

Suggested "general" comment on RESNET's revision of its Cost Effectiveness standard:

Comment:

In general, the National Association of Home Builders believes that the net present value method is an undesirable way to estimate cost effectiveness, because of the method's overall complexity—in particular, because of the large number of assumptions it requires.

For purposes of underwriting a particular mortgage, the RESNET standard as currently specified has additional weaknesses. It uses a rule of thumb of 10 percent for the downpayment and a historical average for the mortgage rate. In the case of underwriting a specific mortgage for a particular energy improvement, characteristics of the actual mortgage in question should be used.

The proposed standard allows for the term of the mortgage to be different than the default of 30 years. This is desirable, because shorter-term mortgages (such as 15 years) do exist, especially for the relevant case of home improvement loans. However, the proposed standard also specifies a fixed analysis period (nAP) of 30 years. The standard does not provide a rationale for this fixed period, which seems particularly inappropriate for the purpose of underwriting a shorter-term mortgage. Why should the underwriter of a 15-year home improvement loan be concerned about estimated cost savings in years 16-30?

As noted by the commenter who submitted Comment #1, the inclusion of the income tax offset term $-P2_A$ and the property tax cost term $P2_D$ seem cumbersome and unnecessary given that the standard later requires that these terms be zero (by specifying that both the income tax and property tax rates shall be zero). However, rather than eliminate these terms for simplification, it would be preferable to specify values for them. If applied to a specific mortgage, it would be appropriate to use the borrower's marginal income tax rate and the effective property tax rate on the home for which the mortgage is being used. In a more general application, national average tax rates are readily available.

Like the commenter who submitted Comment #8, we have a general concern about the accuracy of first-cost estimates. In the case of a specific improvement to a specific home, however, we generally believe that the builder or remodeler in question will be able to provide reasonable information. However, maintenance in the "operation and maintenance cost" term $P2_C$ can be important in the case of particular types of improvements, such as heat pumps. Therefore, the standard should provide a schedule of annual maintenance cost estimates for the major categories of improvements (which may be zero in certain cases, such as improvements to a home's thermal envelope).

Like the commenter who submitted Comment #11, we are concerned about the unjustified and apparently arbitrary specification of the discount rate DR. Difficulty in specifying critical parameters such as this is one of the reasons NAHB favors an overall simpler approach.

Another critical parameter in the proposed standard is the useful life of the improvement, which figures prominently in the salvage value and replacement cost terms in Eqn 303.3.3-7. At the short end of the scale, replacement costs could be a major issue for certain features like heat

pumps, for which the useful service life may depend on climate and maintenance. At the long end, improvements to the thermal envelope are generally assumed to last the life of the home, which could easily be 100 years and lead to a very large salvage value and offset to the cost, the proposed standard is applied as published without modification. In fact, in this case, Eqn 303.3.3-10 would imply that the improvement has more than 100 percent of its useful life left at the end of the analysis period, probably due to a typo in the formula $RLFrac=(Life-nAP)/nAP$.

It is impossible to evaluate a standard that relies so heavily on the service life parameter without information about how that parameter is to be specified. In practice, the standard could classify virtually any improvement as cost effective or not based on a single unknown parameter that is very difficult to estimate. A standard with such black-box characteristics should not be promoted as a general tool for calculating economic cost effectiveness of building energy improvements.

Justification for Change:

To simplify the calculations, removing parameters that are arbitrary, unjustified, and difficult to estimate adequately. Also to generate a standard that resembles traditional criteria for underwriting mortgages for owner-occupied housing, which are based on the first-year cost of the mortgage.

Proposed Change:

Replace the net present value calculation with a simpler criterion for cost effectiveness: that the first-year energy savings be at least large enough to cover the estimated first-year cost of a mortgage, adjusted for differences in maintenance costs. If the standard is being applied to a specific mortgage, require that terms on that specific mortgage be used to estimate its cost. Publish a schedule of annual maintenance cost estimates for the major categories of improvements and refer to this schedule in the standard.