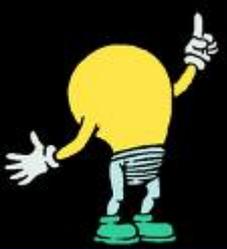


ENERGY SAVINGS FOR HOMEOWNERS

*Department of Cable Communications
and Consumer Protection*
Fairfax County, Virginia
November 2009





A Very Brief Refresher

- The rate of electrical use (power) at any moment is measured in **watts**
 - One 100-watt light bulb uses 100 watts
- A **watt-hour** (Wh) measures the amount of watts used over a one-hour period (time)
 - One 100-watt light bulb used for one hour = 100 Wh
- Electric utilities measure and bill electricity consumption in **kilowatt hours** (kWh)
 - One 100-watt light bulb used for 10 hours = 1,000 Wh = 1 kWh
- The average Virginia residential customer consumes about 1,200 kWh per month

Electric Energy Costs

Virginians have enjoyed low electric rates . . .

U.S. Average Residential Monthly Bill – 2007

Census Division State	Number of Consumers	Average Monthly Consumption (kWh)	Average Retail Price (cents/kWh)	Average Monthly Bill
South Atlantic	25,336,801	1,156	10.03	\$115.95
DC	212,389	773	11.18	\$86.42
DE	387,923	960	13.16	\$126.40
FL	8,445,561	1,163	11.22	\$130.47
GA	4,001,957	1,171	9.10	\$106.48
MD	2,163,625	1,086	11.89	\$129.15
NC	4,090,510	1,143	9.40	\$107.38
SC	2,035,713	1,210	9.19	\$111.20
VA	3,319,055	1,207	8.74	\$105.55
WV	860,068	1,138	6.73	\$76.63
U.S. Total	123,949,916	936	10.65	\$99.70

U.S. Department of Energy – Energy Information Administration (DOE/EIA)

Electric Energy Costs

But electric rates are set to rise:

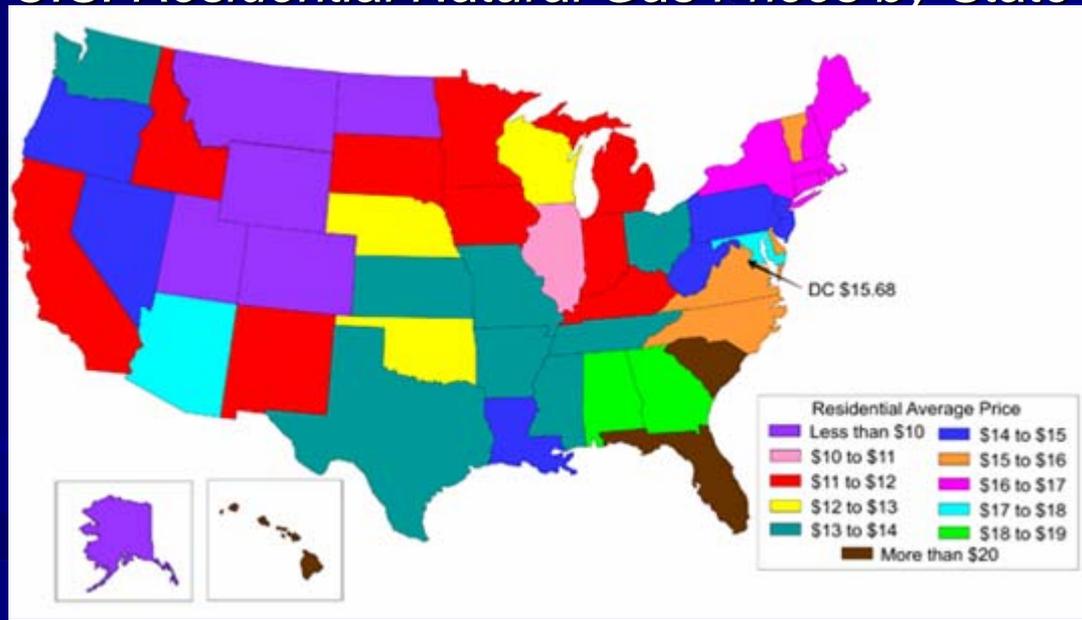
- Recent state legislation passes on more costs to customers of Dominion Virginia Power
 - New add-on “rate adjustment clauses”
 - New financial incentives to reward utility performance
- Fuel costs are volatile, and likely to rise as economic activity increases
- New costs on the horizon
 - Generation and transmission infrastructure
 - Carbon emissions

