



Energy Tax Credits

Replacement Windows

BY NOW, MOST MONTANA HOMEOWNERS have heard the news: Many home energy efficiency investments are eligible for a 30 percent federal tax credit, up to \$1,500 per taxpayer. The Montana state credit is 25 percent, up to \$500 per taxpayer.

Qualifying investment must be in place during the tax year the credit is claimed. The federal credit may be claimed for 2010; whether it will be renewed for next year remains unclear.

Assume for the moment that you have addressed the basic recommendations that most energy audits uncover for space heating: set-back thermostats, adding insulation to the attic, sealing around doors and windows, etc. Now what?

Experts say to concentrate on the building envelope — the walls, ceiling and floors. But also take a hard and careful look at windows. Energy efficient replacements windows can be eligible for tax credits. But there are important tax aspects to discuss.

The Nature of Glass

Glass can be a major source of heat loss in a room, since the glazing itself offers little thermal protection. The insulating property is measured by its resistance to transmission of heat — known as the R-value. A single pane of glass is about R-1, which isn't much. Consequently, in some homes, up to a quarter of heat loss may be through windows. Of course, warm air is also lost directly through gaps around poorly sealed windows and frames.

But glass has an additional characteristic: it allows the sun's heat into a home. At our latitude in most areas of Montana, an unobstructed, untreated double-glazed window facing due south is a net heat gainer from the sun's rays. This means a window can allow more heat into a space during the day than is lost, even over most long winter nights. Unfortunately, windows without an optimal aspect to the sun lose more heat than they gain — particularly north-facing ones which have zero solar gain in winter. And west-facing windows can cause overheating during the warm seasons, contributing to the cooling energy load known as air conditioning.

In general, all single-pane glass is a strong candidate for an additional glazing at the very least, or a possible change-out.

Operable Windows

Operable windows can be particularly problematic, especially in older and historic homes. "Double-hung" windows are those that slide up and down against the adjacent sash. Many are assisted in this action by a sash cord or chain connected to a counterweight hidden behind the window casing.

High-efficiency, double- and even triple-glazed replacement windows are available for almost any size opening. Most replacement double-hung windows do not require counterweights and this channel can be packed with insulation. An additional glazing should always be considered for this type of window, and the seals between sashes replaced.

A great many other styles of operable window systems are also in common use: crank-style, tilt-out and pivot casements, sliding casement, louvered and jalousie, etc. Once again, assess the seals for integrity and weigh a change-out against an additional interior or exterior glazing. Plastic interior storm window kits are available from certain hardware stores or online at surprisingly reasonable prices.

Federal Tax Credits

Energy Star certification was once considered the gold standard when considering replacement window units. But homeowners can no longer rely on this standard to capture the federal 30 percent tax credit. The U.S. Department of Energy insists that only replacement windows and doors of the highest caliber shall be eligible for the federal credit. Another major departure is that the new standard is one-size-fits-all. That is to say, a single standard applies to windows whether installed in frigid Montana or sun-drenched Arizona.

A particularly troublesome provision of the standards involves the heat-gain coefficient, which measures how well the glass blocks the sun's rays from penetrating to heat a room. It's a number between 0 and 1, with a lower number indicating less solar penetration. The one-size-fits-all standard calls for a heat-gain coefficient of 0.3 — designed to block most solar penetration. The problem is that at our latitude, many homeowners want solar rays to penetrate the glazing in winter to warm elements in a room. But by specifying a higher coefficient, the product becomes ineligible for the credit. Some observers expect adjustments to the standards for various climate zones for the 2010 tax year.

Thermal Properties

The thermal properties of glass are measured in U-values, the rate that heat is transferred through the material. The lower the U-value, the better. A single pane of glass has a U-value of roughly 1. The better triple-pane windows on the market today range from about 0.15 U-value — considered outstanding — to 0.35 U-value.

Energy Star is a federal certification standard of the Environmental Protection Agency and includes window products with 0.35 U-values. However, the minimum standard to meet the federal tax credit is 0.30 U-value. Consequently, not all Energy Star window and door products qualify.

Multi-pane glass often features a special coating on an inside layer that reduces conductive heat losses and is known as low-emittance (or low-e) glass. Multiple layers of glazing in replacement windows create dead-air spaces — which may be filled with argon or other gases. These and other features further improve energy efficiency and allow some manufacturers to approach a 0.1 U-value — considered the Holy Grail for thermally efficient glass. But this level of efficiency comes at a hefty price.

High quality replacement windows are extremely costly per square foot and return on investment may be measured over decades rather than years. For some homeowners, a handful of windows will tap out the federal tax credit — a \$5,000 expenditure on qualifying windows captures the \$1,500 maximum credit. Still, in previous years the credit was capped at

\$200. And as a new program, you can claim the credit even if you had reached the stated lifetime maximum in previous years.

Get it in Writing

The new federal standard is technically difficult and expensive for manufacturers to meet. At the outset of 2009, most nationally distributed window makers offered only a few premier lines that met the numbers. Presumably, more products are becoming available since the inception of the higher standards. Make sure your contractor provides a certificate that the replacement windows meet the federal tax credit standards, if that's the level you're shooting for. Also, keep in mind that the federal credit is for the cost of the product only.

Montana Tax Credit

For installations on or after July 1, 2010, the Montana tax credit now mirrors the federal standards. Installations prior to July 1 can claim the credit with windows and doors at the more relaxed 0.35 U-value, which encompasses just about all products with an Energy Star label. Labor and installation costs can be included for the Montana tax credit, but not for the federal credit.

Don't neglect to consider storm windows over your existing windows. Storm windows and doors are more broadly eligible for state and federal credits without the careful consideration of replacement window U-values.

Resources

For more information about this and other energy conservation measures in your home or business, contact the Department of Environmental Quality energy offices at (406) 841-5231 or 5232. Or visit the website: <http://deq.mt.gov/Energy/index.asp>. The DEQ maintains the Energize Montana website at: <http://deq.mt.gov/Energy/index.asp>. The *Energy Savers Guidebook* is a homeowners' reference to conserving energy. It's available as an online document or can be ordered from the DEQ.

The Environmental Protection Agency's Energy Star program can be accessed online at: www.energystar.gov. The site offers good information about window and glazing products.

The Montana Department of Revenue offers a website that shows the overlap of state and federal energy tax credits at: <http://recovery.mt.gov/revenue/default.mcp>. The site also offers links for additional information about state and federal conservation tax credits.

The Tax Incentive Assistance Project (TIAP) is a coalition of public interest nonprofit groups, government agencies, and other organizations in the energy efficiency field. Its website is designed to give consumers and businesses the information needed to make use of the federal income tax incentives for energy efficient products and technologies. The TIAP website can be accessed at: <http://energytaxincentives.org/>

A low-cost, do-it-yourself interior storm window design endorsed for use on historic windows is offered online at: www.arttec.net/Thermal-Windows/index.html. The plans call for 1x4-inch frames and shrink-film glazing. The cost is about \$1 per square foot.

Build It Solar is a resource center for renewable and sustainable energy for the do-it-yourself homeowner. The site offers window treatment resources and links at:
www.builditsolar.com/Projects/Conservation/conservation.htm#WindowTreatments