

Comparison of Illinois Residential Stretch Energy Code and International Energy Conservation Code (IECC) 2024



1. Purpose

In 2021 Illinois enacted the **Climate and Equitable Jobs Act (CEJA)**, which directs the Illinois Capital Development Board (CDB) to offer an optional “stretch” energy code that exceeds the efficiency requirements of the statewide base energy code. CEJA’s stretch code targets increase efficiency gains progressively, with each version of the residential stretch code increasing efficiency by, at minimum, an additional 7%.

Beginning **January 1, 2025**, municipalities may adopt the **Illinois Residential (and/or Commercial) Stretch Energy Code (Stretch Code)** by ordinance, making it their local minimum for new construction, additions, and major renovations. Illinois’ statewide residential energy code is based on the 2021 IECC model code. However, the CDB is currently developing the next statewide base code,

which is expected to use the **2024 International Energy Conservation Code (IECC)**, as well as the next update to the stretch code. The revisions to the two codes are expected to be adopted separately in late 2025 or early 2026.

This brief is a technical reference for municipal code officials, plan reviewers, and policy makers who must choose to either:

1. Adopt the Stretch Code now, or
2. Continue using the statewide base code and prepare for that base code to be updated based on IECC 2024.

This document may also be useful for designers and builders for understanding the similarities and differences between the stretch code and the IECC 2024.

2. How does the Stretch Code differ from IECC 2024? *(Details in Appendices)*

Step 1—Mandatory “Readiness” Package

The Stretch Code adds four mandatory measures to the IECC 2024 model code that every new building, addition, or major renovation must include under all code compliance paths:

- EV-ready infrastructure
- Solar-ready provisions
- Electric-ready circuits and panel space
- Demand-response-capable controls and water-heater

Step 2—Additional and Different Compliance Paths

After the Step 1 “Readiness” Package is documented, a building may follow any of the compliance paths defined in the stretch code. The table below provides short description of each compliance path. Appendix A offers a more detailed comparison of compliance pathways in the two codes.

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COMPLIANCE PATH	HOW STRETCH DIFFERS FROM THE BASE 2024 IECC
PREScriptive (2024 IECC SECTIONS R401-R404, R408)	Stretch Code requires buildings to include additional efficiency measures by either installing heat pumps or earning at least 30 efficiency credits under section R408, while the model 2024 IECC only requires 10 credits.
SIMULATED TOTAL BUILDING PERFORMANCE (TOTAL UA)	Stretch Code swaps the IECC's energy-cost test for a site-energy target and tighter envelope backstops; the model IECC keeps a slightly stricter air-leakage cap.
ENERGY RATING INDEX (ERI)	Stretch Code uses different ERI scores for all-electric vs. mixed-fuel homes and retains a UA backstop, while the model IECC differentiates between buildings with, and without, on-site PV and keeps the tighter air-leakage limit.
PASSIVE HOUSE (PHIUS)	Stretch Code explicitly accepts a PHIUS certificate as full compliance (readiness package still required); under the model IECC a jurisdiction may choose to adopt PHIUS certification as a compliance path.
RESIDENTIAL ZERO ENERGY	Stretch Code makes the IECC's net-zero pathway permanently available statewide, with use of on-site or off-site renewables; whereas the model IECC requires a municipality to adopt that option before a building can use it.

A building complies with the Illinois Residential Stretch Energy Code only after it has documented all four readiness measures from Step 1 and has fully satisfied one of the compliance paths listed in Step 2.

3. What stays the same?

For most low-rise dwellings, the 2024 IECC and the Residential Stretch Code remain nearly identical on the fundamentals: blower-door testing, duct-leakage limits and insulation levels, pipe insulation, ventilation-fan efficacy and high efficacy interior lighting, baseline roof-, wall-, slab- and window R-/U-values, and the use of ANSI/RESNET/ICC 301 whenever an Energy Rating Index is calculated.

