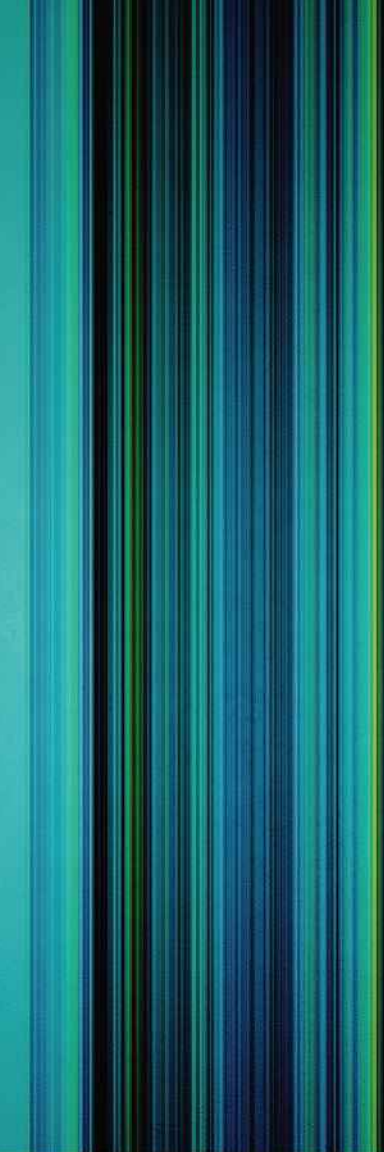


Virginia Energy Sense  
**Do-It-Yourself  
Guide**



Energy Saving Tips From

**VALUE YOUR POWER**  
**VIRGINIA ENERGY SENSE**



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*Virginia Energy Sense* is the Commonwealth's statewide energy education initiative providing information and tools to help residents learn about energy and take steps to save energy at home, at work, and at school. Under the guidance of the State Corporation Commission, it was created by the General Assembly in support of the state's goal to reduce Virginia's electric energy consumption by 10%.

**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 provide a few do-it-yourself (DIY) projects that will improve the comfort of your home and reduce your utility bills.

Read through the guide, assess your home, and take action! You'll be amazed how a little elbow grease goes a long way towards lowering your energy bill and increasing your efficiency. Share the guide with your friends, neighbors, and co-workers to encourage them to learn more about easy improvements to help save energy while saving money.

Check out our website **VirginiaEnergySense.org** where you can:

- Try our free Home Energy Test to measure your home's efficiency
- Take the 10% Challenge to reduce your own energy use
- Find financial incentives available for energy-saving purchases and upgrades
- Read about Virginia's energy use, policy, and plans

Stay in touch and contact us if you need help.  
Good luck and remember to Value Your Power!





Getting Started:

# Home Energy Audit

A home energy audit (also called an energy assessment) is a good step to help you figure out how much energy your home uses and identify opportunities to improve efficiency. A professional energy audit costs about \$400 but can detect much greater savings that can reduce your energy bill for years to come. You can also conduct a simple energy audit on your own (page 4).

During a professional assessment, the auditor will analyze your energy bills and ask you about your comfort in your home, including questions about drafty areas. The auditor will examine the outside of the home to determine its size and features. Then, the auditor will go room by room taking notes, conducting tests, and identifying potential energy savings. The auditor will also test your heating and cooling system to see if 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 existing problems such as condensation or drafty rooms
- Gather copies or a summary of your home's yearly energy bills
- Know your home's average thermostat setting for summer and winter

Once you've pinpointed trouble spots, read on for projects to help reduce your energy use and save money all year long.

**NO ONE HAS EVER  
ENJOYED AN AUDIT...  
UNTIL NOW!!**





Conduct Your Own  
**Energy Audit**



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

## Getting Started

### Step 1: Collect these materials

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

### 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 air leaks by lighting an incense stick and passing it around edges of common leak sites. Wherever the smoke is sucked out of or blown into the room, there's a draft. Once you find

air leaks, use the tape to mark their locations.

- Check inside and outside for the following issues or concerns and fix them right away:
  - Insulation levels in exterior walls, basements, attics, crawlspaces.
  - Holes and cracks in any walls, foundation, windows, doors, plumbing, wiring.
  - Make sure your fireplace flue is tightly closed.
  - Check lighting patterns. Are you leaving lights on during the day? Can you switch to more efficient light bulbs?

**READY. SET.  
SAVE!**



### Safety Tip:

Be sure to watch for "back drafting." You do not want combustion appliances and exhaust fans competing for air. To avoid this issue make sure to vent clothes dryers to the outside, use a properly sized range hood if you use a gas range and consider installing a carbon monoxide alarm to help you monitor indoor air pollution.

