

Title 21 of the Official Compilation of Codes, Rules and Regulations of the State of New York is amended by adding a new Part 510 to read as follows:

Part 510. Evaluation Criteria for Determining the Cost Effectiveness of Proposed Changes to the
Energy Conservation Construction Code of New York State

Section 510.1 Scope and Purpose

(a) The New York State Legislature has established greenhouse gas (GHG) emissions reduction mandates in New York State to 40% below 1990 levels by 2030 and then to 85% below 1990 levels by 2050. The State Energy Conservation Construction Code (Energy Code) is an important regulatory tool to assist in achieving these goals. The New York State Fire Prevention and Building Code Council (Code Council) is authorized to review and amend the Energy Code, or adopt a new Energy Code, through the promulgation of rules and regulations. To amend the Energy Code, the Code Council must determine that the Energy Code remains cost effective with respect to building construction in the State. The Code Council's cost-effective determination must include a life-cycle cost analysis; and the value of societal effects, such as reductions in GHG emissions.

(b) The purpose of this Part is to (1) establish a methodology for determining whether the life-cycle costs for a building will be recovered through savings in energy costs over the design life of the building under a life-cycle cost analysis; (2) define secondary or societal effects to be considered in the cost effectiveness determination; and (3) provide a method for quantifying the societal effects so that they can be added to the life-cycle costs. This Part implements amendments to paragraph (a) of subdivision 2 of section 11-103 of the Energy Law, as enacted by the "Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2022."

Section 510.2 Definitions

Whenever used in this Part, unless otherwise expressly stated, the following terms shall have the meanings indicated below.

- (a) *Commercial Building*. Commercial building shall have the same meaning as set forth in 19 NYCRR section 1240.2.
- (b) *Code Council*. Code Council means the State Fire Prevention and Building Code Council, as established by section 374 of the Executive Law and enacted by the New York State Fire Prevention and Building Code Act, chapter 707 of the Laws of 1981.
- (c) *DOE*. DOE means the United States Department of Energy.
- (d) *DOE Commercial Methodology*. The DOE Commercial Methodology means the U.S. Department of Energy's *Methodology for Evaluating Cost-effectiveness of Commercial Energy Code Changes*.
- (e) *DOE Residential Methodology*. The DOE Residential Methodology means the U.S. Department of Energy's *Methodology for Evaluating Cost-Effectiveness of Residential Energy Code Changes*.
- (f) *Energy Code*. Energy Code means Part 1240 of Title 19 of the Official Compilation of Codes, Rules and Regulations of the State of New York.
- (g) *Energy Code update*. Energy Code update means an amendment to the Energy Code, which may include the adoption of a new Energy Code by the Code Council.
- (h) *Effective Useful Life*. Effective useful life means the estimated, median length of time in years that an energy system, energy conservation measure, or piece of equipment is functional, prior to replacement.
- (i) *Emissions Factors*. Emissions factors mean the amount of GHGs emitted per unit of electricity or fuel used.

- (j) *Energy Price*. Energy price means the average annual retail price of electricity or fuel.
- (k) *Energy Price Escalation Rate*. Energy price escalation rate means the projected change in energy prices over time.
- (l) *Fuel*. Fuel means natural gas, propane, kerosene, diesel, or oil.
- (m) *Life-cycle Cost*. Life-cycle cost shall have the same meaning set forth in as section 11-102 of the Energy Law.
- (n) *NYSERDA*. NYSERDA means the New York State Energy Research and Development Authority.
- (o) *Prototype Building Model*. Prototype building model means the whole building energy simulations developed by U.S. Department of Energy for a series of commercial and residential building configurations, which models may be used for evaluating or comparing current Energy Code to a proposed Energy Code update.
- (p) *Residential Building*. Residential building shall have the same meaning as set forth in 19 NYCRR section 1240.2.
- (q) *Study Period*. Study period means the number of years into the future that costs and revenues are considered in this Part. The study year period as used in this Part is 30 years.
- (r) *TRM*. TRM (Technical Resource Manual) means the New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs - Residential, Multi-Family, and Commercial/Industrial.

Section 510.3 Life-cycle Cost Analysis of Energy Code Updates

(a) Life-cycle costs of an Energy Code update for commercial buildings will be analyzed by using the methodology for determining life-cycle cost net present value of savings established in the *DOE Commercial Methodology*, as incorporated by reference in section 510.7 of this Part and as modified in this section for New York State. Life-cycle costs of an Energy Code update for residential buildings will be analyzed by using the methodology for life-cycle costs established in the *DOE Residential Methodology*, as incorporated by reference in section 510.7 of this Part and as modified in this section for New York State.

(b) Building Energy Use Evaluation. For both commercial and residential buildings, whole building simulation will be used to calculate annual energy consumption for the duration of the study period for relevant end uses of buildings with construction starts that fall within a three-year period commencing on the effective date of an Energy Code update.

(1) Building Prototypes. Prototype building models developed by DOE under the Building Code Energy Program will be selected as follows:

(i) Commercial prototype building models. 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.

