Update: Energy Codes for Buildings & Equipment Efficiency Standards

April 2023

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 GOES “ALL IN” TO REDUCE OR ELIMINATE EMISSIONS IN FEDERAL GOVERNMENT BUILDINGS

Executive Order 14057 issued in December 2021 calls for a net-zero emissions federal building portfolio by 2045, including a 50-percent emissions reduction by 2032. It also requires a 65-percent reduction in scope 1 and 2 greenhouse gas emissions, as defined by the Federal Greenhouse Gas Accounting and Reporting Guidance, from federal operations by 2030 from 2008 levels.

- In December 2022, the White House Council of Environmental Quality (CEQ) published the Federal Building Performance Standard. The standard requires agencies to cut energy use to achieve zero Scope 1 emissions in 30 percent of the gross square footage of federally owned building’s by 2030. The baseline for standard building operations Scope 1 emissions is set at October 1, 2021 levels. The new standard suggests facilities should “implement all practicable electrification by upgrading system-specific equipment for space heating and domestic/service water heating system types. In addition, all cooling, cooking, backup generators used for non-emergency services (e.g., demand response), and laundry loads that do not qualify as an exclusion must be all-electric.”
- The U.S. Department of Energy (DOE) released the Clean Energy for New Federal Buildings and Major Renovations of Federal Buildings, a Supplemental Notice of Proposed Rulemaking on December 21, 2022, that sets emissions reduction targets and requires equipment and appliance electrification in new Federal buildings as well as Federal buildings undertaking major renovations. The targets are 90 percent in FY 2025 and 100 percent in FY 2030 relative to emissions in FY 2003, which follows language that was written into the Energy Independence and Security Act of 2007. DOE held a public webinar on January 5, 2023 and multiple stakeholders filed comments on the supplemental notice of proposed rulemaking by February 21, 2023. In February, the comment period was extended by DOE to March 23, 2023.
The Bottom Line
The US government is significantly ramping up its efforts to reduce Scope 1 emissions in new and existing federal buildings. EEI member companies that work with federal government buildings should be aware of these policies that now are in effect.

DOE ACCELERATES APPLIANCE EFFICIENCY STANDARD RULEMAKINGS
Over the past several months, DOE has accelerated its pace of appliance standards rulemakings in terms of proposed rules, final rules, and no new standard determinations. One driver for action was a September 2022 announcement by DOE committing the agency to a new timetable for updating energy efficiency standards for 20 categories of common consumer products and commercial equipment. This agreement resolved a lawsuit that was filed by 17 state attorney generals against DOE in October 2020, which alleged that DOE failed to comply with deadlines for updating energy efficiency standards for a range of product categories set by previous federal laws.

Since that time, DOE has taken the following actions:

No New Standards Determinations. DOE has published proposed or final determinations that the current efficiency standards for the following products do not need to be improved, due to low energy savings and/or lack of economic justification:
- Commercial Warm Air Furnaces (12/23/2022 final)
- General Service Fluorescent Lamps (02/13/2023 final)
- Packaged Terminal Air Conditioners (02/13/2023 final)
- Packaged Terminal Heat Pumps (02/13/2023 final)
- Small Electric Motors (02/06/2023 proposed, comments due 04/07/2023)
- Variable Refrigerant Flow Air Conditioners (01/30/2023 final)
- Variable Refrigerant Flow Heat Pumps (01/30/2023 final)

Proposed Rules for New Standards (out for public review). DOE has published proposed rules for the following products with comments due by the dates listed below:
- Battery Chargers (05/15/2023)
- Consumer Clothes Washers (05/02/2023)
- Consumer Conventional Cooking Products (04/17/2023)
- Consumer Refrigerators/Freezers (04/28/2023)
- Distribution Transformers (03/27/2023)
- External Power Supplies (04/03/2023)
- General Service Lamps (03/27/2023)
- Miscellaneous Residential Refrigeration Products (May 30, 2023)
- Uninterruptible Power Supplies (03/06/2023)

Proposed Rules for New Standards (pending review by the White House Office of Management and Budget). These proposed rules were received by the White House Office of Management and Budget (OMB) on the dates listed and have yet to be published for public notice and comments:
- Residential Dishwashers (12/07/2022)
- Consumer Water Heaters (02/06/2023)

Final Rules for New Standards (pending review by the White House Office of Management and Budget). Following a public notice and comment process, these final rules were received by OMB on the dates listed and have yet to be published:
- Room Air Conditioners (11/29/2022)
- Air Cleaners (01/18/2023)
- Pool Heaters (02/01/2023)
- Electric Motors (02/21/2023)

The Bottom Line
DOE has accelerated and will continue to accelerate its appliance standards rulemakings over the next few years. Some of the decisions will have significant impact on EEI member companies and their energy efficiency programs. It also should be noted that DOE has been sued by manufacturers and gas trade associations over final published regulations for commercial boilers and manufactured housing.

