

# Proven Energy Savings For Your Home

Today, 98% of Colorado's energy is produced from fossil fuels – coal, oil, and natural gas. Their combustion provides us with heat and light, but costs us money each month in our utility bills, and has environmental consequences. By becoming energy efficient, you not only reduce your utility bills, and increase your indoor comfort, but you also help the environment. Here are some simple ways you can become more efficient.

DO THIS	HERE'S WHY	APPOXIMATE COST
<b>CONSERVE (short-term fix)</b>		
Turn your thermostat down	For every 1 degree you turn it down, you'll save about 3% off your heating cost.	FREE
Turn off lights as you leave rooms	Lighting, cooking, and other appliances account for about 33% of a home's energy bill. Using them less saves you money.	FREE
Microwave foods rather than use the oven		FREE
Wash only full loads of laundry		FREE
Turn down the temperature of your water heater	Water heating typically accounts for 14% of your utility bill. You may be paying to heat it to a higher temperature than you really need.	FREE
<b>EASY EFFICIENCY TRICKS (simple steps – big savings)</b>		
Replace light bulbs with compact fluorescent bulbs	If you replace just 25% of your lights in high-use areas with fluorescence, you can save about 50% of your lighting energy bill.	\$7 – 20 per bulb
Wrap your water heater with a water heater insulating blanket	This is one of the cheapest ways to save money fast. It may pay for itself in 3-6 months.	\$10 – 15
Insulate the first 3 feet of hot AND cold water pipes going into water heater	The pipes going into your water heater conduct heat out of the heater and into the air just like a spoon in a cup of hot coffee. Foam pipe wraps are cheap, easy to install, and control the heat loss from metal pipes.	\$2.50
Seal around windows and doors	Poorly sealed houses allow costly conditioned air to escape through gaps. Caulking reduces uncomfortable drafts, and high utility bills.	\$10 - 25
<b>CREATE A PLAN FOR SERIOUS SAVINGS (FOR THE BEST PAYBACK, LONG-TERM)</b>		
Go to <a href="http://www.eren.doe.gov/consumerinfo">www.eren.doe.gov/consumerinfo</a> (Internet access may be available from your local library if you don't have it at home.)	"Random weatherizing" – that is, investing in home improvements without a plan, can sometimes cost you more money than you'll save in reduced energy bills. Take advantage of free information! This web site has lots of great information.	FREE
Ask an energy expert for advice: Call (800) 363-3732 Or email questions to <a href="mailto:doe.eren@nciinc.com">doe.eren@nciinc.com</a>	Your specific questions may be answered by knowledgeable folks at the US Department of Energy.	FREE
Get an E-Star energy rating: Call (303) 297-7395 or (800) 877-7450 for more information or for a list of certified energy raters.	This computer-analyzed report simulates various improvement scenarios for your house. It estimates how much money you'll save from your utility bill for each possible improvement you make. This helps you prioritize your investments before you begin. A blower door test is included in every rating, helping you to pinpoint air leaks.)	Typically \$250-400, the cost varies depending on size and complexity of your house.

