive Compliance Path

Add new text as follows:

10.5.1 Renewable energy resources

Buildings shall be served by *renewable energy resources* complying with Section 10.5.1.1 and 10.5.1.2.

10.5.1.1 Onsite Renewable Energy

The *building* site shall have *equipment* for *on-site renewable energy* with a rated capacity of not less than 0.25 W/ft² or 0.85 Btu/ft2 (2.7W/m2) multiplied by the sum of the *gross conditioned floor area* for all floors up to the three (3) largest floors.

Exception to 10.5.1.1

1. Any *building* located where an unshaded flat plate collector oriented toward the equator and tilted at an angle from horizontal equal to the latitude receives an annual daily average incident solar radiation less than 3.5 kWh/m2·day (1.1 kBtu/ft2·day).

2. Any *building* where more than 80% of the *roof* area is covered by any combination of *equipment* other than for *on-site renewable energy systems*, planters, vegetated space, *skylights*, or occupied *roof* deck.

3. Any *building* where more than 50% of *roof* area is shaded from direct-beam sunlight by natural objects or by structures that are not part of the *building* for more than 2500 annual hours between 8:00 a.m. and 4:00 p.m.

2. New construction or *additions* in which the sum of the *gross conditioned floor area* of the three largest floors of the new construction or *addition* is less than 10,000 ft2.

3. *Alterations* that do not include *additions*.

10.5.1.2 Renewable energy certificate documentation

Documentation shall be provided to the code official that indicates that renewable energy certificates (RECs) associated with the on-site renewable energy will be retained and retired by or on behalf of the owner or tenant.

10.7 Submittals

Add text as follows:

10.7.3.1 Record Documents

Construction documents shall require that within 90 days after the date of system acceptance, record documents shall be provided to the building owner. Record documents shall include, as a minimum, the location of pathways for routing of raceways or cable from the renewable energy system to the electrical service panel and electrical energy storage system area, location and layout of a designated area for electrical energy storage system, and location of designated EV-Ready spaces in parking facilities.

Chapter 11 – Energy Cost Budget Method

11.4 Simulation general requirements

Add text as follows:

11.4.1 Simulation Program

The *simulation program* shall be a computer-based program for the analysis of *energy* consumption in *buildings*. For components that cannot be modeled by the *simulation program*, the exceptional calculation methods requirements in Section 11.4.5 shall be used.

Exception to 11.4.1

When approved by the *adopting authority*, a separate computer-based program shall be permitted to be used to calculate *on-site renewable energy*.

Revise text as follows:

11.4.3.1 On-Site Renewable Energy and Site-Recovered Energy.

Site-recovered energy shall not be considered *purchased energy* and shall be subtracted from the *proposed design energy* consumption prior to calculating the *design energy cost*. *On-site renewable energy* shall be subtracted from the *proposed design energy* consumption prior to calculating the *design energy cost* provided that the building owner

a. owns the *on-site renewable energy system*,
b. has signed a lease agreement for the *on-site renewable energy system* for at least 15 years or
c. has signed a contractual agreement to purchase *energy* generated by the *on-site renewable energy system* for at least 15 years.

The reduction in *design energy cost* associated with *on-site renewable energy* that exceeds the *on-site renewable energy* required by Section 10.5.1.1 shall be no more than 5% of the calculated *energy cost budget.*

On-site renewable energy included in the *budget building design* shall be subtracted from the *budget building design* energy consumption prior to calculating the *energy cost budget.*

11.4.3.2 Annual Energy Costs.

The *design energy cost* and *energy cost budget* shall be determined using rates for *purchased energy* (such as electricity, gas, oil, propane, steam, and chilled water) that are approved by the *adopting authority*. Where *on-site renewable energy* or *site-recovered energy* is ~~used~~ in excess of what is required in the *budget building design* by Table 11.5.1, the *budget building design* shall be based on the *energy* source used as the backup *energy* source, or electricity if no backup *energy* source has been specified. Where the proposed design includes *on-site electricity generation systems* other than *on-site renewable energy systems*, the baseline design shall include the same generation systems excluding its *site-recovered energy*.

Revise table as follows:

Table 11.5.1 Modeling Requirements for Calculating Design Energy Cost and Energy Budget

Proposed Design **(Column A)** ***Design Energy Cost*** **(DEC)**	***Budget Building Design*** **(Column B)** ***Energy Cost Budget*** **(ECB)**
15. On-Site Renewable Energy	
On-site renewable energy in the *proposed design* shall be determined as follows: a. Where a complete *system* providing on-site *renewable energy* exists, the model shall reflect the actual *system* type using actual component capacities and efficiencies. b. Where a *system* providing on-site *renewable energy* has been designed, the *system* model shall be consistent with design documents. c. Where no *system* exists or is specified to provide *on-site renewable energy*, no *system* shall be modeled.	*On-site renewable energy* shall be included in the *budget building design* when required by Section 10.5.1, and shall be determined as follows: a. Where a *system* providing *on-site renewable energy* has been modeled in the *proposed design*, the same *system* shall be modeled identically in the *budget building design*, except the rated capacity shall meet the requirements of Section 10.5.1.1. Where more than one type of *on-site renewable* energy system is modeled, the total capacities shall be allocated in the same proportion as in the *proposed design*. b. Where no *system* exists or is specified to provide *on-site renewable energy* in the *proposed design*, *on-site renewable energy* shall be modeled as an unshaded photovoltaic system with the following physical characteristics:

	• Size: Rated capacity per Section 10.5.1.1 • Module Type: Crystalline silicon panel with a glass cover, 19.1% nominal efficiency and temperature coefficient of – 0.47%/°C; performance shall be based on a reference temperature of 77°F (25°C) and irradiance of 317 Btu/ft2·h (1000 W/m2). • Array Type: Rack-mounted array with installed nominal operating cell temperature (INOCT) of 103°F (45°C) • Total system losses (DC output to AC output): 11.3% • Tilt: 0-degrees (mounted horizontally) • Azimuth:180 degrees If the *on-site renewable energy system* cannot be modeled in the *simulation program*, Section 11.4.5 shall be used.

Chapter 12 – Normative References

Revise table as follows:

Reference	Title
American National Standards Institute (ANSI) 1899 L Street, NW, 11th Floor, Washington, DC 20036	
ANSI/CTA-2045-B	Modular Communications Interface for Energy Management

Normative Appendix G – Performance Rating Method

G2 Simulation general requirements

Add text as follows:

G2.2 Simulation Program.

The *simulation program* shall be a computer-based program for the analysis of *energy* consumption in *buildings* (a program such as, but not limited to, DOE-2, BLAST, or EnergyPlus). The *simulation program* shall include calculation methodologies for the *building* components being modeled. For components that cannot be modeled by the *simulation program*, the exceptional calculation methods requirements in Section shall be used.

Exception to G2.2

When approved by the *adopting authority*, a separate computer-based program shall be permitted to be used to calculate *on-site renewable energy*.

G3 Calculation of the proposed design and baseline performance

Revise table as follows:

Table G3.1 Modeling Requirements for Calculating Proposed and Baseline Performance

No.	*Proposed Building Performance*	*Baseline Building Performance*

18. *On-Site Renewable Energy*	
On-site renewable energy in the *proposed building performance* shall be determined as follows: a. Where a complete *system* providing on-site *renewable energy* exists, the model shall reflect the actual *system* type using actual component capacities and efficiencies. b. Where a *system* providing on-site *renewable energy* has been designed, the *system* model shall be consistent with design documents. c. Where no *system* exists or is specified to provide *on-site renewable energy*, no *system* shall be modeled.	*On-site renewable energy* shall not be included in the *baseline building performance*.

Amendments to KCMO 2018 Code Package (Ordinance 2000418)

Article III: One-and Two-Family Dwellings

Revise text as follows:

R303.4 Mechanical Ventilation. Building and dwelling units complying with Section N1102.4.1 shall be provided with mechanical ventilation in accordance with Section M1505, or with other approved means of ventilation.

Add text as follows:

CHAPTER 11 [RE] ENERGY EFFICIENCY. All efficiency related sections shall refer to equivalent sections of IECC 2021 / IRC 2021 without exception.

Delete amendments noted for:

- **Table N1102.1.2**
- **Table N1102.1.4**
- **N1102.2.10**
- **N1103.3.5**
- **N1106.4 (R406.4)**
- **N1109.1.1, Exception 5**

_____

Approved as to form and legality:

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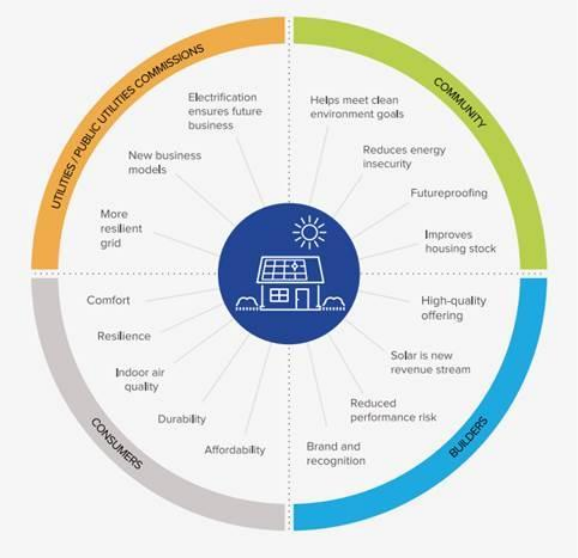
ATTACHMENT 2

Kansas City: We Need Strong Building Codes that Protect Our City's Health and Future!

By adopting the most updated version of the International Energy Conservation Code with no weakening amendments, we will ensure that all residents of Kansas City can lead healthy lives in homes they can afford while preserving our community's well-being for years to come.

