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# TAMING HIGH ENERGY COSTS



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Colorado  
Office of  
Energy  
Conservation

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## **A word about this publication . . .**

The Office of Energy Conservation, which Governor Richard D. Lamm established in 1977, is part of the Department of Regulatory Agencies. The OEC offers a broad range of conservation services for Colorado families, institutions and businesses. Some of the services and publications available are discussed in detail in this booklet. If you have questions not answered here, call us at 866-2507.

The cover of this booklet, along with most of the illustrations throughout, are the work of Rob Pudim, a well-known Boulder artist. His editorial cartoons appear in dozens of newspapers throughout the west.

Pudim selected the character, "E.C., the energy conservation beaver," as the symbol of OEC's conservation programs partly because of the animal's role in Colorado history and partly because of its recognized skill in protecting its lodge against severe high-country winters. The beaver is nature's master weatherizer. The other reason, of course, is our belief that not even so serious a subject as energy conservation needs to be dull.

December, 1983



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# Introduction

The consumer who tries to make home energy decisions based on current headlines faces a bewildering task. After hearing for a decade that oil shortages would always be with us, a global "energy glut" suddenly dominated the news. Fuel prices actually dropped, substantially in some cases, something we were told would probably never happen.

Those events left questions and the questions have unavoidably extended to the subject of energy conservation. Confusion, skepticism and sometimes even cynicism have eroded the commitment to energy conservation.

The 1973 oil embargo and the fuel shortages of 1979 should have permanently altered the way we think about energy and the way we use it. The hard facts of those events are basically unchanged today, regardless of the headlines.

- The fossil fuels that provide most of our energy needs are limited. They will not last forever. The more carefully we use them, the longer they will last.
- The U.S. no longer controls either the supply or the price of oil-based commodities on which the nation depends.
- The cost of heating our homes, driving our cars and fueling the nation's industrial plants can only increase. Price reductions are likely to be temporary.

There is another fact unchanged since 1973: energy conservation pays, whether energy prices go up, down or remain stable. We are not powerless in the face of high or rising energy prices. There are steps we can take to save money by reducing our home energy use. The steps are simple, some even free. And often the same steps that save money and energy also increase our comfort. Conservation makes sense today and will make even more sense in the future.

The goal of this booklet is to show you ways to save money and energy. We can do little more than scratch the surface of the subject of energy conservation here. This booklet will give you some idea of what to expect in energy prices in the years ahead and suggest ways you can save the most energy with the smallest investment. It also lists some of the resources that are available to give you further assistance.

Chief among those resources are the conservation experts at the Colorado Office of Energy Conservation and at its Energy Extension Service offices around the state. These centers are listed on Page 00.





The OEC also has a wide range of publications available that will help you save energy, explore alternative and renewable energy sources, and take advantage of state and federal tax credits for energy-saving improvements. We also have consumer awareness literature that can steer you away from some of the more common pitfalls. In addition, the Public Service Company of Colorado has made available to the OEC its excellent series of energy conservation booklets. Each one deals with a specific area, such as insulation, energy saving appliances, caulking and weatherstripping. These booklets are well-illustrated, clearly written, and easily understood.

Included with this packet is a list of the publications we provide, along with a handy, postage-paid order form. Check off the publications you'd like to receive and return the form to us. We'll fill your order promptly.

*NOTE: Most of the publications are free, but a few are so costly to produce that we must charge for them. These are listed separately. If you select one of these publications, please include with your order a check payable to the Colorado Office of Energy Conservation.*

## Energy prices: Where from here?

Forecasting energy prices is an imprecise science at best. Four or five years ago, few would have guessed that a global recession and the effectiveness of energy conservation measures would produce oil surpluses and drive energy prices down. It's useful to keep this in mind as you review various projections: they are careful, expert guesses, but guesses all the same. An upheaval in the Middle East, or anything else that causes an interruption in the fuel supply, could drastically alter the forecast.

Natural gas prices for home heating in 1982 were about four times as high as in 1975. Electricity prices doubled in the same period. But Public Service Company of Colorado reports that its October 1, 1983, natural gas prices are **15 percent lower** than on October 1, 1982. Projections for gas and electric rates over the next decade, compared to anticipated inflation rates for the same period, look like this:

	<b>Inflation Projection</b>	<b>Gas Price Increases</b>	<b>Electric Price Increases</b>
1984	5%	4%	8%
1985	6%	3%	8%
1986	6%	5%	4%
1987-93	6%	5%	7%

The good news, if these projections prove to be accurate, is that the tremendous annual jumps in gas prices should ease for the next few years. Prices will increase, to be sure, but at a rate slightly less than the inflation rate. So if your income keeps pace with inflation, you will actually gain slightly on high natural gas prices, according to the projections. Electrical rates will probably rise slightly faster than the anticipated inflation rate.

