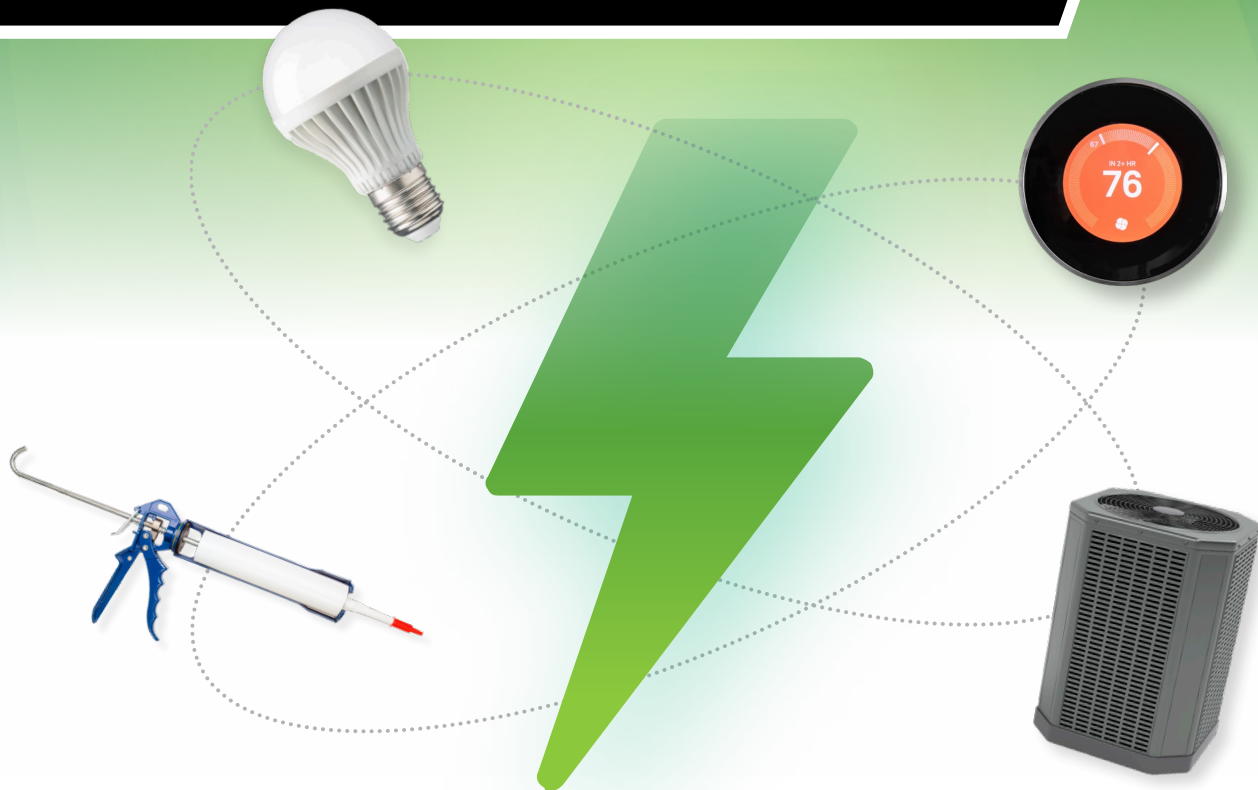


Do-It-Yourself Guide

Energy Saving Tips From Virginia Energy Sense




VIRGINIA
ENERGY SENSE
VALUE YOUR POWER



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Virginia Energy Sense is the commonwealth's energy use education and outreach initiative, operating under the guidance of the State Corporation Commission. It provides information and tools to help residents save energy at home, work, and school.

Our mission is to help all Virginians understand their energy use and how to save energy easily and cost-effectively.

The purpose of this guide is to outline a few do-it-yourself projects that will improve the comfort of your home and lower your utility bills. You'll be amazed: A little elbow grease can go a long way toward lowering your electricity bill and increasing your energy efficiency! You can also share this guide with your friends, neighbors, and co-workers so that they too can save energy and money.

For more, check out **VirginiaEnergySense.org**, where you can:

- Find seasonal energy saving tips to help you save on your electricity bill year-round.
- Find financial incentives and rebates for energy-saving purchases and upgrades.
- Read about Virginia's energy usage and electricity sources.

Good luck, and remember to value your power!

Getting Started: Home Energy Audit



A home energy audit (also called an energy assessment) helps you figure out how much energy your home uses and identify opportunities to improve efficiency. You can conduct a simple home energy test on your own (see Page 4). On the other hand, a professional energy audit, which costs about \$400 on average, can lead to greater savings, reducing your energy bill for years to come.

