Did you know that the typical U.S. family spends close to $1,300 a year on their home's utility bills? Unfortunately, a large portion of that energy is wasted. The amount of energy wasted just through poorly insulated windows and doors is about as much energy as we get from the Alaskan pipeline each year. By using a few inexpensive energy-efficient measures, you can reduce your energy bills by 10% to 50% and, at the same time, help reduce air pollution.

The key to achieving these savings is a whole-house energy efficiency plan. To take a whole-house approach, view your home as an energy system with interdependent parts. For example, your heating system is not just a furnace – it's a heat-delivery system that starts at the furnace and delivers heat throughout your home using a network of ducts. Taking a whole-house approach to saving energy ensures that dollars you invest in energy efficiency are wisely spent.

Energy-efficient improvements not only make your home more comfortable, they can yield long-term financial rewards. Reduced operating costs more than make up for the higher price of energy-efficient appliances and improvements over their lifetimes. Improvements may also qualify you for an energy efficiency mortgage, which allows lenders to use a higher-than-normal debt-to-income ratio to calculate loan potential. In addition, your home will likely have a higher resale value.

This information shows you how easy it is to reduce your home energy use. It is a guide to easy, practical solutions for saving energy throughout your home, from the insulating system that surrounds it to the appliances and lights inside. Please, take a few moments to read the valuable tips on this Web site that will save you energy and money and, in many cases, help the environment by reducing pollution and conserving our natural resources.

The first step to taking a whole-house energy efficiency approach is to find out which parts of your house use the most energy. A home energy audit will show you where these are and suggest the most effective measures for reducing your energy costs. You can conduct a simple home energy audit yourself, you can contact your local utility, or you can call an independent energy auditor for a more comprehensive examination.

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INSULATION AND WEATHERIZATION

Checking your home's insulating system is one of the fastest and most cost-efficient ways to use a whole-house approach to reduce energy waste and maximize your energy dollars. A good insulating system includes a combination of products and construction techniques that provide a home with thermal performance, protect it against air infiltration and control moisture.

Insulation

Should I insulate my home? First, check the insulation in your attic, ceilings, exterior and basement walls, floors and crawl spaces to see if it meets the levels recommended for your area. Insulation is measured in R-values – the higher the R-value, the better your walls and roofs will resist the transfer of heat. The U.S. Department of Energy (DOE) recommends ranges of R-values based on local heating and cooling costs and climate conditions in different areas of the nation.

Although insulation can be made from a variety of materials, it usually comes in four types – batts, rolls, loose-fill and rigid foam boards. Each type is made to fit in a different part of your house. Batts are made to fit between the studs in your walls or between the joists of your ceilings or floors.

Weatherization

Warm air leaking into your home during the summer and out of your home during the winter can waste a substantial portion of your energy dollars. One of the quickest dollar-saving tasks you can do is caulk, seal and weather-strip all seams, cracks and openings to the outside. You can save 10% or more on your energy bill by reducing the air leaks in your home.

HEATING AND COOLING

Heating and cooling your home uses more energy and drains more energy dollars than any other system in your home. Typically, 44% of your utility bill goes for heating and cooling. No matter what kind of heating, ventilation and air-conditioning system you have in your house, you can save money and increase comfort by properly maintaining and upgrading your equipment. But remember, an energy-efficient furnace alone will not have as great an impact on your energy bills as using the whole-house approach. By combining proper equipment maintenance and upgrades with appropriate insulation, weatherization and thermostat settings, you can cut your energy bills and your pollution output in half.

Ducts

One of the most important systems in your home, though it's hidden beneath your feet and over your head, may be wasting a lot of your energy dollars. Your home's duct system, a branching network of tubes in the walls, floors and ceilings, carries the air from your home's furnace and central air conditioner to each room. Ducts are made of sheet metal, fiberglass or other materials.

Unfortunately, many duct systems are poorly insulated or not insulated properly. Ducts that leak heated air into unheated spaces can add hundreds of dollars a year to your heating and cooling bills. Insulating ducts that are in unconditioned spaces is usually very cost effective. If you are buying a new duct system, consider one that comes with insulation already installed.

Ducts – Out of Sight, Out of Mind. The unsealed ducts in your attics and crawl spaces lose air – uninsulated ducts lose heat, wasting energy and money.

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Sealing your ducts to prevent leaks is even more important if the ducts are located in an unconditioned area such as an attic or vented crawl space. If the supply ducts are leaking, heated or cooled air can be forced out unsealed joints and lost. In addition, unconditioned air can also be drawn into return ducts through unsealed joints. In the summer, hot attic air can be drawn in, increasing the load on the air conditioner. In the winter, your furnace will have to work longer to keep your house comfortable.

