HOMEOWNER'S ENHANCEMENT GUIDE

Chapter 9: Going Green: Save Energy, Water, and Money!

WHAT DOES IT MEAN TO BE GREEN?

Being green is about considering the impact you have on the environment. Recycling soda cans and plastic water bottles is a good start. There are also various simple projects you can complete around your house that will help reduce the energy and water you use and lower your utility bills. Using natural products and materials can also have health benefits. And when the time comes to sell your "green" house, you may be able to ask a higher price if it is more energy efficient than your neighbors.

FOR INFORMATION ON FEDERAL ENERGY EFFICIENCY TAX CREDITS VISIT:

www.energystar.gov/index.cfm?c=tax_credits.tx_index

You'll also here the word "sustainability" talked about. This means considering whether products are made from renewable raw materials and the amount of energy used to manufacturer and transport them to a store near you. The goal of sustainability is to provide what we need for living today without compromising what is available to future generations.

ESTABLISH A RECYCLING CENTER AT HOME

By sorting household recyclables by type:

- glass bottles and jars
- metal cans and foil products
- #1 or #2 plastic bottles
- newspapers and mixed paper

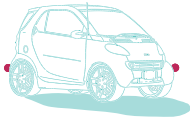
You'll be ready for curbside pick-up or occasional drop-off at one of the Henrico County Recycling Centers.

FIND YOUR CLOSEST RECYCLING CENTER:

www.henrico.us/utility/solidwaste/recycling.html

REDUCE, REUSE, RECYCLE

1. **Buy materials that are**
   - non-toxic
   - renewable
   - durable
   - have recycled content
   - clean, non-polluting
   - abundant
   - natural
   - locally grown or manufactured
2. **Select products and materials that are**
   - energy efficient
   - take advantage of natural sources of energy
3. **Choose quality products that**
   - will last longer and reduce the need to replace
   - work better and need less maintenance and new parts
4. **Look for previously owned products rather than buying new. Donate or recycle products for which you no longer have a need.**
5. **Keep it local**
   - help reduce the energy consumed in transportation
   - contribute to local economy



WHERE IS THE MONEY GOING?

HOME ENERGY AUDIT

While professional home energy audits are available, they are not free. By conducting your own, and using online resources, you can save enough money to fix the leaks you find and start reaping the benefits of a more efficient home.

HOW TO FIND LEAKS

Professional energy audits use a blower door to depressurize your house and check for air leaks. You can approximate this by following the steps below during months when it is noticeably cooler outside than inside:

1. Close windows, exterior doors, and fireplace flues.
2. Turn off combustion appliances such as gas furnaces and water heaters.
3. Turn on all exhaust fans (kitchen and bathroom) or use a large window fan to move air out of rooms.
4. Using a damp hand, follow "Where To Look for Leaks" to detect the movement of cool air which will alert you to the location of leaks.

WHAT TO DO WHEN YOU FIND LEAKS

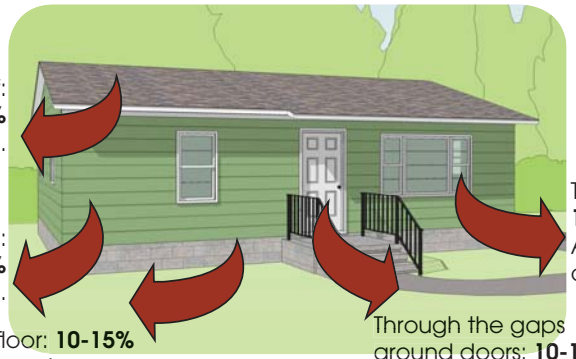
A Do-It-Yourself Guide to Sealing and Insulating @
www.energystar.gov/index.cfm?c=diy.diy_index

WHERE TO LOOK FOR LEAKS

Once you've sealed your house following "How To Find Leaks" check these locations for the infiltration of cool air from outside.

1. Holes in walls for plumbing pipes
2. Gaps around the chimney at the roof
3. Recessed lights between heated and unheated spaces
4. Inside cupboards and closets
5. Electrical outlets and switch plates
6. Window frames and base boards
7. Windows and doors
8. Attic hatches and fans
9. Window air-conditioning units

IF YOU HAVE AIR LEAKS, HERE'S WHERE YOUR MONEY IS GOING AND WHAT YOU CAN DO ABOUT IT:



Through the roof: **30-40%** Add insulation.

Through the walls: **20-30%** Add wall insulation.

Through the floor: **10-15%** Insulate crawl space.