Kansas City has the opportunity to become a leader in energy efficiency, building healthy, resilient communities, and addressing the climate crisis by adopting the 2021 International Energy Conservation Code (2021 IECC) with a Zero-Code Appendix. By passing the 2021 IECC without weakening amendments, Kansas City will:

Protect the health of all residents. The 2021 IECC will use the most up to date health science that will protect residents from respiratory illnesses caused by indoor air pollution. Nationwide, reducing electricity use by adopting recommended energy efficiency measures would save more than 2,000 lives, prevent nearly 30,000 asthma episodes each year, and save over $20 billion in avoided health issues. Reducing these impacts will be especially beneficial for Kansas City, which has ranked consistently as one of the worst U.S. cities for people suffering from asthma or allergies due to the increased air pollution and climate change.



(credit: **Rocky Mountain Institute**)

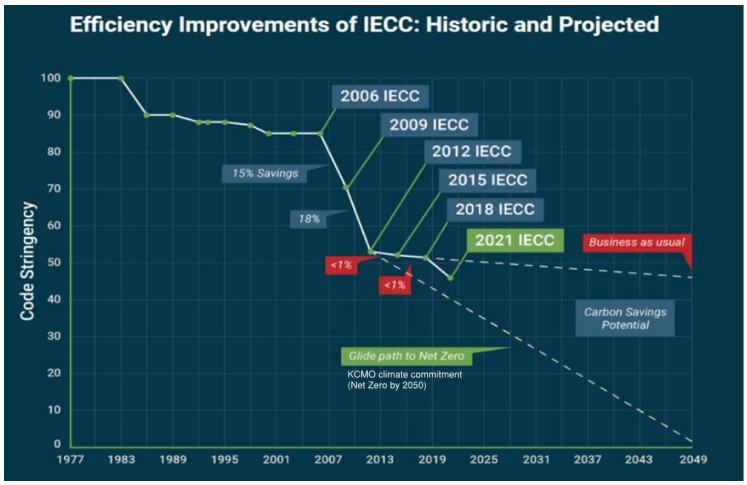
Save Kansas Citians money. Adopting the 2021 IECC would help new homeowners and home renters save over $300 every year from reduced energy usage. Adopting the most up to date codes also enables businesses to thrive by reducing overhead costs and spurring economic development. Those who face disproportionately high energy cost-burdens, like renters and low-income families, would benefit from landlords investing in upgrades or new buildings being required to install measures that will lower tenants' energy bills. Adopting the 2021 IECC instead of a weaker or outdated version will also conserve city resources that would be lost if Kansas City were to adopt and train staff to apply a weaker version that will need to be updated soon anyway.

Reduce climate pollution. The 2021 IECC would make homes more than 35% more energy efficient than under the current building code. This will drastically reduce greenhouse gas emissions by lowering the amount of electricity used to power homes and buildings, which accounts for up to 40% of greenhouse gas emissions.

Promote equity and preserve our communities. Owners of energy efficient homes are 32% less likely to default on their loans, preventing foreclosures and maintaining our neighborhoods. Low-income home-owners and renters spend up to 20% of their income on utility bills. By keeping utility costs low, homeowners and renters are able to maintain their homes and age in place.

Increases our resilience against extreme weather. Adopting strong energy codes lowers the amount of energy wasted by buildings and **is one of the best strategies** cities can use to protect themselves against natural disasters. Kansas City is ranked fifth among the highest of 25 cities to be most impacted by climate change, and the urban heat island effect will cause Kansas City to be warmer than the rural Midwest. Updating our building codes to include the strongest efficiency measures will help ensure they are more prepared to cope with extreme weather conditions.

Support Kansas City's climate protection goals. In 2008 Kansas City adopted its Climate Protection Plan, and the City is now in the process of updating the Climate Protection Plan to reduce greenhouse gas emissions 100% by 2030 to protect the health and welfare of all our residents and become a leader in community equity and climate resilience. The city has also signed the **"We Are Still In"** pledge, U.S Conference of Mayors Resolution 86, and most recently been involved in the **Climate Action KC** coalition to create a regional climate action plan, all of which are working towards meeting the greenhouse gas emissions reduction goals of the Paris Climate Agreement. Kansas City ***will not*** meet its goals without adopting strong energy efficiency codes. This will be the case if the City adopts an outdated or watered down model code. If the City is to reach its goals, it is imperative that the City take the necessary steps to meet them and lead by example by adopting the IECC 2021 and the Zero-Code Appendix. There is no time to lose.



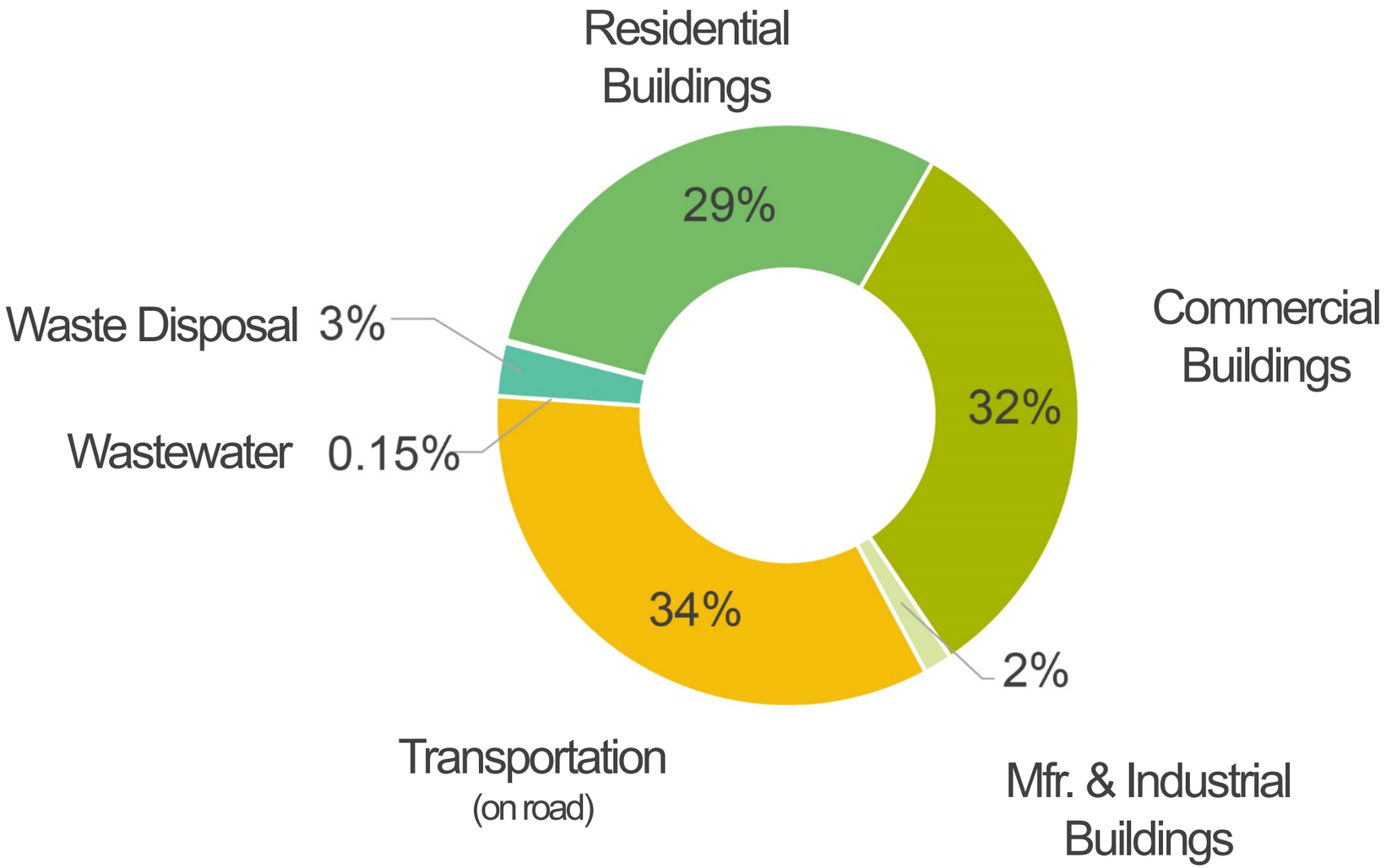
(credit: **American Chemistry Council**)

Strengthen Kansas City's economy. People want to live in healthy communities where they know they are valued and their well-being will be prioritized. Likewise, **companies** wanting to show their commitment to the welfare of their employees and to the planet are **investing in cities who are investing strong climate protection, renewable energy, and sustainability policies**. As energy codes and standards are updated and adopted, new employment opportunities become available. **Meeting energy efficiency standards requires the help of additional technical experts**. In addition to creating jobs, energy codes boost the economy by letting people reinvest the money they are saving on energy costs. ***It is the only code that pays for itself***. Economic analysis indicates that every dollar spent on energy code compliance and enforcement **yields $6 dollars in energy savings**. When governments invest in energy codes, their citizens have additional money to invest in their local economies.

