

Update: Energy Codes for Buildings & Equipment Efficiency Standards

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WELCOME

The equipment we buy, the buildings in which we live and work, and the vehicles we drive are all subject to energy codes and efficiency standards. These codes and standards “set the floor” for the efficiency and safety of all new products and buildings.

When codes and standards are technically feasible and economically justified, there are significant net benefits to customers. Energy codes and efficiency standards should be driven by actual customer savings.

FEDERAL ACTIONS UPDATE

U.S. GOVERNMENT TAKES SEVERAL ACTIONS RELATED TO BUILDING EFFICIENCY, CODES AND STANDARDS

Over the past four months, the federal government has taken significant legislative and executive actions that will affect government and private sector building energy usage.

Legislation

Infrastructure Investment and Jobs Act: President Biden signed this bill into law on November 15, 2021. Provisions related to building energy efficiency, codes, and standards totaled nearly \$6 billion, including:

- Building Energy Codes: \$225 million (FY22-26) awarded by U.S. Department of Energy (DOE) to states and other eligible entities to support the adoption and enforcement of the most recent building energy codes.
- INSULATE Buildings Act: \$250 million (FY22 only) to create an energy efficiency revolving loan fund for insulation upgrades at commercial and residential buildings. Most of the funding is directed to the 15 states with the highest per capita energy consumption.
- Energy-Efficient Schools: \$500 million (FY22-26) for energy efficiency and renewable energy improvements at public schools.
- Federal Buildings: \$250 million (FY22 only) for the Federal Energy Management Program to conduct energy efficiency upgrades in federal buildings (using an existing grant program).
- Industrial Efficiency: \$550 million (FY22-26) available through DOE to support advancements in energy efficiency and decarbonization for smaller U.S. manufacturers.
- Energy Conservation Block Grants: \$550 million (FY22 only) to the existing Energy Efficiency and Conservation Block Grant program, which can be used for building energy efficiency retrofits and related improvements.
- Increased Weatherization Assistance: \$3.5 billion for the Weatherization Assistance Program, which provides funding for low-income homeowners to improve building energy efficiency.

National Defense Authorization Act for FY 2022: President Biden signed this bill into law on December 27, 2021. Key building energy provisions for the Department of Defense include:

- Ensuring that 10 percent of its major military installations achieve net-zero energy, water, and waste by 2035.
- Establishing a demonstration initiative focused on the development of long-duration energy storage technologies.
- Setting energy and water efficiency targets using industry best practices for data centers.

Executive Actions

On December 8, 2021, the White House issued Executive Order Number 14057, entitled “[Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability](#)”. For federal government buildings and facilities, the executive order requires a net-zero emissions building portfolio by 2045, including a 50 percent emissions reduction by 2032. Under the Executive Order, federal agencies are required to:

- Pursue building electrification strategies in conjunction with carbon pollution-free energy use, deep-energy retrofits, whole-building commissioning, energy and water conservation measures, and space reduction and consolidation.
- Design new construction and modernization projects greater than 25,000 gross square feet to be net-zero emissions by 2030.
- Implement the White House Council on Environmental Quality (CEQ’s) [Guiding Principles for Sustainable Federal Buildings](#) in building design, construction, and operation of all new federal buildings and renovated existing buildings.
- Use performance contracting, in accordance with the provisions of section 1002 of the Energy Act of 2020 (Public Law 116–133, division Z), to improve efficiency and resilience of federal facilities, deploy clean and innovative technologies, and reduce greenhouse gas emissions from building operations.

In November 2021, the GSA Green Building Advisory Committee released information about [Federal Building Decarbonization Principles](#). Key principles and recommended actions include the following:

- *Accelerate the rate of carbon-free building retrofits.* Retrofit 6 percent of the federal portfolio each year between 2022 and 2030 to “operational zero carbon” and “operational zero carbon-ready” standards to reach 50 percent reduction by 2030.
- *To optimize for cost and impact, plan comprehensively to include efficiency, electrification, demand flexibility, and solar/storage.* Energy grid “loading order” of generation resources matters, and varies with location and existing conditions. Improvements should include both capital and operational expenses and savings (and should be lifecycle cost effective and include the social cost of carbon).
- *Zero carbon retrofits should coincide with upgrade cycles where possible -* each building should have a roadmap for reducing carbon emissions including vulnerabilities and solutions to align around deferred maintenance and end-of-equipment life.
- *Maximize the use of onsite renewable generation,* by installing solar on or adjacent to the building or load; then consider green power purchasing through the local electric company; then consider renewable energy procurement and bundled renewable energy certificates.
- *Include embodied, refrigerant, and EV charging emissions.* Aim to reduce embodied carbon in new construction and renovations by a minimum of 40 percent below baselines as per the federal building stock (or Carbon Leadership Forum data) as appropriate, reducing that threshold over time. Extend the lifespan of existing buildings to reduce the need for new buildings.
- *Support resilience, health and comfort.* Consider incorporating resilience strategies in all buildings at the time of retrofits. Ensure 1-2 days of passive survivability (limited mission fulfillment functionality with no active energy input to maintain comfort criteria). For residences and critical facilities, aim to provide a minimum of two days survivability during a prolonged power outage.
- *Support system-wide optimization to avoid unintended consequences.* Efforts to reduce carbon emissions should avoid creating a bigger problem for the grid. Solutions should account for the regional energy mix. Validate and align building/site decarbonization plans or roadmap based on electric company plans.

