

ASSESSMENT OF PUBLIC COMMENTS FOR EVALUATION CRITERIA FOR DETERMINING THE
COST EFFECTIVENESS OF PROPOSED CHANGES TO THE ENERGY CONSERVATION
CONSTRUCTION CODE OF NEW YORK STATE

The New York State Energy Research and Development Authority (NYSERDA) received comments in response to the proposed rulemaking to create a new Part 510 of Title 21 of the Official Compilation of Codes, Rules and Regulations of the State of New York published in the New York State Register on December 27, 2023 (Proposed Rule).

NYSERDA received 30 comments in response to the Notice of Proposed Rulemaking for the Proposed Rule. NYSERDA has summarized and provided responses to 14 separate categories of comments below.

Overall Approach

Many of the comments submitted expressed support for NYSERDA's approach and its reliance on the U.S. Department of Energy's Methodology for Evaluating Cost-effectiveness of Commercial and Residential Energy Code Changes (collectively referred to as the DOE Methodologies). Some commenters suggested relying on the International Organization for Standardization (ISO) framework for Life Cycle Assessment (LCA) or the ISO guidelines for performing life-cycle cost analyses of building and constructed assets rather than the DOE Methodologies. ISO standards and guidelines were considered, but it was determined that the DOE Methodologies better reflect the costs and benefits associated with the implementation of an Energy Code in New York State than the ISO tools, which are intended to be used for analyzing the environmental and economic impacts of a specific project, building or service. Because the DOE Methodologies are a more appropriate model for analyzing the statewide code, no changes to the Proposed Rule are necessary for this comment area.

A commenter questioned the need to conduct separate cost effectiveness analysis for measures that are already included in ASHRAE 90.1, 90.2 and 90.4 as those measures have already been determined to be cost effective. While a cost effectiveness analysis is often performed for the development of ASHRAE standards, such analysis is not required under the American National Standards Institute (ANSI) consensus process. Additionally, ASHRAE cost-effectiveness analysis, when used, is applied to individual code change proposals. In contrast, New York State Energy Law (Energy Law) directs NYSERDA to establish a standard that the Code Council may use to determine that the entire Energy Code is cost effective, which is not a feature-by-feature level of analysis. Given the alignment of the Proposed Rule with the analysis requirements in Energy Law, no changes to the Proposed Rule are necessary for this comment area.

Commenters stated that Energy Code cost analysis performed by the New York State Department of State (DOS) should be reviewed and justified using the same methodology and cost analysis. Cost analysis requirements that DOS is required to perform under the State Administrative Procedure Act are: (1) distinct from the cost-effectiveness analysis that Energy Law directs NYSERDA to establish by rule, and (2) would be assessed on a proposal-by-proposal basis instead of looking at the whole code. Because the Proposed Rule aligns with the requirements set forth in the Energy Law, no changes are necessary for this comment area.

A commenter requested that all analysis under the Energy Code and related codes and regulations be transparent and readily available for public review. Transparency of the analysis is critical for the public to understand the cost effectiveness of an Energy Code update, which is why the Proposed Rule directs the use of publicly available datasets where possible. Because the Proposed Rule provides transparency by directing the use of publicly available datasets, no changes are necessary for this comment.

Study Period

Comments indicated support for a 30-year study period as compared to the 10-year payback model. One comment suggested that a 60-year study period would be more appropriate as that longer time frame is a more accurate reflection of a building's useful life. Buildings constructed under a new Energy Code may have a useful life that exceeds thirty years; however, a 30-year study period balances the impact of future replacement costs, inflation, and energy escalation against the higher uncertainty of these costs, the further into the future they are considered. A 30-year study period is also consistent with the DOE Methodologies and is widely used for life-cycle cost analysis in government and industry. Given the balance and alignment provided by the 30-year study period in the Proposed Rule, no changes are necessary for these comments.

Building Prototypes and Model Cases

Commenters submitted that the model cases should analyze a fossil fuel building baseline case relative to an all-electric building proposed case or, alternatively, that the evaluation should be unbiased with regard to energy sources. Under the Proposed Rule, the baseline case will include some fossil fuel building equipment and systems for the current Energy Code update, specifically those constructed prior to the effective date of the zero emissions new construction requirements in Energy Law and Executive Law (ZENC requirements) and equipment and use types that are exempt from the ZENC requirements. Using an all-fossil fuel baseline case would also not be appropriate because the current Energy Code is fuel neutral, i.e., it does not mandate the use of fossil fuel equipment. Additionally, the Proposed Rule is consistent with the DOE Methodologies by requiring representative building prototype models, including those in the baseline case, to align with anticipated predominant new construction system and equipment parameters in New York State. It is reasonable to anticipate that new construction and systems used for that construction will comply with the zero emissions new construction (ZENC) requirements, where applicable. For these reasons, no changes to the Proposed Rule are necessary for this comment area.

