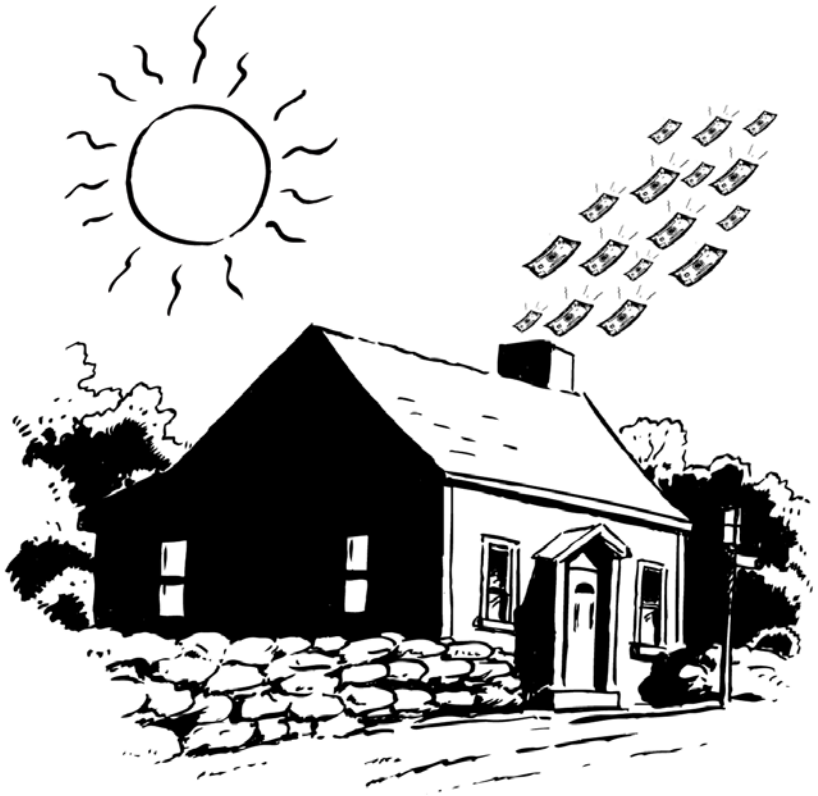
SAVING ENERGY IN COLORADO

No Cost, Low Cost & Home Improvement Projects That Save Energy and Money at Home



Energy Outreach Colorado

Helping all Coloradans afford home energy.

www.EnergyOutreach.org

LEARNING TO USE LESS IS EASY

Today, 98% of Colorado's energy is produced from fossil fuels – coal, oil, and natural gas. Their combustion provides us with heat and light, which costs us money each month on our energy bills. Producing energy also has environmental consequences.

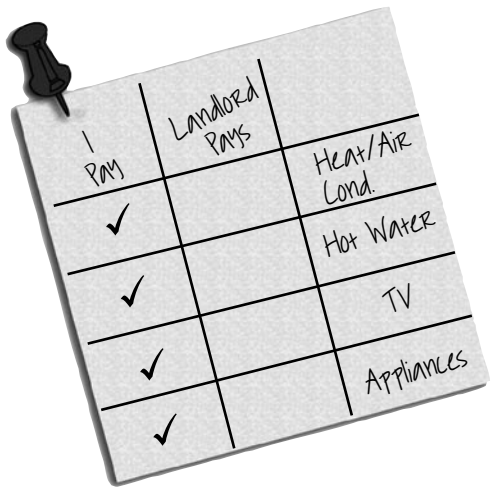
By becoming more energy efficient, you can reduce your energy bills and increase your indoor comfort. You also can help the environment. **Saving Energy In Colorado** offers many simple ways to save energy!

WHETHER YOU RENT OR OWN YOU CAN SAVE ENERGY DOLLARS.

Even if you rent your house or apartment, rather than own it, chances are you pay at least part of the utility costs. Whether you own or rent, you can save a lot of energy dollars!

Make a checklist of who pays the bills. If you own a house than you pay all the bills. Making a checklist will also help you see the energy users you pay for every month:

Remember, even if your landlord pays some of the utility costs, your conservation efforts will help you have a strong argument against a possible rent increase!



