

Better Buildings Energy Efficiency Cost-Effectiveness Tool (v2.0)

Glossary

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BBNP Energy Efficiency Cost-effectiveness Tool Glossary¹

Avoided costs: The forecasted economic benefits of energy savings. These are the costs that would have been incurred if the energy efficiency activity were not implemented. The following types of avoided costs are represented in the tool:

- Generation energy (\$/MWh) – reflects avoided electricity purchases
- Generation capacity (\$/kW-year) – reflects avoided new generation capacity in the short- and long-term
- Transmission and distribution (T&D) capacity (\$/kW-year) – reflects avoided transmission and distribution investments²
- Natural gas energy (\$/therm) – reflects commodity and delivery costs
- Fuel oil (\$/gallon) – reflects commodity costs and is pertinent only for homes with fuel oil heating
- Water (\$/1,000 gallons) – relevant only for states that consider avoided water costs as part of the Total Resource Cost or Societal Cost tests.

Discount rate: A measure of the time value of money. The choice of discount rate can have a large impact on the cost-effectiveness results for energy efficiency. Discounting translates a stream of future benefits (e.g., monetized energy savings) or spending into present value. Each cost-effectiveness test compares the net present value of costs and benefits for a given stakeholder perspective, requiring a discount rate assumption. For a utility, the discount rate typically is assumed to be the weighted average cost of capital — i.e., the weighted average of rates on loans or bonds and payments on equity. The tool requires the entry of the following discount rates: utility (or other program administrator) discount rate, societal discount rate, and participant discount rate.

Evaluation, measurement, and verification (EM&V): The conduct of any of a wide range of assessment studies and other activities aimed at determining the effects of a program and understanding or documenting program performance, program or program-related markets and market operations, program-induced changes in energy efficiency markets, levels of demand or energy savings, or program cost-effectiveness. Market assessment, monitoring and evaluation, and measurement and verification are aspects of evaluation. “Measurement and verification” is a subset of evaluation that includes activities undertaken in the calculation of energy and demand savings from individual sites or projects.

Free rider: A program participant who would have implemented the program measure or practice even in the absence of the program.

¹ Most definitions in this glossary were taken directly or adapted from the glossary in Appendix A of the [Energy Efficiency Program Impact Evaluation Guide](#) prepared for the [State and Local Energy Efficiency \(SEE\) Action Network](#). Some other resources for energy efficiency terms and concepts are listed at the end of this glossary.

² In some jurisdictions, generation and T&D capacity values may be presented in \$/MWh units.

Impact evaluation: An evaluation of the program- or measure-specific, directly or indirectly induced, changes (e.g., changes in energy and/or demand use) associated with an energy efficiency program.

Incremental cost: The difference between the cost of existing or baseline equipment or service and the cost of alternative, energy-efficient equipment or service.

Integrated resource planning: A public planning process and framework within which the costs and benefits of both demand- and supply-side resources are evaluated to develop the least-cost or best value mix of resource options. Integrated resource planning reports may be useful sources for the avoided cost data inputs that are required in the tool.

Levelized cost: A constant value or payment that, if applied in each year of the analysis, would result in a net present value equivalent to the actual values or payments which change (usually increase) each year. Often used to represent, on a consistent basis, the cost of energy saved by various efficiency measures with different useful lives.

Load shape: In the cost-effectiveness tool, load shapes are the numerical expression of the way in which annual energy savings from more efficient measures are spread across time. The pre-loaded load shapes in the tool are yearly load shapes and represent how savings are spread over 8,760 hours. The sum of the 8,760 hourly factors equals 1.0.

Marginal cost: The price paid for the next increment of product or service. The marginal cost of electricity is the price to be paid for kilowatt-hours at and beyond the peak generating capacity in the time period in question.

Marginal emission rates: The emissions associated with the generating unit operating at the margin in each hour of the day.

Measures: Any equipment, system, behavioral strategy or modification of equipment, systems, or operations that reduces the amount of energy that would otherwise have been used to deliver an equivalent or improved level of end-use service on the customer's premises.

Net present value: The value of a stream of cash flows converted to a single sum in a specific year, usually the first year of the analysis. It can also be thought of as the equivalent worth of all cash flows relative to a base point called the present.