Natural Gas Energy Costs

Virginia is a higher-cost area for natural gas

- Residential consumers along the Atlantic Coast tend to pay the most for natural gas

U.S. Residential Natural Gas Prices by State - 2007

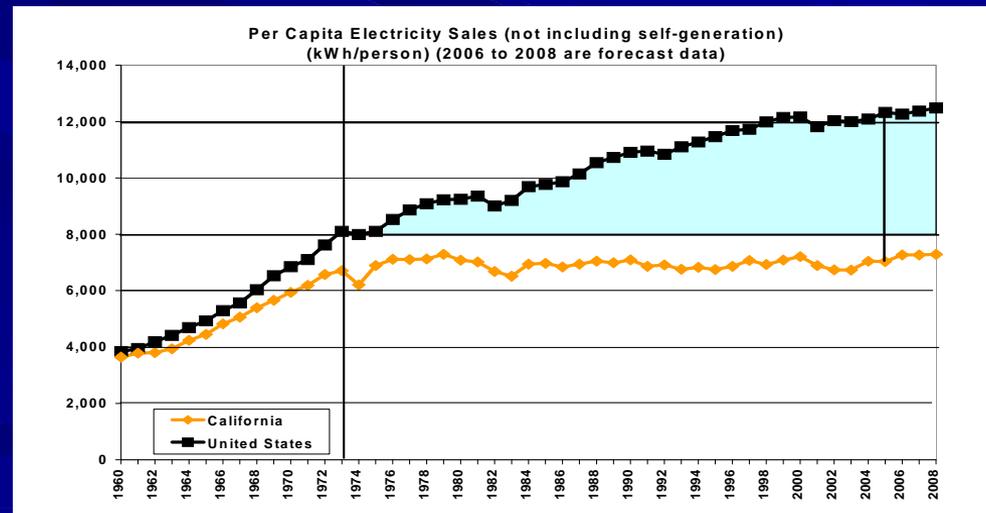


Lowering Your Energy Costs

- Saving energy saves money directly
- Two key approaches:
 - *Conservation* – “using less energy” – is the no-cost option
 - Example: turn off lights in an empty room
 - *Energy efficiency* – “using energy more efficiently” – can be a low-cost option
 - Wide range of opportunities, including caulking and weatherization, heating and/or cooling improvements, and appliance upgrades

