

Guidance for Calculating a Cost Benefit Ratio (CBR)

The PACE Legislation requires NYSERDA to establish criteria for determining the cost-effectiveness of Energy Efficiency Improvements. An improvement is deemed to be cost-effective when it is included in the lists of “Pre-Qualified Energy Efficiency Improvements” approved by NYSERDA or if it has a CBR of 1.0 or greater.

It should be noted that while a specific improvement may be deemed to be generally cost-effective, and therefore approved as an improvement eligible for PACE financing, there is no guarantee that the improvement will be cost effective in every application. In addition, because the CBR takes into account societal benefits, it should not be assumed that an improvement deemed cost-effective will pay for itself in energy bill savings over the life of the PACE loan or over the average life of the improvement.

This guidance should be used for the following purposes:

- Approval of a proposed Energy Efficiency Improvement, which may be calculated at the project level or for each measure, if appropriate, for PACE financing by a municipality if the Energy Efficiency Improvement is not on the list of “Pre-Qualified Energy Efficiency Improvements” or
- Request from a manufacturer or other entity to include an Energy Efficiency Improvement on the list of “Pre-Qualified Energy Efficiency Improvements.” The requestor must include the details of the CBR calculation, along with assumptions used in the calculation, with the request form on NYSERDA’s website at <https://www.nyserdera.ny.gov/All-Programs/Programs/Commercial-Property-Assessed-Clean-Energy> and submit the request in accordance with the instructions on the form.

Treatment of Ancillary Measures

NYSERDA recognizes that, in some cases, certain ancillary measures must be accomplished for improvements to proceed or to resolve energy-related health and safety issues, and that these ancillary measures may not contribute to energy savings. These may include, but are not limited to mold mitigation, lead abatement, asbestos removal, flue repairs, repair of gas leaks, ventilation improvements, installation of smoke and carbon monoxide detectors and minor roof repairs. NYSERDA suggests that PACE program administrators may include such necessary ancillary measures in PACE financing but may exclude them from the CBR calculation. However, PACE program administrators must ensure that including the ancillary measures in the PACE financing does not extend the term of the PACE financing repayment period beyond the weighted average of the useful life of the improvements included in the project.

Determining the Energy Savings

NYSERDA considers the savings methodologies included in the New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs (also known as the “Technical Resource Manual¹”), as filed and effective pursuant to Public Service Commission Matter

¹ Department of Public Service. (2018, January 1). Technical Resource Manual.
<http://www3.dps.ny.gov/W/PSCWeb.nsf/All/72C23DECF52920A85257F1100671BDD?OpenDocument>

Number 15-01319: In the Matter of the Technical Resource Manual, one acceptable approach for calculating energy savings for Energy Efficiency Improvements.

NYSERDA also considers third-party testing of products in a laboratory recognized by the US Environmental Protection Agency (https://www.energystar.gov/index.cfm?c=third_party_certification.tpc_labs) an acceptable approach for verifying savings.

Calculating the CBR

CBR divides the total estimated benefits (including energy savings, societal benefits and other project related benefits as described below) over the lifetime of the proposed project (present value) by the total eligible construction and other required costs (i.e. audit costs) that are part of the PACE Financing. A municipality may decide to use a simple CBR calculation or to add other factors as appropriate, as described below. An improvement is deemed to be cost-effective when it has a CBR of 1.0 or greater.

1. Total Savings. The following may be considered in determining the value of the total savings:
 - a. Value of expected energy cost savings for an Energy Efficiency Improvement over the life of the Improvement.
 - b. A 3% discount rate for determining the present value of benefits.
 - c. NYSERDA recommends using the average of the last three years of local energy prices.
 - d. Changes in expected use of the building and resulting changes in the baseline of energy consumption to which the energy efficiency benefits are applied.
 - e. Value of greenhouse gas emissions savings using NYSERDA's average emissions factor of 1160 lbs./MWh for electric, 117 lbs./MMBTU for gas, 136.1 lbs./MMBTU for propane and 162 lbs./MMBTU for oil. Value of carbon dioxide² as follows:

Year	3% Average
2015	\$39
2020	\$46
2025	\$50
2030	\$55

² As referenced in Appendix C of the Benefit Cost Analysis Framework Order issued January 21,2016 (<http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bF8C835E1-EDB5-47FF-BD78-73EB5B3B177A%7d>).

2035	\$60
2040	\$65
2045	\$70
2050	\$76

- f. Validated (proof must be provided) changes in maintenance costs;
 - g. Value of water savings from energy efficiency related water usage reductions (for example, from high efficiency dish washers and low-flow shower heads).
 - h. Value of energy bills savings and/or revenues associated with installation of renewable energy systems that are installed as part of the Energy Efficiency Improvement project (optional – if included, cost must also be included below).
2. Total Eligible Costs. The following factors and considerations should be applied in the calculation:
- a. Estimated cost (either total cost of equipment, materials and labor (including in-house labor); or total projected cost of lease, subscription or power purchase agreement) of the Energy Efficiency Improvement(s), excluding ancillary measures as described above.
 - b. Estimated cost of renewable energy systems (either total cost of equipment, materials and labor; or total projected cost of lease, subscription or power purchase agreement); that are installed as part of the energy efficiency project, if the savings are included in the Total Savings above.
 - c. Any other cost, such as an audit feasibility study, as required by the municipality.