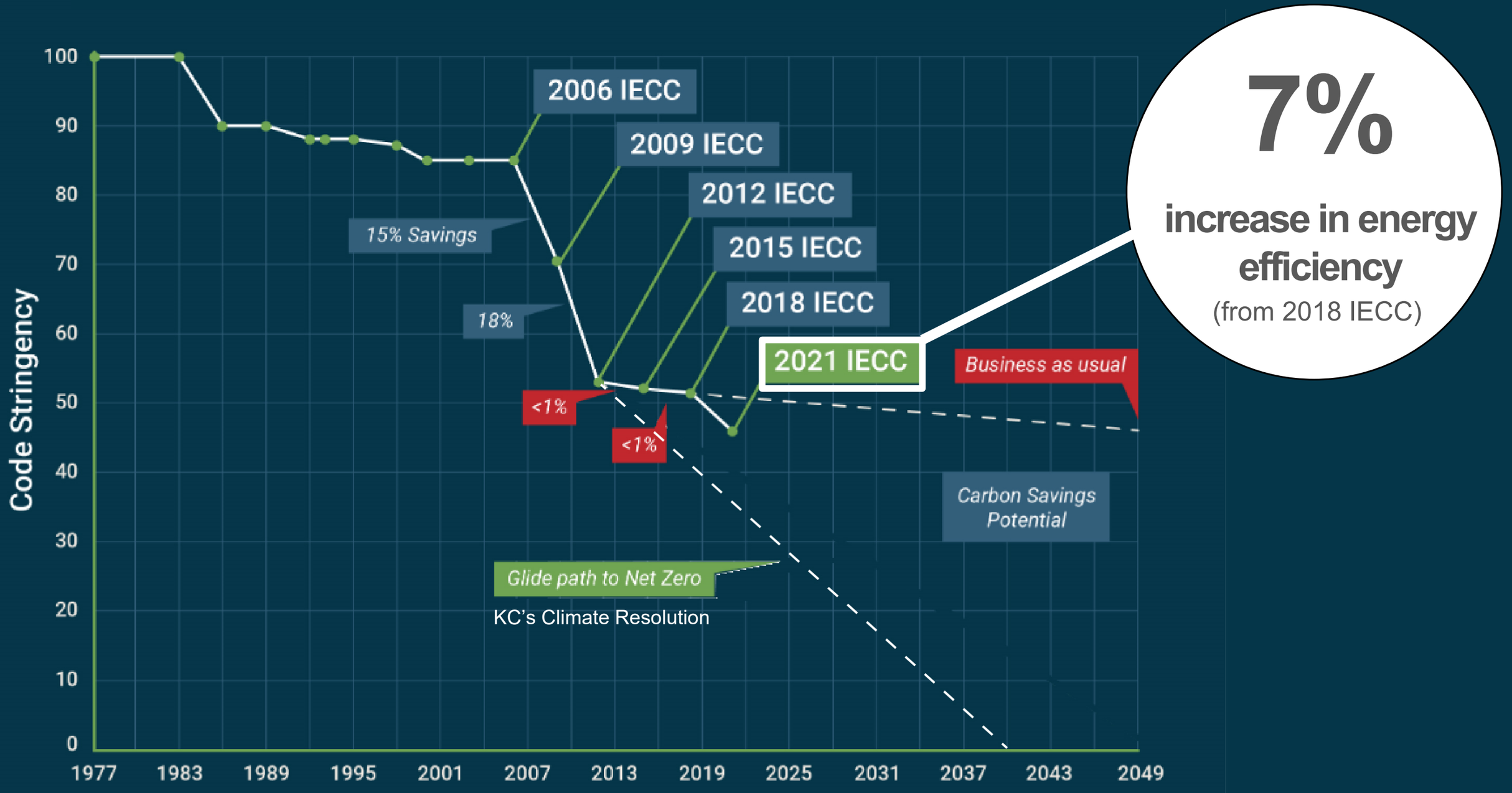
KC Needs Strong Building Codes to Protect Our Future
Adopt the 2021 IECC with No Weakening Amendments!

ATTACHMENT 3

KC Metro 2015 GHG Emissions Inventory



CLIMATE ACTION KC

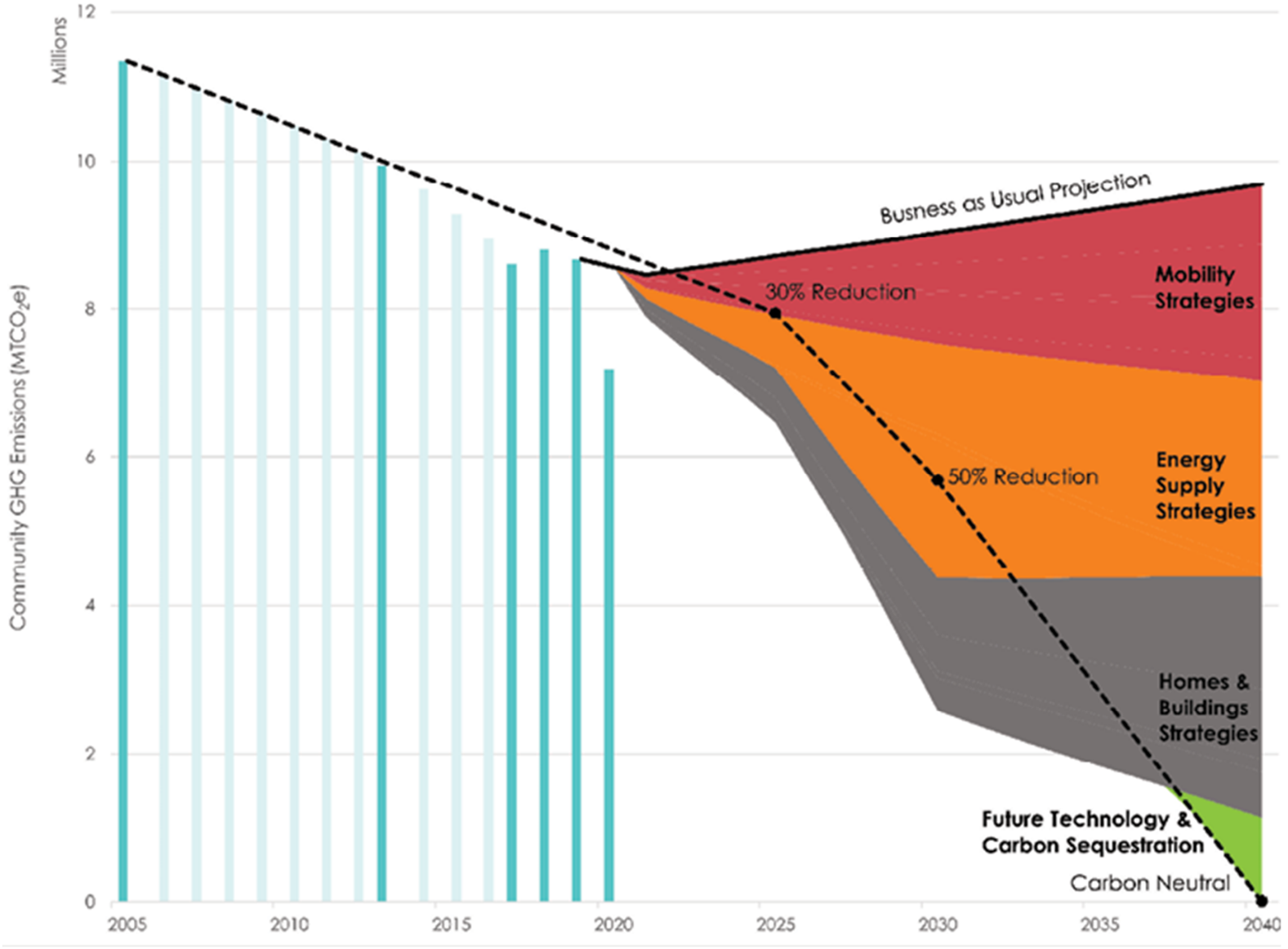


7%

increase in energy efficiency

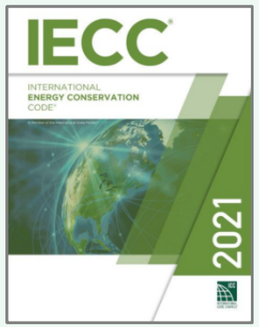
(from 2018 IECC)

Path to Carbon Neutrality



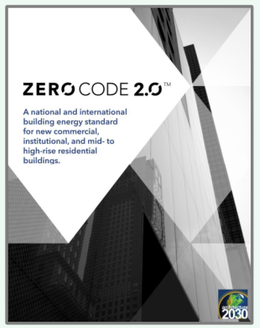
CLIMATE ACTION KC

Recommendations for Kansas City



Adopt IECC 2021
(no weakening amendments)

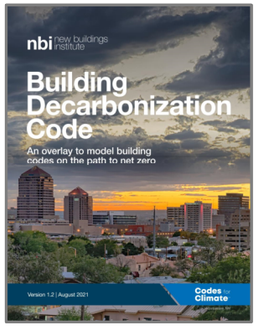
+



Zero Code
(voluntary)

Strengthening Amendments

1. Electrification Readiness
2. EV Readiness
3. PV & Storage Readiness
4. Mixed-fuel buildings



Electrification Readiness

Electric-Readiness

- Electric infrastructure required for:
  - Water heating
  - Space heating
  - Clothes drying
  - Cooking
  - "Other"
- Requirements for:
  - Branch circuits and labeling
  - Physical space and other associated needs (i.e. condensate drains)

EV Readiness

Electric Vehicles

- Residential: One- and two-family dwellings
  - Requires one EV-ready space/dwelling unit
  - Requires minimum capacity of 9.6kVA for charging
  - Redirects multifamily to commercial requirement
- Commercial: incorporates language from 90.1-2022 for mandatory on-site solar
  - EVSE, EV-ready, EV-capable required by occupancy type
  - Allows trading up to meet required percentages
  - Allows ALMS installation to reduce total capacity

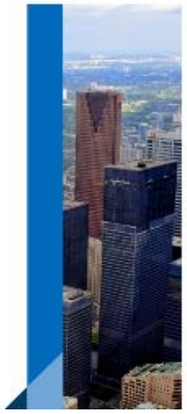
PV & Storage Readiness

On-site Solar Generation

- Residential: incorporates Appendix RB into main body of text
  - Requires solar ready zone and infrastructure
  - Redirects multifamily (3+ units) to commercial requirement
- Commercial: incorporates language from 90.1-2022 for mandatory on-site solar
  - 0.25W/ft2 * gross area of three largest floors
  - Requires documentation of RECS retained or retired

Energy Storage Ready

- Commercial Only: incorporates language from Appendix CB into main body of text
  - Requires dedicated space for energy storage
  - Requires reserved space on main electrical panel