Lowering Your Energy Costs

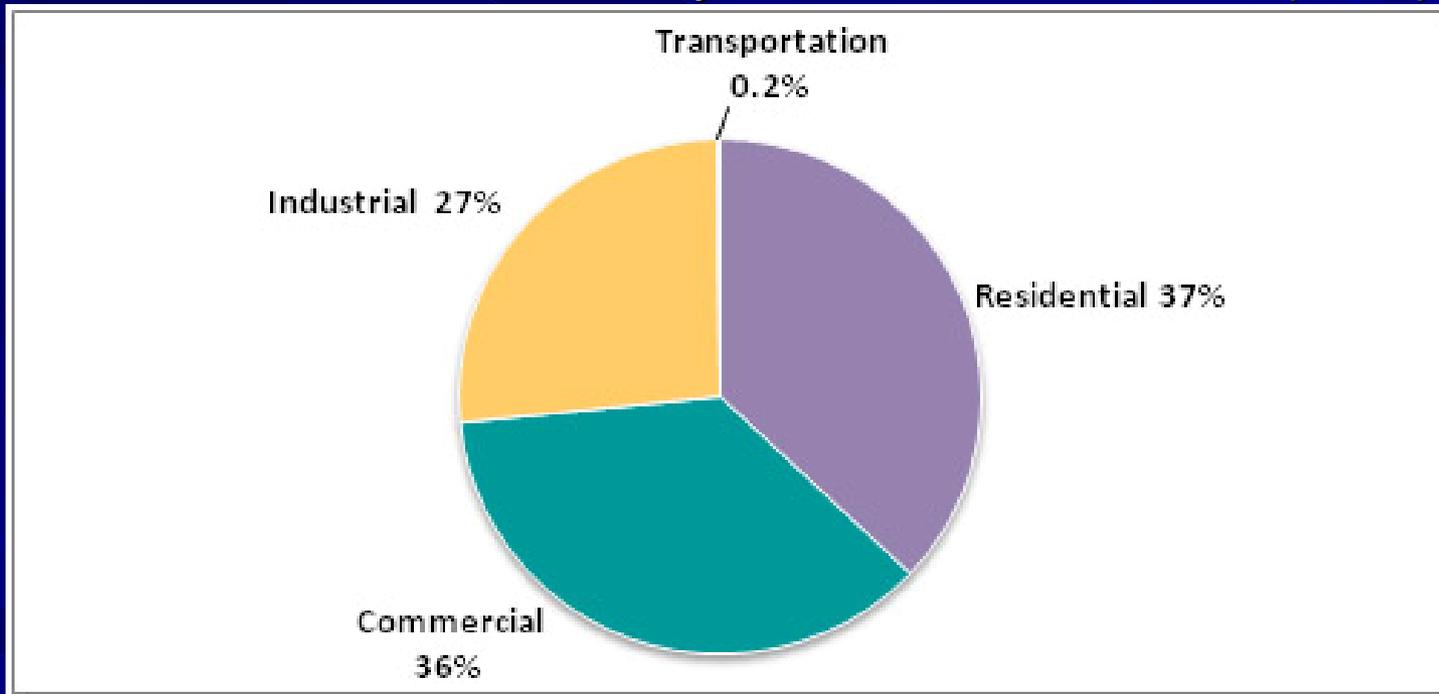
- Saving energy helps keep rates lower, too
 - Reducing energy use delays the need to build new generation plants and transmission facilities
- Energy efficiency has helped California hold per-capita electricity consumption steady since the 1970's
 - Energy savings through 2003 are equal to the output of 24 500-MW power plants



Homeowners Can Make A Difference

The residential sector accounts for about 37% of total U.S. electricity consumption

Total Retail Sales of Electricity to Ultimate Customers (2008)