The bad news is that if your utility bills were painful last winter, they are likely to be painful this winter too, unless you find some ways to cut your consumption of natural gas and electricity.



# Saving energy and money— where to begin

The idea of a new, super-insulated, earth-sheltered, solar-heated, wind or photovoltaic-powered space age "dwelling unit" is an appealing one. The appeal grows as utility bills grow and as alternative energy devices become more common, more dependable and more affordable.

Coloradans continue to be among the leaders in the use of renewable energy sources for their homes. One measure of that activity is the fact that Colorado now ranks third nationally in the production of solar heating equipment. Renewable energy is a vital weapon in the fight against energy's high costs and uncertain supplies. The Colorado Office of Energy Conservation is a major source of information for Colorado consumers who are exploring renewable energy sources for residential use and is actively involved in promoting such use. It makes good economic sense, good environmental sense and is very much in our selfish interest as well as in the national interest.

*If you are considering "going solar" for home space or hot water heating, or just wondering whether solar or wind energy is the right choice for your home, the OEC can help. We have a number of publications that will suggest some things to think about and things to avoid. Our major renewable resource publications are listed on the enclosed order form.*

## Not for everyone . . . yet

As exciting and as attractive as the new technologies are, the hard reality is that they are simply beyond the reach of many people. Most of us will have to meet the challenge of saving money and saving energy in conventional homes conventionally equipped. And we can do it. First, though, we have to avoid the trap of thinking that anything less spectacular than a solar dream home is somehow not worth doing, of thinking that our only other path to energy savings is to huddle in a heavy sweater and pray fervently for a warm winter.

Several points are worth remembering:

- Most of the nation's housing stock for the year 2000 is already built. That means most of us will be living in the homes we are in, or homes very much like them, for a long time to come. It's a costly error to think there is nothing we can do to turn them into reasonably energy-efficient places to live.
- The same conservation principles that apply to the energy-efficient dream home apply equally to the average Colorado home. The goal, regardless of the home you live in, is to be comfortable, use energy as efficiently as possible, keep the heat in and the cold out.
- The simple energy conservation steps **do** make a difference. **In fact, some of the least expensive conservation measures will save you the most energy and the most money.**

A good rule for your residential conservation program is to start with the least expensive measures—low-cost, no-cost steps— then move up the scale, weighing the returns in energy savings against the initial investment.



# Where does the energy go?

Nearly 20 percent of all the energy used in the United States is consumed in our homes. That's the 20 percent that concerns us here. On the average, here's where the home energy goes:\*

- Well over half the energy we use in our homes, **57.5 percent**, goes to keep our living spaces warm.
- The second biggest user in the average home is the water heater, claiming another **15.1 percent**.
- Tied at a distant third are cooking and refrigeration at **5.7 percent** each.
- Air conditioning takes another **3.6 percent** of home energy.
- Lighting consumes **3 percent**.
- Clothes drying accounts for **1.6 percent**.
- The balance, around **8 percent**, is used to operate radios, television sets, stereos and the dozens of appliances, tools and gadgets common in American homes.



\*Source: the Association of Home Appliance Manufacturers.

## The energy audit

How much of that home energy is used productively and how much is waste—energy we pay for, but energy that adds nothing at all to our comfort or convenience?

In the decade since Americans began to care about energy use, a lot of horrifying statistics have been circulated describing how much of our energy use is sheer waste. One of the most startling—and the more so because it has been verified in several studies—is the amount of energy that is wasted in the average American home: **around 50 percent**.

If these studies are accurate, we could be more comfortable, have just as much hot water and just as much convenience from our appliances—all for half the energy at half the price.

We have no simple bag of tricks that will allow you to cut your home energy costs down the middle. And none of us lives in the "average American home." The point is this: our homes and our home energy systems waste enormous amounts of energy. That waste can be identified and greatly reduced. Many of the steps to eliminate waste are inexpensive or free but still yield big savings. Some are no more complicated than making minor adjustments in the way we live and the way we use energy.



A home energy audit is the best tool for finding out how you use energy in your home, how you waste it and steps you can take to eliminate that waste. A number of Colorado utilities offer computerized home energy audits. The cost is \$15 and can be added to your utility bill. The audit will give you:

- An analysis of where waste occurs in your home;
- An evaluation of the amount of energy each of your major home appliances uses;
- A list of steps you can take at little or no cost to save energy and save money;
- A calculation of the likely energy savings from each conservation measure you implement;
- A list of other energy saving improvements you can make to your home, how much each will cost and how much each will save; and
- Additional information on conservation, solar energy, and state and federal tax credits that can help pay for your conservation improvements.

In addition to utility companies, there are private firms that specialize in energy audits. And you can perform your own simplified energy audit based on some of the tips contained in this booklet and other publications we can provide. An audit you perform yourself may not give you the detailed cost and savings data you'll get from a professional audit, but it will show you a surprising number of ways to save energy you now waste. It will also give you a methodical, step-by-step plan to follow in your conservation program.