Mixed Fuel Buildings

C406 ADDITIONAL EFFICIENCY REQUIREMENTS

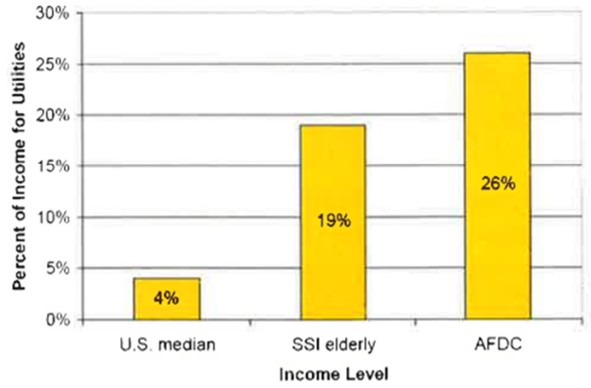
Revise text as follows:

C406.1 Additional energy efficiency credit requirements. New *all-electric buildings* shall achieve a total of 10 credits and new *mixed-fuel buildings* shall achieve a total of 15 credits from Tables C406.1(1) through C406.1(5) where the table is selected based on the use group of the building and from credit calculations as specified in relevant subsections of C406. Where a building contains multiple use groups, credits from each use group shall be weighted by floor area of each group to determine the weighted average building credit. Credits from the tables or calculation shall be achieved where a building complies with one or more of the following:

Affordable Housing - IECC 2021

- Lowers energy cost burden for renters
- Provides healthy living environments

Figure 1. Energy Cost Burden as a Percentage of Income



It could be claimed that lower-income families are more likely to rent than own their homes, which is borne out by national statistics. But this assertion only reinforces the importance of energy codes in making housing affordable: because renters can't choose the efficiency of their homes, energy codes must be in place to protect them. This is why ***the low-income housing advocacy community staunchly supports energy efficient codes***.

Source: The Affordable Housing Energy Efficiency Alliance. *The Affordable Housing Energy Efficiency Handbook.* http://h-m-g.com/multifamily/ahcea/Handbook/AHEEAHandbook.pdf

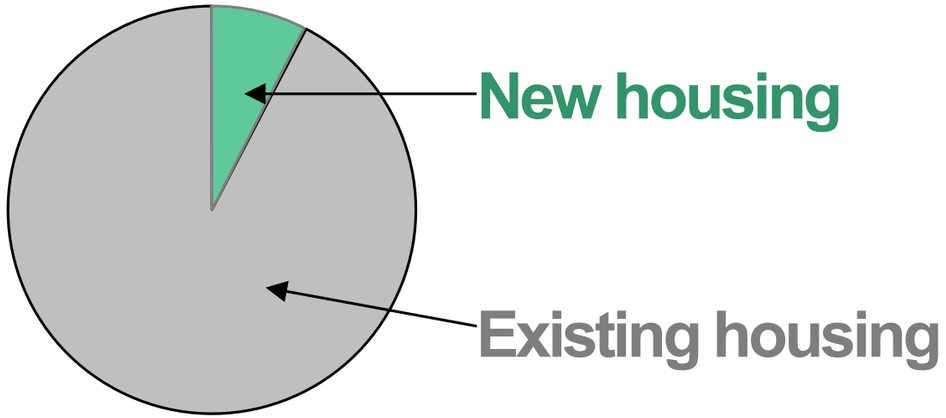
Kansas City Housing Impacts

2019 KC Regional Housing Sales – 39,232 sales

Existing housing (not affected by 2021)

36,578 houses (91% of sales)

Average price - $229, 658



New housing

3,735 units

Average price - $411,363

Impact of 2021 code less than 3% (using conservative impact estimate)

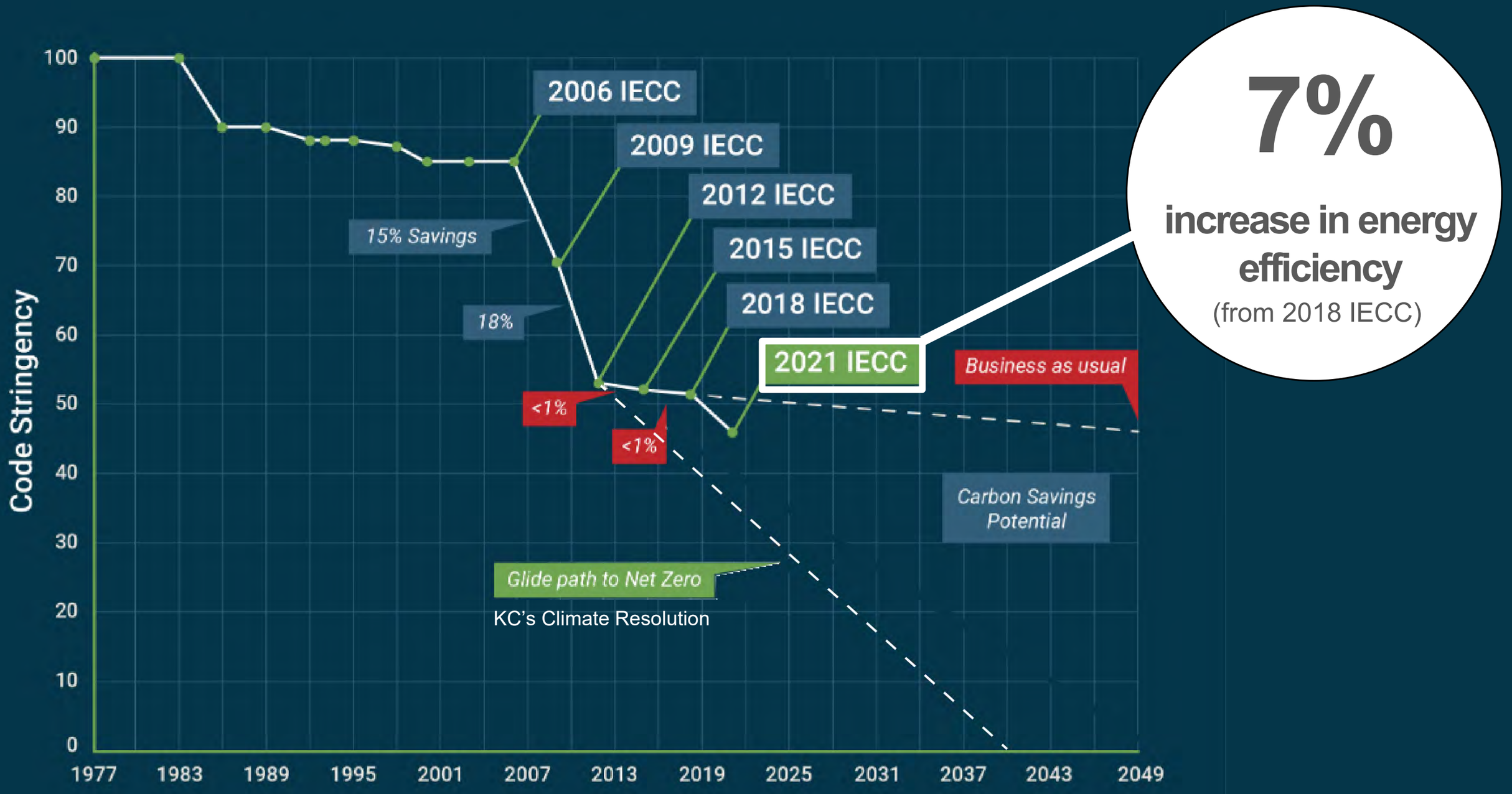
Primary KC Impact of IECC 2021 will be on Commercial, Mid-Rise Buildings

Source: Heartland Multiple Listing Service and the Kansas City Regional Association of Realtors

ATTACHMENT 4

ALIGN BUILDING CODES WITH KC's CLIMATE COMMITTMENTS

Foundations of Net Zero Emissions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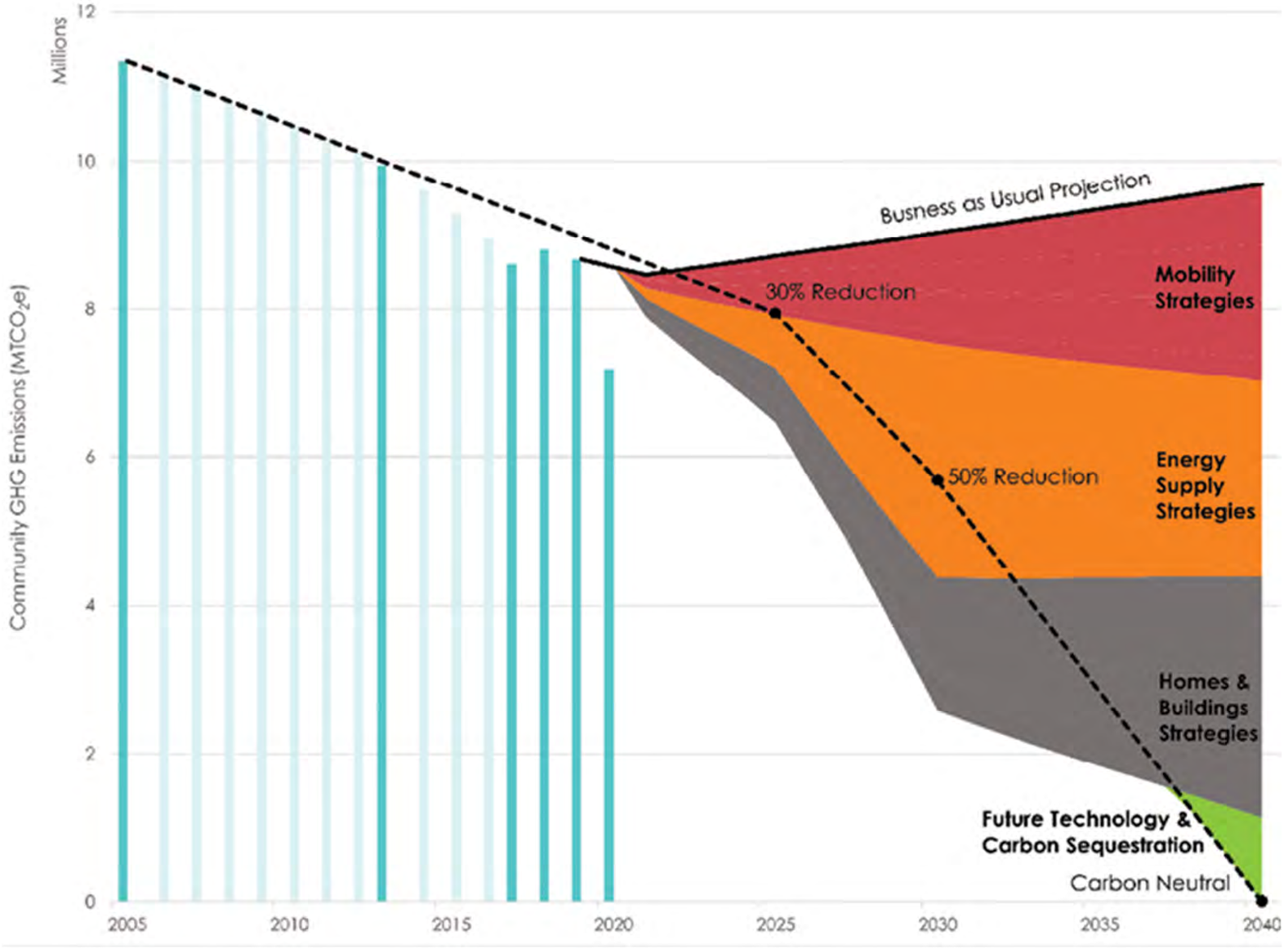
2009 IECC
2012 IECC
2015 IECC
2018 IECC
2021 IECC
15% Savings
18%
<1%
<1%
Business as usual
Carbon Savings Potential
Glide path to Net Zero
KC's Climate Resolution
7%
increase in energy efficiency
(from 2018 IECC)