# COLORADO ENERGY ORGANIZATIONS AND RESOURCES

ORGANIZATIONS	ACTIVITIES
<p><b>OEMC's Energy Saving Partners program</b>            Contact: Gene Barfield            Contact Phone: (303) 894-2383 or 1-800-632-6662            Contact Email: <a href="mailto:oemc@state.co.us">oemc@state.co.us</a>.</p>	<p>Providing No-cost Weatherization Services to Help Low-income Coloradans Reduce their Energy Bills and Enjoy Safer and More Comfortable Homes. This program provides cost-effective household energy efficiency or "weatherization" upgrades to low-income, senior and physically-challenged Coloradans.</p>
<p><b>E-Star Colorado</b>            Contact Phone : (800) 877-8450 or (303) 297-7395            Contact website: <a href="http://www.e-star.com">www.e-star.com</a></p>	<p>As the home energy rating system for the state, E-Star Colorado provides energy ratings for new and existing homes. An energy rating is a computerized analysis of a home's energy efficiency. Ratings include property-specific recommendations for improvements, including the estimated cost and savings that can be gained by making those improvements.</p>
<p><b>Xcel Energy</b>            Contact Phone: (303) 571-3434 or (800) 894-3368</p>	<p>Xcel Energy can help you with payment options, budget billing, or tell you about the opportunity to buy wind-generated electricity through Excel Energy's <i>Windsource</i>.</p>
<p><b>Boulder Energy Conservation Center</b>            Contact: Sue Wallace            Contact Phone: (303) 441-3278            Email : <a href="mailto:becc@earthnet.net">becc@earthnet.net</a></p>	<p>BECC for a fee will conduct a professional residential energy audit on a home or a business. We also offer professional consulting services to help determine the size and potential payback of a domestic hot water solar system or a photovoltaic system.</p>
<p><b>Community Office for Resource Efficiency</b>            Contact: Randy Udall            Contact Phone : (970) 544-9808            Contact Email : <a href="mailto:core@aspeninfo.com">core@aspeninfo.com</a></p>	<p>The Community Office for Resource Efficiency (CORE) promotes energy-saving technologies and green power in western Colorado.</p>
<p><b>LIHEAP -Energy Assistance Program</b>            Contact website:  <a href="http://www.cdhs.state.co.us/oss/FAP/LEAP/LEAP.htm">www.cdhs.state.co.us/oss/FAP/LEAP/LEAP.htm</a>            Contact Phone: (800) 782-0721</p>	<p>The Low-Income Energy Assistance Program (LEAP) helps needy Coloradans pay their winter utility bills.</p>
<p><b>CEAF–Colorado Energy Assistance Foundation</b>            Contact Phone: (303) 825-8750            Contact website: <a href="http://www.ceaf.org">www.ceaf.org</a></p>	<p>CEAF is a private nonprofit organization that has been assisting Coloradans with their home energy needs since 1989. CEAF brings together citizens, utilities and service providers to solve the home energy needs of less-fortunate Coloradans.</p>
<p><b>FHA – Energy Efficient Mortgages</b>            Contact Phone: (800) 543-9378 x 1002            Contact website:  <a href="http://www.hud.gov/local/den/ownahome.html">www.hud.gov/local/den/ownahome.html</a></p>	<p>Homes that are energy efficient have lower utility bills each month, saving their owners money. That saved money can be used toward a higher mortgage payment than normal with an Energy Efficient Mortgage or combine with a 203(k) rehab loan. Contact FHA for more information on how to qualify.</p>
<p><b>Fannie Mae</b>            Contact: Fannie Mae's Consumer Resource Center            Contact phone: 1-800-7FANNIE  <a href="http://www.fanniemae.com/neighborhoods/products/housing/environment.html">www.fanniemae.com/neighborhoods/products/housing/environment.html</a></p>	<p>Find out about Fannie Mae's housing finance products that support environmentally-sound construction, including: the Energy Efficient Mortgage that allows you to qualify for a larger mortgage amount to buy a home that is energy-efficient or one that needs energy improvements; and the Colorado Built Green Mortgage that allows you to qualify for a larger mortgage based upon the energy and water savings in the home you are buying.</p>
<p><b>Solar Energy International</b>            Contact: Ken Olsen            Contact Phone : (970) 963-8855            Contact website: <a href="http://www.solarenergy.org">www.solarenergy.org</a>            Contact Email : <a href="mailto:sei@solarenergy.org">sei@solarenergy.org</a></p>	<p>Solar Energy International (SEI) is a non-profit training organization whose mission is to empower others to use renewable energy technologies through education and technical assistance. SEI provides "hands-on" workshops for people who want to learn about and/or work in renewable energy or sustainable building technologies.</p>

Saving money every month is so easy to do!



## PROVEN ENERGY-SAVING FOR YOUR HOME

If your home has been guzzling too much gas this winter, we recommend you make some energy upgrades and "pay yourself back" with savings and improved comfort. The big improvements come from the top five proven upgrades listed below. We've listed a second-tier group of options as well.

