ENERGY NOTES

Mobile Homeowner's Guide To Saving Money & Energy

How To Reduce Your Electric Bills In One Weekend

INTRODUCTION

Many mobile homes in Montana, especially those built before 1976, were constructed with little thought to energy efficiency. However, you can do a great deal to cut the energy loss in your home and keep more cash in your pocket. This fact sheet describes several easy and low-cost measures that may save you money on your electric bill now and for many years to come.

Close to 70 percent of all mobile homes in our region are never moved once they are placed on site. More than eight out of ten mobile home residents own rather than rent their homes. Therefore, the emphasis should be on the "home," and not on the "mobile," of mobile homes. It's where you and your family live, and you want your home to be a warm, comfortable and safe place.

Keeping your home environment warm and comfortable takes energy, which in Montana often means electric heat. However, the electric bill you pay each month may be higher than you would like. The primary reason for your high energy bills may be that much of your heating dollar is going to waste. The ideas presented in this fact sheet can help keep your electric bills as low as possible.

The actions you'll need to take, such as sealing air leaks, insulating your hot water heater, and checking your heating system, aren't difficult. So try to set aside one weekend in the near future to take care of them. You'll be surprised how much more comfortable your home will feel, and how much more reasonable your electric bills will be. But don't procrastinate. The longer you put it off, the more money you'll be spending on energy that isn't being used to keep your home comfortable.

Before You Start. . .
Make Sure Your Mobile Home Is Level!

Many of the following easy methods for reducing energy use will not be successful if your mobile home is not level on its foundation. Window and door openings may be misaligned, and other building materials in the mobile home may separate, allowing cold winter air to enter your home. Make sure your home is level before you do anything else.

How can you tell if your mobile home is level? You can get a good idea by using some of the following methods:

- Check to see if your door frames and window frames are crooked, or your doors and windows don't properly close.
- Run a string from one end of the mobile home to the other end at floor level, and then check to see if the mobile home sags beneath the taut string.
- Place a small ball on top of counters, tables, and dressers. If your mobile home isn't level, the ball may roll in the direction of the downward tilt.
- Place a bubble level on the floor (but don't be fooled by warped linoleum).

CAUTION: Although many of these energy-saving ideas may apply to homes not heated with electricity, some do not. Mobile homeowners who use natural gas, propane, or other fuel must follow other measures when insulating their water heater or adjusting their furnace. Contact your gas utility for more information on reducing energy costs if your mobile home uses a fuel other than electricity.

Leveling your mobile home probably isn't something you want to do yourself. It's difficult and dangerous. Unless you're experienced with 20-ton jacks and special pressure-treated wedges, it's best to hire a professional contractor. Ask fellow mobile home owners for recommendations of professionals who work on mobile home foundations, and get estimates from at least three contractors before picking one.

After you're sure your mobile home is level, many of the steps to energy savings are fairly simple. You'll need a few common tools and some supplies from the hardware or building supply store, but the results of your effort will be a much more comfortable home for you and your family.

STEP 1. Eliminate Air Leaks

The first thing you should do is plug the leaks that are letting heat escape. Even though the individual leaks may appear to be small, they do add up. If you could combine all of the cracks around the windows in your mobile home, the gaps where plumbing and electrical wires pass through the walls, the spaces between doors and thresholds, and other such openings, the combined area could easily be as large as an open window. This is especially true if your mobile home was built before the tougher 1976 energy codes were passed.

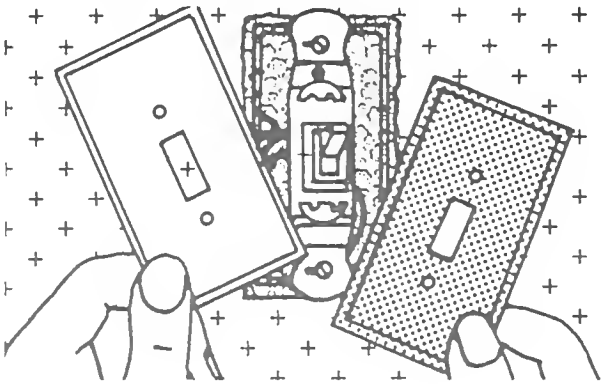
Plugging leaks in your mobile home is straightforward, but you have to know which leaks to plug first. If you simply caulk and weatherstrip the small cracks and gaps around your windows and doors, you probably won't save much energy. Studies on mobile home weatherization effectiveness have shown that you'll realize the largest energy savings by plugging the big leaks and gaps first. Here's where to find them:

- Repair any broken glass in your windows, as well as any large gaps in your mobile home that you can see daylight through.