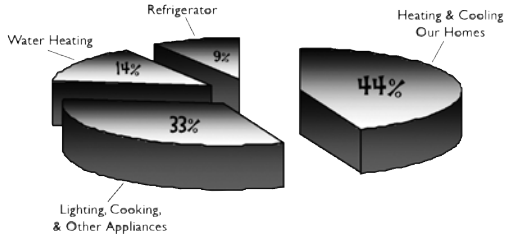
NO COST WAYS TO SAVE ENERGY

TURN YOUR THERMOSTAT DOWN IN THE WINTER	For every 1 degree lower, you'll save about 3% off your heating cost. When you leave your house or go to sleep, keep the setting between 60°–65°. During times when you are home, like after work and school, keep the setting between 66°–70°. 
TURN OFF LIGHTS AS YOU LEAVE ROOMS **MICROWAVE FOODS RATHER THAN USE THE OVEN** **WASH ONLY FULL LOADS OF DISHES AND LAUNDRY**	Lighting, cooking, and using other appliances account for about 30% of a home's energy bill. Using them less saves you money. Unplugging appliances when you aren't using them, like the toaster, will also save energy and money.
LET THE SUN HELP HEAT YOUR HOME	On average, Colorado has 360 days of sunshine, so on sunny winter days make sure to open the blinds, drapes or curtains to let the sun help heat your home. Close them at night to keep the warm air in and the cool air out.
ADJUST THE TEMPERATURE ON YOUR HOT WATER HEATER	Water heating typically accounts for 14% of your energy bill. Try to keep the temperature at 120° or lower. Experiment to see how much it can be reduced and still provide you with enough hot water.

LOW COST WAYS TO SAVE ENERGY

SEAL LEAKS AND CRACKS, ESPECIALLY AROUND WINDOWS AND DOORS	Poorly sealed homes allow conditioned air to escape through gaps. Caulking and weatherstripping reduce uncomfortable drafts and high utility bills. **COST:** $10–$25
WRAP YOUR WATER HEATER WITH AN INSULATION BLANKET	This saves money fast, and may pay for itself in 3–6 months. Water heater insulation is easy to buy and install. **COST:** $10–$15
INSULATE THE FIRST 3 FEET OF HOT AND COLD WATER PIPES GOING INTO AND OUT OF WATER HEATER	The metal pipes going into and out of your water heater conduct heat up and out of the heater into the air. Foam pipe insulation is cheap, easy to install, and helps control the heat loss. **COST:** $5
REPLACE LIGHT BULBS WITH NEWER COMPACT FLUORESCENT LIGHT BULBS (CFLS)	By replacing just 25% of your lights in high-use areas with compact fluorescent light bulbs (CFLs), you can cut your lighting costs in half. **COST:** $5–$14 per bulb
CHECK AND REPLACE FURNACE FILTERS REGULARLY	Check your furnace filter often—replace or clean it as needed, but at least once every two months during the heating season. A dirty furnace filter makes your furnace work harder to push air through it, and raises your energy bill. **COST:** $10–$30
INSTALL A PROGRAMMABLE THERMOSTAT	A programmable thermostat will help save money and keep your home comfortable by automatically adjusting your temperature settings, saving you about $100 per year. Look for the Energy Star® logo. **COST:** $20–$40

INVESTING IN YOUR HOME TO SAVE ENERGY



Assure Adequate Attic Insulation

If your attic has less than three inches of insulation, adding more makes sense ($400 – $700 for a typical home). For added efficiency, ensure that the R-value of the additional insulation is above code (R-38 or better). *Note: Be sure to look for heat sources like recessed lights and electric junction boxes that are uncovered. Block around these so as to not create excessive heat build-up (and possible fire) due to adding insulation.*

Insulate Walls

If you have uninsulatd 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 cost to be $1,000 to $2,000 in most homes. (Homes with masonry or brick walls can be improved by adding foam and stucco on the outside or adding frame walls on the inside, which will add to your costs and will take longer to pay back.)

Furnace Replacement or Maintenance

On average, nearly half of your utility bill goes to heating and cooling your home. If you have an old furnace (15 years or older) and can afford to invest in a new one be sure to look for a 90+% efficient furnace. In fact, Energy Star® rated furnaces are 15% more efficient than a conventional furnace. A new, high-efficient furnace can cost between $2,000 and $2,500.

Is a new furnace not in your budget? Regular maintenance helps performance, improves the comfort of your home, and helps reduce energy bills. Small adjustments that change the temperature at which the blower comes on and shuts off will often save energy. Again, it is vital to the performance of your furnace that you change the air filter every 2–4 months. Contact a heating and cooling maintenance specialist.