<i>Do This</i>	<i>Here's Why</i>
<p><b>1. Seal air leaks in your furnace's ductwork.</b></p>	<p>This provides triple benefits; it reduces potential safety problems, upgrades comfort and saves energy. A competent do-it-yourselfer can handle this task if the ductwork is exposed in a basement or crawl space; for \$20 of mastic, you can do the job in a few hours. (NOTE: using duct tape on ductwork is, ironically, a complete waste of time! Don't bother. And <i>don't</i> seal up your furnace flue.) If ducts are inaccessible, and you have comfort and energy bill problems, the new aerosolized sealant (injected under pressure into your sealed-off ducts) offers an alternative that does a great job much of the time, but it's costly (\$600 - \$1,000) and not a do-it-yourself project. There are associated safety and performance issues that may make it advisable to work with an experienced weatherization specialist.</p>
<p><b>2. Water heater package</b></p>	<p>This includes a tank blanket, pipe insulation and flow regulators. A \$15-\$20 package should pay for itself in 3-6 months.</p>
<p><b>3. Assure adequate attic insulation</b></p>	<p>If your attic has less than three inches of insulation, adding more makes sense. This costs in the \$400 - \$700 range for a typical home. A competent do-it-yourselfer might save a couple hundred dollars here, as some large retail lumber yards will loan you an insulation blowing machine if you buy enough insulation. Again, you may want to work through an experienced insulation contractor.</p>
<p><b>4. Wall insulation</b></p>	<p>If you have uninsulated wood-frame walls, you can pay an insulation contractor to blow cellulose insulation into the empty cavities. This will achieve major energy savings, significantly improve comfort, and increase your home's resale value. Expect the tab to run between \$1,000 and \$2,000 in most homes. (Homes with masonry or brick walls can be substantially improved by adding foam and stucco on the outside or adding frame walls on the inside. Both of these approaches are quite costly.</p>
<p><b>5. Seal big air leaks</b></p>	<p>Sealing them can be easier than you think, but first you have to find the holes. For example, whole-house fan louvers. Hint: windows and doors usually aren't the biggest problems. (Caution: in your basement, if there are two metal ducts bringing in fresh air next to your furnace, don't seal them off! They allow your furnace to operate safely.)</p>

- More on other side -

**More home energy-savers are listed below. You'll probably need some professional help to make wise decisions with some of these items.**

<i><b>Do This</b></i>	<i><b>Here's Why</b></i>
<b>1. More air sealing</b>	This is where a house-tightness test pays dividends. Performed with a large exhaust-fan device called a blower-door, the test helps a technician locate and quantify your home's air leaks. Weatherization professionals and home energy raters are the two groups equipped with blower doors. Once holes are located, they can be sealed. For more information on the blower door test, or to contact an energy rater, call (800) 877-8450.
<b>2. Furnace tuneup</b>	Regular maintenance helps performance. Small adjustments that change the temperature at which the blower comes on and shuts off will often save energy. Cleaning the blower also boosts efficiency. And whenever your furnace filter is dirty, it should be replaced (every 4-8 weeks).
<b>3. Foundation insulation</b>	Your crawlspace can be insulated with R-19 batts. Unfinished basement walls can be insulated with R-11, vinyl-faced blankets. Finished basement wall cavities can be filled with cellulose (though not if your basement is simply paneled with very little space between it and the concrete wall).
<b>4. Upgrading to fix insulation flaws</b>	Is the bedroom over your garage cold in winter and hot in summer? One key reason is that it has more surfaces exposed to the outdoors. Finding and fixing insulation flaws here costs some money and requires help from a professional.
<b>5. Replacement windows (with low-e glass)</b>	New windows will save energy, especially if you have old single-pane metal windows. But the primary justifications for this upgrade are usually improved aesthetics, better comfort and higher resale value. This is the big-ticket item on the list--think \$500 and up per window--and entirely depends on circumstances and budget. (See note under "Energy Myths")



## FIVE TOP NEW-HOME ENERGY SAVING WINNERS

If you're out cruising for a new home, and you want to be sure it'll be both energy-efficient and comfortable, start by shopping for these five features. Yes, there are others, and we'll list them as well. But these top five are the workhorses. Details below should help you narrow your shopping list.