During a professional assessment, the auditor will analyze your energy bills and ask about your level of comfort at home, inquiring about any drafty areas. The auditor will examine the outside of the home to determine its size and features. Then the auditor will take notes, conduct tests, and identify potential energy savings in each room of the house. The auditor will also test your heating and cooling system to see whether it is running correctly.

A typical assessment includes the following:

- Blower door tests to determine a home's air tightness.
- Infrared camera inspections, which reveal hard-to-detect areas of air infiltration and missing insulation.
- Furnace efficiency tests to measure your gas or electricity use.
- Surface thermometers to measure room temperatures.

To prepare for a professional audit, you can:

- Make a list of any known problems, such as condensation or drafty rooms.
- Gather copies or a summary of your home's yearly energy bills.
- Know your home's typical thermostat setting for summer and winter.

Once you've pinpointed trouble spots, read on for projects you can complete to reduce your energy usage and save money all year long

A man with a goatee, wearing a grey polo shirt and a black wristwatch, is reaching up with both hands to adjust a circular ceiling light fixture. He is looking upwards with a focused expression. The background shows a bright, airy room with large windows and white curtains. A black banner with white and green text is overlaid on the left side of the image.

Conduct Your Own Home Energy Test

If you're ready to take a close look at your home's energy usage, follow these steps to check for potential energy waste and inefficiencies.

Getting Started

Step 1: Collect These Materials

- Air filter
- Caulk
- Duct sealant (mastic)
- Energy-efficient light bulbs
- Insulation
- Outlet gaskets
- Painter's tape
- Plastic sheeting for windows
- Power strips
- Weatherstripping

Step 2: Prepare Your Home

- Turn off your furnace.
- Shut all windows and doors.
- Turn on all exhaust fans that blow air outside, such as bathroom fans or stove vents.

Step 3: Walk Through Your Home

- Check for air leaks by lighting an incense stick and passing it around edges of common leak sites, such as doors and windows. Wherever the smoke is sucked out of or blown into the room, there's a draft. Once you find air leaks, use tape to mark their locations.
- Check the insulation levels in the basement, the attic, crawl spaces, and exterior walls.
- Check inside and outside for holes or cracks in or around the foundation, walls, windows, doors, plumbing, and wiring.
- Make sure your fireplace flue is tightly closed.
- Consider your light usage. Do you leave lights on during the day? Are you still using incandescent or compact fluorescent lightbulbs, which can be replaced with more efficient LED bulbs?



Safety Tip

Watch out for backdrafts, which occur when combustion appliances are used without adequate ventilation, releasing exhaust and even carbon monoxide, a toxic and odorless gas, into your home.

To avoid this issue, vent clothes dryers to the outside and, if you have a gas range, use a properly sized range hood. Also make sure that gas water heaters, gas or oil furnaces, and traditional fireplaces have properly sized and blockage-free flues so that they vent properly. In addition, you should have carbon monoxide detectors installed to monitor for toxic air indoors.

Home Energy Checklist

	PROBLEM	SOLUTION	✓
Exterior Walls, Basements, Attics, and Crawl Spaces	Insufficient insulation (insulation that has receded away from the edge of the joists)	<ul style="list-style-type: none"> • Add insulation. 	
Electrical Outlets	Cracks or air leaks	<ul style="list-style-type: none"> • Caulk. • Install gasket cover. 	
Switch Plates	Cracks or air leaks	<ul style="list-style-type: none"> • Caulk. 	
Overhead Lighting and Lamps	Lights turned on when not needed	<ul style="list-style-type: none"> • Change your lighting habits. • Switch to energy-efficient lightbulbs. 	
Wiring	Air leaks, cracks, or holes in walls around wiring	<ul style="list-style-type: none"> • Caulk. 	
Windows and Frames	Air leaks in window frames Drafty old windows Cracks near or in window frames	<ul style="list-style-type: none"> • Caulk. • Install plastic sheeting. • Install storm windows. 	
Baseboards	Cracks	<ul style="list-style-type: none"> • Caulk. 	
Door Frames and Weatherstripping	Drafts and air leaks	<ul style="list-style-type: none"> • Add weatherstripping • Caulk. 	
Doors	Cracks or holes	<ul style="list-style-type: none"> • Caulk. • Add insulation. • Add weatherstripping. 	
Fireplace	Drafts and air leaks	<ul style="list-style-type: none"> • Make sure flue is tightly closed. • Seal leaks with noncombustible or high-heat sealant. 	