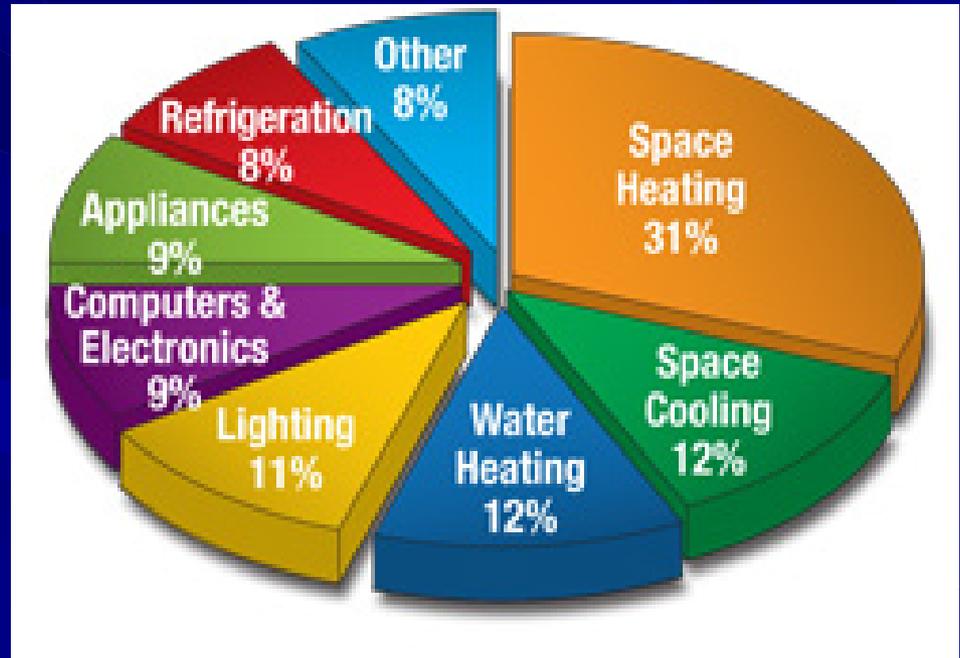


Pew Center on Global Climate Change (DOE/EIA data)

Energy Efficiency in the Home

Home energy use falls into several key categories: heating/cooling, lighting, appliances, and electronics

Home Energy Consumption



U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy (DOE/EERE)

The EnergyStar Program

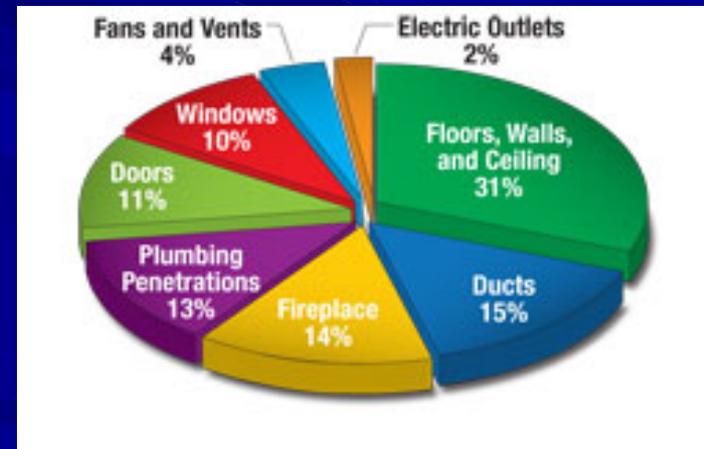
- EnergyStar helps consumers make energy smart choices by identifying the most energy efficient products
 - EnergyGuide labels provide information about an appliance's annual energy consumption and operating cost
- Covers more than 60 product categories for both home and office
- Program established in 1992 with the goal of protecting the environment through energy efficiency



The Whole-House Approach to Efficiency

- This approach views a home as an energy system with interdependent parts
- Example: a heating system starts at the furnace and relies on a network of ducts to deliver heat throughout the home
 - Even a high-efficiency furnace will waste fuel if the walls, ducts, attic, doors, and windows are not properly sealed and insulated

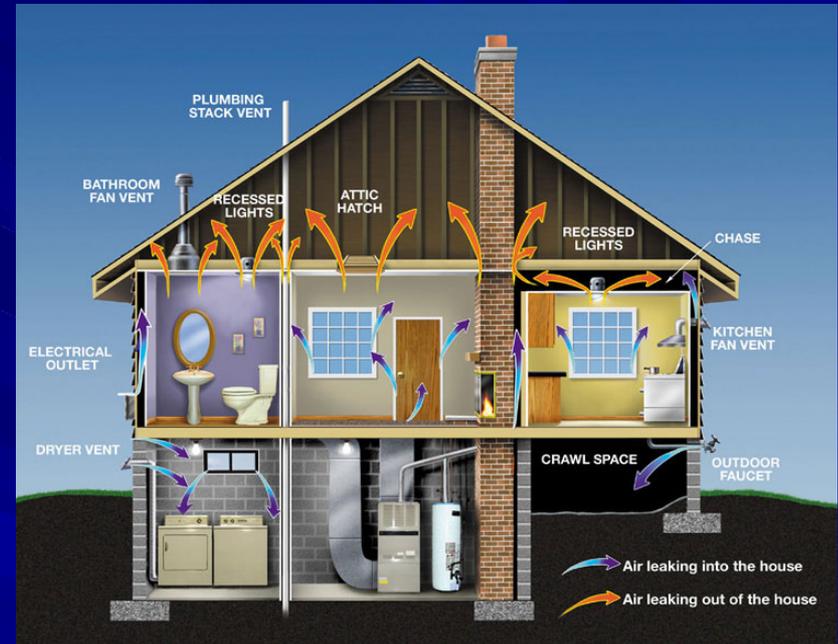
Sources of Air Leaks



DOE/EERE

The Home Energy Audit

- The first step in a “whole house” approach
- Identifies areas where energy losses are occurring
 - Reducing drafts can result in energy savings of 5% to 30%
- Suggests the most effective measures for cutting a home’s energy costs



