

C&I Energy Efficiency Program Guidelines

Building Envelope

The following is the minimum information required for energy conservation measures (ECM's) related to building envelope. Projects applying for incentives related to building envelope must comply with all applicable requirements listed herein.

Building Envelope Definitions:

The following is a list of the most common envelope measures:

Wall/Ceiling Insulation:

This measure covers the installation of wall and ceiling insulation to reduce thermal conductance of the building envelope. Energy and demand savings are realized through reductions in the building's heating and cooling loads.

Window Replacement:

This measure covers the installation of high efficiency windows with reduced thermal conductance, solar heat gain coefficient, and air infiltration. For the purposes of this measure, a window is defined as an assembled unit consisting of a frame/sash component holding one or more pieces of glazing functioning to admit light and/or air into an enclosure designed for a vertical installation in an external wall of a commercial building.

Secondary Window System (Window Insert)

This measure covers the installation of a single glazed window that sits behind the existing single or double-glazed window. The secondary layer and the small gap in-between creates an extra insulation by slowing the movement of heat from one side of the window to the other.

Window Glazing:

This measure covers the replacement of window glazing only (instead of replacing the entire window assembly including glazing and frame) with reduced heat conduction and solar heat gain coefficient.

Required Project Documentation:

All projects must provide the following documentation:

1. A detailed scope of work narrative:
 - a. Indicate the extent of work to be done (For example, specify if insulation or window replacement is taking place on the entire building or limited to specific floors)
 - b. Commercial Building Type (e.g. Large Office, Hospital, Retailer, etc)
 - c. Provide the year the building was built along with any dates associated with renovations implemented on any part of the building envelope
 - d. Provide the type, size, and efficiency of the heating and cooling systems at the facility
 - e. Provide the operating schedule of the heating and cooling equipment
 - f. Provide typical space temperature setpoints
2. Savings Calculations
 - a. Calculations must clearly detail how energy savings were estimated, including showing all engineering formulas and documenting factors, values and assumptions used in the analysis.
 - b. All projects, excluding gut rehab¹, should use existing conditions as the savings baseline for building envelope measure savings analysis. Supporting documentation as described in Section 3 below must be provided to substantiate existing building envelope and HVAC system efficiencies. Gut rehab must use values defined in the latest Energy Conservation Code of New York State or New York City (whichever applies) as baseline.
 - c. Show calculations used to determine savings including:
 - i. Existing & Proposed Consumption (kWh)

¹ A renovation that removes material down to structural load-bearing beams (NYS Technical Resource Manual)

- ii. Existing & Proposed Summer Demand (kW)
 - iii. Existing & Proposed Fuel Consumption
 - 1. Gas (Therms)
 - 2. Steam (Mlbs)
 - 3. Oil (Gal)
 - d. The NYSTRM captures energy savings for various envelope measures. Refer to the latest [NYSTRM version](#) for a full list of commercial and industrial building envelope (“shell”) measures covered.
 - e. In cases where the NYSTRM does not apply or the scope of work proposes installation of multiple building envelope measures (e.g. Window Replacement and Wall Insulation), the [Con Edison C&I Building Envelope Tool](#) may be used to calculate energy savings.
 - f. Energy modelling may also be submitted to quantify project savings. Models must be developed using approved modeling software; refer to the latest C&I Program Manual for a list of approved software. Native modelling files must be provided with application documents.
3. Existing Conditions & Proposed Work Supporting Documentation
- a. Design drawings or cutsheets must include applicable R/U-value and/or Solar Heat Gain (SHG) coefficient of the existing envelope. If unavailable, vintage versions of [ASHRAE Standard 90.1](#) will be used based on the building’s construction year. For window glazing projects, DOE-2 glazing libraries² will be used based on glazing type.
 - b. Cutsheets for the proposed material/equipment being installed must include the applicable R/U-value and Solar Heat Gain Coefficient (SHGC).
 - c. Existing HVAC cooling and heating system capacities and efficiencies, supported by manufacturer equipment datasheets, industry standard performance test results, or as-built design drawings³. If unavailable, vintage versions of [ASHRAE Standard 90.1](#) will be used based on the equipment’s installation year.
 - d. Measurements related to dimensions of the walls and/or windows must be provided. This should be supported by floor plans, architectural elevation drawings, etc. For savings associated with Leakage/Infiltration, the results of a pre- and post-install blower door test must be submitted showing the change in leakage rate from depressurizing the building to a standard pressure difference of 75 Pascals or 0.3 inches of water column. If blower door testing cannot be provided:
 - i. Baseline maximum air leakage/infiltration rate will be selected based on vintage versions of [ASHRAE Standard 90.1](#). The vintage used will correspond to the energy code in place at the time the building was constructed.
 - ii. Proposed air leakage/infiltration rate will be based on 0.25 CFM/sqft as per the TRM, unless documented otherwise.

When Building Heating and Cooling Loads (BHL/BCL) are entered as inputs in the Con Edison C&I Building Envelope Tool and the numbers are not obtained with the values embedded in the tool, a load calculation report in support of these loads must be provided. BHL & BCL shall be calculated following ANSI/ASHRAE/ACCA Standard 183-2007(RA2020), ACCA Manual N 5th ed.73, or other code-approved equivalent computational procedure.

² [DOE22 Volume 4 Libraries](#)

³ Refer to [Early Replacement/Extended Life Guidelines](#)