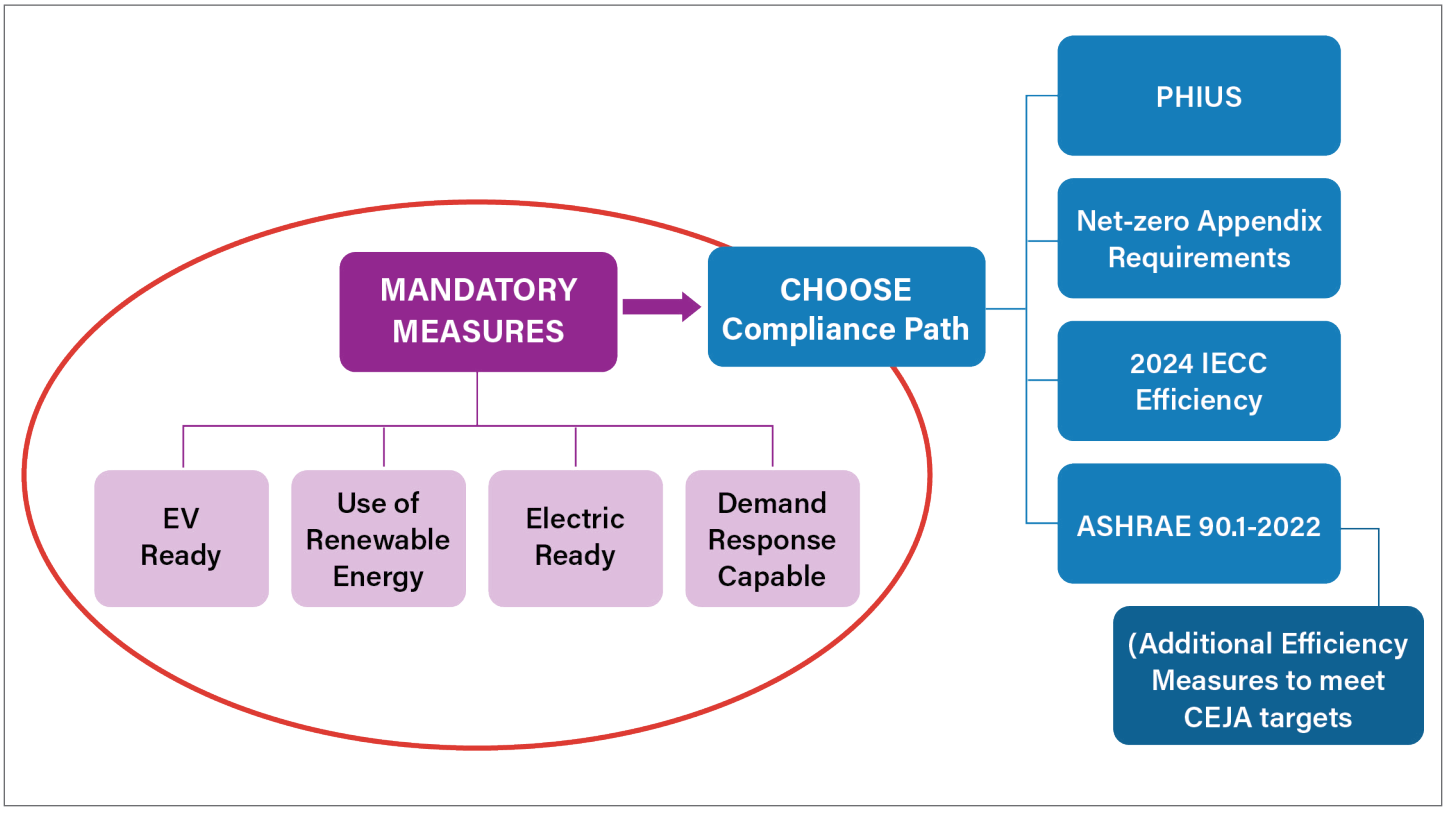
Field Guide—2023 Illinois Commercial Stretch Energy Code: Mandatory Provisions

The 2023 Illinois Commercial Stretch Energy Code (Stretch Code) is designed to meet site energy index of 0.60 (40% less energy use than 2006 IECC) and is based on the 2024 IECC model code. It offers four pathways to achieve compliance but contains mandatory readiness requirements that apply to every compliance path.