(ii) Residential prototype building models. DOE residential building prototypes will be modified as necessary to align with anticipated predominant new construction system and equipment parameters in New York State.

(2) Building Model Cases. Two cases for each prototype building model will be analyzed. One model case will be a building that complies with the current Energy Code and other legal requirements, including Energy

Law section 11-104(6) and Executive Law section 378(19); the other model case will be an otherwise identical building that complies with the proposed Energy Code update and other legal requirements, including Energy Law section 11-104(6) and Executive Law section 378(19).

(i) Prototype building model cases will be configured to use typical and financially reasonable design parameters of each of the two cases.

(ii) Prototype building model components that are unchanged by a proposed Energy Code update are identical in prototype building model cases.

(3) Climate Zones. Each selected prototype building model will be simulated in each New York State climate zone, weighted by anticipated percentage of statewide new construction starts, to estimate the overall state average energy impact of the proposed Energy Code update. The calculated statewide impact will be weighted to account for both climate zone and building type specific differences in new construction that may be affected by the proposed Energy Code update.

(c) Costs

(1) Energy Prices. Retail energy prices will be based on the most recently-available New York State commercial or residential energy prices as of the date the analysis is performed, derived from public sources, which shall include, when available, reporting sources maintained by a federal or New York State entity authorized by law to report such information and/or an investor-owned public utility. Energy prices for delivered fuel will be based on weighted average delivered fuel cost derived from an estimate of fuel use by type in New York State. Energy prices will be escalated in accordance with the methods in this subdivision.

(i) Energy Price Escalation. Energy price escalation rates will be based on the projected change in energy costs in New York State. Energy price escalation values will be derived from public sources, which shall

include, when available, reporting sources maintained by a federal or New York State entity authorized by law to report such information, the New York Independent System Operator (NYISO), and/or an investor-owned public utilities and may use a combination of projections for the near term such as published investor-owned public utility sources. For purposes of this section, contemporaneous information reported in the U.S Department of Energy's Energy Information Administration regarding Short Term Energy Outlook and Annual Energy Outlook, and/or NYISO System & Resource Outlook may be used.

(ii) Energy Price Weighting by Climate Zone. When available, energy prices may be calculated using weighted energy prices, by climate zone, to better account for the variability of energy prices throughout the different regions of New York State. Climate zone specific energy prices are calculated by weighting the delivered energy and energy cost of utilities serving the different New York State climate zones.

(2) Effective Useful Life. The effective useful life of equipment and systems will be determined in accordance with Appendix P of the TRM, as incorporated by reference in section 510.7 of this Part. If equipment or material is not listed in the TRM, or if the value in the TRM is unreliable, an alternative source may be used. If a source alternative to the TRM is used, the source and effective useful life will be cited in reporting.

(3) Labor and Material Costs. Labor and material cost estimates will be adjusted for Albany, Buffalo, and New York City in accordance with the *DOE Commercial Methodology* and the *DOE Residential Methodology*, which are incorporated by reference in section 510.7 of this Part.

(4) Property Tax. Property tax will not be included in life-cycle cost analysis.

(d) Life-cycle Cost of Energy Code Updates for Commercial Buildings.

(1) Ownership Scenarios. Life-cycle costs for commercial buildings will be analyzed in accordance with the *DOE Commercial Methodology* for privately owned buildings, as incorporated by reference in section 510.7 of this Part.

(2) Maintenance Costs. If data is publicly available to support estimating maintenance costs, weighted by New York State climate zones, this level of analysis will be performed.

(3) Loan Interest Rate. Loan interest rate will be determined based on the most recent commercial loan rates when the analysis is performed for New York State as applied in the *DOE Commercial Methodology*, as incorporated by reference in section 510.7 of this Part.

(4) Income Tax Rate. The income tax rate will be equal to the combined federal and New York State corporate income tax rates in effect for the reporting year in which the evaluation is performed.

(5) Aggregating Results. The results will be aggregated using average weighting factors based on the most recent as of the date the analysis is performed New York State-derived disaggregated construction volume data. For purposes of this section, data obtained from Dodge Data & Analytics Construction Projects Starts Database, or equivalent commercially available a source, shall be deemed sufficient.

(e) Life-cycle Costs of Energy Code Updates to Residential Buildings

(1) Mortgage interest rate. The mortgage interest rate will be based on the ten-year historical average of a conventional 30-year real estate loan in New York State.

(2) Loan Fees. Loan fee values will be based on most recent New York State data as of the date the analysis is performed from a credible source such as the Freddie Mac Weekly Primary Mortgage Market Survey.

(3) Aggregation across foundation types. The results will be aggregated across foundation types using average weighting factors based on the most recent New York State-derived data as of the date the analysis is performed.

(4) Aggregation across Heating Equipment Types. The results will be aggregated across heating equipment types using average weighting factors based on the most recent New York-State-derived data and statutory requirements as of the date the analysis is performed.

(5) Aggregation across Building Type. The results will be aggregated across building types using average weighting factors based on the most recent census data for New York State or the best available New York State market data as of the date the analysis is performed.