<i>Ask For This</i>	<b>HERE'S WHY</b>
1. <i>Sealed leaks in ductwork</i>	Colorado homes have the leakiest ductwork in the nation. In many cases, that means some second-floor bedrooms are cold in winter and hot in summer. Tape doesn't seal duct leaks because all tapes are temporary; both the cloth "duct tape" and the more expensive aluminized tape don't stick after a few years. So, ask if <i>all</i> the ducts have been sealed with mastic. (Mastic is a gooey substance that's smeared on with a brush. It is obvious once you see it...)
2. <i>High-performance windows</i>	Today nearly all windows are rated by an organization called the National Fenestration Rating Council (NFRC). The NFRC sticker tells you how efficient the window is and how effectively it blocks out unwanted summer sun. Ask for a window with an NFRC rating of U-0.38 or lower (lower, such as U-0.35 or 0.33, is better); this window will include special coatings that improve comfort, reduce fabric fading, decrease window condensation, save energy and improve resale value. What's not to like? The U-0.38 windows are commonly available on the market; ask for them.
3. <i>Better insulated wall</i>	Wall insulation is rated by R-value. The higher the R-value, the greater the energy savings. R-13 is standard in most new homes today; it's not enough. R-18 is a reasonable target for today. R-22 is even better for the long-term view. One additional benefit: adding a layer of foam boards outside your exterior walls should help your structure last longer; it cuts down on condensation within walls.
4. <i>Insulated foundation</i>	Make sure all components of the foundation are insulated: crawl-space walls (R-19), basement walls (R-10), and the edges of slabs at grade (R-8).
5. <i>Sealed combustion furnaces, fireplaces and water heaters</i>	While these save some energy, the main benefit relates to health and safety. Ask a heating contractor or Home Energy Rater about this factor.

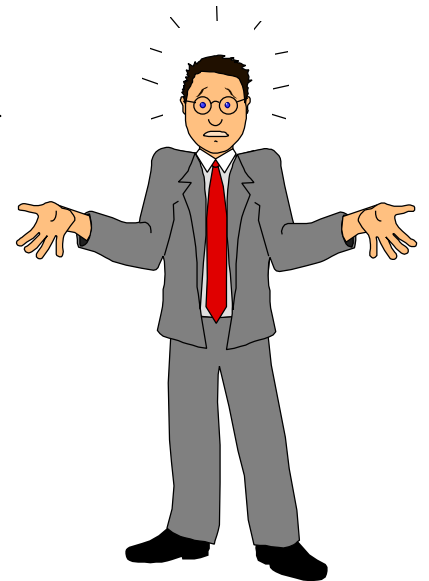
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<b><i>Ask For This</i></b>	<b><i>Here's Why</i></b>
<b>1. Good building orientation</b>	In most Colorado climates, a no-cost way to cut energy bills and eliminate the need for air conditioning is to buy a home with most of its windows facing south and north. A new home with primarily east- and west-facing windows is likely to require some mechanical cooling (except in colder mountain locations).
<b>2. Tight construction, especially where it counts!</b>	Who wants to have cold air leaking around their bathtubs against outside walls or their family room fireplaces and entertainment centers? Ask the builder how they solve common air leaks around these two sites. The only way to know whether a home is tight is to have it <i>tested</i> with a device called a blower door. Home Energy Raters can provide this test and help you evaluate all other items on this list. But tight construction should be balanced with the following item...
<b>3. Controlled supply of fresh air</b>	This doesn't save energy, but it's essential if you want your indoor environment to be healthy.
<b>4. Energy-efficient water heater</b>	Ask for a model that has an Energy Factor (EF) of 0.60 or higher.
<b>5. Insulation systems that add extra value</b>	In E-Stars' experience, walls and attics with insulation (cellulose, fiberglass, mineral wool or foam) that is either sprayed or blown into tend to be tighter. Innovative systems like structural insulated panels and insulated concrete forms provide the most effective insulation we've seen, but you have to evaluate the extra cost, which can be considerable.

**Will a home with the top five features cost more?**

Yes. A \$250,000 home with these features might run \$1000 to \$4000 extra, depending on a particular builder's standard package. But when incorporated into a "systems thinking" type of package, these features should pay for themselves in energy savings and improved comfort today, with better resale value tomorrow.

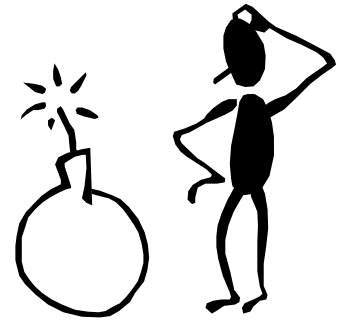
I learned all about energy efficiency from my grandma's friend. Is it true?