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4. Where the Stretch Code goes beyond IECC 2024 (Details in Appendixes B, C, D, and E)

WHAT'S DIFFERENT IN THE STRETCH CODE	PRACTICAL EFFECTS (changes in design, construction, or review)
Readiness packages All paths	Avoids costly retrofits. Conduit, panel space and roof set-asides are installed during construction, so adding EV chargers, installing solar panels, or converting to all-electric HVAC/appliances later requires only installing the equipment, not demolition and rewiring to prepare infrastructure to support additional electrical system requirements, thus reducing first-cost barriers to future electrification and grid-interactive demand response.
Requires 20 more “additional package” credits or an all-electric heat-pump package Prescriptive path	Pushes deeper efficiency or electrification. Builders must add more insulation, high-performance windows, heat pump water heaters, etc., or combine heat pumps for space and water heating with a tight envelope to deliver more energy savings than the IECC’s 10-credit requirement.
Site-energy target with tighter envelope backstops Simulated-Performance	Focuses on energy use instead of energy cost. By measuring real energy use, the rule keeps insulation and window quality from being reduced to compensate for other elements and makes efficient electric or heat-pump systems a practical choice. The 2024 IECC still sets a slightly tighter air-leakage limit.
Revised Home Energy Rating System (HERS) Index criteria—target scores are set by fuel type (all-electric vs. mixed-fuel) instead of by the presence of on-site PV ERI path	Pushes mixed-fuel homes to higher efficiency while keeping an envelope safety net. Dwellings using combustion heating must meet stricter ERI targets. This path keeps insulation and window quality from being reduced to compensate for other elements of the building design. It also makes efficient heat pumps an attractive option for achieving compliance.

5. Guide to appendices

The detailed comparison tables referenced in this brief are organized as follows:

- Appendix A—Compliance paths
- Appendix B—Requirements applicable to compliance paths (2024 IECC and Stretch Code)
- Appendix C—Prescriptive path requirements
- Appendix D—Simulated total building performance path (2024 IECC Stretch Code)
- Appendix E—ERI Path (R406): 2024 IECC and IL Stretch Code

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Appendix A—Compliance paths

Residential compliance paths: 2024 IECC and IL Stretch Code

COMPLIANCE PATH OPTIONS (Meet all Overall Requirements, then choose ONE Compliance Path)		
COMPLIANCE PATH	2024 IECC	IL RESIDENTIAL STRETCH CODE
Prescriptive Path	Requires compliance with Sections R401 through R404 and R408.	Compliance with Sections R401-R404 and R408 of the 2021 IECC; strengthened to meet CEJA targets.
Simulated Total Building Performance (Total UA) Path	Requires compliance with Section R405. Based on annual energy cost.	Compliance with Section R405; revised to be based on a Site Energy metric instead of utility cost to align with CEJA targets.
Energy Rating Index (ERI) Path	Requires compliance with Section R406.	Requires compliance with Section R406; aligned ERI ventilation calculation and ERI metric with CEJA targets.
PHIUS Path	Can be used as an alternative compliance path if allowed by local jurisdiction.	Certify to PHIUS as permitted by Section R102.1.1.
Residential Zero Energy Path	Compliance with Appendix RC if allowed by local jurisdiction. ERI values of 42 for no on-site renewable energy, requires adding on-site power to meet ERI of 0.	Meet requirements of Appendix RC; ERI values of 46 for no on-site power, requires adding on-site power to meet ERI of 0. Backstop value determined in accordance with Section R406.3.