- Check all of the areas around plumbing fixtures, behind your bathtub, behind washing machines, and beneath sinks. Also, check the area where the hot water pipes come into the mobile home if your hot water tank is located in an outside closet. If the holes surrounding the pipes are larger than necessary, stuff the gaps with fiberglass insulation. Then put a patch of paneling, wall board or plastic over the fiberglass stuffing, and caulk the patch into place for a tight seal. An expanding spray-foam caulk can also be used, especially in hard-to-reach places. It's easiest to find leaky spots during cold windy weather. You can use your hand to locate the cold incoming drafts, especially on the side of your mobile home facing the wind.

- Install insulating gaskets (available from hardware stores) behind all outlets and light switch plates. Do this by turning off the electricity at the circuit breaker, remove the wall outlet switch plate, place an insulating gasket behind the plate, and then reattach the plate and turn on the power. Also consider installing safety plugs in little-used outlets (such as behind your sofa). These plugs will help reduce air leakage through the outlet.

FIGURE 1: Installing Insulating Gaskets



- Look for small gaps around ceiling vents, light fixtures, and exhaust fans.

- If you have a double-wide mobile home, check the "marriage line" that joins the two halves. Caulk this area if you detect any leaks.

- Check for loose exterior panels and trim. Repair if necessary.

After you've repaired or sealed these large infiltration areas, go for the little ones. Caulk and weatherstrip any leaks around door and window frames. Be sure to choose a good quality acrylic latex caulk for the interior, but stick with a more elastic silicone caulk for the outdoor repairs.

Keep in mind that it's possible to make your mobile home too tight. If your mobile home is tightened too much, there may not be enough fresh air exchange. This can lead to respiratory problems and moisture and mildew formation. The main indicator that your mobile home is too tight is the presence of excessive moisture. Using exhaust fans in the bathroom during baths or showers will help, as will using exhaust fans over your kitchen stove when cooking (this is especially important for safety sake if you cook with natural gas).

STEP 2. Give your Heating System a Physical Exam

Since almost all of the electricity that enters the heating elements of an electric furnace is converted into heat, an electric furnace is said to be 100 percent efficient. But this doesn't mean that 100 percent of that energy is being used to keep your home warm and cozy. Much of the energy may be escaping from your heating system before it reaches your living area.

Heating systems are often subject to large losses due to duct leakage. This leakage can be responsible for up to 30 percent of home heating costs. Duct leakage rates tend to be much higher in mobile homes than in site-built homes, because ducts often separate during transport or due to movement on unstable foundations.

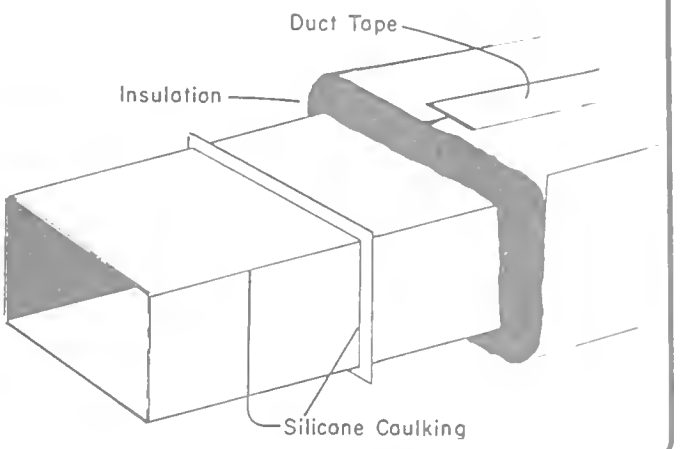
Look for leaks at all the joints in the ducts of your heating system. In older mobile homes the ductwork will often separate at these connections. Many of the leaks occur near the registers where the riser duct connects to the trunk duct. Some people believe that heat leaked out of the ducts under their mobile home eventually seeps into the mobile home, and therefore isn't really lost. But the truth is these leaks can be very costly, since the heat lost rarely gets into the living areas. To look for leaks and cracks, lift up the floor registers, then use a flashlight and look for cracks where the duct material meets the floor. These cracks can be easily caulked. Then look down the duct with a flashlight and small mirror. You may be able to get the best view by shining a flashlight down the main duct from the register at one end of the home and looking in with a mirror from a register at the other end. Look for joints in the sheet metal of the ducts and see if there are separated joints with open cracks.