Energy Audit Options

- ***On-line options*** typically describe the economics of energy efficiency improvements
 - Home Energy Saver at <http://hes.lbl.gov/>
- In a ***do-it-yourself energy audit***, the homeowner conducts a simple but diligent walk-through to spot problems
 - www.energysavers.gov/your_home/energy_audits/
- ***Professional energy audits*** involve detailed examinations and the use of assessment tools by energy auditors to thoroughly inspect a home and recommend improvements

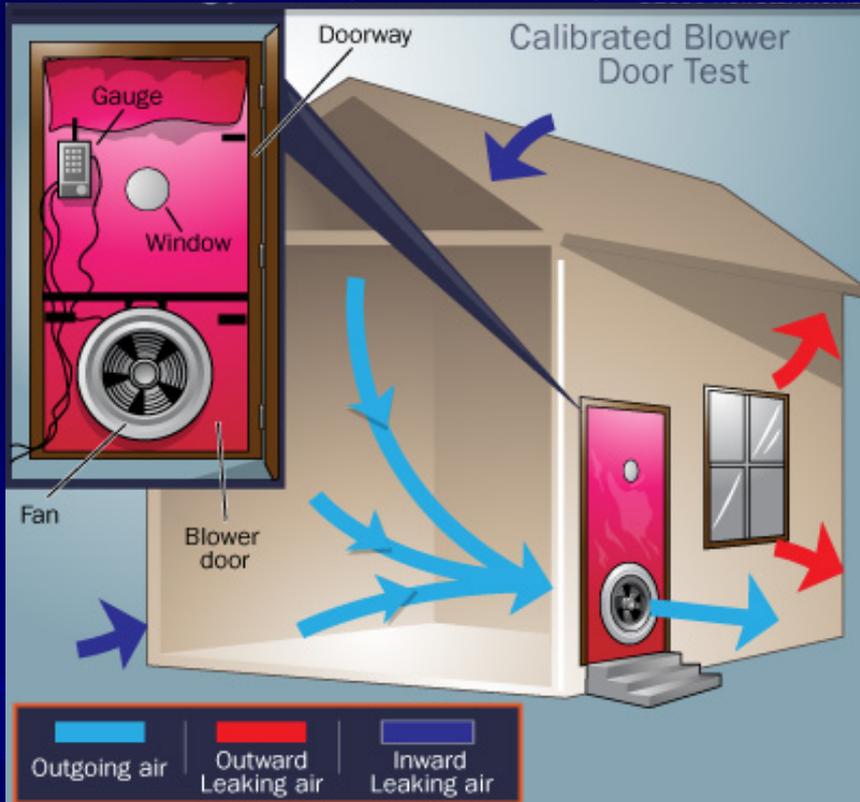
Professional Audit Overview

- Homeowner selects an energy rater or auditor
 - Ask about certifications and insurance
 - Check complaint history and references
- Homeowner prepares for the energy audit
 - Compile utility bills for the last year
 - Prepare a list of suspected problems
 - Empty ashes from the fireplace
- Auditor will examine and test the home
 - Visit may take approximately three hours
 - Evaluation addresses all aspects of home energy use
- Auditor will recommend efficiency improvements

A Professional Energy Auditor . . .