Through the windows: **10-15%** Add weatherstripping and storm windows.

Through the gaps around doors: **10-15%** Add weatherstripping and storm doors.

WHERE IS THE MONEY GOING?, continued

EXTERIOR HOUSE ELEMENTS

Almost every choice you can make about the exterior of your house now has a green option. These suggestions can help cut down on summer cooling costs:

- consider reflective roof materials to reduce heat gain
- pick light colors for painted exterior walls
- mount shutters on hinges so they can be closed to block sun and wind
- add trees or a porch to shade the house in summer

INCREASE YOUR INSULATION AND SAVE 20-30% ON HEATING AND COOLING

1. Add insulation in walls, floors, ceiling, and crawlspaces. The higher the R-value listed on the product, the more energy savings. Recommended ranges for the R-value of insulation in Henrico County are:
   - Attic: 38-60
   - Wall Cavity: 19-21
   - Floor: 19-38
   - Basement Wall: 13-19
   - Crawl Space Wall: 19-30

CAULKING AND WEATHERSTRIPPING CAN SAVE 5-30% OF YOUR ENERGY COSTS

1. Weatherstrip between doors and windows and their frames to prevent drafts and air leaks.
2. Use rubber gaskets behind outlets and switch plates on exterior walls.

MYTH:

Replacing old windows with new double glazed windows will result in enormous savings as windows and doors are the primary source of home air leakage.

TRUTH:

Only 15% of air leakage is through windows. An existing single-glazed window with a storm window provides roughly the same sealing as a new double-glazed window and costs a lot less.

EXISTING WINDOW FIXES:

- **SASH LOCK**
  Use to increase the seal between the upper and lower sash and reduce air leakage.
- **WEATHER-STRIPPING**
  Add to your existing windows and increase their efficiency by up to 50%.
- **INTERIOR OR EXTERIOR STORM WINDOWS**
  Use with your existing windows rather than replacing your windows. Storm windows can reduce heating and cooling costs by up to 30%.

  Avoid installing storm windows or doors with an unpainted metal finish. Purchase units that are the color of your trim or paint them to match.
- **HIRE A LOCAL CONTRACTOR**
  To fix existing windows and keep the money in Henrico County.

Department of Energy's Insulation Fact Sheet

www.ornl.gov/sci/roofs+walls/insulation/ins_07.html

OUT WITH THE OLD, IN WITH THE NEW - WINDOWS THAT IS

BENEFITS OF REPLACEMENT WINDOWS

1. Energy Efficiency

EnergyStar windows can save Henrico homeowners an average of $497 dollars in utility bills when replacing the house's single-pane windows.
(According to the EnergyStar website)

2. Maintenance

Many replacement window options are constructed of weather-resistant materials reducing or eliminating the need to paint! Options for tilt-in and rotating windows simplify window cleaning.

3. Change in Design

Update the look of your house by changing the number or orientation of the panes without changing the size of the opening.

4. Added Value

Replacement windows can be one of the best home improvement projects when it comes to the return on your investment. Enhancing the curb appeal of your home can set it apart from others in the neighborhood when it comes time to sell.

5. Reduce Noise Pollution

The thicker the glass and the more room between panes, the quieter your house will be.

WHAT TO LOOK FOR

- Pick replacement windows that have a low-e coating. This means that the glass is coated with thin layers of metal that reflect solar heat from the outside in the summer and help heat your home in the winter.
- Look for windows that have two layers of glass with an inert gas- or air-filled gap between the glass that acts as insulation.
- A standard double-pane window still allows 75% of the sun's heat into your home. EnergyStar windows reduce heat gain, keeping you cooler in the summer and warmer in the winter.
- Choose windows with warm edge spacers – the spacers between the two panes of glass are typically aluminum. Look for steel, foam, or fiberglass to further reduce heat transfer.
- Windows are rated by U-factor: look for units with a rating of .30 or less for maximum energy efficiency.

COST

The price range for a standard 30" by 48" vinyl window is usually between $150 and $500 depending on features, with an additional cost for installation.

1. Sash Replacement

The most affordable option, this requires that the frame is in good condition, and involves just the replacement of the operable part of the window, leaving the original frame visible.

2. Panning of Frame

To get the look of a completely new window without the demolition involved in a complete tear-out, the operable part of window is removed, but the frame is kept and covered with a material to match the new window.

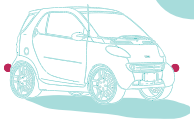
3. Complete Tear-out

With this option the window, frame and sash are removed. Because it involves disturbing walls it has the highest associated cost.