## Where the heat goes

If the first rule for a sensible home energy conservation program is to start with the least expensive steps and work up, the second rule should be this one: Start tracking down energy thieves in the systems that use the most energy. The first targets should be the two uses that together account for nearly three-fourths of the energy used in the average home: keeping our living spaces comfortable and heating hot water. That's where the greatest waste usually is and where the biggest, cheapest and easiest savings can be found.



## Sealing the leaks

We all know our home heating systems are simply mindless machines that we control to make our lives more comfortable. Still, as winter



heating bills start coming in, it's easy to cringe when the furnace goes on and to start thinking of it as the monster that lives in the basement—the one with a will of its own that breathes heat and consumes money, your money, and more at every feeding.

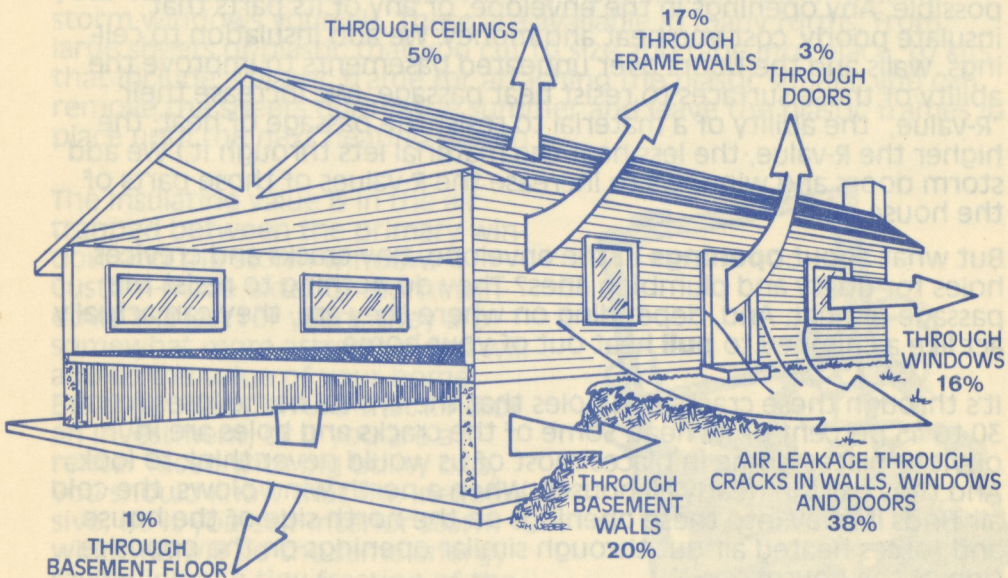


We often blame our furnaces when the more serious problem is a "leaky" house. Ordinarily, our furnaces only do what they have to do in response to the commands we give them when we turn up the thermostat. The more your house leaks cold air in and warm air out, the harder your furnace works to bring the house to a temperature at which you feel comfortable.

Most of us are at least vaguely aware that our houses let too much cold air in and too much warm air out and that if we can slow the rate of leakage, we can save money and energy. A common response to high heating bills is, "I've got to get storm windows and add some attic insulation."

Your house may well need storm windows and additional attic insulation, but there is usually a much more basic problem you should attend to first: caulking and weatherstripping, sealing the leaks.

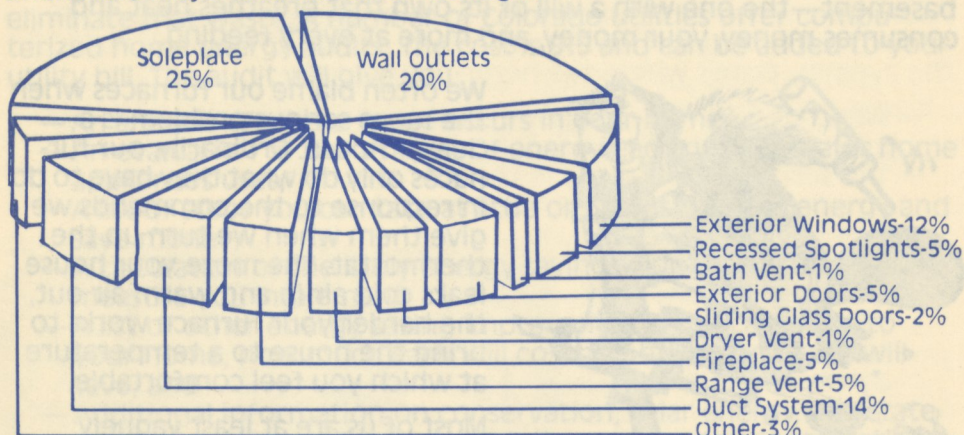
The following diagrams illustrate why that is so. The first shows the ways heat is lost through various parts of the house.



