

Minnesota Sustainable Building 2030: Calculation of Cost-Effectiveness for Variance Application

Prepared by

**Center for Sustainable Building Research, University of Minnesota
Center for Energy and Environment**

November 10, 2010

Cost-Effectiveness for Minnesota Sustainable Building 2030:

The significant improvements in building performance that are called for by the Sustainable Buildings 2030 (SB2030) energy performance standards are required to be achieved in a cost-effective manner. A review of more than 100 recent projects across a wide variety of building types has shown that the energy performance level called for by the SB 2030 standards can be achieved cost-effectively for the overwhelming majority of building types and situations. However, the analysis did recognize that there are exceptional situations where there may not be cost-effective options for achieving the low energy use goals for a particular project. Therefore, a variance may be granted for a project that is able to document that energy savings design options were investigated in an effort to achieve the SB2030 performance level, but that the design options were not able to cost-effectively achieve the energy savings called for by the SB2030 standard. This document outlines the cost-effectiveness criteria as well as the calculations and documentation necessary for a variance application to be considered.

Cost-Effectiveness Criteria. The legislation authorizing the establishment of the SB2030 standards calls for cost-effectiveness to be evaluated according to practices used for the evaluation of utility energy conservation (CIP) programs. For the convenience of project development teams, program staff have evaluated the financial impacts of a range of variables to see how CIP program cost-effectiveness criteria translate into building industry standard measures of cost-effectiveness. This analysis has found that nearly all projects with a simple payback period of 15 years or less are cost-effective to both the public building owner and society at large. Therefore, variances for lack of cost-effectiveness will only be considered for projects that can document that reasonable alternative energy saving design alternatives were considered in an attempt to achieve the SB2030 Energy Standard, but were found to have a simple payback (before any utility rebates) of longer than 15 years. Any such projects that cannot fully achieve the SB2030 Energy Standards cost-effectively, shall still incorporate all reasonable energy saving upgrades that have a simple payback of 15 years or less (except upgrades that have an expected life that is less than the expected payback). Besides review of savings calculations, projects requesting variances will be subject to a general review of the list of design options evaluated and may be required to consider additional design options. The simple payback shall be calculated as outlined in the following section, and documented as outlined in the Variance Documentation section of this document.

Simple Payback Calculation. Simple payback is a calculation that gives an estimate of how many years it will take for the energy cost savings to pay back the initial cost of an energy saving improvement. It is calculated by dividing the initial cost (or added cost of a design alternative in the case of a new construction project) by the first year's energy cost savings (without consideration of potential utility rate changes or the cost of capital). The table below outlines the basis of the simple payback calculation inputs that are to be used for the purposes of determining potential eligibility for a variance from the SB2030 Energy Standards.

- Documentation of building energy simulations as outlined in Building Performance Evaluation Guide for both the base building and the non-cost effective energy saving design. Clearly documented assumptions about equipment ratings may be substituted for CD information about make and models where appropriate based on the time that the simulation was performed.
- Hard copy and/or pdf clearly indicating the utilities, rate structures and rates used.

Incremental cost estimates shall be documented by any combination of signed documents from:

- appropriate contractor(s),
- project architect,
- project engineer, and/or
- third-party estimator.

Formal requests for variances, appropriate documentation, and questions shall be directed to:

Richard Strong
Center for Sustainable Building Research,
University of Minnesota
1425 University Avenue SE, Ste 140
Minneapolis, MN 55455
stron081@umn.edu
Phone: 612 624-7327