Path to Carbon Neutrality



CLIMATE ACTION KC

Recommendations for Kansas City

Adopt IECC 2021
(no weakening amendments)

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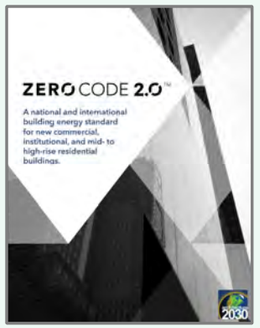
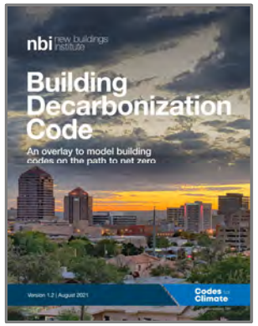


Zero Code
(voluntary)

Strengthening Amendments

1. Electrification Readiness
2. EV Readiness
3. PV & Storage Readiness
4. Mixed-fuel buildings



Electrification Readiness

Electric-Readiness

- Electric infrastructure required for:
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  - Space heating
  - Clothes drying
  - Cooking
  - "Other"
- Requirements for:
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  - Allows trading up to meet required percentages
  - Allows ALMS installation to reduce total capacity

PV & Storage Readiness

On-site Solar Generation

- Residential: incorporates Appendix RB into main body of text
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  - 0.25W/ft2 * gross area of three largest floors
  - Requires documentation of RECS retained or retired

Energy Storage Ready

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  - Requires reserved space on main electrical panel

Mixed Fuel Buildings

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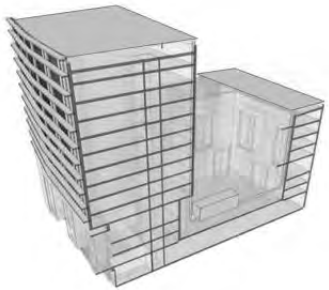
ZERO CODE™

ZERO CODE™

Commercial • Institutional • Mid-Rise/High-Rise Residential Buildings

1

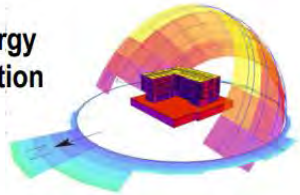
Design an energy efficient building in compliance with the 2021 IECC *or better*.



2

Establish the building's renewable energy requirement from:

an energy simulation



or

default renewable energy table

29

Climate Zone

Building Type

Building Area Type	0A/1A	0B/1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
kBtu/kM²-y																	
Multifamily (R-2)	43	48	41	41	43	42	36	45	43	47	47	47	46	41	53	48	53	59
Healthcare/Hospital (I-2)	119	120	119	113	111	109	105	124	120	108	116	110	105	126	116	131	142
Hotel/motel (R-1)	73	76	75	68	66	67	64	69	66	66	71	66	65	77	72	81	89
Office (B)	31	30	30	29	29	29	25	29	28	27	25	24	24	25	33	28	32	36
Restaurant (A-2)	389	428	411	408	444	420	392	460	437	457	531	484	464	569	538	644	750
Retail (M)	46	50	45	46	44	44	37	48	44	44	52	50	46	60	52	64	77
School (E)	42	46	40	40	40	39	36	39	39	40	40	39	43	37	44	45	45	54
Warehouse (S)	9	12	9	11	12	11	10	17	13	14	23	21	17	15	32	23	32	32
All others	55	58	54	53	53	51	48	54	52	51	57	54	50	63	57	63	73	

3

Meet the requirement by integrating onsite renewable energy when feasible.

4

If necessary, procure offsite renewable energy.