Although it's slightly more difficult than sealing the obvious leaks, see if you can seal hidden cracks in the duct system. It's common for leaks to occur on the seams of the duct risers and where the riser attaches to the plenum.

Metal ducts can be sealed with silicone caulk, a latex putty that's combined with fabric reinforcement, or a special flexible tape that combines aluminum foil with butyl putty. This specially designed tape is generally available from a heating contractor. Normal duct tape is not appropriate for sealing leaks, since the adhesive will soon come loose.

After you've sealed all the duct leaks you can, you should apply duct insulation to all ducts located in unheated spaces. This may be difficult to do yourself if the ducts are inaccessible underneath your home—consider having a contractor do the job for you. Duct insulation is available in blankets one and two inches thick. Wrap the ducts in the insulating blanket and seal the joints of the insulation tightly with metalized or vinyl-backed duct tape made especially for this application. You can also have the "belly barrier" beneath your mobile home sealed, and then insulate the area containing the ducts between the belly barrier and the mobile home floor. This is typically accomplished by blowing in insulation. This step may require special tools and expertise to do properly—again consider hiring a specialist.

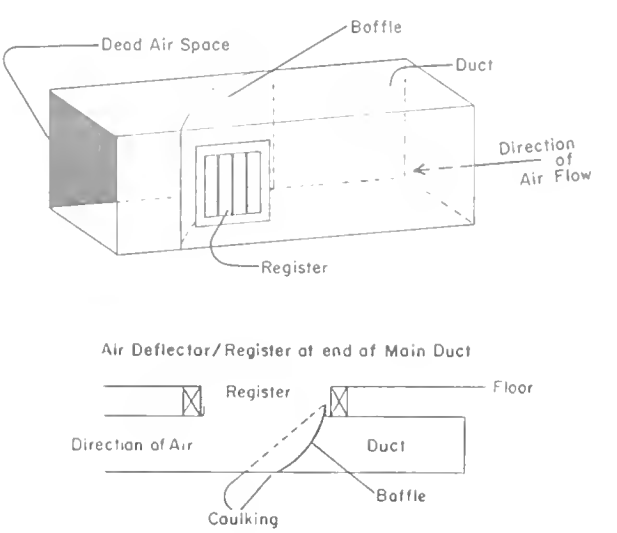
FIGURE 2: Insulating Your Ductwork



Installing Warm Air Deflectors

The last registers at either end of your mobile home can pose a special energy problem. These ducts may continue beyond the register, even though there are no more registers. It's possible that the end of this last section of duct is not capped or is very leaky. When the furnace fan runs, it may push air out the end of the duct, under the floor. If possible, you should try to seal the cracks and leaks in the end of the plenums, though this area is often inaccessible. However, you can add a curved deflector to push the air up through the register. To do this, first check inside the ducts at the end registers with a flashlight to see if the ducts continue beyond the registers. If they do continue on, cut a deflector out of a piece of thin sheet metal or other flexible material (even large coffee cans split down the side). Bend the deflectors in place beneath the register as shown in the diagram below. Use caulk, duct tape, or sheet metal screws to hold the deflector firmly in place.

FIGURE 3: Installing A Warm Air Deflector



Eliminate Air-Flow Obstructions

You might be surprised what can fall into air ducts. Shoes, children's toys, silverware, and other items can drop into uncovered grates and clog the ducts. Remove each grate and check inside with a flashlight for any obstructions.

The heating registers themselves can be a cause of restricted air flow. Check to see if the louvers on the register have been bent from furniture or foot traffic. The louvers can be bent back into position with needle-nosed pliers, or new registers can be purchased.

Clean the Furnace Air Filter Regularly

Check your electric furnace's air filters at least monthly, and clean or replace them if necessary. Clean air filters are essential to maintaining the best efficiency of your electric furnace.

Adjust the Temperature

The lower your thermostat setting in the winter, the more energy you will save. Try to keep your thermostat around 68 degrees in the daytime and 60 to 65 degrees at night. Consider installing a clock thermostat with automatic setback to do this daily adjustment for you. If you can't adjust to the lower temperatures, even after dressing warmly, then just try to keep the temperature as low as comfort will allow. You may find that doing the other weatherization measures listed here will make your mobile home more comfortable at lower temperatures than it was at higher temperature prior to reducing the air infiltration.