Exactly how much heat your house loses through the various parts of the structure depends on many things: whether it's insulated and how well, whether it has single or double-pane windows, whether it's been caulked and weatherstripped. Whether your house is a ranch-style, two story or a tri-level will also make a difference. But regardless of these variables, the single biggest source of heat loss in a



home is through air infiltration—air leakage. The following chart shows the major sources of air leakage.



Home energy conservation specialists have a favorite principle that is as depressing as it is unavoidable: heat always moves from warm to cold. And it gets there through what specialists call "the building envelope." This way of thinking about your home's heated space can help you to understand what happens to the expensive heat your furnace generates.

The envelope is nothing more than the major surfaces that enclose the part of your home that you heat and air condition. It's made up of the floors, walls and ceiling that separate you from the outside environment. And the goal is to make it as energy efficient as possible. Any openings in the envelope, or any of its parts that insulate poorly, cost you heat and money. We add insulation to ceilings, walls and the floors over unheated basements to improve the ability of those surfaces to resist heat passage. (We increase their "R-value," the ability of a material to resist the passage of heat; the higher the R-value, the less heat the material lets through it.) We add storm doors and windows to increase the R-values of those parts of the house.

But what about **openings** in the envelope, tiny cracks and crevices, holes for utility and plumbing lines? They do nothing to resist the passage of heat. And, depending on where they are, they can actually act like a chimney to **pull** heat out of your home.

It's through these cracks and holes that the typical home loses from 30 to 45 percent of its heat. Some of the cracks and holes are in obvious places, some in places most of us would never think to look. And they exist in nearly all houses. When a north wind blows, the cold air finds its way into these openings on the north side of the house and forces heated air out through similar openings on the opposite side of the house.

It may be hard to imagine that a crack so small you'd scarcely see it can let so much costly heat escape from your home. But a crack **one-sixteenth** of an inch wide around a window frame will leak as much air as a nine-square-inch opening, roughly the same as a fist-sized hole punched through your wall. Altogether, the leaks in a typical home add up to a hole in the wall that is from four to eight feet square.



## Caulking and Weatherstripping

Fortunately, the treatment for these sources of air infiltration and heat loss is inexpensive and simple. And nothing will pay the kind of dividends in energy savings and comfort that you can gain from a carefully caulked and weatherstripped house.

The general rule is to caulk or weatherstrip wherever two different surfaces meet on your house, where siding meets the foundation walls, along a chimney, where plumbing or electrical lines enter or leave your house, around doors and windows. If either of the surfaces moves, weatherstrip the point at which they meet; if neither moves, caulk it.

*Write for the caulking and weatherstripping packet listed on the attached publications order form. The illustrated guides will tell you where to look for the cracks and crevices that are costing you heat, which materials to buy for certain applications, the tools you will need and how to apply the caulking and weatherstripping.*

## Storm Windows

Once you've sealed the leaks in your home, the next place to look for major heat savings is storm windows. As we enter the heating season, we see the familiar ads claiming this or that storm window will "cut heat loss through your windows by 50 percent." Assuming the window is well-made and carefully installed so that it fits tightly and is sealed all the way around, the claim is true—of almost any storm window. But you can do the same thing—**cut heat loss through your windows in half**—by installing inexpensive interior plastic storm windows yourself. These are available in many forms, from large sheets of plastic that you cut to size and tape into place, to kits that include a plastic frame for attaching the plastic sheets; you can remove the sheets during the summer and leave the plastic frames in place until the next heating season.

The insulating value is in the air trapped between the primary window and the storm window. Custom-made exterior storm windows will last for years, they are somewhat more attractive and will add to the value of your home. But if you can't afford that kind of an investment, or if you are a renter faced with big utility bills, you should know that the inexpensive, do-it-yourself interior storm windows will do the same energy saving job at a tiny fraction of the cost.

None of this is to argue against expensive exterior storm windows. But if you have to choose between them and some other energy conservation steps, there are others that will return their cost in energy savings more quickly.





## Movable insulation

Another option to consider—again, once you've caulked and weatherstripped to plug the leaks—is "movable insulation" for your windows. Movable insulation is simply a way of covering the window opening inside the house with a good insulating material to prevent heat loss. The R-value of some of these window treatments greatly exceeds that of windows covered with storm windows.

Movable insulation can be as simple as a "window stuffer" you can make yourself for a few dollars with a rigid foam material, such as styrofoam or mattress foam, cut to fit tightly into the window opening. These can be removed when the sun is shining to allow you to gather the solar heat through your windows and replaced when the sun goes down. Window treatments can be as elaborate as insulated wooden shutters that hinge or slide into place and can cost as much as \$20 a square foot. In between is a variety of insulated shades to help cut down heat loss through your windows.