Heat Pumps

If you use electricity to heat your home, consider installing an energy-efficient heat pump system. Heat pumps are the most efficient form of electric heating in moderate climates, providing three times more heating than the equivalent amount of energy they consume in electricity. There are three types of heat pumps: air-to-air, water source and ground source. They collect heat from the air, water or ground outside your home and concentrate it for use inside. Heat pumps do double duty as a central air conditioner. They can also cool your home by collecting the heat inside your house and effectively pumping it outside. A heat pump can trim the amount of electricity you use for heating as much as 30% to 40%.

Look for the ENERGY STAR® label when buying a heat pump.

Solar Heating and Cooling

Using passive solar design techniques to heat and cool your home can be both environmentally friendly and cost effective. Passive solar heating techniques include placing larger, insulated windows on south-facing walls and locating thermal mass, such as a concrete slab floor or a heat-absorbing wall, close to the windows. In many cases, you can cut your heating costs by more than 50% compared to the cost of heating the same house that does not include passive solar design.

Fireplaces

When you cozy up next to a crackling fire on a cold winter day, you probably don't realize that your fireplace is one of the most inefficient heat sources you can possibly use. It literally sends your energy dollars right up the chimney along with volumes of warm air. A roaring fire can exhaust as much as 24,000 cubic feet of air per hour to the outside, which must be replaced by cold air coming into the house from the outside. Your heating system must warm up this air, which is then exhausted through your chimney. If you use your conventional fireplace while your central heating system is on, these tips can help reduce energy losses.

Gas and Oil Heating Systems

If you plan to buy a new heating system, ask your local utility or state energy office for information about the latest technologies available to consumers. They can advise you about more efficient systems on the market today. For example, many newer models incorporate designs for burners and heat exchangers that result in higher efficiencies during operation and reduce heat loss when the equipment is off. Check the Shopping Guide under Major Appliances for additional information on how to understand heating system ratings.

Look for the ENERGY STAR® and EnergyGuide labels.
Air Conditioners

It might surprise you to know that buying a bigger room air-conditioning unit won't necessarily make you feel more comfortable during the hot summer months. In fact, a room air conditioner that's too big for the area it is supposed to cool will perform less efficiently and less effectively than a smaller, properly sized unit. This is because room units work better if they run for relatively long periods of time than if they are continually, switching off and on. Longer run times allow air conditioners to maintain a more constant room temperature.

Sizing is equally important for central air-conditioning systems, which need to be sized by professionals. If you have a central air system in your home, set the fan to shut off at the same time as the cooling unit (compressor). In other words, don't use the system's central fan to provide circulation, but instead use circulating fans in individual rooms.

Programmable Thermostats

You can save as much as 10% a year on your heating and cooling bills by simply turning your thermostat back 10% to 15% for 8 hours. You can do this automatically without sacrificing comfort by installing an automatic setback or programmable thermostat.

WATER HEATING

Water heating is the third largest energy expense in your home. It typically accounts for about 14% of your utility bill.

There are four ways to cut your water heating bills: use less hot water, turn down the thermostat on your water heater, insulate your water heater, and buy a new, more efficient water heater. A family of four, each showering for 5 minutes a day, uses 700 gallons of water a week; this is enough for a 3-year supply of drinking water for one person. You can cut that amount in half simply by using low-flow aerating showerheads and faucets.

WINDOWS

Windows can be one of your home's most attractive features. Windows provide views, day lighting, ventilation and solar heating in the winter. Unfortunately, they can also account for 10% to 25% of your heating bill. During the summer, sunny windows make your air conditioner work two to three times harder. If you live in the Sun Belt, look into new solar control spectrally selective windows, which can cut the cooling load by more than half.

If your home has single-pane windows, as almost half of U.S. homes do, consider replacing them. New double-pane windows with high-performance glass (e.g., low-e or spectrally selective) are available on the market. In colder climates, select windows that are gas filled with low-emissivity (low-e) coatings on the glass to reduce heat loss. In warmer climates, select windows with spectrally selective coatings to reduce heat gain. If you are building a new home, you can offset some of the cost of installing more efficient windows because doing so allows you to buy smaller, less expensive heating and cooling equipment.

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LANDSCAPING

Landscaping is a natural and beautiful way to keep your home more comfortable and reduce your energy bills. In addition to adding aesthetic value and environmental quality to your home, a well-placed tree, shrub or vine can deliver effective shade, act as a windbreak and reduce overall energy bills.