STEP 3. Keep Yourself in Hot Water

Heating your living space consumes the most energy, but heating the water in your hot water tank is usually the second largest energy user in your home. Completing the following simple conservation measures can easily help you save money on your water heating bills.

Insulate Your Hot Water Tank

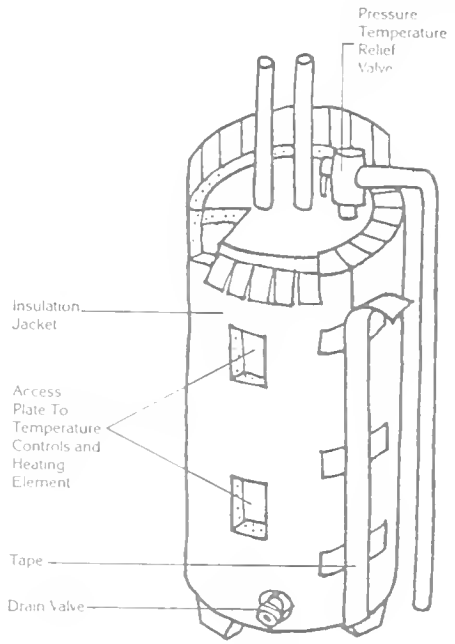
In a study of over 200 mobile homes, the Bonneville Power Administration found that the average homeowner saved $40.00 per year by insulating the water heater. That adds up to more than $200.00 savings over 5 years for a simple insulation project that costs less than $30.00 for materials. Insulating your hot water tank is one of the best ways to save energy on your heating bill.

Water heaters in mobile homes are often located in a small closet accessible from outdoors, and the air surrounding the heater can be almost as cold as the outside air. That means your water heater needs all the help it can get to stay warm when it's 20 degrees below zero in January.

Wrapping your water heater with an insulating blanket will help keep the water hot in your tank on even the coldest days. Water heater blankets are usually made of fiberglass insulation covered with a vinyl facing. You can purchase them in most hardware or building supply stores. When you wrap the tank with the blanket, be sure to tape all seams—usually wide strips of vinyl tape are supplied with the blanket. Be careful not to cover the access panels to the temperature controls, the drain or draw valve, and the pressure relief valve. You may have to cut openings in the blanket to allow the proper access.

Unlike gas water heaters, the top of an electric water heater can be completely covered with insulation.

FIGURE 4: Insulating Your Electric Water Heater



CAUTION-These instructions only apply to electrically-heated water tanks. The tops of gas water heaters must never be covered, nor should pilot lights or thermostat areas be insulated. Obtain more information from your gas utility before you insulate a gas water heater tank.

Insulate Your Water Pipes

Insulate all water pipes near the water heater. It is especially important to insulate the water heater pipes if the tank and pipes are located in an exterior closet. You can buy special foam pipe coverings from your hardware store. It may also be possible to wrap the pipes in the same insulation blanket as the water heater.

If the space holding your water heater is very small, you may be unable to install a water heating blanket. If this is the case, it's still a good idea to insulate the doors and the walls of the water heater closet.

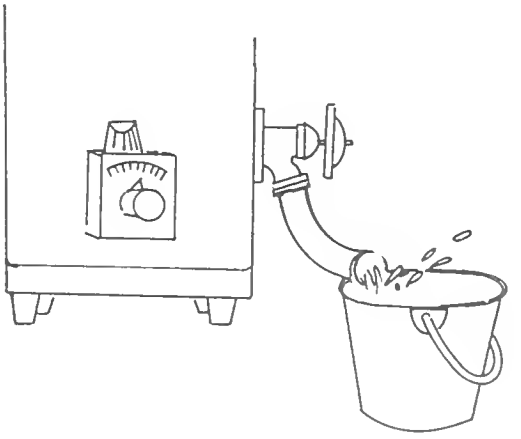
Insulate your Water Heater Closet

CAUTION-If your water heater is located in a small closet accessible from the outside, the heat given off from the water heater may be needed to keep the pipes from freezing. It is essential to insulate both the tank and all of the pipes of water systems located in outside closets. Insulate the door and walls of the closet too. If you are unable to insulate everything, do only the door and walls of the closet.