FINDING A NEW HOME FOR YOUR OLD WINDOWS

Check with local architectural salvage companies or the Richmond Metropolitan Habitat for Humanity ReStore for their guidelines on donations of salvaged windows and other building materials.

www.richmondhabitat.org/restore.html



WHERE IS THE MONEY GOING?, continued

LIGHTING

Turn off lights when not in use. This can cut 10% of your electricity costs.

Replace the most frequently used bulbs with compact florescent lights (CFL). Although they cost more, each light lasts 10 times longer than an incandescent bulb and can save you $30 in electricity over its lifetime.

COMPUTERS AND ELECTRONICS

Set your computer to power down or "sleep" after 20 minutes of inactivity.

Plug electronic devices, appliances with an adaptor, and lights into a power strip that can be switched off when not in use. Many home electronics and appliances use electricity when they are turned off (phantom load), accounting for up to 40% of all household electricity usage.

TO FIND OUT YOUR CURRENT ENERGY USAGE

www.energystar.gov/index.cfm?fuseaction=HOME_ENERGY_YARDSTICK.showGetStarted

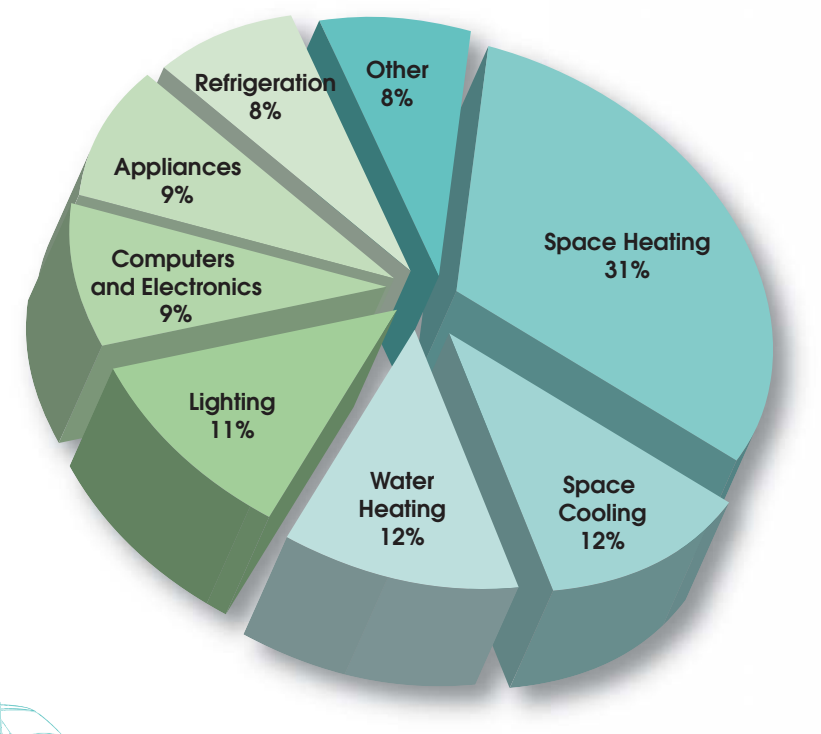
MYTH:

Money can be saved by not turning florescent lights on and off.

TRUTH:

Little energy is used to turn florescent lights on and they should be turned off if not needed.

BREAKDOWN OF TYPICAL HOUSEHOLD ENERGY USE

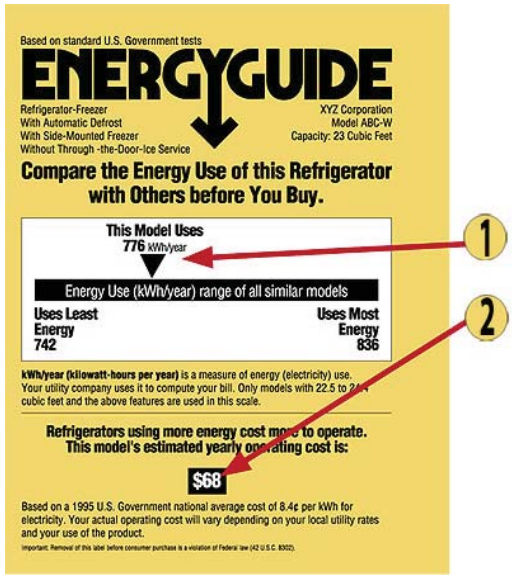


MYTH:

Warm water rinsing of clothes and dishes is more effective than cold water.