	PROBLEM	SOLUTION	✓
Attic	Cracks and air leaks, especially those at an attic entrance near an air-conditioned or heated room	<ul style="list-style-type: none"> • Caulk. • Add weatherstripping. 	
Air Conditioning	Cracks and air leaks, particularly around window-mounted units Air filters	<ul style="list-style-type: none"> • Replace filter. 	
Air Registers and Ducts	Dirty registers decreasing airflow Air leaks or disconnected ducts	<ul style="list-style-type: none"> • Clean the air registers. • Replace ducts. • Reattach connections with mastic sealant or foil tape. 	
Pipes and Plumbing	Air leaks, cracks, or holes surrounding plumbing	<ul style="list-style-type: none"> • Caulk. • Add foam. 	
Foundation	Cracks or holes	<ul style="list-style-type: none"> • Add cement patches. • Add insulation. 	
Siding	Cracks and air leaks	<ul style="list-style-type: none"> • Caulk. • Add insulation. • Repaint. 	
Mail Slots	Cracks and air leaks	<ul style="list-style-type: none"> • Caulk. 	
Refrigerator	Air leaks	<ul style="list-style-type: none"> • Replace gaskets and seals if you can slip a piece of paper between gasket and door frame. 	



Top 10 Efficiency Upgrades

There are plenty of simple steps you can take that cost little to no money and make a dent in your energy usage. Here are 10 things you can do to lower your utility bills:

1. **Unplug appliances.** Unplugging appliances and turning off lights are some of the easiest steps you can take to become more energy-efficient. Unplugging small appliances and devices when they are not in use can save the average household \$100 each year.
2. **Install gaskets behind outlets and switches.** Install gaskets to seal off the wall cavity behind outlets and switch receptacles. This prevents air from escaping through the small holes. You can also use gaskets to seal off recessed lighting.
3. **Clear your vents.** Make sure the areas in front of vents are clear of furniture, rugs, and other obstructions. Blocked vents can force your system to use 25% more energy to distribute air.
4. **Use power strips.** Put laptop AC adapters, cellphone chargers, and other electronic devices and accessories on power strips. Electronics draw power even when they're not in use.
5. **Check your water heater settings.** Lowering your water heater's maximum temperature to 120 degrees Fahrenheit can lower your water heating costs by up to 22% annually. To save even more money, insulate your hot water pipes and wrap your water heater with an insulation blanket.
6. **Replace filters.** Have your cooling system serviced once a year and change or clean your air filters monthly or as needed.
7. **Use energy-efficient bulbs.** Replace incandescent and compact fluorescent lightbulbs with LED ones. Compared with incandescent bulbs, LED bulbs use up to 90% less energy and last up to 25 times as long. The average American home uses about 20 lightbulbs, so that's a lot of savings!
8. **Use window shades to regulate temperature.** In the summer, keep shades and curtains closed during the day to prevent the sun from heating up your home. During the cooler months, leave them open to take advantage of natural heat from the sun.
9. **Run your ceiling fans.** Ceiling fans move air around, making rooms feel more comfortable. In the summer, a fan running counterclockwise allows you to set your thermostat 3–5 degrees higher for the same level of comfort, lowering your cooling costs by up to 5%. During winter, set your fan to run clockwise at a low speed for a gentle updraft that forces warm air down into the room.
10. **Use energy-efficient appliances.** Purchase ENERGY STAR-certified products, which have the highest energy-efficiency ratings.

How To Seal Cracks and Air Leaks



The energy lost through small holes and cracks around your home can add up to 20% of your energy bill. You can easily and significantly reduce wasted energy by sealing these holes and cracks.

Insulation

Depending on the location of air leaks in your home, some forms of insulation may work better than others.

Insulation is made from a variety of materials:

- Batts and rolls, or blanket insulation, can be hand cut and trimmed to fit particular spaces.
- Loose-fill insulation (small particles of fiber, foam, or other materials) or foam-in-place insulation (liquid foam) is well suited for any place where it's difficult to install other types of insulation.
- Rigid foam panels of insulation can be used to insulate almost any part of your home.

Make sure to research which insulation types and R-value are best for your home. R-value is a measure of insulation's ability to resist heat traveling through it — higher R-values indicate better insulating effectiveness — and depends on the insulation's type, thickness, and density. Different R-values are recommended for different climate zones. (Virginia is in Zone 4.)

Spray foam insulation is good for filling larger gaps and can be installed using a do-it-yourself kit. However, it may be better left to a professional because of chemicals that need to be handled with care. Laying batts and rolls is an easy job to do yourself. For areas that are harder to reach, you can rent a blower to spread loose-fill insulation.

You can always consult a professional to learn more about the right type of insulation for the different spaces in your home and to ensure safe and proper installation.

Caulk

There are several different types of caulks available, so be sure to read the packaging carefully to find the right one.

Caulk is best for sealing gaps or cracks that are 1/4 inch or less. Be sure to start with a clean, dry surface. When filling larger gaps, move slowly to let the caulk adequately fill the space. Give your project a neat, finished look by using a wet finger to smooth out any excess caulk.