Source: Architecture 2030
Graphic adaptations: Sefaira; DOE, Green Ideas


BUILD SMART
FROM THE START

IECC 2021


AIA Kansas City
THE AMERICAN INSTITUTE OF ARCHITECTS


U.S. GREEN BUILDING COUNCIL
USGBC


SIERRA CLUB
MISSOURI CHAPTER


Citizens' Climate Lobby


the NATIONAL ORGANIZATION of MINORITY ARCHITECTS
Kansas City


Westside Housing


U&I
Urban Neighborhood Initiative


NRDC
NATURAL RESOURCES DEFENSE COUNCIL


KC TENANTS


Health Forward
FOUNDATION

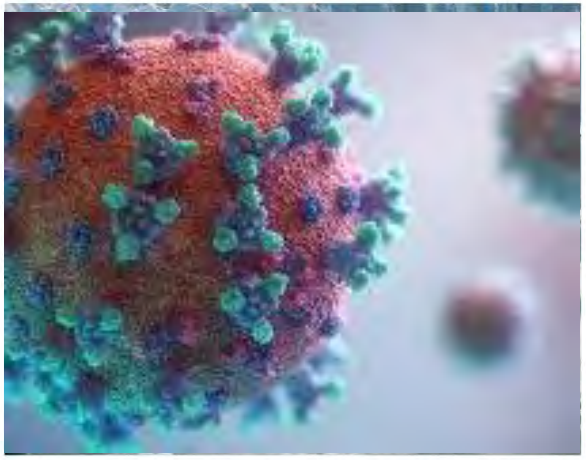

ELEVATE ENERGY
Smarter energy use for all


ENVIRONMENT
MISSOURI


reNEW
MISSOURI

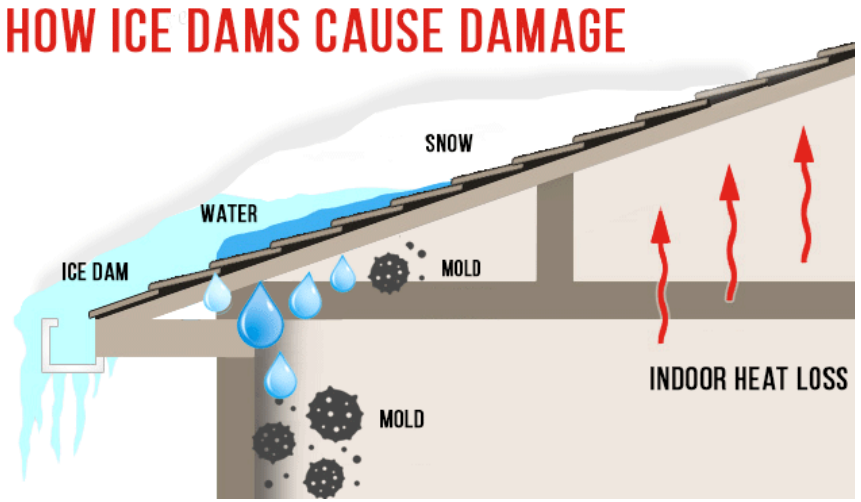

HEALTH
SAFETY
WELFARE

Sheltering in place

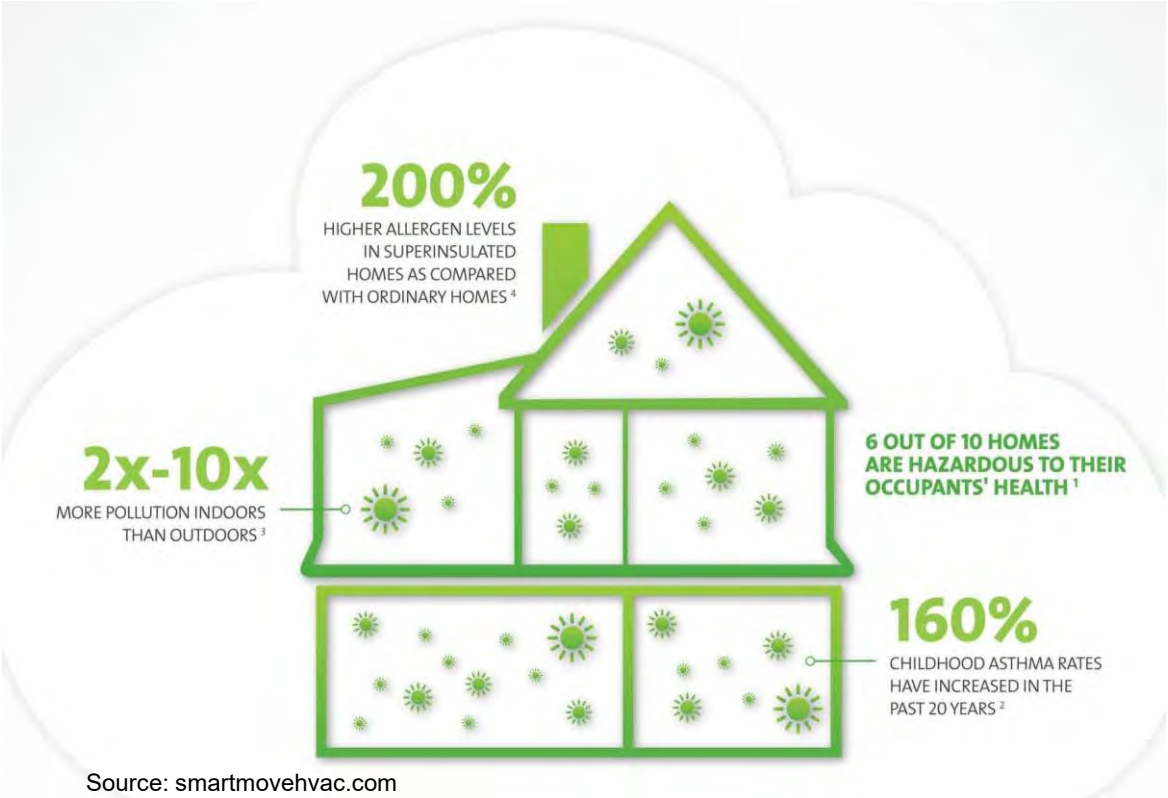


Improves durability

HOW WINDOW CONDENSATION CAUSES DAMAGE

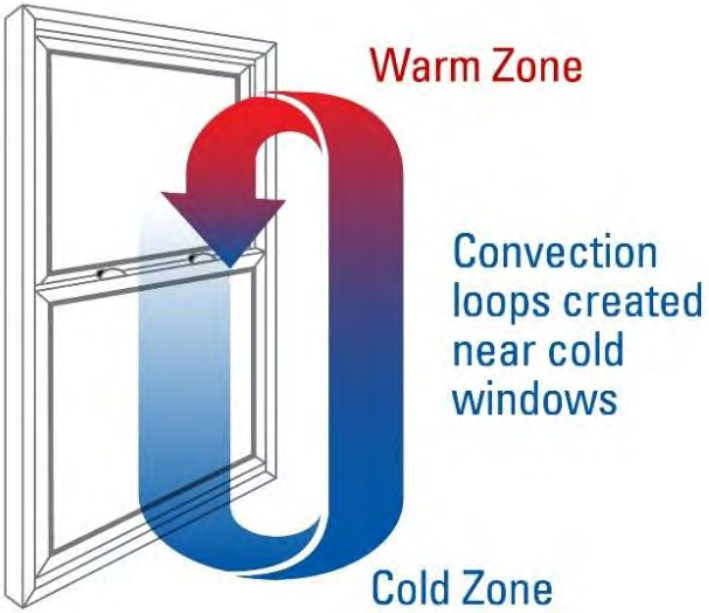


Improves indoor air quality



Source: smartmovehvac.com

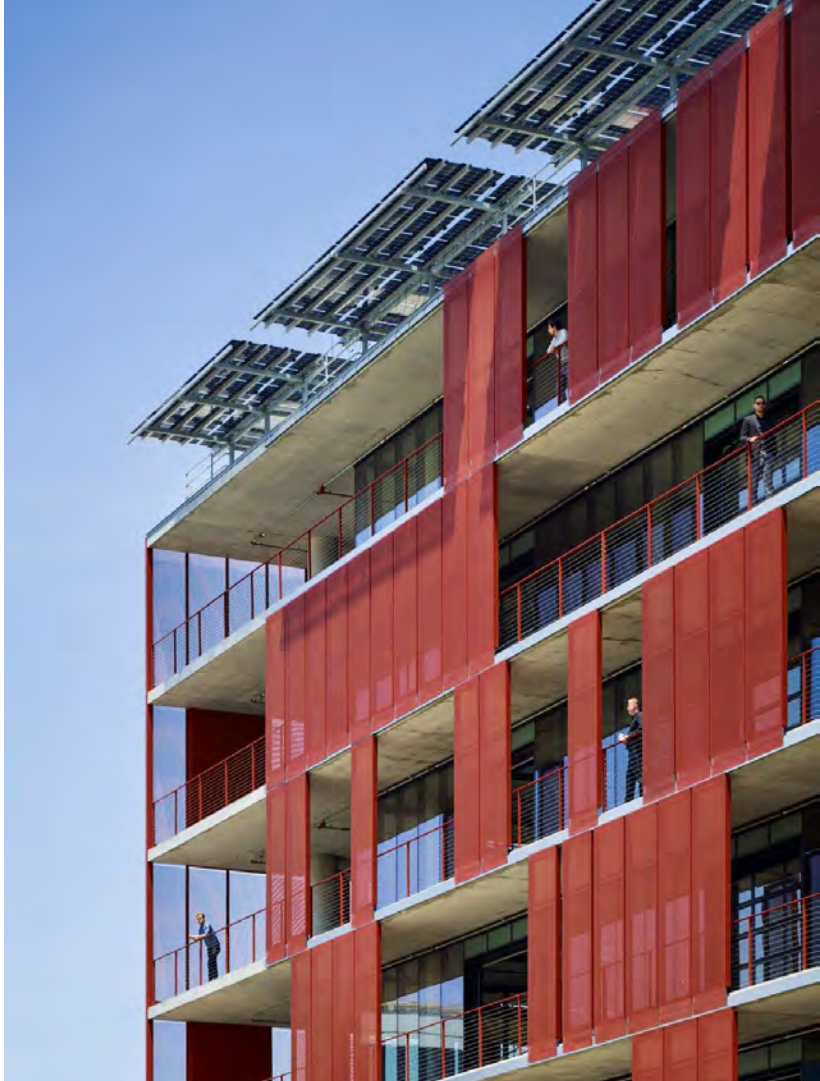
Improves indoor comfort



COST SAVINGS

Energy bill savings

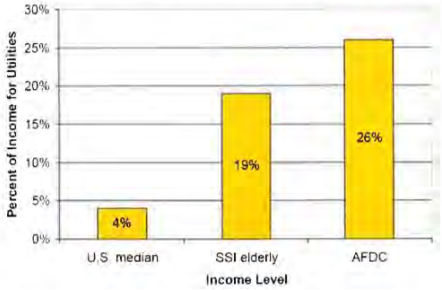
Life Cycle Costs of a Building



Affordable Housing - IECC 2021

- Lowers energy cost burden for renters
- Provides healthy living environments

Figure 1. Energy Cost Burden as a Percentage of Income



It could be claimed that lower-income families are more likely to rent than own their homes, which is borne out by national statistics. But this assertion only reinforces the importance of energy codes in making housing affordable: because renters can't choose the efficiency of their homes, energy codes must be in place to protect them. This is why ***the low-income housing advocacy community staunchly supports energy efficient codes.***

Source: The Affordable Housing Energy Efficiency Alliance. *The Affordable Housing Energy Efficiency Handbook.* http://h-m-g.com/multifamily/ahcea/Handbook/AHEEAHandbook.pdf

Helps stabilize energy rates and reduces national demand

COMMERCIAL UPDATES

Ready and Resilient

Commercial

- Energy Improvement, 10% Savings
- Building Enclosure Changes
- Lighting Improvements
- Flexibility for Builders to Comply
- Zero Code Appendix


RESIDENTIAL
UPDATES

Ready and Resilient

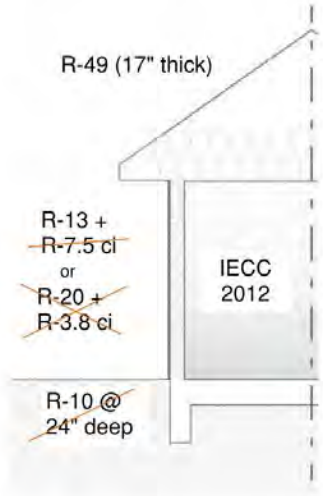
Residential

- Building Enclosure Updates – Insulation/Glazing
- Leakage Rate Testing
- Improved Air Sealing Requirements
- Lighting Quality/Efficacy Improvements
- Water Heating, Compact Design
- Flexibility for Builders to Comply
- Energy Rating Index (ERI) Pathway
- Zero Energy Residential Appendix

Envelope Changes

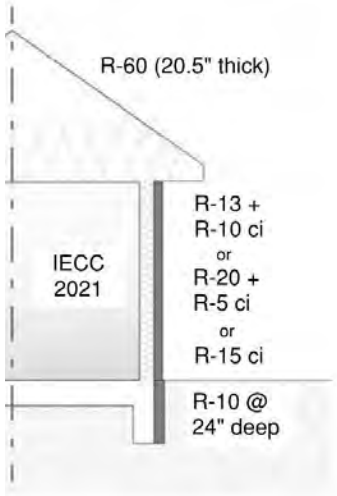
+ 35%
(energy savings from current)

