



CSL # 868816

P.O. Box 721
Nevada City, CA 95959
530-273-4422
www.SustainableEnergyGroup.com

Cost Effective Energy Retrofits

In the last column of Going Green we learned why reducing our monthly energy expense is becoming increasingly crucial to our economic survival in these challenging times. In today's column we'll focus on energy options that have been proven, through measurement and verification, to save more money than they cost.

The main reason I write these columns is to fill the need for reliable, trustworthy and accurate information concerning energy-related topics, in particular the economics of energy retrofits. From my perspective it's a constant battle against the barrage of misinformation being propagated by so many other sources. So today's column is going to take a brief look at energy retrofits that are cost effective versus those that aren't. But before we do, let's review some important caveats.

What are the criteria required for an energy retrofit to be deemed "cost effective"? The retrofit must provide a Return On Investment (ROI) of at least 7%. The better retrofits fall into the range of 15%-25% and higher. Another measure of cost-effectiveness is "positive net cash flow". For example if the annual savings associated with a retrofit is \$1,000 and the annual loan cost associated with the retrofit is \$800, that's \$200 worth of positive net cash flow. In other words, the retrofit saves more money than it costs.

Secondly it's important to point out that general information you'll see – like "save up to 25% on your electricity bill with this gadget" – must be taken with a grain of salt. That's because your actual savings will vary all over the map depending on your situation, the weather, and many other factors. In some cases you may get no savings at all for your investment.

The only way to really know what to expect from your investment is to have an experienced energy professional evaluate the costs and savings of your options, accounting for all the factors specific to your building and location. So while I'll give you examples of cost-effective energy retrofits, whether they'll pencil out in your particular situation is best determined by a professional. And for a true apples-to-apples comparison you should always use the same basic economic criteria (loan rate & term, energy cost escalation rate, etc) in order to make the options you're considering truly comparable.

So with those caveats in mind, here are a few energy options I've found to be cost-effective in our local area under most conditions.

The expenses associated with transportation, especially with gas going over \$4/gallon and climbing, should be first on your list. I know, this isn't exactly an energy retrofit, but given the savings potential it's not off topic!

When my wife needed a new four wheel drive back in 2003 we bought a station wagon that gets 25-30

MPG. We get a fair amount of snow where we live so one 4WD in the driveway was required. We could have bought the most popular SUV on the market at the time instead, but it gets just 15-20 MPG. Either one could serve our needs, but the SUV was more expensive to purchase and operate. So in this case it was simply a matter of practicality over perception. A vehicle with the best fuel economy that fills your needs (emphasis on “needs”) is the best choice if you’re in the market for a new or used car. The list of things you can do to save gas with your existing vehicle is long and probably familiar to most people but here’s a nice comprehensive list – <http://www.wikihow.com/Save-Money-on-Gas>

In terms of buildings, cost-effective energy efficiency retrofits include additional attic insulation (if you currently have six inches or less), sealing air leaks in the attic floor, and replacement/retrofitting of leaky recessed can lights. These last two items should be completed prior to adding additional insulation. High quality fluorescent lamps are now available as well, and should replace high usage incandescent lamps.

Duct repair and sealing of your forced air heating and cooling ducts is usually cost-effective. It’s more common than not to find the ducts are too small and the furnace and air conditioning equipment is too large. If the equipment is 20-25 years old it should be replaced with right-sized equipment and the ducted air distribution system should be right-sized to the equipment, sealed against air leakage, and insulated to an R-value of 6 (crawl space ducts) to 8 (attic ducts).

Solar Electricity, depending on the amount of sunlight available to your solar panels, can be very cost-effective. It’s important that it not be over priced, however (as it often is from out of area companies), so always get at least 2 or 3 comparable bids, ideally all for the same size system. Average monthly bills of \$100 or more and a home equity loan (to fund the project) with a term of 10 to 15 years usually pencils out to an ROI in the 10-30% range.

Solar Water Heating will provide an ROI in the range of solar electricity, sometimes higher, if there are two or more people in the home and the backup heater is either propane gas or electric. A system with minimal future maintenance, replacement and repair costs is also important.

On-demand or “instantaneous” water heaters will sometimes pencil out, when compared to a medium efficiency tank heater, if you have two or more people in your household, but it depends on the installation cost and the efficiency of the unit.

On the flip side we have a variety of energy retrofits that aren’t cost effective.

A flier I saw recently said a Window replacement retrofit would give you an ROI of 72.4%; the source it referenced, however, listed 72.4% as the “cost recouped” at resale; obviously not the same thing as “ROI”! Of course these windows would improve indoor comfort and reduce noise from outside, but replacement windows are rarely justified on the basis of energy savings alone.

Similarly, whole house energy retrofits don’t typically pencil out from an economic standpoint alone, but they do improve comfort and can address a variety of health and safety issues.

Radiant barriers (shiny foil products) laid out over your attic floor insulation aren’t recommended. While such products will save you money over time if placed under the sloped roof above the attic floor, placing them on the attic floor will cause them to collect dust and become ineffective after a while. But the higher the insulation in your attic floor, the lower the savings from these products; their

benefit almost disappears once your attic floor is insulated up to an R-value of 38 or more, which is the recommended R-value for our climate.

One thing you should avoid altogether are “Power Saver” devices that claim to save 8% to 25% on your electricity bill. I saw an ad for one of these in The Union’s classified ads. They go by many names but you’ll see references to them improving “power factor” or cleaning up “dirty power”. They’re plugged into an electrical outlet or wired into your electrical panel and you’ll pay \$250 or more to purchase one, but they won’t save you a dime.

As always I encourage people to email me if they have an energy related question. I’ll usually reply within a day or two, and enjoy the opportunity to help people in our local community navigate through the confusing abyss of choices. I can refer you to resources for further information, rebates and tax credits, and do-it-yourself guides. I’m also interested in your thoughts on any subjects you’d like to see me cover in more detail in future columns, and appreciate all the thoughtful comments I get...keep those cards and letters comin’ folks!

Ray Darby is President of Sustainable Energy Group Inc., a Grass Valley company offering energy efficiency and solar services for residential and commercial buildings, from comparing the alternatives through installation and servicing of energy systems of all types. You can reach him at 530-273-4422, via email RayDarby@SustainableEnergyGroup.com, or visit their web site at www.SustainableEnergyGroup.com.