



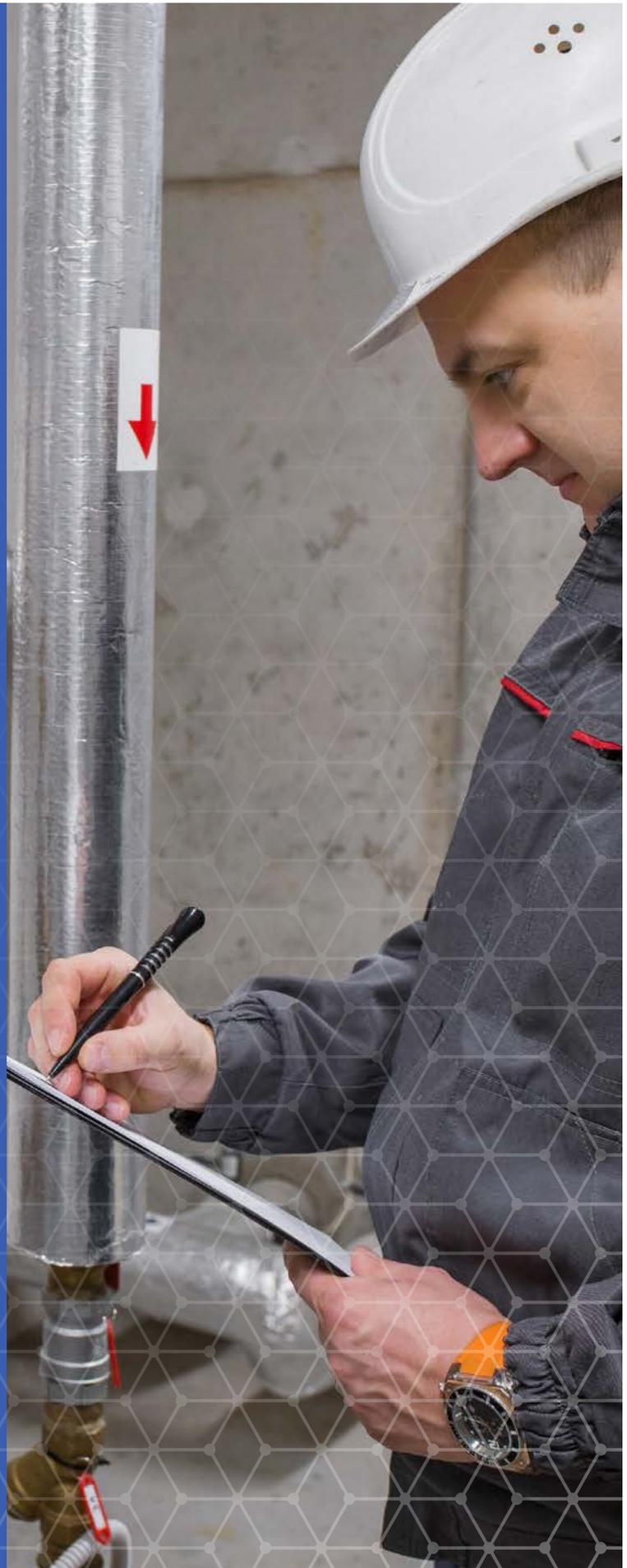
RETAIL INDUSTRY  
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# BUILDING ENERGY CODES - ASHRAE V. IECC: AN INTRODUCTION FOR RETAIL

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This Building Energy Codes factsheet is a part of a series on Energy Efficiency in Buildings – Standards and Codes for Retail.



## EXECUTIVE SUMMARY AND BACKGROUND

More than 40 percent of the total energy consumed, and 70 percent of the electricity used in the United States is used for operating buildings. Appliances and building-related equipment such as electric motors, lighting, refrigerators, and water heaters account for almost all the energy used in buildings—the U.S. Department of Energy (DOE) estimates that these products represent about 90 percent of residential energy use, 60 percent of commercial building energy use, and 30 percent of industrial energy use. [[EESI Fact Sheet: Energy Efficiency Standards for Appliances, Lighting and Equipment](#)] Making these processes more efficient in buildings saves businesses billions of dollars on energy bills, avoids unnecessary pollution, creates jobs, improves U.S. competitiveness, and reinvigorates domestic manufacturing [[EERE: Energy-Saving Homes, Buildings & Manufacturing](#)].

To inform retailers and other commercial businesses on the latest updates in building efficiency standards and energy codes at both the national and state levels, RILA's Retail Compliance Center (RCC) is producing a series of factsheets covering:

- DOE Appliance and Equipment Standards
- Light Bulb Efficiency Standards
- Building Energy Codes: ASHRAE vs. IECC
- State Energy Efficiency Laws and Codes

This fact sheet provides a starting point and quick reference tool for retailers on the two major energy code models in the U.S. The summary table below provides a comparison between the new commissioning requirements in accordance with ASHRAE/ IES Standard 202 (Commissioning Process for Buildings/Systems) and the IECC 2021 requirements, broken down into categories including building envelope, mechanical, lighting, and other items.

## BUILDING ENERGY CODES: ASHRAE V IECC

Building energy codes are regulatory instruments that specify minimum energy efficiency standards for residential and commercial building sectors. The building codes can be mandatory or voluntary and are often complemented by other energy efficiency building incentives.

The U.S. does not have a national building code or energy code in place. Instead, state or local governments can choose to either adopt one of the model energy codes, a modified version of the model code, their own state-specific code, or no code at all. Once a building energy code is adopted, it becomes state law and buildings are subject to inspection and requirements based on the code. It is important for retailers to be aware of the building energy code requirements in their state.