# Home Energy Checklist

X	Location	Problem	Solution
	Exterior Walls, Basements, Attics, and Crawlspace	Insufficient insulation	Add insulation
	Electrical Outlets	Cracks, air leaking	Caulk Install gasket cover
	Switch Plates	Cracks, air leaking	Caulk
	Overhead Lighting and Lamps	Lights turned on when not needed	Change your lighting habits Switch to energy efficient light bulbs
	Wiring	Air leaks, cracks or holes in walls around wiring	Caulk
	Windows/Frames	Leaks in window frames Drafty or old windows Cracks near or in window frames	Caulk Plastic sheeting Storm windows
	Baseboards	Cracks	Caulk
	Door Frames/Weather Stripping	Drafts and air leaks	Weather stripping Caulk
	Doors	Cracks or holes	Caulk Insulation Weather stripping
	Fireplace	Drafts and air leaks	Make sure flue is tightly closed Caulk or weather strip leaks



X	Location	Problem	Solution
	Attic	Cracks and leaks, especially at the attic entrance if near an air conditioned/heated room	Caulk Weather stripping
	A/C Units	Cracks and air leaks, particularly around window-mounted units Air filters	Caulk Insulation Replace with a new filter
	Air Registers/Ducts	Dirty registers decreasing air flow Air leaks or disconnected ducts	Clean the air registers Replace duct work Reattach connections with mastic sealant or foil-back tape
	Pipes Plumbing	Leaks, cracks or holes surrounding plumbing	Caulk Foam
	Foundation	Cracks or holes	Cement patches Insulation
	Siding	Cracks and air leaks	Caulk Insulation New paint
	Mail Slots	Cracks and air leaks	Caulk
	Refrigerator	Check to see if you can slip a piece of paper between the gasket and the door frame	Replace gaskets and seals

How to:

# Top 10 Efficiency Upgrades



**I LOVE TOP 10 LISTS...  
AND SAVING  
ENERGY.**

There are plenty of simple low or no-cost steps that can make a dent in your energy use. Here are 10 things you can do to reduce 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. Unplug small appliances when they are not in use and on bright, sunny days when natural light is sufficient, you can keep the lights off to reduce lighting expenses by 10 - 40%.
- 2 **Install Gaskets Behind Outlets & Switches:** Install gaskets to seal off the wall cavity behind outlets and switch receptacles to prevent 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 result in as much as a 25% increase in energy being used to distribute air.
- 4 **Use Power Strips:** Put laptop AC adapters, cell phone chargers and other electronic devices on power strips. Electronics continue to draw power, even when they're not in use. Look for green power plugs which allow you to leave some electronics — like a DVR — turned on.
- 5 **Check Your Water Heater Settings:** Lowering your water heater's maximum temperature to 120° can save 7-11% of water heating costs. You can also wrap your water heater with an insulation blanket to save even more money.
- 6 **Replace Filters:** Have your cooling system serviced once a year and change or clean filters once per month.
- 7 **Use Energy Efficient Bulbs:** Replace regular light bulbs with CFLs or LEDs. Switching one CFL can save \$40 or more over the lifetime of the bulb and LED lights use at least 75% less energy than incandescent lighting.
- 8 **Use Window Shades Wisely:** 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 **Consider Fans:** Ceiling fans move the air around spaces which can make rooms more comfortable. Fans usually allow for a 3° to 5° higher temperature setting, and each degree saves about 3% on cooling costs. During winter, reverse your motor and operate the ceiling fan at low speed in the clockwise direction. This quick fix causes a gentle updraft, forcing warm air down.
- 10 **Use Energy Efficient Appliances:** Purchase ENERGY STAR qualified products as they will have the highest energy efficiency ratings.

A man and a woman are shown from behind, measuring a window frame with a yellow tape measure. The woman, on the left, has long dark hair in a braid and is wearing a colorful striped shirt under denim overalls. The man, on the right, is wearing a blue t-shirt under denim overalls. They are both focused on the task, with the woman holding the top of the tape measure and the man holding the bottom. The window they are measuring has a white frame and a dark screen. The background is a plain white wall.

How to:

# Seal Cracks and Air Leaks

**SAVING MONEY  
ON YOUR  
POWER BILL  
IS A SNAP.**



**Did you know that up to 50% of your electricity bill is due to energy lost through small holes and cracks found around your home? You can easily and significantly reduce wasted energy by sealing cracks and holes in your home.**

Depending on the location of the air leaks in your home, some materials may offer better solutions.

**Insulation** is made from a variety of materials:

- Batts and rolls, or blanket insulation, can be hand-cut and trimmed to easily fit spaces.
- Loose-fill (small particles of fiber, foam or other materials) or foam-in-place (liquid foam) insulation is well suited for places 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.

## Installation

- To ensure your safety and proper installation, be sure to research which insulation options are best for your home and consider consulting a professional to learn more about the right R-value for your home. (Hint: Virginia is in climate zone 4.)
  - Use spray foam insulation for filling larger gaps (1/4 inch to 3 inches).
  - Laying batts and rolls is an easy DIY job. For areas that are harder to reach, you can rent a blower to spread loose-fill insulation.
- If insulation already exists between the rafters, place the second layer over and perpendicular to the first (the second layer of roll insulation should not have a backing or vapor retarder membrane.)