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Appendix B—Requirements applicable to all compliance paths in both the 2024 IECC and the IL Stretch Code (Sections R402 and R403)

Requirements applicable to all compliance paths in both the 2024 IECC and the IL Stretch Code (Sections C402, C403)

CODE COMPONENT	2024 IECC	IL RESIDENTIAL STRETCH CODE
Blower Door Test	Required	
Duct Testing	All ducts must be tested for tightness	
Duct Tightness	Conditioned: < 3 ducted returns: must not exceed 8 cfm/100 sq ft. ≥ 3 ducted returns: must not exceed 12 cfm/100 sq ft. Unconditioned: < 3 ducted returns: must not exceed 3 cfm/100 sq ft. ≥ 3 ducted returns: must not exceed 4 cfm/100 sq ft.	Conditioned: Must not exceed 8 cfm/100 sq ft. Unconditioned: Must not exceed 4 cfm/100 sq ft.
Min. Duct Insulation	R-8 for duct diameter 3 inches and larger R-6 for duct diameter smaller than 3 inches	
Use of Cavities as Ducts	Prohibited for both supply and return ducts.	
Min. Piping Insulation	$\geq R-3$	
Ventilation	Comply with M1505 of IRC or IMC	
Ventilation Fan Efficiency	Comply with Table R403.6.2	
High Efficacy Interior Lighting	All permanently installed luminaires must be capable of operation with an efficacy of at least 45 lumens per watt or contain lamps capable of operation with an efficacy of at least 65 lumens per watt. Controls are required for permanent fixtures. <i>Stretch code removes minor exceptions that IECC 2024 allows.</i>	

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Appendix B continued—Requirements applicable to all compliance paths in both the 2024 IECC and the IL Stretch Code (Sections R402 and R403)

Requirements applicable to all compliance paths in both the 2024 IECC and the IL Stretch Code (Sections C402, C403)

CODE COMPONENT	2024 IECC	IL RESIDENTIAL STRETCH CODE
EV readiness	Not required unless specifically referenced in the adopting ordinance.	Single family (SF) homes are required to be EV-ready or EV Charger-installed; Multifamily (MF) buildings must comply w/ commercial stretch code EV infrastructure requirements.
Solar readiness	Not required unless specifically referenced in the adopting ordinance.	SF homes are required to be solar-ready; MF buildings must comply w/ commercial stretch code solar readiness and installation requirements.
Electric readiness	Not required unless specifically referenced in the adopting ordinance.	Mixed-fuel residential buildings are required to be electric-ready for water heating, space heating, cooking and clothes drying.
Demand Response	Not required unless specifically referenced in the adopting ordinance.	Demand-response-capable thermostats and water heaters are required.

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Appendix C—Prescriptive path requirements

Prescriptive Path (R401-R404, R408) requirements: 2024 IECC and IL Stretch Code

REQUIREMENT	2024 IECC	IL RESIDENTIAL STRETCH CODE
Max. Envelope Air Infiltration	3 ACH50	
Min. Wood Frame Wall R-Value	30 or 20+5continuous insulation (ci) or 13&10ci or 20ci	20+5ci or 13+10ci or 20ci
Max. Wood Frame Wall U-Factor	0.045	
Min. Floor R-Value	CZ 4: R-19 or 13+5ci or 15ci CZ 5: R-30 or 19+7.5ci or 20ci	CZ 4: R-19 CZ 5: R-30
Max. Floor U-Factor	CZ 4: 0.047 CZ 5: 0.033	
Min. Foundation Wall R-Value	CZ 4: R-10ci or 13 CZ 5: R-15ci or 19 or R-13&5ci	
Max. Basement Wall U-Factor	CZ 4: 0.059 CZ 5: 0.050	CZ4 and CZ5: 0.050
Min. Roof/Ceiling R-Value	R49	R60
Max. Roof/Ceiling U-Factor	0.026	0.024
Max. Fenestration U-Factor	0.30	
Additional Compliance Package	Achieve at least 10 energy credits from not less than two measures specified in Table R408.2.	Achieve 30 energy credits from modified Section R408 (taken from 2024 IECC) OR Install electric heat pump space heating and water heating with a tight envelope (2 ACH50 + ERV/HRV).