Carefully positioned trees can save up to 25% of a typical household's energy for heating and cooling. Computer models from DOE predict that just three trees, properly placed around the house, can save an average household between $100 and $250 in heating and cooling energy costs annually. During the summer months, the most effective way to keep your home cool is to prevent the heat from building up in the first place. A primary source of heat buildup is sunlight absorbed by your home's roof, walls and windows. Landscaping can also help block and absorb the sun's energy to help decrease heat buildup in your home by providing shade and evaporative cooling.

Contact your county extension agents, public libraries, local nurseries, landscape architects, landscape contractors and state and local energy offices for additional information on energy-efficient landscaping and regional plants and their maintenance requirements.

LIGHTING

Increasing your lighting efficiency is one of the fastest ways to decrease your energy bills. If you replace 25% of your lights in high-use areas with fluorescents, you can save about 50% of your lighting energy bill.

Indoor Lighting

Use linear fluorescent and energy-efficient compact fluorescent lamps (CFLs) in fixtures throughout your home to provide high-quality and high-efficiency lighting. Fluorescent lamps are much more efficient than incandescent bulbs and last 6 to 10 times longer. Although fluorescent and compact fluorescent lamps are more expensive than incandescent bulbs, they pay for themselves by saving energy over their lifetime. Look for the ENERGY STAR® label when purchasing these products.

Outdoor Lighting

Many homeowners use outdoor lighting for decoration and security. When shopping for outdoor lights, you will find a variety of products, from low-voltage pathway lighting to high-pressure sodium floodlights. Many lights can be controlled with motion detectors, so they only turn on when they are needed.

APPLIANCES

Appliances account for about 20% of your household's energy consumption, with refrigerators and clothes dryers at the top of the consumption list.

When you’re shopping for appliances, you can think of two price tags. The first one covers the purchase price – think of it as a down payment. The second price tag is the cost of operating the appliance during its lifetime. You'll be paying on that second price tag every month with your utility bill for the next 10 to 20 years, depending on the appliance. Refrigerators last an average of
20 years; room air conditioners and dishwashers, about 10 years each; clothes washers, about 14 years.

What's the Real Cost?
Every appliance has two price tags – a purchase price and the operating cost.

When you do have to shop for a new appliance, look for the ENERGY STAR® label. ENERGY STAR® appliances have been identified by the U.S. Environmental Protection Agency and DOE as being the most energy-efficient products in their classes. They usually exceed minimum federal standards by a substantial amount. The appliance shopping guide lists some of the major appliances that carry the ENERGY STAR® label and provides helpful information on what to look for when shopping for an appliance.

To help you figure out whether an appliance is energy efficient, the federal government requires most appliances to display the bright yellow and black EnergyGuide label. Although these labels will not tell you which appliance is the most efficient, they will tell you the annual energy consumption and operating cost for each appliance so you can compare them yourself.

Dishwashers
Most of the energy used by a dishwasher is for water heating. The EnergyGuide label estimates how much power is needed per year to run the appliance and to heat the water based on the yearly cost of gas and electric water heating. When it is time to buy a new unit, look for the ENERGY STAR® label.

Refrigerators
Refrigerators with the freezer on top are more efficient than those with freezers on the side. The EnergyGuide label on new refrigerators will tell you how much electricity in kilowatt-hours (kWh) a particular model uses in one year. The smaller the number, the less energy the refrigerator uses and the less it will cost you to operate. In addition to the EnergyGuide label, don’t forget to look for the ENERGY STAR® label. A new refrigerator with an ENERGY STAR® label will save you between $35 and $70 a year compared to the models designed 15 years ago. This adds up to between $525 and $1,050 during the average 15-year life of the unit.

Laundry
About 80% to 85% of the energy used for washing clothes is for heating the water. There are two ways to reduce the amount of energy used for washing clothes – use less water and use cooler water. Unless you’re dealing with oily stains, the warm or cold water setting on your machine will generally do a good job of cleaning your clothes. Switching your temperature setting from hot to warm can cut a load’s energy use in half.

When shopping for a new washer, look for an ENERGY STAR® machine. These machines may cost more to buy but uses about a third of the energy and less water than typical machines. You’ll also save more on clothes drying, because most remove more water from your clothes during the spin cycle. Look for the ENERGY STAR® label (How to Read the EnergyGuide Label).

When shopping for a new clothes dryer, look for one with a moisture sensor that automatically shuts off the machine when your clothes are dry. Not only will this save energy, it will save wear and tear on your clothes caused by over-drying. Keep in mind that gas dryers are less expensive to operate than electric dryers. The cost of drying a typical load of laundry in an electric dryer is 30 to 40 cents compared to 15 to 25 cents in a gas dryer.

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