This document offers simplified information to help code officials and building design professionals understand these mandatory readiness requirements. This document is not comprehensive; please consult code language to ensure compliance.

Figure 1: *Commercial Stretch Code Mandatory Measures and Paths to Commercial Stretch Code Compliance*



CREATED BY Slipstream, MEEA, and Metropolitan Mayors Caucus

Field Guide—2023 Illinois Commercial Stretch Energy Code: Mandatory Provisions

Electric Vehicle (EV) Ready Requirements

Full code language can be found in section C405.14.

There are three categories of EV parking space requirements in the Stretch Code: Electric Vehicle Supply Equipment (ESVE) Spaces, EV Ready Spaces, and EV Capable Spaces. They are defined as follows:

Electric Vehicle Supply Equipment (EVSE) Space

An automobile parking space where operational EVSE has been installed, and an EV charger is installed and is ready to use.

ESVE is the equipment for plug-in power transfer including the ungrounded, grounded and equipment grounding conductors, and the electric vehicle connectors, attachment plugs, personal protection system and all other fittings, devices, power outlets or apparatus installed specifically for the purpose of transferring energy between the premise's wiring and the electric vehicle.

EV Ready Space

An automobile parking space for which EVSE can be installed without making additional electrical infrastructure improvements. EV Ready Spaces provide a branch circuit and an outlet or enclosure for connection to EVSE so that charging equipment can be easily installed. These spaces require an electrical connection to the building that the parking space serves.

EV Capable Space

An automobile parking space provided with electrical infrastructure, including raceway or cable assemblies, electrical capacity and electrical distribution equipment space, necessary for connection to EVSE. The system and circuit capacity is in place and conduit and raceways are installed; however, wiring and conductors have not been installed.

The minimum percentage of all available parking spaces for a building that must be EVSE spaces, EV Ready Spaces, and EV Capable Spaces shall be determined in accordance with ***Table 1***.

Table 1. *IECC 2024 table C405.14.1—Electric vehicle space requirements*

Occupancy Type	General Building Type	EVSE Spaces	EV Ready Spaces	EV Capable Spaces
A	Assembly	10%	0%	10%
B, E, I, M, S-2 parking garages	Office, retail, educational	15%	0%	30%
F, R-3, R-4	Factory, supportive housing, and congregate residential	2%	0%	5%
H, S (Excluding parking garages)	Hazardous	1%	0%	0%
R-1, R-2	Residential	20%	5%	75%

Compliance with each requirement is calculated based on the total number of parking spaces, rounded up to the nearest whole number. For buildings with more than one parking facility, requirements apply to each facility individually.

Note: The number of EV Ready spaces that exceed the minimum requirement can count towards the EV Capable requirement; the number of EVSE installed spaces beyond the minimum requirement can count towards the EV Ready or EV Capable requirement.

Field Guide—2023 Illinois Commercial Stretch Energy Code: Mandatory Provisions

Renewable Energy Use Requirements

Full code language can be found in appendix CB & section C405.15

Buildings are required to comply with requirements for installation of renewable energy systems, or procurement of off-site renewable energy when on-site renewable energy is not feasible.

On-site renewable energy systems

Buildings must have an on-site renewable energy system (renewable energy derived from solar, wind, etc.). The minimum required direct current (DC) power rating of the system is 0.75 watts per square foot of gross conditioned floor area in the building.

[***Note:*** The floor area used for the calculation shall not exceed the combined gross floor area of the three largest floors.]

Buildings that are in one of the following four categories may procure off-site renewable energy, rather than install on-site renewable energy systems.

1. The building does not receive more than 1.1 kBtu/ft² per day of solar radiation.
2. More than 80% of the roof is covered by a permanent obstruction.
3. More than 50% of the roof area is shaded between 8:00 am and 4:00 pm for a total of 2,500 hours or more annually.
4. Buildings with conditioned floor area less than 5,000 square feet.