## Home Energy Myths

<p><b>1. Myth:</b> setting back your thermostat doesn't save any money. (NOT TRUE!)</p>	<p><b>Rule of thumb:</b> for every 1 degree that you set back your thermostat for an 8-hour period (e.g., overnight), you reduce your heating consumption by 1%. For every 1 degree F that you permanently set back your thermostat (24/7), you reduce your heating consumption by 3%. <u>Recommendation:</u> turn down your thermostat several degrees every night.</p>
<p><b>2. Myth:</b> You've probably heard this claim on radio stations this winter: "Replacing your old windows with state-of-the-art windows can cut your heating and cooling bills by 47%." (NOT TRUE!)</p>	<p><b>Rule of thumb:</b> replacing single-glazed metal windows (R-1) with state-of-the-art (R-4) windows should reduce energy consumption by 15% (+/- 5%), or about 1/3 as much as advertised. The amount of those savings depends on how leaky the older windows are, how many windows the older home has, how tight and well-insulated the home is, and how efficiently the heating system operates. You can only figure this out by performing a comprehensive building analysis of the building--something the advertisers don't bother to mention. (Note: per the comment under #5 above, the two biggest benefits from replacing windows are improved comfort, aesthetics and added resale value, not energy savings.)</p>
<p><b>3. Myth:</b> basements and crawlspaces don't need to be insulated, since they are primarily below grade and we don't live in them. (NOT TRUE!)</p>	<p><b>Fact:</b> foundation components lose considerable amounts of heat through the above-grade concrete. Based on studies here in Colorado and elsewhere, you should reduce your heating bill by 5%-10% when you insulate your foundation, depending on size of foundation, number of floors above it, how well the home is insulated, etc.</p>
<p><b>4. Myth:</b> tightening up ducts doesn't really save energy because the ducts are normally located inside the house. (NOT TRUE!)</p>	<p><b>Fact:</b> sealing leaky ducts will put heat where you want it and will balance the system so it operates more efficiently and more safely. Fixing ductwork problems pays multiple dividends.</p>
<p><b>5. Myth:</b> If a home has lots of attic insulation, you're well on the way to having an energy-efficient home. (NOT TRUE!)</p>	<p><b>Fact:</b> if an older home has a modest amount of attic insulation (say 3 or 4 inches), you're next priority is adding insulation to uninsulated building components, especially walls. Uninsulated walls are large sources of heat loss and occupant discomfort in older homes.</p>

## CAUTIONS WHEN INVESTING IN HOME ENERGY SAVING ITEMS



### 1. **When you tighten up a home, the internal functioning of the home can change enough to pose potential threats to homeowner health and safety.**

This is where it helps to work with an experienced weatherization specialist who understands the safe operation requirements of conventionally vented combustion appliances (e.g., furnaces, water heaters and fireplaces). After energy improvements, one should test to assure the continued safe operation of those combustion appliances.

### 2. **Replacing your furnace is expensive.**

With few exceptions, it is not recommended unless or until it breaks. When replacing a furnace, picking a sealed-combustion appliance provides a 12% savings on annual heating bills. (Warning: if you install other energy improvements, any replacement furnace should probably be smaller than the one it replaces.)

### 3. **Storm windows are generally not worth the investment.**

While they are a lot less expensive than replacement windows, they don't last nearly as long and can end up detracting from your home's appearance. (There are exceptions to this guideline.)

### 4. **Investments in energy efficiency should normally increase your home's value.** However, *poorly installed products can cause problems.* It's important to have the work done by someone with adequate experience. Obtain references prior to hiring contractors to perform expensive improvements.

### 5. **The parts of a house work as a somewhat complex and interactive system.**

This can make the achievement of cost-effective energy and comfort improvements a little more difficult than you might think. (E.g., most bedrooms over garages tend to be colder than the rest of the house during the winter. But the causes could be poorly installed insulation, ducts that leak air, and/or poorly designed ductwork.) The first proposed solution is not always the best solution. Some contractors (heating contractors, insulation contractors, replacement window specialists) tend to propose their product as the answer to all your problems. You may need some third-party advice to help you sort amongst the options.