But, as with storm windows, the cheapest alternative will serve as well as the most expensive . . . providing it is properly fitted. The choice is between cost and convenience and attractiveness, not between cost and effectiveness.

*Write for the packet on doors, windows and window treatments. It contains information on R-values on various window treatments, including storm windows, easy instructions for making some of the simpler stormwindows and movable insulation, and advice on materials and installation.*

## The heating system

The energy conservation steps we've looked at so far are all designed to reduce your heating system's workload by plugging air leaks and reducing heat loss. The next step is to ensure that your heating system is working efficiently.



Many of the steps you should take to make your heating system as efficient as possible are the same steps you should take to ensure your heating system is safe. Having your heating equipment serviced by a reputable heating specialist before the heating season can serve both purposes: you can reduce your fuel bill by as much as 10 percent annually and prevent the discomfort and expense of equipment break-down during the winter. You will also satisfy yourself that the system is operating safely.

You might want to consider having some energy-saving adjustments made to the furnace at the same time. Improperly adjusted pilot lights consume much more gas than necessary. Some systems have settings on the blowers to ensure that as much warmth as possible is extracted from the air your furnace heats. If the blower comes on too long after the burner starts up—and goes off too soon after the burner shuts off—you are wasting heat.



A qualified serviceman can make the adjustment for you, clean the furnace and flue outlets, check belts for tension and wear, oil motor and fan bearings, and check the system's safety devices.

During the heating season, you can take several steps to ensure that your system is working at its peak efficiency:

- Check and change furnace filters regularly;
- Keep heat vents and cold air returns free of obstructions such as draperies and furniture;
- Vacuum radiators, baseboard heating units, and duct covers frequently; dust acts as an insulator and prevents the passage of heat into rooms.
- Examine your heating ducts yearly for leaks that allow expensive heat to escape to unheated parts of the house instead of flowing into the rooms you live in. Leaks can be sealed with a good quality duct tape. Ducts that pass through unheated areas should be insulated.

An energy audit or your heating contractor may be able to tell you whether your furnace is the right size for your house. Often, after older homes have been weatherized, the furnace is bigger than it needs to be. That wastes fuel and money. In some cases, burners can be replaced with smaller, more efficient ones.

*For more information, write for the heating system packet. It will explain your heating system, what its various parts are and how they work together, as well as some things you can do during the heating season to make sure the system continues to work safely and efficiently. The packet will also explain some of the new, energy-saving devices for heating systems, how they work and what you can expect to save with them.*



## Insulation

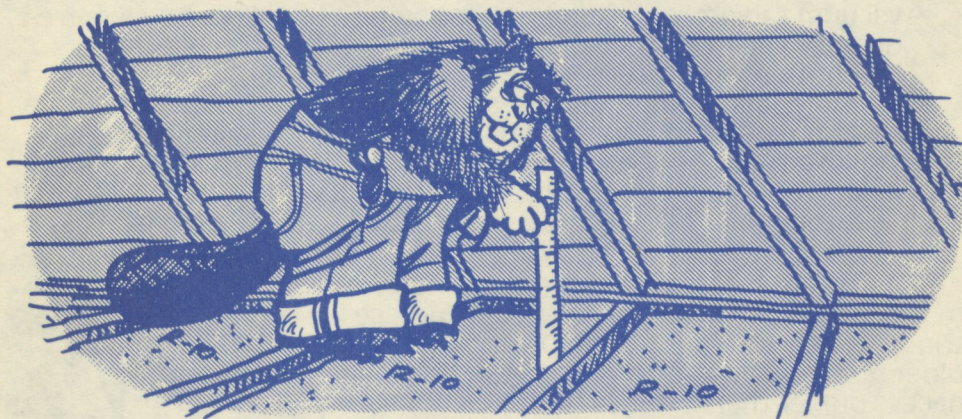
Perhaps because the insulation manufacturers have done such a good marketing job, insulation is the first thing that occurs to many of us when we seek ways to cut down energy costs at home. As we've seen, it usually isn't the most economical first step we can take. But after we've plugged the leaks, warmed up the windows and made sure the heating system is working as efficiently as it should, insulation is the next place to look for energy savings.

A major difference between insulation and the other conservation measures we've covered is cost. While there are price differences between insulation materials, none is cheap. For that reason, it's



often a mistake to simply assume you need more insulation. If your house was built during the past 10 years or so, you may already have adequate insulation. Or, there may be some insulation in the attic and you'll need only to add to it.

Check to see if your attic has adequate insulation or any at all. Measure its depth. If the insulating material is loose fill, rather than blankets or batts, measure a spot where the insulation seems to be at about an average depth. Then, determine what the material is.



The loose fill insulations, poured in between the ceiling joists, will be mineral wool, fiberglass or cellulose. (Cellulose looks like paper and is—paper treated with a fire retardant chemical.) The blanket material will likely be either mineral wool or fiberglass.