Weatherstripping

Some weatherstripping materials may be better suited for your home than others are. If you're sealing a leak around something that moves often, like a door or window, consider using flexible options like foam tape or door sweeps.

Measure the perimeter of doors and windows in your home to determine how much material you will need. Add 10% to your total measurement to give yourself enough material to work with.

Some forms of weatherstripping may not require tools for installation, making it even easier for you to fix problem areas.

How To Use a Programmable Thermostat



Safety Tip

If your heating and cooling project requires extensive installation or you're concerned about risks involved with installing electrical equipment, contact a professional.

About Programmable Thermostats

A programmable thermostat regulates temperatures in your home and accounts for variables such as your schedule, the time of day, and the time of year.

Thermostats come with a variety of scheduling functions. Homeowners with schedules that change daily may opt for models with separate settings for each day of the week. For more consistent schedules, five-day models allow you to keep one setting throughout the week while switching to a different setting on the weekends.

Programmable thermostats can range in price from \$20 to a few hundred dollars. Some models have other features you may want to consider:

- Digital, backlit displays.
- Touchpad screen programming.

- Voice, smartphone, or Wi-Fi programming.
- Hold and vacation features.
- Indicators that tell you when it's time to change air filters.
- Indicators that signal malfunctioning of heating or cooling systems.
- Adaptive recovery features that sense the amount of time it will take to reach the next temperature setting.

Installing and Programming Your Thermostat

- Before installing, shut down the electricity at the corresponding breaker and read the instructions that come with the thermostat.
- Select a location for your thermostat on an interior wall in your home, away from heat or air sources that could affect temperature readings.
- As you program a schedule for your thermostat, take into consideration when you're asleep or away from home.

See below for sample programmable thermostat settings to save energy.

SETTING	TIME	WINTER WEEKDAYS	SUMMER WEEKDAYS
Wake	6 a.m.	Thermostat is set at 68° F	Thermostat is set at 78° F
Away	8 a.m.	Thermostat is set at 60° F	Thermostat is set at 85° F
Evening	6 p.m.	Thermostat is set at 68° F	Thermostat is set at 78° F
Sleep	10 p.m.	Thermostat is set at 60° F	Thermostat is set at 82° F

How To Make Appliances More Energy-Efficient



Get the most out of your appliances with these quick tips for making them run efficiently.

Computers

- Activate power management settings. Your computer should have power management tools that allow you to control how your computer consumes energy.
- Close applications not in use. Programs running in the background force your machine to multitask and prevents it from entering sleep mode.
- If you plan to be away from your screen for a while, turn off the monitor instead of using a screen saver.
- If you're in the market for a new computer, look for ENERGY STAR-certified models.

Washing Machines

- Run a cold wash as often as possible. Unless you're dealing with oily stains, washing in cold water does a good job of cleaning.
- Don't use too much detergent. Overuse requires longer rinse times.

Clothes Dryer

- Put your dryer in a warm space to reduce warming time.
- Clean the lint filter after every load.
- Run full loads, but don't overload your dryer.
- Use the auto-dry setting.
- Reduce or eliminate dryer use by air-drying items.

Dishwashers

- Run full loads only.
- Disable the heated-dry setting to air-dry your dishes.

Refrigerators and Freezers

- Make sure the door seals are tight. If you can slip a piece of paper between the door frame and the gasket, you've got a leak.
- Set your fridge between 35 and 38 degrees Fahrenheit and your freezer to 3 degrees Fahrenheit.
- Cover foods stored in the refrigerator. Moisture from uncovered food forces the compressor to work harder.
- Keep your refrigerator and freezer full of food to reduce the need to cool empty spaces.
- Clean the coils on the back of your fridge where dust builds up to help the refrigerator run more efficiently.

Ovens

- Avoid excessive preheating. Try to start baking while your oven is still coming to temperature to avoid wasting energy.
- Avoid opening the door to check on your food.
- Allow your oven to multitask. Bake several items at once while leaving enough space between dishes that they cook evenly.
- Use glass and ceramic pans. These deliver the same results as metal pans while allowing you to lower your oven temperature by 25 degrees Fahrenheit.

For More Information

If you're interested in additional resources, information, and steps you can take to save energy, visit the **Virginia Energy Sense website**. You'll learn:

- What your energy bill means and how you can save energy at home, work, and school.
- What rebates and tax incentives are available to you.
- How to assess your home energy usage and make cost-effective improvements.

To learn more, visit:



Virginia Energy Sense is a proud partner of ENERGY STAR.

Visit **VirginiaEnergySense.org** for more energy saving tips.



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