Replace Windows With Low-e Glass

New windows will save energy, especially if you have old single-pane metal windows. But the primary justification for this upgrade is usually improved aesthetics, better comfort and higher resale value. This is the big-ticket item on the list – think $500 and up per window.

What to Look for When Shopping for a New Home

1. Sealed Ductwork

Colorado homes have the leakiest ductwork in the nation. 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 **ALL** the ducts have been sealed with mastic. *(Mastic is a gooey substance that's smeared on with a brush.)*

2. High Performance Windows

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 (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. The U-0.38 windows are commonly available on the market; ask for them.

3. Well Insulated Walls

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-19 is a reasonable target for today and is compliant with Denver code. R-22 is even better for the long-term. 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. Insulated Foundation

Make sure all components of the foundation are insulated: crawl-space walls (R-19), basement walls (R-11), and the edges of slabs at grade (R-8).

5. Sealed Combustion Furnace and Water Heater

While these save some energy, the main benefit relates to health and safety. Ask a heating contractor or Home Energy Rater about this factor. You can call E-Star Colorado at 1-800-877-8450.

6. Good Building Orientation

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).

7. Tight Construction

Ask the builder how they solve common air leaks, such as around bathtubs or family room fireplaces. Home Energy Raters can provide tests and help you evaluate all other items on this list. This should be coupled with a controlled supply of fresh air. For more information check out pages 14–15, or download a list of certified energy raters in your area at www.energyoutreach.org/tips.asp.

8. Controlled Fresh Air Supply

This doesn't save energy, but it's essential if you want your indoor environment to be healthy. Hire a professional to assess your home and make recommendations or adjustments as needed.

9. Energy Efficient Water Heater

Ask for a model that has an Energy Factor (EF) of 0.60 or higher.

10. Extra Insulation Systems

According to E-Star Colorado, walls and attics with insulation (cellulose, fiberglass, mineral wool or foam) that is either sprayed or blown into spaces tend to be tighter and provide better insulation. Innovative systems like structural insulated panels (SIPs) and insulated concrete forms provide the most effective insulation, but you have to evaluate the extra cost.

Do Homes With These Features Cost More?

Yes. A $250,000 home with these features might run $1,000 to $4,000 extra, depending on a builder's standard package. But when incorporated into a "system thinking" type of package, these features should pay for themselves in energy savings, improved comfort, and better resale value.

ENERGY MYTHS

FALSE **Setting back your thermostat doesn't save money.**	**Rule of Thumb:** 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 Farenheit that you permanently set back your thermostat (24/7), you reduce your heating consumption by 3%. **Recommendation:** turn down your thermostat several degrees every night. Better yet, install a programmable thermostat to do the job for you!
FALSE **Replacing your old windows can cut your energy bills in half.**	**Rule of Thumb:** replacing single-glazed metal windows (R-1) with state-of-the-art (R-4) windows should reduce energy consumption by 15% (+ or – 5%), or about 1/3 as much as advertised. The amount of those savings depends on how leaky the old 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. For a list of certified energy consultants in your area that can provide a building analysis or energy audit for you go to www.energyoutreach.org/tips.asp. *(Note: The biggest benefits from replacing windows are improved comfort, aesthetics and added resale value, not energy savings.)*
FALSE **Basements and crawlspaces don't need to be insulated.**	**Fact:** foundation components lose considerable amounts of heat through the above-grade concrete. Based on studies, you can reduce your heating bill by 5%–10% when you insulate your foundation, depending on its size, number of floors above it, and how well the home is insulated.
FALSE **Tightening up ducts doesn't save energy because the ducts are normally located inside the house.**	**Fact:** sealing leaky ducts will put heat where you want it and will balance the system so it operates more efficiently and more safely.

CAUTION!

What To Look Out For When Investing In Home Energy Saving Items

▶ **When you tighten up a home, its internal functioning of the home can change enough to pose potential health threats.**

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). See pages 14–15 for more information or go to www.energyoutreach.org/tips.asp.

▶ **Replacing your furnace is expensive.**

With few exceptions, it is not recommended unless or until it no longer functions. When replacing a furnace, choosing a sealed-combustion appliance will provide a 12% savings on annual heating bills. (**Note:** if you install other energy improvements, like insulation, any replacement furnace should probably be smaller than the one it replaces since it won't need to work as hard.)

▶ **Investments in energy efficiency should 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.