Each of these materials has a rated R-value per inch. In Denver's climate, the accepted attic insulation level is R-30. Find your insulation material on the chart below to determine its R-value, then multiply the R-value by the number of inches of insulation to get the total.

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<b>MATERIAL</b>	<b>R-VALUE PER INCH</b>
Loose fill	
Mineral wool	2.9
Fiber glass	2.2
Cellulose	3.7
Blanket and batt	
Mineral wool	3.1
Fiberglass	3.1

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If you have four inches of loose fill mineral wool in your attic now, the R-value is about R-12. You'll need to add another six inches or so to get to R-30. (If you can't identify the attic insulation material, but there's less than six inches of it, chances are you should add to it.) If there's no insulation, you'll need 10 inches or so to get to R-30.

Many Colorado municipal building codes require new homes to be insulated to a level of R-19 in the attic, R-11 in the walls. If you already have R-19 insulation in your attic, according to conservation specialists, you should think carefully before spending more money there. The energy savings return per additional dollar spent drops substantially from R-19 to R-30. There are probably better places to spend your conservation dollars. (A general rule for calculating the cost of attic insulation is one-and-a-half cents per square foot of attic space per R-value added.)

## Warming the floors

When you check for insulation, be sure to look at the floors over unheated basements or crawl spaces. A lot of cold air finds its way into homes through these areas. Fiberglass batts or blankets can be installed between the floor joists—in the case of crawl spaces, an unpleasant job but a simple one and well worth doing.

Before you decide whether to do your own insulation work or hire a contractor to do it, shop around. Conservation specialists report that you can contract for some insulation jobs as cheaply as you can buy the materials and install them yourself.

Either way, there's a number of precautions you should take. If you do it yourself, safety considerations are important—where you can safely step in the attic, how to insulate around recessed light fixtures and chimneys to avoid fire hazards, whether the insulation material itself is adequately treated for fire resistance, and when to use protective clothing and equipment.

If you contract to have the work done, select the contractor carefully. Get at least three bids or estimates in writing. Check with the Better Business Bureau and trade associations about the reputations of firms you are considering. Ask contractors for names of customers who can vouch for their work. Check with the local building inspector to determine if permits are required and what local standards and codes are recommended. Most contractors are reputable and conscientious; a few simple precautions can steer you away from the hand-ful who are not. **And get a contract.**

*All these steps and other important information on home insulation are spelled out in the insulation packet which includes the Office of Energy Conservation's consumer protection brochures. The insulation packet will also give you illustrated instructions on how and where to insulate, as well as the kind of materials you should use.*



## Hot water heaters

Next to space heating, heating hot water takes the biggest single bite out of the average family's energy budget—about 15 percent of the total.

In this major energy-consuming system, as with space heating, there are two routes to energy conservation: heating water as efficiently as possible and using hot water as wisely as possible.

### Touch that dial

Far and away, the easiest, cheapest and most productive step you can take is to make sure you are not paying to heat water to a temperature higher than you really need.



It's difficult to tell you how hot your water should be. Some families do nicely with water heated to around 120 degrees or even less; others want hotter water for dishwashers and other uses. The only rule is to set the temperature as low as you can and still have water hot enough to suit your needs.

On most hot water heater models, there is a dial on the lower half of the tank with settings of "low, medium, high" or "warm, normal, hot." These usually cover a temperature range from 100 degrees to about 160 degrees. Use a thermometer to tell you how hot your tap water is. Temperatures of 130 to 140 degrees Fahrenheit can cause scalding. If yours is in this range, you may be able to use the next lower setting on the dial.

Another conservation measure that can cut down on your water heating cost is to insulate the tank. But this measure is only really effective if your hot water heater is in an unheated or marginally heated space.

As heated water sits in the tank, heat escapes. The water cools, signaling the internal thermostat to turn on the gas or electricity to bring the tank water temperature back up to a preset level. And this occurs even if you aren't running hot water anywhere in the house.

If the water heater sits in a heated part of the house, the escaping heat contributes to the space heating and you benefit from it. But if it is in an unheated basement, for example, the heat escapes without doing you any good—though you still pay for it.

All water heaters are insulated and the newer models may have adequate insulation; older ones probably don't. You can slow heat loss and save energy by adding an additional layer of insulation. Insulation kits are available at hardware stores, lumber yards and energy conservation centers. They include instructions—some of them relate to safety, so read them carefully—and can be easily installed in a few minutes.



That same heat loss process occurs on a smaller scale through the pipes that run from your hot water heater to other parts of the house. Insulating the first few feet of these pipes as they leave the water heater can reduce heat loss and the amount of work your hot water heater has to do.

Drips from hot water taps can cost you energy and money. One drip a second amounts to 200 gallons a month. Showers use much less hot water than baths—on the average, only about 5 to 8 gallons per minute for a shower. And you can cut that to three gallons per minute or less by using a flow-restrictor in your shower head.