TRUTH:

Clothes and dishes get just as clean with a cold water rinse.



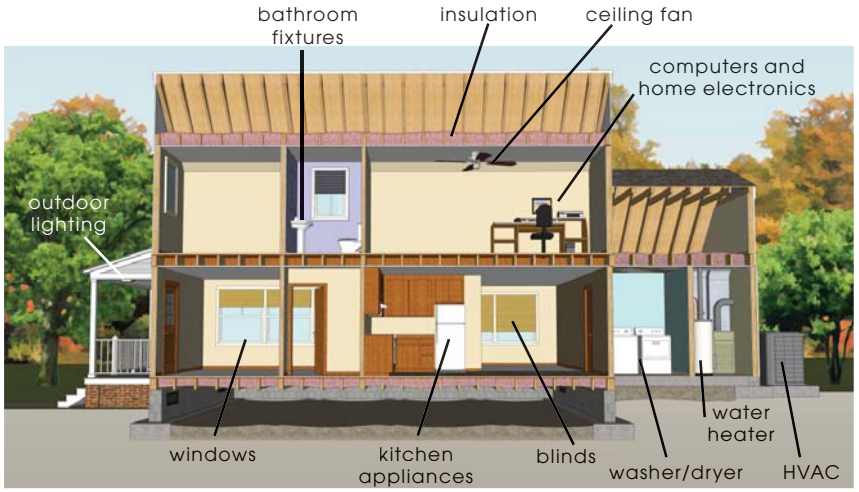
Use the EnergyGuide label to help in comparison shopping between different models of new appliances. The further to the left the triangle in the white box is, the less energy the appliance uses. The black box below shows the annual energy cost for that model.

APPLIANCES	
SAVE	Unplug your second refrigerator and save $150 a year.
SAVE	Set your hot water heater to 120 degrees. Water heating accounts for 12% of the average utility bill. Each 10 degree reduction saves 3-5% in energy costs. The lower temperature also reduces mineral build up, corrosion, and possible scalding.
COST $0	Run the dishwasher, clothes washer, and dryer only when full and use the energy saving setting.
$0	Dry clothes on a clothesline.
$	An insulating blanket for your water heater can pay for itself in one year.
$$	Consider an ENERGY STAR-rated replacement if your water heater is over 7 years old. Tankless water heaters reduce energy consumption by heating water on demand rather than using energy to keep previously heated water hot.
$$-$$$	Replace dishwashers and clothes washers built before 1994 with ENERGY STAR models. A new clothes washer can save more than $100 in electricity annually and 20 gallons of water for each load. Using cold water can save an additional $60.
$$$	Replace your refrigerator with an ENERGY STAR rated unit if it was built prior to 1990. Refrigerators account for up to 10% of home energy use. Those built before 1990 use two to three times more energy than new models.

WHERE IS THE MONEY GOING?, continued

HEATING AND COOLING

SAVE	Reduce heating bills by opening blinds and curtains on the south side of your house to let the sun provide no-cost heat.
SAVE	Reduce cooling bills in the summer by closing curtains and blinds on the southwest side of the house to prevent heat gain.
SAVE	Close your fireplace damper when not in use to prevent air leakage. An exception to this is in the spring, when your damper can be used to ventilate your house without the need for air-conditioning.
COST $	Use a programmable thermostat. Programmed properly, these devices can save 10% a year on heating and cooling costs. Winter - set to 68 degrees when you are home, lower at night and 55 degrees if you are away for more than 4 hours. Summer – set to 78 degrees when you are home and 85 degrees when you are away for 4 hours or more.
$	Properly seal ducts, especially those in unheated or uncooled spaces. Leaks in ducts can significantly reduce system efficiency.
$-$$	Install a ceiling fan to make a room seem 5% cooler. Look for ceiling fan/light combinations with the EnergyStar label They are up to 50% more energy efficient than older models.
$$$	If you need to replace your heating system, choose the highest efficiency model you can afford. New units are more efficient so make sure you don't get a larger unit than you need.



The graphic above shows a number of areas in your house where you can make energy and water efficiency upgrades.