The Bottom Line

The federal government is taking aggressive actions to make federal buildings more energy efficient and produce less carbon. Member companies with federal government customers should be aware of all of these activities and action items that will be taken over the next several years.

On August 4, 2021, the CRA filed an appeal with the 9th U.S. Circuit Court of Appeals.

DOE ACCELERATES APPLIANCE STANDARDS RULEMAKINGS

Over the past several months and throughout 2021, the U.S. Department of Energy has accelerated their process for updating appliance efficiency standards and efficiency test procedures.

Since the Biden administration took office on January 20, 2021, [DOE](#) has issued 46 test procedure rulemakings, including 8 final rules. DOE has also issued 36 efficiency standards rulemakings, including 6 final rules (3 were “no new/updated standards” standards).

However, 33 efficiency standards rulemakings and 27 efficiency test procedure rulemakings are overdue. As of December 2021, there were lawsuits pending on the status of 20 efficiency standards rulemakings. Looking ahead, over the next four years (2022-2025), an additional 30 efficiency standards rulemakings and 29 efficiency test procedure rulemakings are required by statute.

Three trends have emerged in recent DOE determinations, requests for information, notices of preliminary analyses and technical support documents, and proposed rules:

Trend #1: Expansion of Scope

For existing covered products, such as electric motors, automatic commercial ice makers, and residential water heaters, DOE is proposing to expand the scope of coverage to include previously excluded products. DOE is also proposing to cover products that have not been federally covered products before, such as residential room air cleaners and miscellaneous gas products like patio space heaters and outdoor hearth products.

Trend #2: Parallel Rulemakings for Efficiency Test Procedures and Efficiency Standards

In recent announcements and public notices, DOE is asking for stakeholder input on updated efficiency test procedures and efficiency standards at the same

time. Previously, DOE had followed a more sequential path of establishing or revising test procedures first, followed by efficiency standards rulemakings.

Trend #3: Shorter Stakeholder Comment Periods

In certain recent rulemakings, DOE has been providing stakeholders 30 days to respond to appliance standards updates. In previous years, stakeholders were usually provided with 45 to 60 days to respond.

The Bottom Line

DOE’s accelerated schedule to meet the energy conservation standards and test procedures as mandated in the Energy Independence and Security Act of 2007 (a “six year lookback” for standards and a “seven year lookback” for test procedures) will likely continue over the next few years.

EEI FILES COMMENTS ON MAJOR DOE RULEMAKINGS

On December 10, 2021, EEI filed [comments](#) on the DOE preliminary analysis and webinar for distribution transformers. Among the issues raised in EEI’s comments were equipment classes (treatment of vault transformers), technology assessment, supply chain issues, electric generation emissions and projections, and the cost analysis of liquid-filled units.

On January 27, 2022, EEI filed [comments](#) on the DOE General Service Incandescent Lamp “backstop” requirement rulemaking. Under this rulemaking, federal efficacy standards will be set at 45 lumens/watt and several incandescent and halogen light bulbs would not be allowed to be sold in the United States. Some parties want the backstop rule to be enforced as soon as possible, which could have negative consequences for retailers and consumers. EEI raised concerns about the need for a smooth and flexible market transition for consumers, including electric companies operating residential lighting demand side management programs. EEI also raised the issue of potentially increasing consumer education as part of implementing the backstop requirements and using the most recent electric generation emissions data in the benefit cost analysis.

ASHRAE AND ICC REVIEWING “GAME CHANGING” PROPOSALS FOR THE NEXT VERSION OF MINIMUM ENERGY CODES AND STANDARDS

ASHRAE is working on additions and updates of the 90.1 Commercial Energy Building Standard that will

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be published in the fall of 2022, and ICC is working on the IECC 2024, which is planned to be published in late 2023.