*For a free flow restrictor, plus additional information on your hot water heater, ways to make it more efficient and ways to use less hot water without sacrificing comfort or convenience, write for the hot water heater packet.*



## Energy tax credits

Because of the importance of energy conservation, the federal government and many state governments have enacted tax credits to help you offset the cost of energy conservation improvements to homes and businesses.

Colorado residents can take advantage of one of the highest energy tax credits in the country. The federal government offers a tax credit of 15 percent on the kinds of energy conservation improvements we've been discussing—insulation, storm doors and windows, and modifications to improve the energy efficiency of the heating system. The state offers a 20 percent conservation tax credit for such items.

For solar, wind and geothermal equipment, the federal tax credit is 40 percent and the Colorado credit is 30 percent. There are limits on the amount against which you may claim these tax credits, but it's possible to receive a combined state and federal tax credit of up to \$7,000 for solar, wind or geothermal equipment and \$700 in other energy conservation measures.

(Remember, tax credits are subtracted directly from taxes owed, not deducted from the amount on which taxes are paid. So a \$200 tax credit is worth \$200. And if your tax credit is greater than the amount you owe in taxes in a given year, the unused portion may be credited in future years.)

*For more detailed information, write for the tax credit package. It contains information on both residential and commercial tax credits and will give you an idea of the kinds of solar and other improvements that qualify. You can also contact the Colorado Department of Revenue, 839-5600, or the Internal Revenue Service in Denver, 825-7040, for more information.*



## How we live

Our own personal preferences, habits and needs are major determinants of how we use energy. No one can tell you how warm your house should be anymore than someone can tell you whether you are hot or cold. You should probably be suspicious of anyone who presumes to do either.

The way we live changes with time and circumstances. Some of the habits dating from the days of cheap and seemingly limitless fuel are already changing and new ones are appearing. But by and large, we are still a nation of people steeped in comfort and convenience. The extent of that comfort and convenience is a source of pride, one way we measure our way of life against that of other nations. At the same time we are a nation of people moving from one way of thinking about energy and energy problems to a new way of thinking about them. And we have moved more quickly than many economists dreamed possible in the wake of the oil shocks of the 1970s.

We may never again be a nation that wears woolen longjohns from fall until spring, but a lot of Americans who never wore sweaters before are wearing them routinely now instead of turning the heat up a few degrees. They save energy and money and don't sacrifice comfort or convenience. Here are some other lifestyle energy saving tips that work.

### Thermostat setbacks

Setting your thermostat back is one of those conservation measures that costs nothing and starts saving immediately. One source estimates that in Denver's climate, you can save seven percent of the energy you use during a heating season by setting your thermostat back five degrees for eight hours at night. The savings grow to 11 percent if you also set it back for eight hours during the day. A 10-degree setback at night will save 13 percent; 19 percent if it's set back for eight hours during the day as well.



There are several automatic setback thermostats on the market at prices ranging up to around \$100. They don't do anything you can't do yourself by remembering to turn the setting down before you go to bed, up again in the morning and down if you're away from home during the day. But automatic thermostats don't forget.





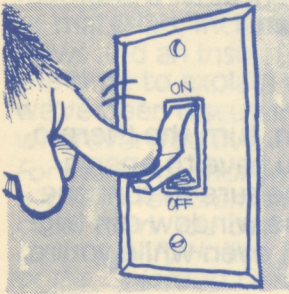
## Electric blankets

Electric blankets use very little energy and really can help you save. With an electric blanket on your bed, you can be very warm and still keep your



thermostat set back at night. Small electric heaters can save you energy if you use them to warm a small space instead of turning up your furnace. If you can warm your bathroom with an electric heater long enough to get ready for work, your thermostat can stay on its low overnight setting and you'll save money.

## Turn it off



Remember to switch off television sets, radios and stereo systems if you are not using them. The energy bill for these can add up. Don't run your dishwasher until it's full; two half-loads use twice the energy of one full load. Air dry the dishes rather than running the dishwasher through its energy-consuming drying cycle.

## Close it off

Close the damper on your fireplace when it's not in use. The same "chimney effect" that pulls smoke away from the fire will suck warm air out of your house. If your fireplace is designed mainly for esthetics rather than for energy-efficient heating, try to avoid burning it on very cold days. Unless your fireplace has an outside air supply, the fire will be supported by heated, inside air which will go out the flue along with the smoke. Some conservation experts argue that all but a handful of highly-engineered fireplace inserts with outside, cold-air supplies will always pull more heat out of your room than they put into it. If your fireplace has no damper, you might consider glass doors or some other way to seal it off.





Many families are finding they can conveniently close off unused rooms during the winter months instead of heating them. Be sure to close heat registers in unused rooms.