MYTH:

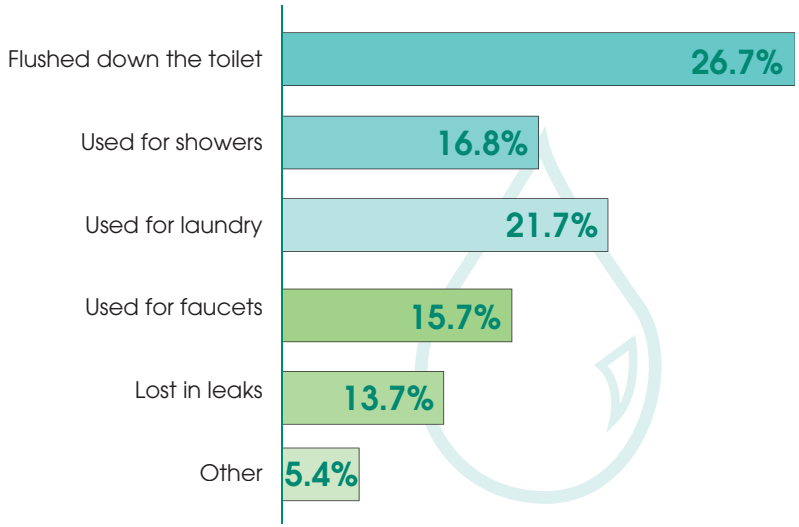
- Turning down the thermostat at night and when you are gone results in higher costs from the need to reheat the house.
- Running the air conditioning all the time is more efficient than shutting it off until needed.

TRUTH:

- Unless you use a heat pump, you will save money by turning the heat down when it is not needed.
- You save energy by not running the air conditioner.

AVERAGE U. S. HOUSEHOLD WATER USAGE

The average U.S. household uses 146,000 gallons of water per year.



WATER EFFICIENCY - WHAT TO DO FIRST?

The most cost efficient options are eliminating leaks in toilets and replacing toilets that are not low-flow models.

Look for this label when buying a new faucet and you may save enough water annually to do 14 loads of laundry.

EPA WaterSense

WATER - INDOORS AND OUTDOORS

Try the water leakage test

- Shut off all water fixtures in the house.
- Read the meter at the street.
- Check the meter after 20 minutes.
- House is leak-free if meter has not moved.

CONSERVE WATER

SAVE	**Take shorter showers.** Each extra minute in the shower uses 5-10 gallons of water.
SAVE	**Turn off** the water when you brush your teeth, clean vegetables, wash dishes.
SAVE	**Use a broom,** rather than a hose, to clean paved surfaces.
SAVE	**Reduce** the amount of water your toilet uses per flush. Add two plastic bottles weighted with sand or pebbles to your toilet tank.
COST $	**Fix leaky faucets.** A slow drip can waste almost 50 gallons of water a week.
$	**Install low-flow showerheads and faucet aerators.** These modifications can save 25-60% of your water consumption in these locations and the energy cost of heating that water.
$	**Check your toilet for leaks.** A leaky toilet can waste 100 gallons of water a day. To test, add a little food coloring to the toilet tank. If you begin to see color in the bowl without flushing, you have a leak and need to adjust or replace the flush valve.
$	**Fix leaks** in hoses, faucets, and couplings.
$$	**Replace** your old toilet with a new, low-flow model.

ADDING ON - THE GREEN WAY

1. If possible, site the addition to take advantage of natural light. Use south facing windows which allow the sun to help heat the addition in winter and lead to lower heating bills (passive solar).
2. Plant deciduous trees and/or install awnings to help shade the addition in summer.
3. Take advantage of natural ventilation.
4. Install operable windows on the east and west sides to provide cross ventilation.
5. Consider transoms above doors that can be opened for additional ventilation.
6. Use a whole-house fan and ceiling fans to provide additional air flow.

The samples above are tongue-and-groove bamboo flooring. It takes as little as three years from planting for bamboo to mature. This compares with decades for most hardwoods and up to 120 years for oak.

LOOK FOR THESE GREEN MATERIALS

- **Counters**
  Green choices for countertops include concrete, native stone, glass tiles, and renewable wood products.
- **Flooring**
  Consider bamboo instead of traditional hardwood floors. Choose woods that are certified and come from responsibly managed forests. The Forest Stewardship Council provides one such certification. Choose natural fiber carpet or a synthetic that has a high recycled content.
- **Paint**
  Look for the Green Seal logo to know that you are purchasing paints that are non-toxic and have low volatile organic compounds (VOCs are a leading source of pollutants).
- **Solar**
  If you are planning to replace your roof and a large part of it faces south, look at the new options for solar shingles and panels. While there is a large initial cost, they could pay for themselves in 5 - 7 years.

Visit the U.S. Green Building Council's Green Home Guide
www.greenhomeguide.org/