Flush the Sediment From Your Tank

It's a good idea to drain some water out of the bottom of your tank each month to remove mineral deposits and dirt. This can usually be done from the drain located near the bottom of the tank. You only need to drain about a bucketful of water each time. Attach a hose to the drain before you open it, and be careful not to get water on the floor of the water heater closet, since this could cause structural damage. You may have trouble closing the drain valve if sediment gets stuck in the valve. If this happens, keep flushing water through the valve until it is clear.

FIGURE 5: Draining Sediment From Your Hot Water Tank



Stop Water Leaks

A few drips of hot water leaking out of your plumbing fixtures may not seem important, but it's a big waste of energy. One drip a second from your faucet can waste 200 gallons of hot water a month. Water leaks not only waste energy, but they can also damage the walls, insulation, floors, and other components of your mobile home. Repair any leaks in your faucets and hot water pipes. You may need to call a plumber to handle some leaks if you're not comfortable doing the repairs yourself.

Lower the Hot Water Temperature

The hotter you keep your hot water, the more energy you'll use. Most people don't need hot water temperature much over 120 degrees. If you have an older model dishwasher, you may want to keep the temperature a little higher (about 130 degrees). Newer dishwasher usually have a water preheater, so you won't need to turn up the water temperature.

Here's how to lower your hot water temperature:

1. Turn off the electricity to the water heater at the fuse box or circuit breaker.

2. At the front of most electric water heaters there are one or two access panels that cover the temperature controls. Water heaters with two panels will have an upper and a lower panel. Unscrew and remove the access panels.

3. Carefully part the insulation so you can see the temperature dial.

4. Using a screwdriver, turn the indicator to the desired temperature setting. If there are two controls, turn the indicator to the same setting on each. Unfortunately, many water heater thermostats are inaccurate, so you should run your own test of the water heater temperature. First, wait for a day after you've adjusted the thermostat to allow the water heater to equilibrate. Then measure the water temperature at the faucet in your mobile home that's the furthest away from the water heater (a candy thermometer works well to get an accurate temperature reading). Then adjust the water heater thermostat if necessary until you get the proper temperature.

5. After the temperature is accurately adjusted, carefully replace the insulation as you originally found it and screw the access panels back on.

6. Turn on the electricity to the water heater.

Restrict the Flow of Hot Water

Install flow restrictors on all water faucets. You should also purchase "laminar low-flow shower heads" from your hardware store to use in your shower. Don't use the standard "aerator" shower heads, since they can add too much moisture to the air in your home. Before buying new shower heads, check to see if your utility offers free ones.

Other Steps to Take When You Have More Time

Even though the above measures will greatly help to reduce energy costs in your mobile home, there are several other measures that can save you even more money and energy. However, these measures may take

a little more time and money and may involve getting professional assistance.

- Install window films or rigid plastic storm windows on the interior of existing windows during the winter months. These products are usually available at hardware or building supply stores.

- Many types of cold air leaks are almost impossible to find yourself. Experts trained in mobile home weatherization may be your best bet to ensure your home is energy efficient. These specialists may use a "blower door," a device which actually tests the air-tightness of your home. They also have the skills to do difficult duct repairs and insulation. You'll need to evaluate whether the benefits of this service will justify the cost. See if your local utility has recommendations for weatherization professionals.

- Add insulation to the ceiling, floors, and walls. This will not only increase the R-value but will also help cut down on infiltration of cold air. It's best if you have professional installers do this work.

- If you're in the market for new appliances, look for new energy-efficient models, especially for your water heater. Conventional hot water tanks have an R-value of around 5, but new energy efficient models have an R-value of R-16 to R-20. The energy savings from a more efficient water heater should pay for the difference in higher price within a year or so. Energy efficient refrigerators, dishwashers, and electric furnaces also are available.

- Try rearranging your furniture, pulling sofas and chairs away from windows. If you are sitting near a window during the winter, you'll often feel colder than if your chair is near an inside wall or closer to the center of the living area.

- Consider using landscaping to reduce heating and cooling costs. Plant a windbreak of evergreen trees and shrubs on the north side of your mobile home to act as a windbreak in the winter. The south, east and west sides can be planted in deciduous trees that will provide shade in the summer while allowing solar energy through in the winter. Using other buildings, fences, or other manmade structures as windbreaks is also an option.

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