*For more on fireplaces, how and when to burn them and how to burn them as cleanly as possible, write for the fireplace and woodstove packet. NOTE: available with this packet is a handy calculation wheel for figuring how the price of the wood you burn for heat compares with the price of natural gas. The cost is \$1.00. Be sure to specify whether you want the calculation wheel along with the free packet and enclose a check or money order if you do.*

## Let it in

Don't forget to open curtains and drapes on south-facing windows on sunny days; it's the cheapest solar heating system around. Close them up tightly at night. North-facing windows cost you heat all winter long; leave them tightly covered as much as you can.

## Keep it in

If your home gets stuffy during the heating season, turn the thermostat back rather than opening a window. But if you have to open a window—especially one near your thermostat—be sure to turn the thermostat way down. If you don't, drafts from the window can trigger the thermostat, signaling the furnace for heat, even while you're trying to cool the house.

There are limits to how carefully you can use doors, but some tips are worth remembering. Be sure doors are not left ajar and that they are not used any more than they have to be. If you have an attached garage, keep the door closed to keep drafts off the wall of your house. And be sure to close the garage doors before opening the adjoining door into the house.





## Other OEC Services

The Colorado Office of Energy Conservation was established by Governor Richard D. Lamm in 1977 to promote energy conservation around the state. In addition to the general residential conservation information outlined in this booklet and solar and renewable energy resources, the OEC has a number of programs aimed at specific groups.

### The Low-Cost Weatherization Program

If you live on a low income, the high cost of energy can be particularly burdensome. The Low-Cost Weatherization program can provide assistance to qualified Coloradans by installing free weatherization materials in your home. Our trained staff will install up to \$100 worth of materials, including weatherstripping, caulking, plastic storm windows and an insulating water heater blanket. Installers will also take the time to explain ways you can save energy—the lifestyle ideas we've been discussing—that will continue to save you energy wherever you live.

*For more information about the Low-Cost Weatherization program and its eligibility requirements, write for the LCW packet using the attached order form. You can also call the Low-Income Energy Assistance Program (LIEAP) Hotline (toll-free) at 1-800-332-3322; in Denver call 394-2112 or the Colorado Office of Energy Conservation at 866-2507. You can also contact your department of social services for information on this program.*

### The Commercial Conservation Program

The Commercial Conservation Program reaches out to Colorado's business and industrial community with its specific and demanding energy needs. The OEC's commercial conservation specialists have worked closely with a number of Colorado industries in workshops and seminars to show them ways to cut their energy use and energy costs, often through low-cost or no-cost measures. Workshops to date have included sessions for the hotel-motel industry around the state, high-rise building owners and managers in the Denver area, dry cleaners, restaurants and meeting places and the Colorado farm and ranch industry.

*The OEC's Commercial Program may be able to help your business or industry. Write for the Commercial Program packet. It will include details of the program and information about state and federal tax credits available for commercial energy conservation. Or you can call the OEC in Denver at 866-2507.*



## The Institutional Conservation Program

In Colorado, the Office of Energy Conservation operates the Institutional Conservation Program (ICP), a federally-funded program to help public and private, non-profit institutions cut their energy costs.

The program provides funds, usually on a 50-50 matching basis, to help provide technical assistance to schools, hospitals, public care institutions and general purpose local governments. The program includes an energy audit to find no-cost or low-cost ways to cut a building's energy consumption, detailed technical help to develop and plan more extensive conservation measures and, for schools and hospitals, funds to implement the conservation measures.

*If you'd like more information on the Institutional Conservation Program, write for the ICP packet. It includes additional details of the program, a copy of the newsletter, EnergyMemo, designed to keep officials abreast of developments in the ICP program; and a series of case studies that look at the conservation steps some Colorado institutions have undertaken with help from the program. You can also call the OEC in Denver, 866-2507, for additional information.*





## **Colorado Energy Extension Service Centers**

The Colorado Energy Extension Service, part of the Office of Energy Conservation, operates a network of nine field offices around the state. Each is staffed by conservation experts with specialized knowledge and information about their areas. They distribute the full range of OEC publications, plus they have developed many in response to local needs and problems.

Each center offers workshops and seminars on a variety of topics and the staffs are always available for specific energy conservation questions and consumer information.

### **Energy Resource Center of the Pikes Peak Region**

617 South Nevada  
P.O. Box 267  
Colorado Springs, CO 80903  
636-2447

### **Denver Energy Resource Center**

Contract Station 6, Box 34  
1525 Sherman St.  
Denver, CO 80203  
722-0909

### **Pueblo Energy Resource Center**

101 North Union Ave.  
Pueblo, CO 81003  
545-7372

### **San Luis Valley Energy Center**

512 Ross Avenue  
Alamosa, CO 81101  
589-2233

### **Southwest Energy Center**

c/o La Plata Electric  
Bodo Industrial Park  
P.O. Box 1948  
45 Stewart  
Durango, CO 81301  
259-1659



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