Commenters also stated that building cases should only be evaluated for insulation values. The Energy Code includes many requirements outside of the building envelope, including requirements for lighting and building equipment requirements, and the cost implications of all new proposals in an Energy Code update must be considered. Given the requirement to analyze the entire Energy Code update and not just insulation, no changes are necessary for this comment area.

A commenter requested a building prototype for higher education laboratories. The Proposed Rule does not contemplate analyzing every building type and does not guarantee that any specific building prototype will be used. Additionally, the Energy Code does not regulate commercial or industrial process loads, such as those loads that may be specific to equipment used in a laboratory. Section 510.3(b)(1)(i) of the Proposed Rule provides that DOE commercial prototype building models will be modified as necessary to align with the anticipated predominant new construction system and equipment parameters in New York State. A minimum of 5 prototypes will be selected to represent not less than 75% of new construction starts by floor area in New York State. The Proposed Rule will capture a meaningful percentage of the most common building types in the State and so changes to the Proposed Rule are not necessary after review of the comment.

Energy Prices and Energy Use Evaluation

Commenters disagreed with the use of weighted average energy prices across the state. Energy prices vary across the state, and in the Proposed Rule these regional price differences are accounted for in the region-by-region analysis for the different climate zones in the state, as specified in section 510.3(b)(3). This cost effectiveness test is meant to be used for the Energy Code for the entire state, not an individual region of the state. As it is reasonable and consistent with the DOE Methodologies to rely on weighting and averages to reach a statewide conclusion, changes to the Proposed Rule are not necessary.

Commenters expressed concern that the analysis failed to account for differences in quantity of fuel used and efficiency of different equipment. In fact, the building models, as described in the Proposed Rule, do account for variability in the quantity of fuel used depending on equipment and fuel type. Commercial base and proposed case models assume mechanical equipment and fuel type most common for the building type within each climate zone, while achieving minimal code compliance as cost-effectively as possible. Residential base and proposed case models also consider additional permutations by foundation type in addition to equipment and fuel type. The base and proposed case models account for the capacity and efficiency of the equipment and the amount of fuel consumed. Because the differences in fuel use and efficiency are accounted for in the Proposed Rule, no changes are necessary for this comment.

Commenters disagreed with the use of current energy prices and proposed using the average price of the preceding 3-5 years. The energy price escalation assumptions in the Proposed Rule are consistent with the DOE Methodologies. Energy price escalation values will be derived from public sources (U.S Department of Energy's Energy Information Administration regarding Short Term Energy Outlook and Annual Energy Outlook, and/or NYISO System & Resource Outlook) and may use a combination of projections for the near term such as published investor-owned public utility sources. Given the consistency with DOE Methodologies and the public nature of the sources used for the Proposed Rule, no changes are necessary for this comment area.

A commenter proposed that water consumption be included in the building energy use evaluation. The scope of the Energy Code is limited to energy conservation and clean energy features, which includes energy efficiency requirements for equipment used to heat or chill water. If an Energy Code proposal reduces hot water consumption, the analysis would account for the corresponding energy savings. Given that the Proposed Rule accounts for energy savings due to water usage as covered by the Energy Code, no changes are necessary for this comment.

A commenter advocated for using time of use rates because blended or average rates overstate the energy savings significantly. Utilities in New York may incorporate demand pricing for commercial customers, and such demand rates are captured by the blended rate, but time of use rates would not apply for residential customers (not to be confused with residential buildings) in New York because utilities in New York state do not impose peak demand pricing for residential customers. A more detailed time of use analysis is more accurate for an individual non-residential building that participates in time-of-use pricing offered by an electric utility; however, for a market-wide analysis that accounts for all hours of operation over a 30-year study period to calculate the incremental impact of a revision to the Energy Code, annual average energy costs are deemed to be appropriate and consistent with the DOE Methodologies. For these reasons, no changes to the Proposed Rule are necessary for this comment.

Seasonal Variability of Construction Costs

Commenters questioned whether the analysis accounted for seasonal variability in construction costs. Consistent with the DOE Methodologies, seasonal labor and material price fluctuation is accounted for in the data set that is used to provide annual average costs for labor and materials impacted by a code change. Because the Proposed Rule adequately addresses this issue, no changes are necessary for this comment area.