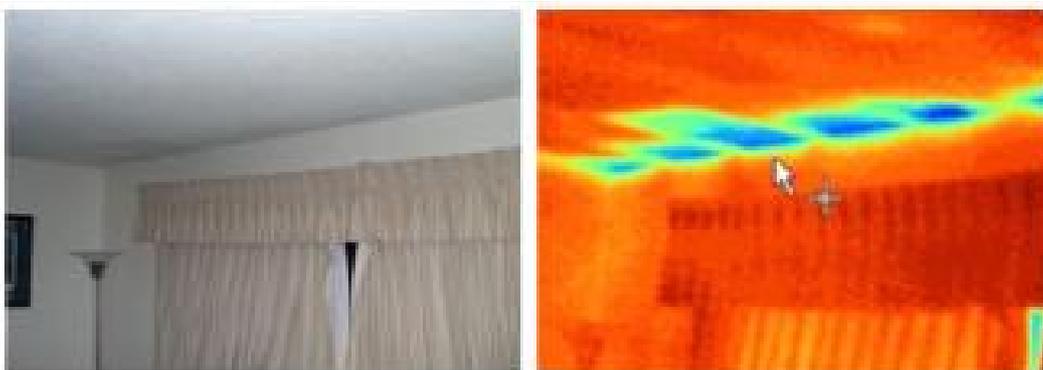
- Examines the building and building envelope
 - Basement (or crawlspace) and attic
 - Windows and doors
- Calculates air leakage
 - Tools include blower door test and/or thermographic inspection
- Assesses heating and cooling systems
 - Including ducts
- Evaluates lighting and appliances
- Provides written report of findings
 - May include financial analysis of energy improvements

Calibrated Blower Door Test



Thermographic Inspections

- Uses an infrared camera to find and/or measure temperature differences of surfaces
- Requires a temperature differential of at least 20 degrees
- Auditor's report will include pictures and/or video



The blue areas indicate missing insulation

Before and After



Who Performs Energy Audits?

- A variety of titles
 - Home Performance Contractors, Building Analysts, Energy Inspectors, or Home Energy Raters
- Currently, no Virginia certification required to provide home energy rating services
- Look for professional certifications and affiliations
 - Building Performance Institute (BPI)
 - Residential Energy Services Network (RESNET)
 - EPA Home Performance with EnergyStar

Buyer Beware!

- Energy auditing is a professional service – be very skeptical of someone who knocks on your door without being invited
- Do your homework before contacting any business
- Be careful if you can't get a straight answer to your question, or fail to get an answer at all
- Check references, insurance coverage, and complaint histories
- Never be rushed into making a decision

Heating/Cooling Efficiencies

■ Short-term, no- and low-cost tips:

- Set your thermostat as low as is comfortable in the winter and as high as is comfortable in the summer
- Clean and replace filters regularly
- Keep registers free of obstructions
- Close drapes, blinds, and shades over large windows and glass doors to form a barrier against heat loss during the winter and heat gain during the summer
- If necessary, install door sweeps on your doors to seal the gap between the bottom of the door and the threshold
- If you have a fireplace, keep the damper closed except when you're having a fire