Net-to-gross ratio: A factor representing net program savings divided by gross program savings to convert gross program load impacts into net program load impacts. The factor itself may be made up of a variety of factors that differentiate gross and net savings, commonly including free riders and spillover. Can be applied to either energy or demand savings. This ratio accounts only for those energy efficiency gains that are attributed to, and the direct result of, the energy efficiency program in question.

Nominal: For dollars, "nominal" means the figure representing the actual number of dollars exchanged in each year, without accounting for the effect of inflation on the value or purchasing power. For

interest or discount rates, “nominal” means that the rate includes the rate of inflation (real rate plus inflation rate equals the nominal rate).

Participant cost test (referred to as “PCT” in the tool): A cost-effectiveness test that measures the economic impact to the participating customer of adopting an energy efficiency measure.

Planning or potential study: A study of energy efficiency potential used by demand-side planners within utilities (or third-party program administrators) to incorporate efficiency into a demand-side management plan or integrated resource planning process. The objective of a planning study is to assess market baselines and identify energy efficiency opportunities that are cost-effective alternatives to supply-side resources in generation, transmission, or distribution. Potential is typically defined in terms of technical, economic, achievable, and program potential. These reports may be useful sources for the avoided cost data inputs that are required in the tool.

Portfolio: Either (a) a collection of similar programs addressing the same market, technology, or mechanisms or (b) the set of all programs conducted by one organization.

Program administrators: An entity that administers an energy efficiency portfolio within a specific geographic region or market. Program administrators include utilities, government agencies, or nonprofit organizations. Administrators typically procure various types of energy efficiency services from contractors (e.g., consultants, vendors, engineering firms, architects, academic institutions, community-based organizations) as they manage, implement, and evaluate their portfolio of energy efficiency programs.

Program design potential study: Undertaken to develop specific measures for the energy efficiency portfolio.

Ratepayer impact measure cost test (referred to as “RIM” in the tool): A cost-effectiveness test that measures the impact on customer rates and whether those rates would have to increase to maintain the current levels of utility operating margin if customers installed energy efficiency measures. The test measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program.

Real: For dollars, “real” means that the dollars are expressed in a specific base year in order to provide a consistent means of comparison after accounting for inflation. For interest and discount rates, “real” means the inflation rate is not included (the nominal rate minus the inflation rate equals the real rate).

Societal cost test (referred to as “SCT” in the tool): A cost-effectiveness test that measures the net economic benefit to the utility service territory, state or region, as measured by the total resource cost test, plus other benefits such as water savings and avoided air pollutant emissions. The cost-effectiveness tool does not encompass the full range of societal benefits, which also can include increased participant safety and comfort, reduced healthcare costs, reduced building safety risks and more.

Spillover: Savings or other impacts of an energy efficiency measure or program beyond those directly associated with participation. There are generally two types of spillover: participant and non-participant.

Summer/winter capacity savings: The maximum capacity savings achieved in summer or winter, depending on the peak season.

Time-of-use periods: Blocks of time defined by the relative cost of electricity during each block. Time-of-use periods are divided into two to four time blocks per 24-hour period — at a minimum, on-peak and off-peak, and by seasons of the year (e.g., summer and winter).

Total resource cost test (referred to as “TRC” in the tool): A cost-effectiveness test that measures the net direct economic impact to the utility service territory, state or region.

Utility/program administrator cost test (referred to as “PAC” in the tool): A cost-effectiveness test that measures the change in revenue the utility must collect from its customers every year to meet an earnings target.

Further Reading

National Action Plan for Energy Efficiency (2007). “Guide for Conducting Energy Efficiency Potential Studies” Prepared by Philip Mosenthal and Jeffrey Loiter, Optimal Energy, Inc.

https://www.epa.gov/sites/production/files/2015-08/documents/potential_guide_0.pdf

National Action Plan for Energy Efficiency (2008). “Understanding Cost Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers” Prepared by Energy and Environmental Economics and the Regulatory Assistance Project.

<http://www.epa.gov/cleanenergy/documents/suca/cost-effectiveness.pdf>

A more comprehensive glossary of energy efficiency terms also may be found in Appendix A of the [Energy Efficiency Program Impact Evaluation Guide](#) produced for the [State and Local Energy Efficiency \(SEE\) Action Network](#).