- When laying down additional insulation, work from the perimeter toward the attic opening and be sure to create a barrier around any light fixtures or soffit vents to avoid a fire or ventilation hazard.

## Caulk

- There are several different types of caulk 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 clean, finished look by using a wet finger to smooth out any excess caulk.

## Weather Stripping

- Some weather stripping materials may be a better option than others. Take into account if the location of the leak is something that will be moved often, like a door or window. If so, consider using flexible options like foam tape or door sweeps. Lock your windows to make them tighter and more draft resistant.
- Measure the perimeter of doors and windows in your home to determine how much material you will need. Add up to 10% to your total measurement to account for waste.
- Some products may not require tools for installation, making it even easier for you to fix problem areas!



**Safety Tip:** If your home requires a more extensive installation or you're concerned about risks involved with installing electrical equipment, consider contacting an HVAC professional.



How to:

# Use a Programmable Thermostat

# A programmable thermostat regulates temperatures in your home and accounts for variables including time of day, seasons, and your schedule.

Typically, thermostat models come in a variety of schedule functions. Homeowners with schedules that change daily can opt for models with separate settings for each day of the week, based on whether you're home or away. For more consistent schedules, five-day models offer the option to keep the same settings throughout the week while switching to different settings for weekends. Depending on your preferences and home needs, programmable thermostats can range in price from \$20 to a few hundred dollars. Some models have other handy options you may want to consider:

- Digital, backlit displays
- Touchpad screen programming
- Voice, mobile phone and/or Wi-Fi programming
- Hold/Vacation features
- Indicators that tell you when it's time to change air filters
- Indicators that signal malfunctioning of heating/cooling systems
- Adaptive recovery features that sense the amount of time it will take to reach the next set-point temperature

## How to Install and Program Your Thermostat

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

### Winter Weekdays

6am – 9am: Thermostat is set at: 68°F  
9am – 5pm: Thermostat is set at: 55°F  
5pm – 10pm: Thermostat is set at: 68°F  
10pm – 6am: Thermostat is set at: 60°F

### Summer Weekdays

6am – 9am: Thermostat is set at: 78°F  
9am – 5pm: Thermostat is set at: 85°F  
5pm – 10pm: Thermostat is set at: 78°F  
10pm – 6am: Thermostat is set at: 82°F



How to

# **Make Appliances More Energy Efficient**

**IT'S TIME TO  
KNOCK A CHUNK OF  
CHANGE OFF THAT  
POWER BILL.**



To ensure you get the most out of your appliances, here are some 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; this prevents the sleep mode feature from working.
- Plan to be away from your screen for a while? Turn the monitor off and nix the screen saver.
- If you're in the market for a new computer, consider ENERGY STAR qualified models.

## Clothes Dryers

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

## Washing Machines

- Wash in cold only. Unless you're dealing with oily stains, washing in cold water will do a good job of cleaning.
- Don't use too much detergent. Overuse will require longer rinse time.

## Refrigerators & 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°F and 38°F and your freezer to 3°F.
- Cover foods stored in the refrigerator. Moisture from uncovered food makes the compressor 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 it run more efficiently.

## Dishwashers

- Run full loads only.
- Choose the air dry vs. heat-dry setting.

## Ovens

- Keep pre-heating to a minimum or avoid all together.
- Avoid checking your food by opening the door.
- Allow your oven to multi-task – bake several items at once and stagger the items to make sure air can flow through the oven.
- Use glass and ceramic pans – they allow you to reduce the heat by 25°F while cooking just as well.



# For More Information

If you're interested in additional resources, information, and next steps to save energy in your home, visit the State Corporation Commission's Virginia Energy Sense website at [VirginiaEnergySense.org](http://VirginiaEnergySense.org). You can learn about:

- The 10% Challenge to help Virginia reach its goal to reduce electric energy consumption levels by 10%.
- Your energy bill and how you use energy — at home, work, and school.
- Rebates and tax incentives available to you — all in one place.
- Assessing your home energy use and seeing how you can make improvements and much more!

To learn more, visit:



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Visit [VirginiaEnergySense.org](http://VirginiaEnergySense.org) or text "VASAVES" to 52886\*  
and learn more energy-saving tips from Jack.

[energysense@scc.virginia.gov](mailto:energysense@scc.virginia.gov)

**State Corporation Commission**

\*Message and data rates may apply.



# Notes

# Take the 10% challenge

**READ THIS BOOKLET  
NOW AND SPEND LESS  
ON YOUR POWER BILL.  
THANK ME LATER.**



**VALUE YOUR POWER**  
VIRGINIA ENERGY SENSE

*A program of the State Corporation Commission*

**VirginiaEnergySense.org**

Virginia Energy Sense is the statewide energy education and outreach program created to help Virginians understand their energy use and support the state's goal to reduce electricity consumption by 10%.