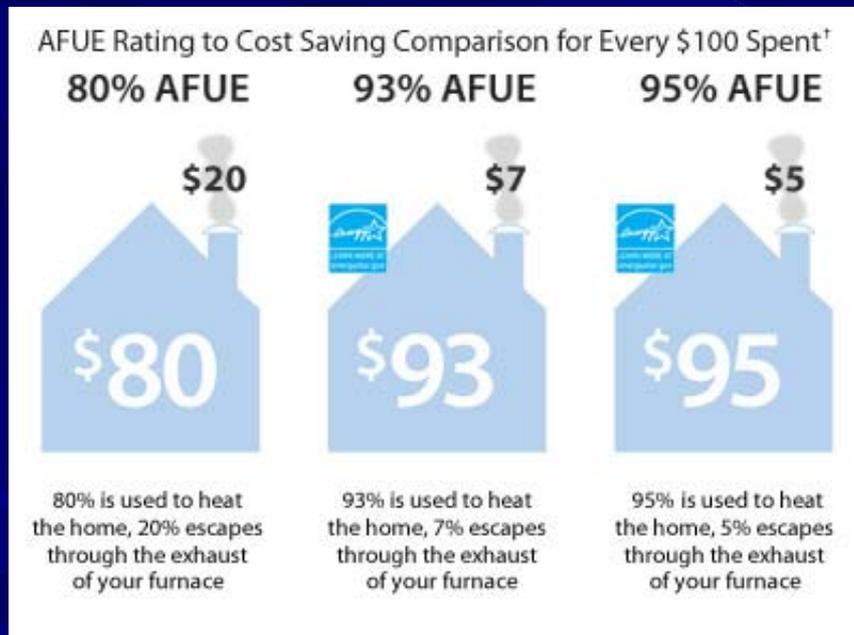
Heating/Cooling Efficiencies

- When buying new equipment, select properly-sized energy-efficient products
 - *Furnaces*: look for high Annual Fuel Utilization Efficiency (AFUE) ratings
 - A variable speed motor fan may save hundreds of dollars annually in electricity costs
 - *Air conditioners*: look for a high Seasonal Energy Efficiency Ratio (SEER)
 - Consider installing energy-efficient ceiling fans to move cooled air at lower cost
- Timely professional maintenance will help maximize efficiency and product life

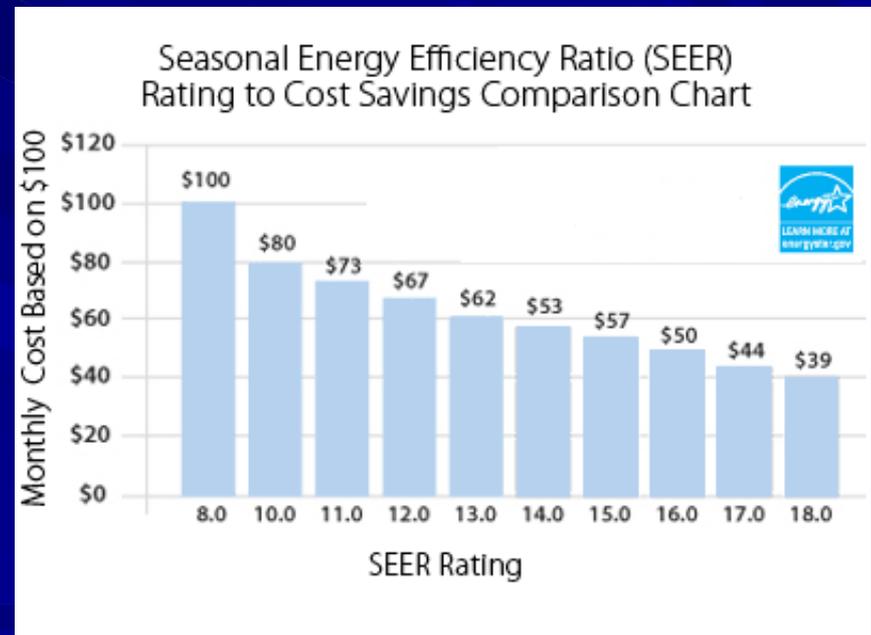
Heating/Cooling Efficiencies

The higher these ratings, the greater the savings!

Furnace Ratings



A/C Ratings

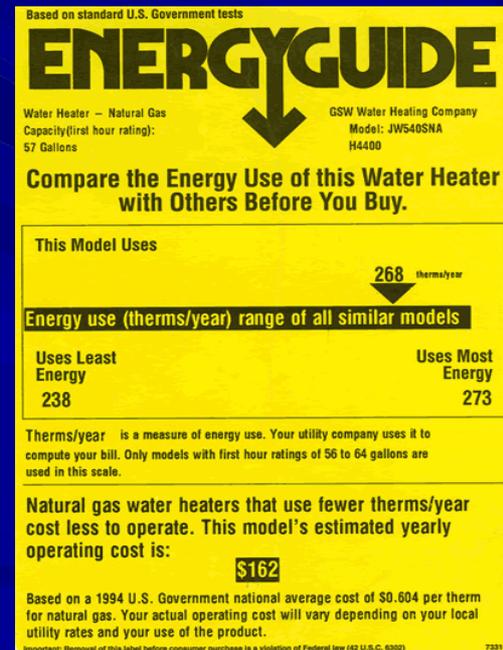


Water Heating Efficiencies

■ Short-term no- and low-cost tips:

- Lower the temperature setting on the hot-water heater
 - 120 degrees should be comfortable for most uses
- If your heater was installed before 2004, insulate it to reduce stand-by heat loss
- Insulate at least the first six feet of hot water pipes
- Install low-flow faucets and showerheads to conserve water

■ When buying new equipment, invest in an energy-efficient EnergyStar water heater



Lighting Efficiencies

■ Short-term no- and low-cost tips:

- Turn off lights when not in use
 - Controls such as timers and photo cells can be installed to automatically turn off lights
- Switch to EnergyStar Compact Fluorescent Lamps (CFLs), which use up to 75% less energy
 - CFLs provide the greatest savings in fixtures that are on for a long time each day
 - CFLs can be recycled at Home Depot locations
- Consider using Light Emitting Diodes (LEDs) for outdoor uses, including pathway and step lights
 - LEDs are durable and perform well in cold weather



Power Used By Home Electronics

- Electronics may continue to draw power even if they appear off
- Many electronics operate in multiple power modes:
 - *Passive Standby or Off*: Microwave not in use, but clock on
 - *Active Standby*: Cordless appliance charging

Product	Watts			kWh
	Passive Standby or Off	Active Standby	Active	Average Annual Energy Use
Home Entertainment				
Plasma TV (<40")	3	-	246	441
DVR/TiVo	37	37	37	363
Digital Cable	26	26	26	239
Satellite Cable	12	11	16	124
DVD	1	5	11	13
Home Office				
Desktop Computer	4	17	68	255
Laptop Computer	1	3	22	83
CRT Monitor	2	3	70	82
LCD Monitor	1	2	27	70
Rechargeable Devices				
Power Tool	4	-	34	37
Cordless Phone	2	3	5	26
Electric Toothbrush	2	-	4	14
Cell Phone	0	1	3	3
Digital Camera	0	-	2	3

www.aceee.org/consumerguide/electronics.htm

Home Electronics Efficiencies

■ Short-term no- and low-cost tips:

– Avoid “phantom loads” associated with electronics and A/C adapters



■ Unplug them when not in use, or

■ Use a power strip and use the switch on that power strip to cut all power to the appliance or adapter

– Buy EnergyStar electronics when possible

– Activate power management features on computers and laptops

■ An EnergyStar computer with power management features activated uses 70% less electricity than a non-EnergyStar computer

Appliance Efficiencies

■ Short-term no- and low-cost tips:

– Refrigerators

- Make sure your refrigerator door seals are airtight
- Cover liquids and wrap foods stored in the refrigerator – uncovered foods release moisture and make the compressor work harder

– Dishwashers

- Avoid using the "rinse hold" on your machine for just a few soiled dishes: it uses 3 to 7 gallons of hot water each time you use it

– Clothes washers and dryers

- Wash your clothes in cold water using cold-water detergents whenever possible
- Use the cool-down cycle to allow the clothes to finish drying with the residual heat in the dryer
- Clean the lint filter in the dryer after every load to improve air circulation

Energy Efficiency Incentives

- Federal “Home Energy Efficiency Improvement Tax Credits”
 - 30 percent tax credit, up to \$1,500, from January 1, 2009 through December 31, 2010
 - Applies to purchase and installation of specific products
- October state sales tax holiday on eligible products costing \$2,500 or less

Suggested Resources

- Energy Savers

- www1.eere.energy.gov/consumer/tips/about.html

- EnergyStar

- www.energystar.gov/

- American Council for An Energy-Efficient Economy

- www.aceee.org/Consumer/index.htm

- Alliance to Save Energy

- http://ase.org/section/_audience/consumers

Home Energy Savings

Questions?

Department of Cable Communications and Consumer Protection

Fairfax County, Virginia

Phone: 703-222-8435

FAX: 703-324-3900

TTY: 711

<http://www.fairfaxcounty.gov/>