(f) Statewide Life-cycle Costs. The statewide life-cycle cost will be the weighted sum of both the residential and commercial life-cycle cost analyses performed in accordance with this section. Weighting will be based on the estimated proportion of new construction starts during the three-year period commencing on the estimated effective date of an Energy Code update.

Section 510.4 Societal Effects

(a) Societal Effects Defined. Societal effects will include the value of avoided GHG emissions resulting from changes in electricity and fuel consumption.

(b) Estimating the value of avoided GHG emissions. Avoided GHG emissions will be calculated by multiplying the incremental annual building electricity and fuel consumption determined in accordance with section 510.3(b) of this Part by the corresponding GHG emissions factors.

(1) Emissions Factors. Emissions factors from the following reports published by NYSERDA detailing emissions factors for grid electricity, *Projected Emission Factors for New York State Grid Electricity*, as incorporated by reference in section 510.7 of this Part, and *Fossil and Biogenic Fuel Greenhouse Gas Emission Factors*, as incorporated by reference in section 510.7 of this Part will be applied.

(2) Monetary Value. The monetary value associated with avoided GHG emissions will be calculated using central values at the 2% discount rate following the New York State Department of Environmental Conservation (DEC) published guidance, *Establishing a Value of Carbon, Guidelines for Use by State Agencies*, as incorporated by reference in section 510.7 of this Part. Central values are discounted to the emissions year. Discounting from the emissions year to present will use a 2% discount rate.

Section 510.5 Presentation of Cost Effectiveness Analysis

(a) The cost effectiveness analysis performed in accordance with this Part will include the content described herein.

(1) Presentation of Life-cycle Cost Results.

(i) Commercial Buildings. The results of the life-cycle cost analysis performed for commercial buildings in accordance with section 510.3 of this Part will be presented in statewide Net Present Value, in dollars, and per square foot of floor area.

(ii) Residential Buildings. The results of the life-cycle cost analysis performed for residential buildings in accordance with section 510.3 of this Part will be presented in statewide Net Present Value, in dollars, and per square foot of floor area or by dwelling unit.

(iii) Statewide Results. The life-cycle cost of both commercial and residential buildings calculated in accordance with section 510.3(f) of this Part, will be presented in statewide Net Present Value, in dollars.

(2) Presentation of Results for Societal effects.

(i) Avoided GHG emissions. The results of the value of avoided GHG emissions calculated in accordance with section 510.4(b) of this Part, presented in statewide Net Present Value, in dollars.

(3) Total Net Present Value of Savings. The sum of the life-cycle costs from section 510.3(f) of this Part will be added to the value of avoided GHG emissions from section 510.4 of this Part, which will be presented as the Total Net Present Value of Savings.

Section 510.6 Cost Effectiveness Presumption

(a) An Energy Code update shall be presumed to be cost effective if the Net Present Value of Life-cycle Cost Impacts as determined in section 510.3 of this Part plus the Net Present Value of Societal Effects as determined in section 510.4 of this Part is greater than or equal to zero.

(b) Existing buildings. A proposed Energy Code update will be presumed to be cost effective in existing buildings subject to the proposed Energy Code update if they are cost effective in new buildings as determined in subdivision (a) of this section.

Section 510.7 Reference Material

The following regulations or technical materials listed in Table RM are incorporated by reference. The documents are available from the addresses listed or, in the case of Federal publications, from the National Archives, 700 Pennsylvania Avenue, NW, Washington, DC 20408, and for inspection and copying at the offices

of the New York State Energy Research and Development Authority. For each reference, additional sources for hard copy materials and websites, where appropriate, are provided.

Table RM

Item	Website	Date
DOE Methodology for Evaluating Cost-effectiveness of Commercial Energy Code Changes prepared by Pacific Northwest National Laboratory *	https://www.energycodes.gov/sites/default/files/2021-07/commercial_methodology.pdf	August 2015
DOE Methodology for Evaluating Cost-Effectiveness of Residential Energy Code Changes prepared by Pacific Northwest National Laboratory *	https://www.energycodes.gov/sites/default/files/2021-07/residential_methodology_2015.pdf	August 2015
Appendix P of the New York Department of Public Service New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs – Residential, Multi-Family, and Commercial/Industrial**	https://dps.ny.gov/system/files/documents/2023/03/c1e1783c-c3d3-48a4-8647-a5923c39553c.pdf	December 30, 2022
NYSERDA Projected Emission Factors for New York State Grid Electricity**	https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Energy-Analysis/22-18-Projected-	August 2022

	Emission-Factors-for-New-York-Grid-Electricity.pdf	
NYSERDA Fossil and Biogenic Fuel Greenhouse Gas Emission Factors**	https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Energy-Analysis/22-23-Fossil-and-Biogenic-Fuel-Greenhouse-Gas-Emission-Factors.pdf	May 2023
New York State Department of Conservation Establishing a Value of Carbon, Guidelines for Use by State Agencies**	https://www.dec.ny.gov/regulations/56552.html	August 2023

* Hard copies available from US Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

** Hard copies are available at One Commerce Plaza, 99 Washington Ave, Albany, NY 12231.