Off-site renewable energy

Buildings that qualify for an exception for on-site renewable energy systems must meet the following requirements before the certificate of occupancy is issued:

The building owner must procure off-site renewable electrical energy through a physical or financial renewable energy power purchase agreement, a community renewable energy facility, an off-site renewable energy system owned by the property owner, renewable energy investment fund, or a green retail tariff.

- The energy contract must be for more than 10 years.
- The minimum amount of off-site renewable energy procured annually is based on the size of the three largest floors of the building, the climate zone where the building is located, and the use of any on-site renewable energy, as specified in Equation 4-11 in section C405.15.2.

The energy must be delivered to the building through direct connection, through the local utility or distribution entity, or via an interconnected electrical network.

Electric Storage Requirements

Full code language can be found in C405.16.

Buildings must have an installed electrical energy storage system (ESS) or have an ESS-ready area. Full requirements on locating these areas can be found in Section 1207 of the 2024 International Fire Code of NFPA 855.

The minimum energy and power capacities for installed ESS or ESS-ready spaces is as follows:

1. ESS-rated energy capacity (kWh) ≥ gross conditioned floor area of the three largest floors (ft²) x 0.0008 kWh/ft²
2. ESS-rated power capacity (kW) ≥ gross conditioned floor area of the three largest floors (ft²) x 0.0002 kWh/ ft²

Additionally, buildings must meet one of the following criteria:

CRITERIA: Electrical energy storage system capacity

The building shall have at least one ESS with a total energy and power capacity of:

1. ESS-rated energy capacity (kWh) ≥ 1.0 x installed on-site renewable electric energy system rated power (kWDC)
2. ESS-rated power capacity (kW) ≥0.25 x installed on-site renewable electric energy system rated power (kWDC)

CRITERIA: Electrical energy storage system ready

The building shall have one or more reserved ESS-ready areas to accommodate future electrical storage.

Field Guide—2023 Illinois Commercial Stretch Energy Code: Mandatory Provisions

Electric Ready Requirements

Full code language can be found in Appendix CH.

Under the stretch code, full electrification of commercial buildings is not required, and fossil fuels may still be used. To comply with electric readiness requirements, commercial buildings with combustion equipment must incorporate certain readiness provisions.

Electric-Ready Space Heating Requirements

For each combustion space heater in the building, space(s) must be allocated, and the electrical infrastructure must be installed, to prepare for replacement of combustion equipment with efficient electric space heating in the future. Such areas and circuitry must meet the following size and electrical standards.

Space—Designated exterior locations for future space-heating heat pump equipment:

- Buildings must have a chase correctly sized to house refrigerant lines between the interior and exterior of the building.
- A condensate drainage mechanism must be installed within three feet of each designated location.

Infrastructure—Designated branch circuits:

- Spaces in which space heating equipment ≤65,000 British thermal unit/ hour (Btu/h) would be installed require a 240-volt electrically isolated branch circuit with an ampacity ≥50.
- For spaces in which heating equipment >= 65,000 Btu/h would be installed, a dedicated branch circuit must be installed as described in section CH103.1.1.3.

Electric-Ready Water Heating Requirements

For each combustion service water heater in the building, spaces must be allocated, and the electrical infrastructure must be installed, that would be needed to replace combustion equipment with heat pump water heating in the future. Such areas and circuitry must meet the following size and electrical requirements.

Location—Designated locations for future electric heat pump water heating equipment:

- Interior locations must be 700 feet^3 or 7 feet^3 per 1,000 Btu/h, whichever is greater. Airflow to the area must be in accordance with sections CH103.1.2.2.
- Exterior locations must be properly sized for equipment and have a chase correctly sized to house refrigerant lines between interior and exterior.

Infrastructure—Designated branch circuits.

Water heating equipment ≤75,000 Btu/h requires a 240-volt electrically isolated branch circuit with an ampacity ≥30. Larger systems must comply with custom requirements in accordance with sections CH103.1.2.3-CH103.1.2.4.

