

## Are You Seeing Green?

5/06/2009

By Doug Myer

We're going green. Anyone who's followed the current events since November 4<sup>th</sup> knows that the focus of the country is on stimulating the economy, and one of the means is the creation of "green jobs and infrastructure". Why are the eyes of the nation seeing green? First and foremost, we are becoming acutely aware that we must be environmentally-responsible to our communities, our country, and our planet. In recent LEED (Leadership in Energy and Environmental Design) studies\*, it is reported that buildings account for as much as 72% of our nation's electricity consumption, as well as 39% of our total energy use. It's no wonder our attention is turned to the building industry for a significant green impact. As stated by a 2009 US Green Building Council news release, "The future clearly centers on energy efficiency, water reduction, cleaner indoor air, (and) sustainable environments."

Economically speaking, going "green" should reduce operating costs and conserve material resources. The American Recovery and Reinvestment Act makes "going green" big news at the personal level. This stimulus bill expands the existing Federal tax credits for energy-efficient capital improvements from 10% to a generous 30%, offered in the form of a Federal Tax Rebate. Oklahoma has received \$107 million as their part of the stimulus package, with over \$46 million ear-marked for state energy programs. That means there is up to \$6,500 available per home for energy efficiency upgrades for a qualified family of four, earning under \$44,000 annually. If we take action on green improvements now, we'll save some "green" in our wallets as well.

So, how do I choose which green improvements to make in my home? There are many directions we can go from here, some significant investments, others nearly free. I would recommend doing the cheapest, easiest things first. For instance, fix those drafts around doors, windows, and your foundation. Usually, a caulk gun or expandable foam is all that is needed. But for the sake of our discussion, let's focus on two areas that may qualify for a 30% rebate from the Federal Government – your attic insulation and your roof.

Insulation is one of those things that everyone seems to know they need, but understand very little about. In the most basic sense, insulation should prevent heat and cold from meeting. In the summer, we want to keep our air-conditioned, cool air inside and the sun's heat out. In the winter, we want our warm living rooms shielded from the wintery temperatures outdoors. For years, our understanding of this process had to do with thermal insulation, like the rolls of the pink stuff in our attics. These Fiberglass or Roc Wool types of insulation are classified as "thermal" for they function much like a blanket. A thermal blanket warms you not because of the fabric, but because of the captured air that it holds, which does the insulating. In our houses we're told that the more of the pink stuff you can put in your house, the better. True, we all need thermal insulation, but why is more better? Just like adding more blankets, thicker insulation offers a greater thickness of captured air to act as a thermal insulator. Today, there are several new types of thermal insulation, some with better performance and environmental safety than traditional spun materials. Although these new eco-friendly products are worth a look, addressing thermal issues solves only part of the problem.

Thermal insulation, since it deals with "capacity" (R-value) can reach a point where it becomes "full". Picture a sponge held under running water. At some point, water runs right through because the

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sponge can hold no more. The more R-value you have, the bigger your sponge, but eventually it still can be filled. Now, picture a heat-wave in Oklahoma – pretty easy to imagine. While temperatures reach 110° in the shade, the temperature in your attic will probably soar to 160° or more. It won't take long in those temperatures for even the best thermal insulation to saturate. But what then? Once your insulation is "full", your insulation has very little capacity, and heat begins to pass through to your conditioned space. In fact, the insulation can work against you, as it releases pent-up heat into your home in the evening, even after the outdoor temperatures have dropped!

So, what can be done about these thermal deficiencies? The solution was discovered by our NASA scientists. When they looked for lightweight, compact heat/cold control for space, they discovered radiant barriers were an important component of the solution. Experimenting with gold, silver and aluminum surfaces, NASA developed radiant barrier technology that reflected away nearly all of the radiant heat, rather than absorbing it. They found a radiant barrier can efficiently hold in body warmth in a space suit, and insulate against the extreme radiation of the sun in space. (You may recall seeing a radiant barrier for the first time as the gold foil on the outside of the Lunar Lander.) The beauty of radiant barrier technology is it has no capacity limits! Its job is to reflect away the heat, and it can do that day-in and day-out without any performance change. Today, the same radiant barrier technology is finding a place in our homes.

Although you may not realize it, radiant barrier technology is in use all around us. From camping blankets, to insulated lunch bags, or reflective car shades, radiant barrier technology is present in our everyday lives. Radiant barrier film is a lightweight, aluminum-faced material that can work with your existing thermal insulation to dramatically increase your home's energy efficiency. With just a single layer over your attic insulation, radiant barrier film can reflect away up to 98% of the radiant energy that was being absorbed by your thermal insulation. Radiant barrier can be installed very quickly, with most jobs requiring only a few hours in your attic. The combined thermal/radiant barrier system helps your house act like an insulated vacuum bottle, efficiently holding your heated or cooled air right where you want it -- within the walls of your living space. (When used as a vapor barrier, the material is available in impermeable versions, but when applied over insulation in your attic, be sure to use the perforated type.) The insulating properties of the combination of thermal and radiant products can be amazing, with homeowners reporting a 8 – 25% reduction in energy costs. This government-tested product performs so significantly, that it qualifies for the 2009 30% tax rebate program. The best news is its low cost and high performance make it the best value of any energy improvement you may choose to make!

Another area that offers significant impact on your energy bill is your roof. Not everyone is ready to replace their roof right now, but what you know about roofing products will help you make a "green" decision in the future. Many roof materials in use today were developed for their protection and durability, but never were evaluated for their thermal properties or environmental impact. Heat buildup, toxic emissions, flammable properties, lifespan and landfill impact are all huge issues with our new green mandates. Due to the typical lifespan of roofs, we will be dealing with these problems for years to come.

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As far as new roofing products go, there are new takes on old materials, such as ultraviolet coatings and cool colors for asphalt shingles. Although this does help asphalt shingles gain an Energy Star rating, it doesn't address the hail damage, weight or landfill issues evident with this product. Yet there is one product that offers abundant eco-friendly features, and that's metal roofing. Here's why: Metal roofing is a 100% recyclable product. New roof panels today very likely contain up to 40% recycled steel, and the same roof panels after a long life-cycle in use, can be 100% recycled into the next useful product. It's unlikely that metal panels will ever become waste in a landfill. Secondly, today's panels are treated with a galvanic undercoating, and then painted with advanced finishes like SMP (Siliconized Modified Polyesters) to withstand sunlight and weather for up to 40 years. Even then, metal roofs can be recoated to extend their life-cycle. Metal panels can outlast many conventional roofs by as much as four times. A metal panel roof is lightweight, not subject to tear-off, and strong. Even most Oklahoma hailstorms can't dent or scratch these panels. But the most important quality of a metal roof with an EnergyStar finish is that it represents the most radiant-reflective roofing material available, bar none. An EnergyStar metal roof reflects radiant energy of the sun, rather than absorb it like other roofing materials. The result is a cooler roof and attic space, which means less work for your insulation and your air conditioner. Because of this, EnergyStar-certified metal roofing qualifies for the same 30% tax rebate as other energy-saving improvements! Wide-ranging new colors and textures ensure your new metal roof will comfortably fit in with most neighborhood homes.

Although we've explored only insulation and roofing material in this article, there are many more green rebate-qualified improvements you can make to your home, and I invite you to explore all that you can. The tax benefit program is designed to run through 2010, so start your green projects soon. Find a reputable contractor, who can properly advise and install your energy-efficient products. Even with tax benefits aside, you will be glad you did, once you see your dramatically-lower utility bills.

\*reference: US Green Building Council document, "Green Building by the Numbers", March 2009;  
Green Building Research, [usgbc.org](http://usgbc.org)