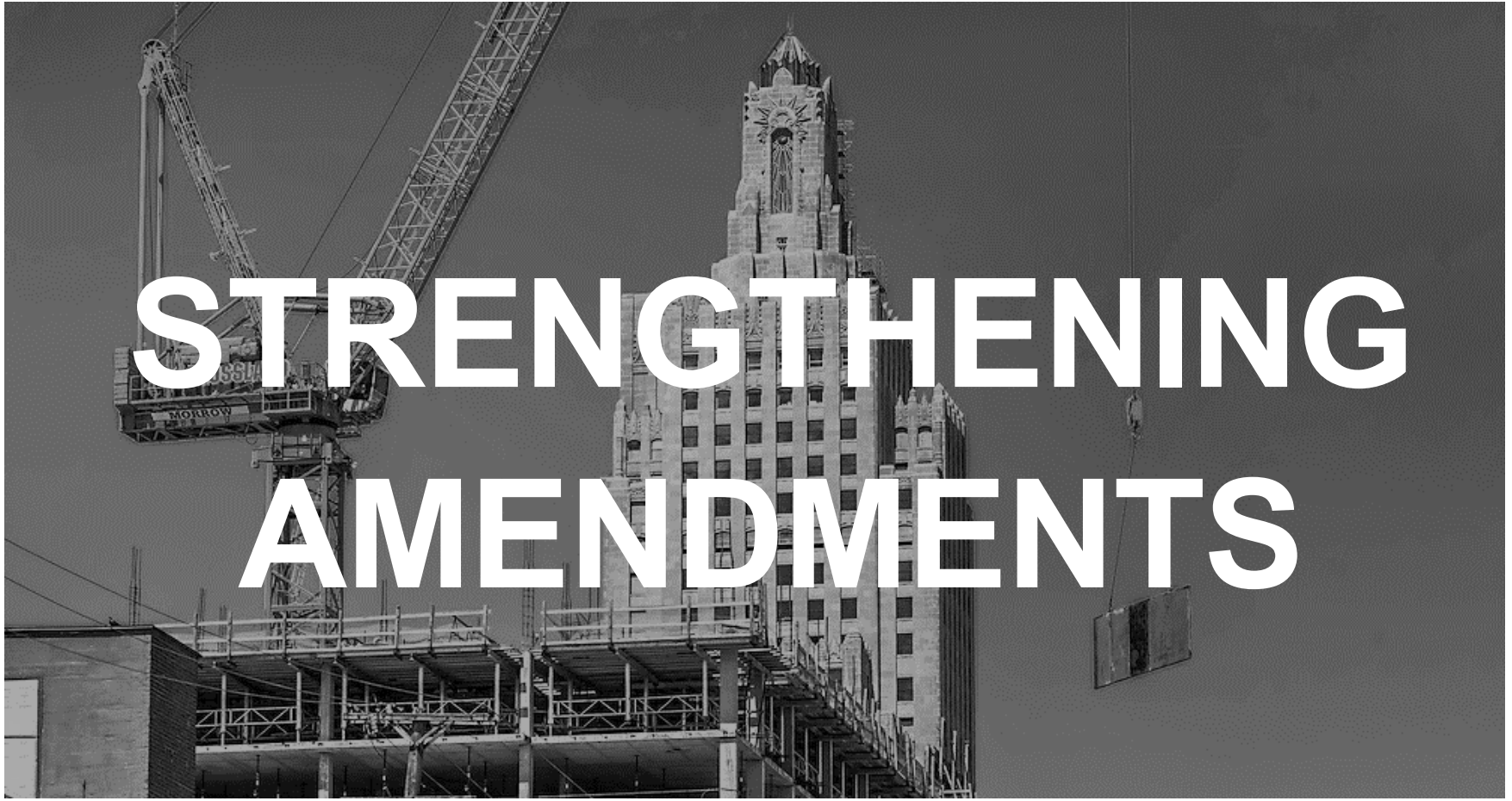
KC Current Energy Code
(IECC 2012 with amendments)



current amendments eleminate increased insulation values

Our Proposal
(IECC 2021 no amendments)

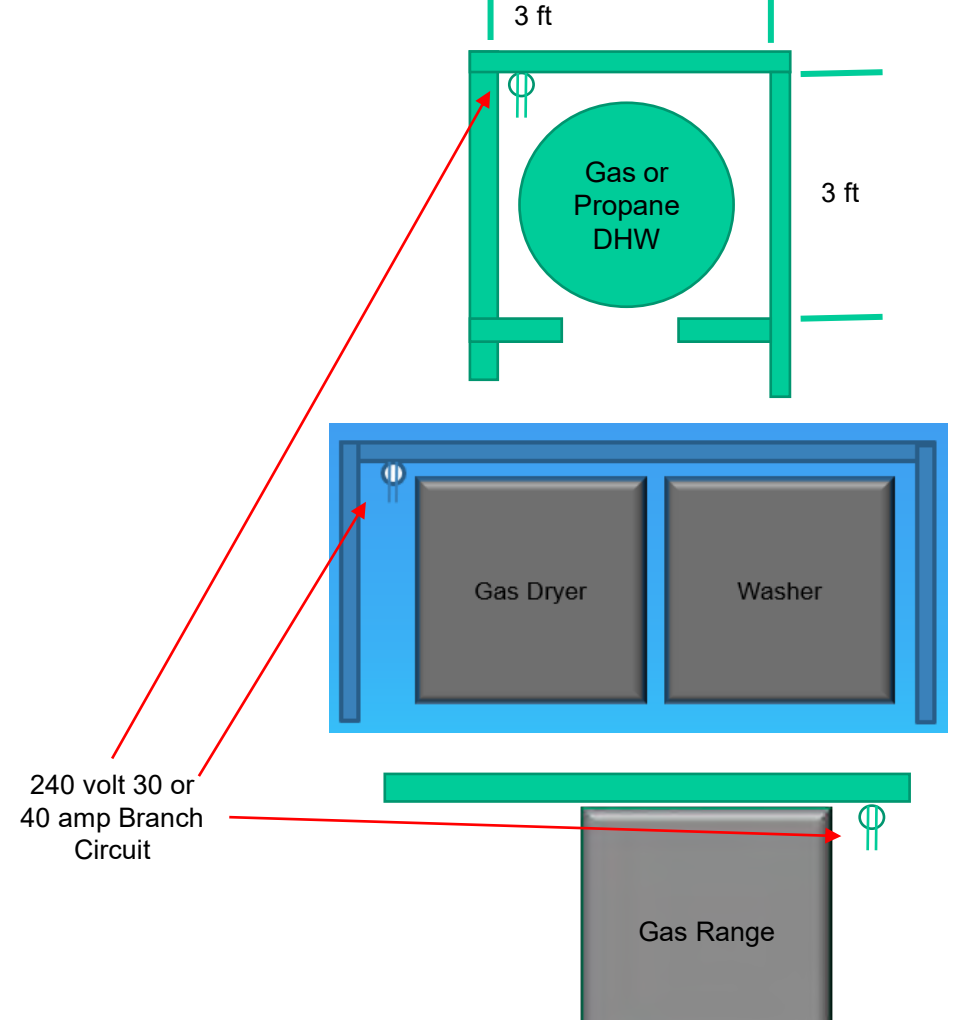




STRENGTHENING AMENDMENTS

Electrification Readiness

- Dedicated electrical receptacle within 3 feet of gas appliances
- Provide space in electrical panel labeled SPARE
- Single pole circuit breaker labeled w/ Future 240V Use
- Water heater space min of 3 ft. X 3 ft. X 7ft.



EV Readiness

- EV Ready and Capable for commercial buildings

PV Readiness

- PV Ready and Capable for commercial buildings

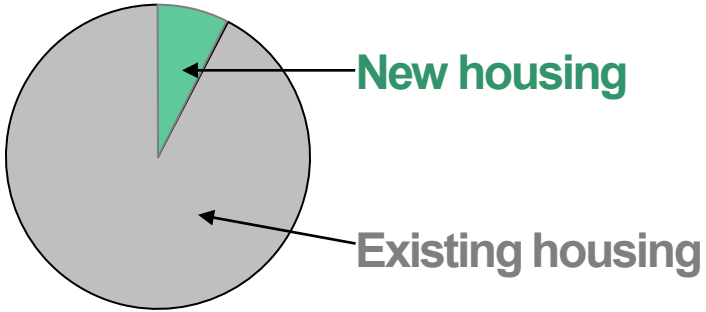
Kansas City Housing Impacts

2019 KC Regional Housing Sales – 39,232 sales

Existing housing (not affected by 2021)

36,578 houses (91% of sales)

Average price - $229, 658



New housing

3,735 units

Average price - $411,363

Impact of 2021 code less than 3% (using conservative impact estimate)

Primary KC Impact of IECC 2021 will be on Commercial, Mid-Rise Buildings

Source: Heartland Multiple Listing Service and the Kansas City Regional Association of Realtors