When it comes to compliance, there are three major components in building energy codes that retailers need to address: lighting, HVAC, and envelope. Within the envelope category, there are several elements subject to energy code regulations including:

- Opaque roof and wall assemblies
- Windows
- Skylights
- Doors
- Foundation
- Floors

In the U.S., model energy codes are developed by two private organizations: the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the International Codes Council (ICC). ASHRAE develops the model commercial energy standard, known as 90.1. The ICC develops the International Energy Conservation Code (IECC), which contains chapters for both residential and commercial buildings. Final versions of each new edition are determined by a vote of the 90.1 committee members for ASHRAE and by the International Code Council membership for the IECC. [[EERE: Energy Codes 101](#)]

DOE has a [Building Energy Codes Program](#) that produces materials and tools which may help retailers and others in the buildings sector to achieve, document, and verify compliance with codes. Retailers have access to the following [[EERE: Building Energy Code Compliance](#)]:

- Technical assistance
- Compliance software and web tools.
- Compliance and savings opportunity measurement

\*Note the Edison Electric Institute states that the IECC 2021 final results are pending confirmation from the Validation Committee. As of early July, a hearing date has not been set. There were many significant changes to the IECC for 2021 and several remain controversial. The decision by the Appeals Board and the ICC Board of Directors will have a direct impact on the estimated energy savings of the 2021 IECC compared to the 2018 IECC. [EEI: [Energy Codes for Buildings & Equipment Efficiency Standards](#)]

The summary table below provides a comparison between the new commissioning requirements in accordance with ASHRAE/ IES Standard 202 (Commissioning Process for Buildings/Systems) and the IECC 2021 requirements, broken down into categories including building envelope, mechanical, lighting, and other items.

PARAMETER	ASHRAE 90.1 - 2019	*IECC 2021
Building Envelope	<p>Combined categories of "nonmetal framed" and "metal framed" products for vertical fenestration (windows)</p> <p>Upgraded minimum criteria for SHGC and U-factor across all climate zones</p> <p>Revised air leakage section to clarify compliance</p> <p>Refined exceptions related to vestibules, added new option and associated criteria for using air curtains</p>	<p>Building envelope requirements updates are more stringent than values found in ASHRAE 90.1-2019.</p> <p>Includes electric submetering requirements for the first time (with provisions that are more stringent than those in ASHRAE 90.1-2019).</p> <p>Includes a more stringent "flex points" system to replace the currently required additional efficiency options, with points varying for different efficiency measures based on building occupancy type and climate zone. A minimum number of points is required for compliance.</p> <p>Includes automatic receptacle controls for the first time (similar to provisions found in ASHRAE 90.1- 2019).</p> <p>Includes a new voluntary appendix (that can be adopted by a jurisdiction for the code) to require commercial buildings to install on-site renewable electric generation systems (solar PV primarily).</p> <p>Includes a new voluntary appendix (that can be adopted by a jurisdiction for the code) to require new commercial buildings to be "zero net energy" at the building site. Zero net energy buildings are required to produce as much energy as they consume.</p>

PARAMETER	ASHRAE 90.1 - 2019	*IECC 2021
Lighting	<p>Lower lighting power allowances for Space-by-Space Method and the Building Area Method, based on LEDs</p> <p>New simplified method for lighting of renovated office buildings and retail buildings up to 25,000 ft<sup>2</sup> (2,300 m<sup>2</sup>)</p> <p>Updated lighting control requirements for parking garages to account for the use of LEDs</p> <p>Updated daylight-responsive requirements</p>	<p>Indoor and outdoor lighting power allowances (Watts/square foot or Watts) updated to be consistent ASHRAE 90.1-2019.</p> <p>New requirement for lighting used for plant growth and maintenance (indoor agriculture) of at least 1.6 micromoles per Joule.</p>
Mechanical	<p>New equipment efficiency requirement tables and increases in efficiency requirements in existing tables</p> <p>New requirements for reporting fan power for ceiling fans and updated requirements for fan motor selections</p> <p>New energy recovery requirements for high-rise residential buildings</p> <p>New requirement for condenser heat recovery for acute care inpatient hospitals</p>	<p>Mechanical equipment efficiency tables updated to be consistent with ASHRAE 90.1-2019.</p>
Other Items	<p>Treatment of EV and alt fuel vehicles in the "performance path": Only account for recharging/refueling of "on-site" vehicles (e.g., forklifts), not "off-site" vehicles (e.g., commuter vehicles, customer / visitor / delivery vehicles, fleet vehicles).</p> <p>Mandatory on-site renewable electricity or energy production is not required in the 2019 standard (but may or will be in the 2022 version)</p>	<p>Does not include mandatory requirements for all new commercial buildings to produce a minimum amount of their own electricity with only solar PV on-site, along with a requirement to retain and retire any associated renewable energy credits.</p> <p>Adds new requirements for electric vehicle (EV)-capable and EV-ready infrastructure at new commercial buildings, based on the number of parking spaces at the building site.</p> <p>Treats EV recharging and AFV refueling the same as 90.1 for the "performance path".</p>



### RETAIL COMPLIANCE CENTER:

- The Retail Compliance Center (RCC) provides resources on environmental compliance and sustainability for all types and sizes of retailers. The RCC's goal is to develop retail-specific resources, tools and innovative solutions to help companies cost-effectively improve their compliance and environmental performance.
- Visit the [Retail Compliance Center](#)