▶ **The parts of a house work as a complex , interactive system.**

This can make the achievement of cost-effective energy and comfort improvements a little more difficult than you might think For example, most bedrooms over garages tend to be colder than the rest of the house during the winter. This could be from poorly installed insulation, ducts that leak air, and/or poorly designed ductwork. Beware: some contractors (e.g., heating, insulation, replacement window contractors) 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 – go to **www.energyoutreach.org/tips.asp** for a list of certified energy raters and consultants.

KEEP YOUR COOL!

In a typical home, summer heat enters your house through:

- **Windows** – the largest single source of heat gain!
- **Appliances** – lighting, cooking, washing, refrigeration, water heating
- **Ceiling**, **Walls** and **Air Leaks**

COST-SAVING TIPS TO BLOCK OUT SUMMER'S HEAT & KEEP COOL AIR INSIDE.

Sun Blockers

Deciduous Trees: Plant fast growing deciduous trees on the east, west, and south sides of your home (low cost, long-term solution), or consider a removable awning for east, west and south windows (higher cost, near-term solution).

Solar Shade Screens: Install them on the exterior of older windows (higher costs); they block up to 75% of the sun's heat, and can be removed for the heating season. Or, apply *reflective window film* to the inside of glass; it looks highly reflective from the outside, but won't look good if applied with wrinkles (inexpensive for do-it-yourselfers).

New Windows: for either a new home or when replacing windows, order *glazing that rejects solar radiation* from east, west, and south-facing windows. Shop for windows with a low Solar Heat Gain Coefficient (SHGC of 0.38 or lower). The SHGC factor can be found on most stickers applied to new windows (moderate cost). **ALL** windows should have a coating on the glass, no matter which way they face.

New Home Design: design proper overhangs for south-facing windows; a two-foot overhang located roughly one foot above the window is a reasonable compromise for most windows (low to moderate cost). East and west-facing windows gain more heat and can't be effectively shaded with normal overhangs.

Heat Blockers

Insulation: attic insulation of R-38 or better will greatly help reduce heat gain through your roof (moderate cost). Wall insulation of R-19 or better will tighten your home, preventing conditioned air from escaping through leaks and cracks.

If your home has brick walls, plant leafy trees and bushes along the east, west and south sides to shade it and keep it cool inside. Eventually, it will be beneficial for you to add insulation – either exterior foam covered with stucco, or an interior insulation layer finished with drywall (higher cost).

Make Less Heat

Refrigerator: your refrigerator adds heat to your house year-round. 9% of your energy costs go to paying for your refrigerator. It's important to maintain your refrigerator. Move it out from the wall and vacuum the condenser coils each year (unless you have a no-clean model). When it's time to replace it, buy the most efficient unit available. Make sure it has the Energy Star® label, which means it uses at least 10% less energy than required by current federal standards (www.energystar.gov).

Note: many people have an extra refrigerator in their garage or basement. Remember it takes a lot of energy to run this appliance so unless you absolutely need an extra one, limit your household to just one refrigerator to save money and conserve energy.

Water Heater: water heating is one of the more consuming energy costs in your home. Water heaters penalize you twice; you pay to heat the water; and the tanks and pipes lose heat into the house, creating comfort problems in the summertime. Add an insulation blanket to the water heater tank and insulation tubing to your water heater pipes (very low cost).

Other Appliances: run heat-producing appliances, such as clothes dryers and dish washers, in the evening when it's easier to flush the heat to the outdoors (no cost).

Light Bulbs: 90% of the energy that incandescent light bulbs use is wasted as heat. Replace incandescent bulbs with compact fluorescents (CFLs).

Move the Air

Fans: moving air that is cooler than 90 degrees cools down the body. Small revolving fans can cool you down and make you feel more comfortable (low energy cost). This should not be used as your primary cooling source, especially if you or someone you know is elderly and frail. Be sure to remain hydrated and never place a fan in an open window during the day when temperatures are extremely hot outside (90 degrees or above).

Install a whole-house fan – one that blows air from the house up into the attic and out the attic's vents. It provides air movement from anywhere in the home where you open a window. (Cheaper than an air conditioner)

Night Time Air: at night, open windows to cool the house down, then shut them the next morning. For security, you can temporarily brace most types of windows against being fully opened.