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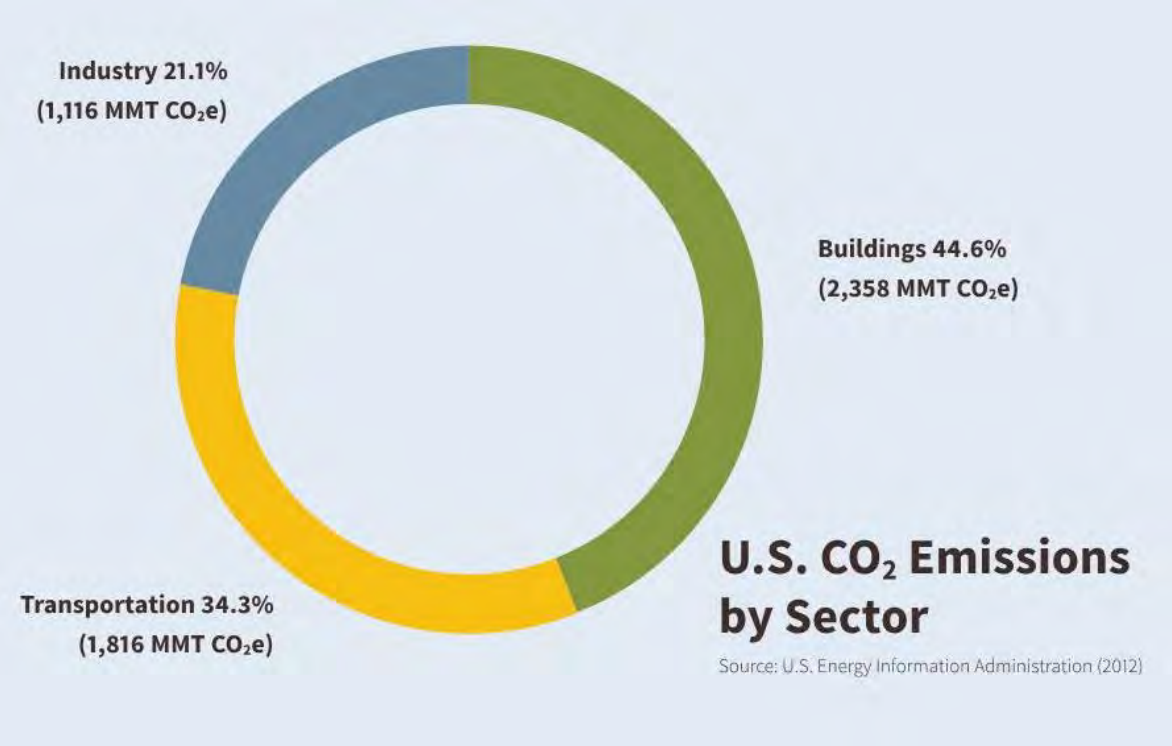
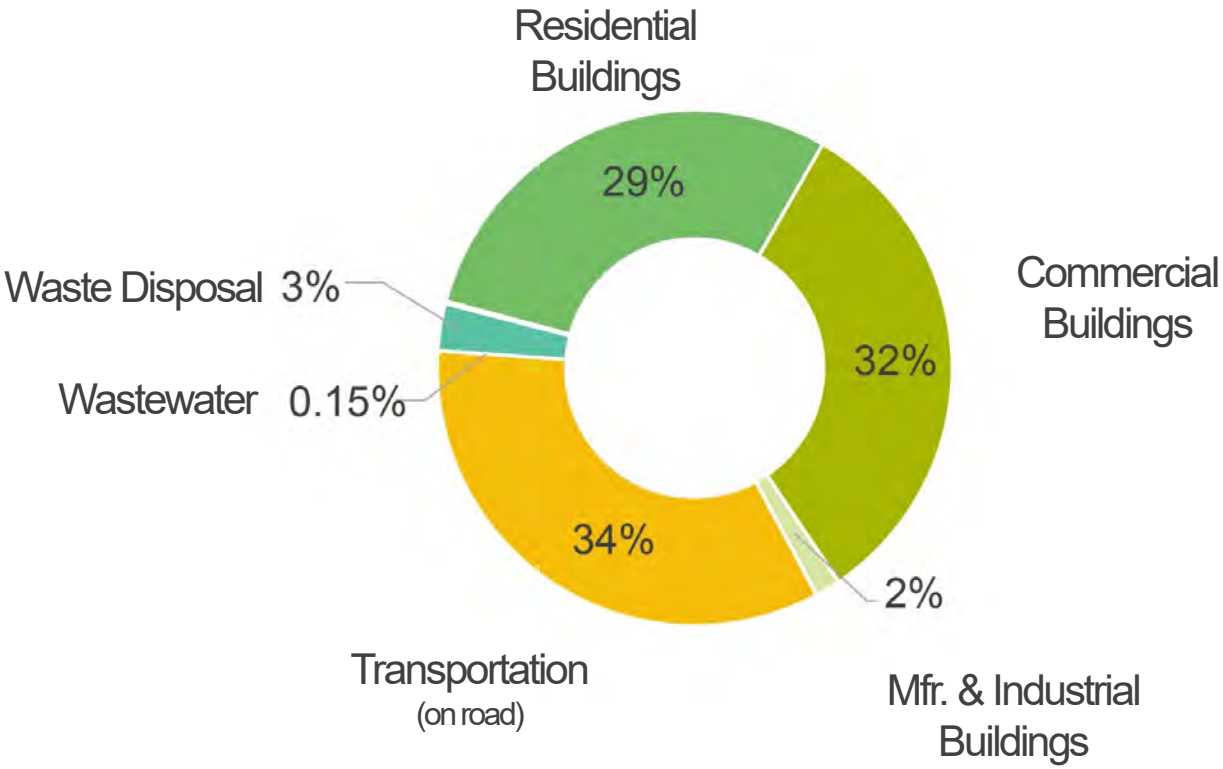
reNEW
MISSOURI


KANSAS CITY'S CLIMATE RESOLUTION
CLIMATE NEUTRAL BY 2040

Why is this important?

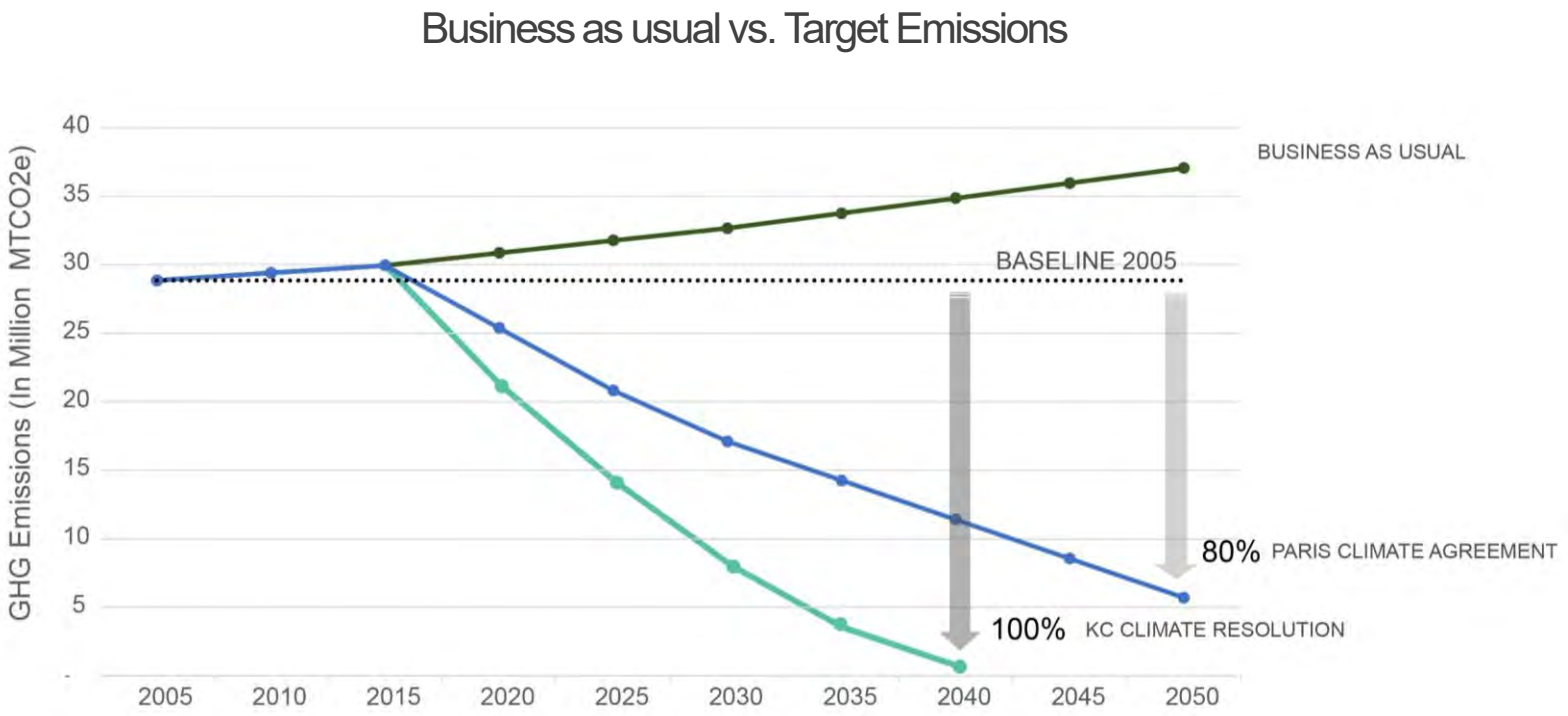


KC Metro 2015 GHG Emissions Inventory



CLIMATE ACTION KC

KC Metro – Carbon Projections



CLIMATE ACTION KC

ATTACHMENT 5

Kansas City Needs Strong Building Codes that Protect Our Communitiy's Health and Future

THE NEED

Build Healthy Homes that protect residents from air pollition.

Lower Utility Bills by ensuring walls are insulated properly.

Strengthen Communities by helping residents afford their homes.

Promote Equity by making energy efficient housing available to all.

Reduce Pollution by building buildings that require less energy.

THE OPPORTUNITY

Kansas City has the chance to be a leader in energy efficiency by adopting the 2021 International Energy Conservation Code (2021 IECC) with a Zero-Code Appendix that will help us to:

Save KC households over $300 annually.

Support our local economy by helping existing businesses and attracting new ones.

Reach Kansas City's Climate Protection Goals.

Protect Our Health and Future!
Adopt the 2021 IECC with no weakening amendments!

We Support Strong Building Codes that Protect Our Communitiy's Health and Future

U.S. Green Building Council USGBC

Sierra Club Missouri Chapter

Health Forward Foundation

KC Tenants

AIA Kansas City
The American Institute of Architects

Citizens' Climate Lobby

NRDC Natural Resources Defense Council

Westside Housing

bnim

Urban Neighborhood Initiative

LWV

the National Organization of Minority Architects Kansas City

Environment Missouri

reNEW Missouri

Metropolitan Energy Center

American Chemistry Council

Climate Council of Greater Kansas City

Climate Action KC

Elevate Energy
Smarter energy use for all

Protect Our Health and Future!
Adopt the 2021 IECC with no weakening amendments!