Among the proposals being discussed by ASHRAE or ICC for these minimum codes and standards are the following:

- Mandatory on-site solar PV systems of 0.25 to 1.50 Watts/ft² of roof space or the conditioned floor area of the top 3 floors of a building.
- Mandatory “net-zero energy” new buildings by a certain date.
- Mandatory “electric ready” infrastructure for space heating, water heating, cooking, and clothes drying in homes and/or commercial buildings where gas equipment is installed.
- All new buildings (commercial and residential) are required to be all-electric.
- Carbon performance requirements for existing and/or new buildings (e.g., 50 percent below a certain year baseline by 2030).
- Mandatory on-site battery energy storage.
- “Electric storage ready” requirements for new buildings.
- Mandatory EV charging stations and/or “EV Ready” parking spaces at residential and/or commercial buildings.

EEL and member company representatives are working with the key subcommittees and full committees on these proposals.

The Bottom Line

It is very possible that at least one minimum energy code

or standard will approve of at least one of these “game changing” proposals by next year.

ASHRAE TO DEVELOP CARBON EMISSIONS STANDARD FOR BUILDINGS

On February 2, 2022, the ASHRAE Board of Directors approved the development and establishment of a new ANSI standard for Evaluating Greenhouse Gas (GHG) and Carbon Emissions in Building Design, Construction, and Operation.

The proposed standard will address measurement and verification of the GHG and carbon emissions of a building or group of buildings over the entire life-cycle of a building. The proposed scope includes new buildings and existing buildings, how to calculate “zero net GHG” and “zero net carbon” buildings, and embodied GHG and carbon emissions of building materials and systems.

There are certain ASHRAE standards that are already including carbon/GHG calculations, such as Standard 189.1 for green commercial buildings in the optional performance path and Standard 105 (Standard Methods for Determining, Expressing, and Comparing Building Energy Performance and Greenhouse Gas Emissions).

The Bottom Line

As interest in reducing carbon emissions from buildings increases, standards development organizations like ASHRAE are beginning to incorporate carbon/GHG estimates and calculations into existing standards and codes along with creating new standards and codes focused on building carbon emissions. A key challenge will be the accurate and consistent calculation of embodied carbon/GHG given international supply chains of construction materials, and origin of appliance/equipment and related components.

STATE/LOCAL UPDATE

NEW YORK CITY BECOMES THE LARGEST CITY IN THE UNITED STATES TO RESTRICT FOSSIL FUEL USAGE IN NEW BUILDINGS

On December 22, 2021, the Mayor of New York City signed and enacted Local Law 154. There are several significant sections of the new law that restricts fossil fuel usage in new buildings. The first part of the law reads “*No person shall permit the combustion of any substance that emits 25 kilograms or more of carbon dioxide per million British thermal units (Btu) of energy,*

as determined by the United States energy information administration, within such building.” According to the U.S. EIA, fuel oil produces 74.15 kg/million Btu, propane produces 62.88 kg/million Btu, and natural gas produces 52.91 kg/million Btu.

The restrictions will be implemented based on building height. For buildings under 7 stories, the restrictions start on January 1, 2024. For buildings that are 7 stories or higher, the restrictions start on July 2, 2027.

There are several significant exemptions in the new law based on building classification and occupancy type, including:

- Buildings used for manufacturing, or the operation of a laboratory, laundromat, hospital, crematorium, or commercial kitchen.
- Buildings under 7 stories where at least 50 percent of the dwelling units are used for affordable housing are exempt until December 31, 2025.
- Buildings that are 7 stories or higher where at least 50 percent of the dwelling units are used for affordable housing are exempt until December 31, 2027.
- Buildings that are classified by the city as group R-3, where emissions are in connection with the provision of hot water and an application for the approval of construction documents is submitted on or before July 1, 2027.
- School buildings where applications filed by or on behalf of the school construction authority are submitted before December 31, 2024.
- Buildings that will be primarily used by an electric company regulated by the public service commission for the generation of electricity or steam.
- A building within a facility operated by the department of environmental protection that treats sewage or food waste.

Other exemptions include the use of patio space heaters, outdoor propane grills, and emergency generators that operate on fossil fuels.

New York City has more than 1 million buildings and for context, new building applications from 2008-2020 ranged from roughly 1,000 to 2,500 applications comprising 20 million to 80 million square feet (42.67 million square feet in 2020), according to the [Real Estate Board of New York](#), Quarterly New Building Construction Pipeline Report: Q4 2020, January 2021.

Comments or Questions?

For questions or more information, please contact Steve Rosenstock at srosenstock@eei.org.



Edison Electric Institute
701 Pennsylvania Avenue, NW
Washington, DC 20004-2696
202-508-5000 | www.eei.org

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