Cooling Options

Evaporative Coolers: an evaporative cooler (swamp cooler) uses evaporation to cool the air blown from the outdoors into the home. It consists of a set of evaporation pads, a small pump, a water reservoir, and a blower, all housed in a vented cabinet. Water is pumped up to the pad and allowed to trickle down through it. As warm outdoor air is pulled through the water-saturated pad by the blower, water evaporates. This cools the air, much as a dry breeze cools your skin when you get out of a pool. The drier the air at a given temperature, the greater the cooling efect. In many homes, all the cooled air enters the home in one central location. Windows are cracked open where you want cool air; or pressure sensitive "up-ducts" installed in the ceiling allow for air to exit up through the attic. In both cases, warm room air is pushed out by cool air flowing in.

Pluses and Minuses: installation costs about half as much as putting in a refrigerated air conditioner, and it takes between 1/3 and 1/5 the energy to operate the evaporative unit. Evaporative coolers tend to require annual maintenance and suffer from limited life expectancies; today some manufacturers warrant the lifetime of some components. Some subdivision covenants prohibit roof-mounted evaporative coolers. Evaporative coolers require large air-flows, make more noise, and humidify the home.

Air Conditioner: a properly sized and installed air conditioner, hooked up to properly designed and sealed ductwork, shouldn't be overly expensive to operate in most averaged-sized older homes that have a few shade trees. But in a new home with lots of west-facing windows, you can run up a fairly large bill, even if all the above items are present. Unfortunately, most homes, especially newer homes, have air conditioners that are hooked up to extremely leaky ductwork and aren't properly inspected during installation. Furthermore, the AC units are normally much larger than they should be (partly due to the leaky ducts and partly due to lack of sizing calculations), so they cost more to buy and install, cost more to operate, present comfort problems, and won't last as long as they should.

Fixing Problems With Air Conditioners: you can have the ducts sealed (usually expensive), then have the air-flow through the system measured, and have someone check the refrigerant charge. These three steps should improve performance.

Many of us in Colorado can get by without mechanical cooling, and have done so for decades, unless we live in one of four general locations: from Canon City down the Arkansas River, from Fort Morgan down the Platte River, from Palisades down the Colorado River, and on the far eastern plains. When we add mechanical cooling appliances in other locations, it's often because we have to overcome problems related to our windows, appliances and air leaks.

When we add cooling, we're causing a problem for utilities: we're adding demand for power at the hottest time of the late afternoon, when it costs utilities the most to supply power.

Many of the steps that you take to reduce cooling problems today will also help lower your heating bills next winter.

NEED MORE INFORMATION?

Energy Outreach Colorado 303-825-8750 www.EnergyOutreach.org	Energy Outreach is a 501(c)3 non-profit organization that brings together citizens, utilities and service providers to solve the home energy needs of income-limited Coloradans.
Heat Help – Toll Free Hotline 1-866-432-8435	If you or someone you know needs help paying their energy bill, call this toll free hotline for information.
Energy Saving Partners (E$P) 1-866-432-8435 oemc@state.co.us www.state.co.us/oemc/programs/residential/e$partners	Provides free weatherization services to help low-income, special needs and senior Coloradans reduce their energy bills.
LEAP – Low-income Energy Assistance Program 1-800-782-0721 leap.program@state.co.us www.colorado.gov/leap	LEAP helps needy, qualifying Coloradans by paying a portion of their winter energy bills.
E-Star Colorado 1-800-877-8450 www.e-star.com	E-Star Colorado provides computerized energy ratings for homes and property-specific recommendations for improvements and savings.

Colorado Energy Science Center 303-216-2026 www.energyscience.org	The Colorado Energy Science Center (CESC) provides energy education programs and resources that promote economic and environmental benefits.
www.coloradoenergy.org	Information about green building, energy efficient applications, wind power, government actions, new technologies and important events.
Energy Star www.energystar.gov	Energy Star® is a government-backed program helping businesses and individuals protect the environment through superior energy efficiency.
Energy Efficiency and Renewable Energy Network 1-877-337-3463 www.eere.energy.gov	The U.S. Department of Energy provides information for energy consumers. They offer a large amount of information for homeowners to commercial and industrial consumers.
Xcel Energy 1-800-328-8226 www.xcelenergy.com	Xcel Energy is the largest utility provider in Colorado. If you are an Xcel Energy customer you can get help with payment options and budget billing. Xcel offers wind source power.

Energy Outreach Colorado is a non-profit agency dedicated to helping all Coloradans afford home energy. Each year Energy Outreach raises millions of dollars for energy assistance, energy efficiency measures for affordable housing and energy efficiency education.

Our goal is to help income-limited families, seniors and individuals with special needs be self-sufficient and enjoy a higher quality of life.

Energy Outreach Colorado

Helping all Coloradans afford home energy.

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