DOE PROPOSES INCREASED EFFICIENCY STANDARDS FOR GENERAL SERVICE LAMPS
The year 2023 is turning into the most significant year for general service light bulb efficiency regulations since the passage of the Energy Independence and Security Act of 2007 set the first efficiency standards for general service incandescent light bulbs.

As of January 1, 2023, the manufacturing and importing of general service lamps in or into the U.S. that have a lighting efficacy of less than 45 lumens/Watt is prohibited. This standard eliminates most, but not all, incandescent and halogen lighting products.

On January 11, 2023, DOE published a proposed rule to further increase the efficiency of general service lighting products. Under the proposed rule, the vast majority of general service light bulbs will need to meet a minimum lighting efficacy of at least 120 lumens/Watt starting in July 2028. This equates to nearly a 3x increase in lighting efficiency compared to the current standards.
efficacy over the current standard of 45 lumens/Watt that just went into effect earlier this year, and a 6x increase compared to the efficiency of halogen light bulbs that can still be purchased until July 31, 2023.

The impact of this proposed rule on consumers is likely to be significant. DOE’s own analysis shows that anywhere from 21 percent to 41 percent of consumers will have higher life cycle costs for the light bulbs that are used the most in a residential setting (over 3 hours per day). Also, only 2 percent of the 12,000 plus light bulbs currently listed on the U.S. Environmental Protection Agency’s Energy Star Certified Light Bulb database are able to meet the proposed 120 lumens/Watt standard.

DOE received 175 comments on the proposed rulemaking by the March 27, 2023 deadline.

The Bottom Line
DOE is proposing very stringent standards for lighting products that could have a negative impact on direct consumer economics and limit the ability of electric companies to provide lighting rebates cost-effectively.

DOE PROPOSES STRINGENT EFFICIENCY STANDARDS FOR DISTRIBUTION TRANSFORMERS; MORE THAN 95 PERCENT OF TRANSFORMERS COULD BE BANNED IN 2027

On January 11, 2023, DOE published proposed rules to significantly increase the minimum efficiency standards of utility liquid-filled distribution transformers, as well as medium-voltage dry type and low-voltage dry type transformers.

DOE’s proposed efficiency requirements are just slightly below the maximum technology option and, if unchanged, almost all transformer cores would need to be constructed with amorphous steel to meet the new standard. The proposed standard would come into effect on January 1, 2027 and the 95-99 percent of distribution transformers currently available in the market containing grain oriented electrical steel (GOES) would not meet the standard. The aggressive timeline and lack of domestic suppliers able to produce amorphous steel cores prompted the following responses from equipment manufacturers, energy companies, and others.

- Several stakeholders, including EEI, requested a 60-day extension of the comment period in January 2023. The letter is here. DOE extended the comment period by two weeks to March 27, 2023.
- On February 10, 2023, APPA and NRECA filed a joint letter with the US Department of Justice Antitrust Division on the potential competitive impacts of the proposed standard and how it would deter further domestic investment in GOES manufacturing. Currently, there is only one domestic supplier of GOES.
- On February 15, 2023, a joint letter written by EEI, APPA, NRECA, NAHB, NEMA, the Leading Builders of America, and the GridWise Alliance was sent to Secretary of Energy Jennifer Granholm and U.S. House and Senate leaders. The letter explained that manufacturers estimate the current order-cycle for most new distribution transformers to be longer than 16 months and, given this existing challenge, requested that DOE maintain the current efficiency levels.

DOE held a public webinar on February 16, 2023, that was attended by more than 370 people, including representatives of EEI, APPA, NRECA, and multiple member companies. Many attendees representing energy companies and manufacturers expressed concerns about the proposed rule, while energy efficiency and environmental advocates supported the proposed rule.

The Bottom Line
DOE is proposing very stringent standards for distribution transformers that could have significant negative impacts on already tight near-and long-term supplies. Comments were due to DOE by March 27, 2023.