Electric-Ready Cooking

Spaces with commercial cooking appliances must have a dedicated, electrically isolated, branch circuit with at least a designated minimum electrical capacity.

Minimum electrical capacities for the designated branch circuit can be found using the following table:

Commercial Cooking Appliance	Minimum Branch Circuit Capacity
Range	469 VA/kBtu/h
Steamer	114 VA/kBtu/h
Fryer	200 VA/kBtu/h
Oven	266 VA/kBtu/h
Griddle	195 VA/kBtu/h
All other commercial cooking appliances	114 VA/kBtu/h

Additional Requirements:

Non- commercial cooking appliances should have a dedicated branch circuit in compliance with section CH103.1.3.2.

Electric-Ready Drying

Commercial drying equipment must have a continuous conduit between a junction box and the electrical panel. The junction box must be no more than three feet from the panel and equipment. Electrical systems must be properly rated and sized for the drying equipment capacity.

Field Guide—2023 Illinois Commercial Stretch Energy Code: Mandatory Provisions

Demand Response Requirements

Demand Responsive Heating and Cooling Systems

Full code language can be found in C403.4.6.

All electric heating and cooling systems must meet demand response requirements, as follows:

In response to a demand response signal, systems shall be able to automatically increase the cooling setpoint and decrease the heating setpoint by 1, 2, 3, and 4 degrees Fahrenheit.

Thermostats that are controlled by direct digital control shall be capable of demand responsive controls, meeting one of the following requirements: based on the type of HVAC system that the thermostat controls.

Air conditioners and heat pumps with two or more stages of control, and a cooling capacity <65,000 Btu/h	All other heating and cooling systems
Demand responsive controls must meet requirements in AHRI 1380	Thermostats for other heating and cooling systems shall have a demand responsive control that meets requirements in C403.4.6.2.

Exceptions:

1. Group I occupancies (live-in care facilities), group H occupancies (high-hazard manufacturing, processing, or storage buildings) and data centers
2. Occupancies or applications requiring precision in indoor temperature control as approved by the code official
3. Buildings that comply with Load Management measure G02 in Section C406.3.3.
4. Buildings with energy storage that have capacity for ≥25% load reduction at peak load for at least three hours.

Demand Responsive Water Heating

Full code language can be found in C404.10.

Electric storage water heaters are required to include demand responsive controls according to the below ratings if they have a storage volume of 40–120 gallons and a nameplate input rating of ≤12 kW. Demand responsive water heaters are able to respond to external signals that direct water heating energy use to off-peak times and store the hot water until it is used.

Exceptions:

1. Water heaters that deliver water ≥180 degrees Fahrenheit.
2. Water heaters that comply with Section IV, Part HLW or Section X of the **ASME Boiler and Pressure Vessel Code**.
3. Water heaters that use three-phase electric power.

Controls for Water Heating must meet the requirements of **AHRI Standard 1430** for demand responsiveness functionality. A directory of AHRI 1430-compliant water heaters can be found at **https://www.ahridirectory.org/search/27?searchMode=program**.

Note: Water heaters manufactured before 7/1/2025 can be AHRI Standard 1430 OR ANSI/CTA-20450B Level 1 rated.

Demand Response Lighting Controls

Full code language can be found in C405.2.8.

Group B (office buildings), E (educational), M (retail buildings) and S (storage) occupancies are required to have ≥75% of the interior general lighting comply with demand response requirements. Demand response lighting controls allow lighting power to be reduced up to specified percentages upon receipt of an external demand response signal.

Exceptions:

1. Buildings with a floor area ≤10,000 square feet.
2. Buildings where a demand response signal is not available from a controlling entity other than the owner.
3. Parking garages, ambulatory care facilities, outpatient clinics, physician or dental offices.

Full demand responsive lighting control specifications can be found in section C405.2.8.1.

FOR ADDITIONAL INFORMATION on this document or stretch code documents, please contact:
Dan Streit at **dstreit@slipstreaminc.org** or **Emma Hurbanis** at **ehurbanis@mwalliance.org**