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Appendix D—Simulated total building performance path (2024 IECC Stretch Code)

Simulated/Total Building Performance Path (R405): 2024 IECC and IL Stretch Code

REQUIREMENT	2024 IECC	IL RESIDENTIAL STRETCH CODE
Total Performance Requirement	For each dwelling unit with 1+ fuel-burning appliances for space heating, water heating, or both, the annual energy cost of the unit shall be less than or equal to 80% of the annual energy cost of the standard reference design. For all other dwelling units, annual energy cost of the proposed design shall be less than or equal to 85% of the annual energy cost of the standard reference design.	Performance compliance based on site <i>energy use</i>, rather than energy costs. The site energy use of the proposed design shall be less than or equal to 71% of the site energy use of the standard reference design.
Max. Air Infiltration	4 ACH50—Improved air tightness can be traded.	5 ACH50—Improved air tightness can be traded.
Backstop levels	Prescriptive U-Factors and F-Factors from Table R402.1.2 multiplied by 1.15 in accordance with Equation 4-2 and Section R402.1.5.	Prescriptive U-factors from Table R402.1.2 multiplied by 1.10 in accordance with Equation 4-1 ¹ .
Max. Ceiling U-Factor backstop	Varies (Prescriptive U-Factors and F-Factors from Table R402.1.2 multiplied by 1.15 in accordance with Equation 4-2). The area-weighted average maximum fenestration U-factor permitted using tradeoffs from Section R402.1.5 or R405 shall not exceed 0.48.	Varies (Prescriptive U-Factors and F-Factors from Table R402.1.2 multiplied by 1.10 in accordance with Equation 4-1). The mechanical ventilation rates used to determine the UA shall not be construed to establish minimum ventilation requirements for compliance with this code.
Max. Wood Frame Wall U-Factor backstop		
Max. Basement Wall U-Factor backstop		
Max. Fenestration U-Factor backstop		
Reference Design	In accordance with Table R405.4.2(1). Air leakage not to exceed 2.5 ACH(50). Heating and cooling system efficiencies: use federal minimum standards (10 CFR §430.32). Capacity: as proposed.	In accordance with Table R405.4.2(1). Air leakage at 3 ACH50. Heating and cooling system efficiencies: as proposed. Capacity: follow Manual S/Manual J calculations.

¹Equation 4-1 in the IL Stretch Code is functionally equivalent to Equation 4-2 in IECC 2024.

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Appendix E—ERI Path (R406): 2024 IECC and IL Stretch Code

ERI Path (R406): 2024 IECC and IL Stretch Code

REQUIREMENT	2024 IECC		IL RESIDENTIAL STRETCH CODE	
Max. Envelope Air Infiltration	4 ACH50—Improved air tightness can be traded.		5 ACH50—Improved air tightness can be traded.	
Home Energy Rating System (HERS) Index Minimum	Without on-site power production: CZ 4: 53 CZ 5: 54	With on-site power production: CZ 4: 40 CZ 5: 43	Without combustion equipment: CZ 4: 54 CZ 5: 55	With combustion equipment: CZ 4: 51 CZ 5: 50
Building Thermal Envelope Backstop	Proposed total building thermal envelope thermal conductance (TC) must be less than or equal to the required total building thermal envelope TC using the prescriptive U-factors and F-factors from Table 402.1.2 multiplied by 1.15, in accordance with Equation 4-2 and Section R402.1.5. The area-weighted average maximum fenestration U-factor permitted using tradeoffs from Section R402.1.5 shall be 0.48.		Proposed total building thermal envelope UA must be less than/equal to total building thermal envelope UA using prescriptive U-factors from Table R402.1.2 multiplied by 1.15 in accordance with Equation 4-1.	
Calculation Standard	ERI calculated in accordance with ANSI/RESNET/ICC 301; EV’s not included in building consumption. The mechanical ventilation rates used for the purpose of determining the ERI should not be construed to establish minimum ventilation requirements for compliance with this code.			