BUILDING ENERGY CODE ACTION UPDATE

ASHRAE PUBLISHES STANDARD 90.1-2022 WITH SIGNIFICANT CHANGES AND MAKES PLANS FOR 2025, 2028, AND 2031 VERSIONS

On January 25, 2023, ASHRAE published the latest version of its Standard 90.1 building energy efficiency standard for new and totally renovated commercial buildings. Major changes of Standard 90.1-2022 include:

- A minimum prescriptive requirement for on-site renewable energy. This change is representative of a more widely adopted shift to renewable energy.
- An optional Mechanical System Performance Path allowing HVAC system efficiency tradeoffs based on the new total system performance ratio (TSPR) metric.
- New requirements to address the impacts of thermal bridging.
Significant efficiency increases in Integrated Energy Efficiency Ratio (IEER) for commercial rooftop packaged units and a new SEER2/HSPF2 metric for < 65,000 Btu/h sized air-cooled heat pumps.

In addition, ASHRAE started to develop work plans for future versions of the standard with the goal of establishing a net-zero emissions minimum energy standard for new and totally renovated commercial buildings for the ASHRAE 90.1-2031 version.

New energy credit requirements for buildings. In the new version of the standard, buildings are required to also achieve a certain number of “energy credits” from a long list of energy conservation measures. Credits for energy conservation measures are shown in new tables and are variable based on building occupancy and climate zone location.

New informative guidance for using carbon emissions, site energy, or source energy as alternative performance metrics to the current energy cost metric.

STATE/LOCAL ACTIONS UPDATE

NEW JERSEY GOVERNOR ISSUES NEW EXECUTIVE ORDERS TO REDUCE OR ELIMINATE EMISSIONS FROM MULTIPLE SECTORS, INCLUDING BUILDINGS

On February 15, 2023, New Jersey Governor Phil Murphy issued two executive orders (EO) and announced plans focused on carbon-free energy, gasoline-powered vehicle sales, and zero-carbon emission heating and cooling systems in homes and businesses.

EO 315 accelerates the goal to have the state’s economy be 100 percent powered by clean energy to 2035, instead of the previous target of 2050.

The governor initiated a stakeholder process to adopt Advanced Clean Cars II in New Jersey, which would require all new cars and light-duty truck sales to be zero-emission vehicles (ZEV) by 2035.

EO 316 established a goal to install electric zero-carbon-emission heating and cooling systems in 400,000 homes and 20,000 businesses by 2030. And to make 10 percent of all low-to-moderate income (less than 80 percent area median income) properties ready for electric heating and cooling by 2030 through the completion of necessary electrical system repairs and upgrades.

The Office of Climate Action and the Green Economy, informed by the Clean Buildings Working Group is required to develop and release a strategic roadmap to eliminating carbon emissions form buildings by March 2024, which has to include recommendations for policy, legislative, regulatory, workforce development, and funding strategies to achieve the goal for building electrification.

LOS ANGELES JOINS OTHER LARGE U.S. CITIES IN REQUIRING ALL-ELECTRIC BUILDING CODES (WITH TWO EXCEPTIONS)

On December 7, 2022, the LA City Council unanimously approved an ordinance requiring new buildings to be all-electric (with exceptions for commercial cooking equipment and life-safety systems that use natural gas). The ordinance went into effect on April 1, 2023. As of February 2023, 74 cities and counties in California have adopted similar laws.

As of early 2023, eight of the 25 most populous U.S. cities have enacted a partial or full ban on the use of natural gas (or all fossil fuels) in new or totally renovated buildings, or enacted regulations to reduce fossil fuel emissions from existing and new buildings. The cities (and their population ranking) that have enacted such laws are:

- New York, NY (#1 - population of 8,467,513)
- Los Angeles, CA (#2 - population of 3,849,297)
- Chicago, IL (#3 - population of 2,696,555)
- San Jose, CA (#10 - population of 983,409)
- San Francisco, CA (#17 - population of 815,201)
- Seattle, WA (#18 - population of 733,919)
- Washington, DC (#23 - population of 668,791)
- Boston, MA (#24 - population of 654,776)

The combined population of the eight cities (18,869,461) represents approximately 5.7 percent of the U.S. population (332.03 million in 2021).

The Bottom Line

There is a continuing trend of larger cities and states taking regulatory and legislative actions to make residential and commercial buildings more energy efficient and more electrified in order to reduce carbon emissions. These actions will have significant impacts on new and/or existing buildings along with energy companies over the next several years.

Comments or Questions?

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