Effective Useful Life

Commenters requested that the costs associated with equipment replacement for equipment with a useful life of less than thirty years be taken into account in the lifecycle cost analysis. The DOE Methodologies provide that when the useful life of equipment is less than thirty years, additional replacement costs shall be captured in the analysis. The Proposed Rule, which incorporates the DOE Methodologies by reference, follows this approach, so changes to the Proposed Rule are not necessary for these comments.

Ownership Scenarios

Commenters questioned why publicly owned buildings are not included in the analysis with regards to emissions. Although the DOE Methodologies suggest a separate analysis for publicly-owned buildings, public buildings were excluded from the lifecycle cost analysis in the Proposed Rule because (1) the additional analysis is not justified given the small portion of public building construction in the state; and (2) public building construction usually has lower costs for a minimally code-compliant building because of the government's ability to access loans at a reduced interest rate. The Proposed Rule does place public buildings and privately-owned buildings into a single class, so all costs and GHG impacts are captured and are equivalent for similarly situated building models. Because publicly owned buildings are addressed in the Proposed Rule, no changes are necessary for this comment area.

Maintenance Costs

Commenters indicated that maintenance costs should be accounted for, regardless of whether data is available to support that analysis. Commenters also disagreed with using weighted averages for maintenance costs across the state. Including maintenance costs where the data is not publicly available would present undue barriers to transparency for the public. Additionally, the Proposed Rule, based on the DOE Methodologies, includes system maintenance in analysis only where a proposed system requires maintenance that measurably differs from those in the analogous baseline system. Climate zone variability on maintenance cost is accounted for through regional labor cost multipliers, which will be applied to all maintenance and replacement cost components in the baseline and proposed models. Because maintenance costs are accounted for in the Proposed Rule in an appropriate manner, no changes are necessary for this comment area.

Loan Interest Rates

Commenters indicated that commercial loan interest and residential mortgage interest should not be included in the lifecycle cost analysis because loan rates vary by borrower, project and lending institution. Others argued that the most recent loan rates would be too high and place an undue burden on the cost side of the equation because current interest rates fail to account for favorable lending factors including the fact that construction loans are often refinanced into lower interest mortgages after the building is constructed.

Consistent with the DOE Methodology, the Proposed Rule includes borrowing costs for commercial and residential real estate because they are both highly leveraged with significant levels of lending. The comments did not suggest an alternative method for estimating interest rates for NYSERDA to consider. As such, no changes to the Proposed Rule are necessary for this comment area.

Income Tax Rate

Commenters questioned the need to include income tax rates in the cost analysis. Consistent with the DOE Methodologies, an income tax rate is used to calculate the incremental increase in income tax deduction associated with a mortgage increase. Changes to the Proposed Rule for this comment area are not necessary.

Aggregation Methods

Commenters requested additional information regarding the size and type of foundation that will be analyzed. Following the DOE Residential Methodology, four types of residential building foundation types will be analyzed: conditioned and unconditioned basements, crawlspace and slab-on-grade. With this clarification, no changes are necessary for this comment area.

Commenters expressed confusion regarding the need to aggregate across equipment heating types based on an assumption that only electric equipment will be analyzed. The Proposed Rule provides for modeling and analysis of different types of heating equipment. The baseline case will include some fossil fuel building

equipment and systems, specifically those constructed prior to the effective date of the ZENC requirements and those use types that are exempt from the ZENC requirements under Energy Law and Executive Law. Because the Proposed Rule allows for analysis of different types of heating equipment, no changes are necessary for this comment area.

Commenters requested additional information regarding the building types and the relationship to the building types located in Chapter 6 of the Building Code. Chapter 6 of the Building Code refers to construction types for the purpose of establishing fire-resistant ratings for different building classifications. The Proposed Rule, in contrast, uses the DOE building prototype models to analyze proposed changes to the Energy Code.

Descriptions of the DOE building model prototypes can be found in the DOE Methodologies, which are incorporated by reference in the Proposed Rule. Because information is incorporated by reference on the building prototypes included in the Proposed Rule, no changes are necessary for this comment area.

Societal effects

NYSERDA received a number of comments that were generally supportive of the inclusion of societal effects in the cost effectiveness analysis and defining societal effects as the value of GHG emissions reductions.

Other commenters disagreed with the concept of including societal benefits in any form or asked NYSERDA to include additional considerations in the definition of societal effects. One set of comments suggested including: (1) the economic or financial impacts to individuals in the event of power outages; and (2) the GHG emission resulting from increased size of backup power generators. Emergency backup power system sizes and economic losses due to power outages are not determined by the Energy Code. Given the limited scope of the Energy Code, no changes to the Proposed Rule are necessary for this comment area.

Commenters also requested accounting for the effect of refrigerants on ozone depletion and global warming in the definition of societal effects. Due to the global phaseout of ozone-depleting substances under the Montreal Protocol, in new construction the refrigeration, air conditioning, and heat pump systems and equipment now use non-ozone-depleting refrigerants. However, the hydrofluorocarbons (HFCs) developed as ozone-friendly refrigerants are potent greenhouse gases, prompting federal and state policy to phase down the use of HFCs and facilitate a transition to lower-global warming potential (GWP) refrigerants. Under the authority of the American Innovation and Manufacturing (AIM) Act, EPA has established restrictions on the installation of new refrigeration, air conditioning, and heat pump products and systems that contain higher-GWP HFCs, with compliance dates that vary by subsector starting in January 2025. In 2022, New York State passed the Advanced Building Codes, Appliance and Equipment Efficiency Standards Act, which allows for the in-building use of lower-GWP refrigerants that are classified as mildly flammable, in accordance with nationally recognized safety standards. In new construction, the refrigeration, air conditioning, and heat pump systems and equipment will rapidly transition to use lower-GWP refrigerants (and in time, ultra-low GWP options); and moreover, since these refrigerants are more flammable, this equipment will require improved leak detection sensors and mitigation steps to meet industry safety standards and building codes. Considering the shifting regulatory and market landscape, there is too much uncertainty around the estimates of refrigerant emissions resulting from Energy Code changes and those would introduce an unacceptable level of uncertainty in the analysis, so no changes to the Proposed Rule are necessary for this comment area.

A commenter also noted that the assessment of societal impacts must be tied to quantitative information specific to the locales and/or regions of the relevant buildings. The Proposed Rule defines societal effects as the value of avoided GHG emissions and provides that the estimated value of those emissions is calculated by applying GHG emission factors to the incremental change in building electricity and fuel use based on the modeling and scenarios conducted for the life-cycle cost analysis. The Proposed Rule contemplates looking at building

models, not any specific building, within each NY climate zone. The projected emission factors incorporated by reference in the Proposed Rule provide upstate and downstate emission factors to the quantified energy used by the building models that may be used. For these reasons, no changes to the Proposed Rule are necessary for this comment area.

Emission Factors and Social Cost of Greenhouse Gasses

Commenters noted that the emission factors of renewable energy sources and the grid fail to account for the full life cycle impacts of these energy sources, including raw material extraction and infrastructure development. The Projected Emission Factors for New York State, which are incorporated by reference into the Proposed Rule, do not include emissions associated with the materials and construction of equipment and infrastructure used to deliver and use any fuel within New York State. The emission factors do account for the extraction, production, and transmission of fossil fuels imported into New York State, consistent with New York's Climate Act. Because a reliable data source of the embodied emissions from materials and equipment in fuels delivery within New York State has not been established at this time, and given that, for the purposes of the cost effectiveness analysis, the embodied emissions would be borne in both the proposed and base cases costs accounting, no changes to the Proposed Rule are necessary for this comment area.

A commenter requested clarification regarding the emission factors that will be used to estimate the value of avoided GHG emissions and suggested using marginal emission factors rather than average emission factors to account for loads added to the power grid. Long-run marginal emission factors for grid electricity will be used for the purposes of the cost-effectiveness analysis. Because of this clarification, no changes are necessary for this comment.

A commenter requested the use of a regionally corrected marginal abatement cost when calculating the social cost of greenhouse gas emissions. The purpose of the Proposed Rule is to account for the societal effects

resulting from Energy Code changes, so it is appropriate to apply the damages-based value of carbon following the New York State Department of Environmental Conservation (DEC) published guidance, *Establishing a Value of Carbon, Guidelines for Use by State Agencies*.

Existing Buildings

Commenters urged NYSERDA to include a separate cost effectiveness analysis for existing buildings in the Proposed Rule. The costs associated with Energy Code compliance for a renovation to an existing building, when triggered, are not dissimilar from the cost of Energy Code compliance in new construction. Energy Law and Executive Law expressly prohibit the Code Council from imposing all electric new construction requirements on existing buildings. Additionally, DOE Methodologies do not provide a framework, building models or scenarios for analyzing such cases. Given the similarities in costs and lack of framework in the DOE Methodologies, no changes to the Proposed Rule are necessary for this comment area.

After careful review and consideration of all comments received, NYSERDA has determined that changes are not necessary to the text of the Proposed Rule.