

2016

home energy pledge guidebook

steps & resources to reduce home energy consumption



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Viridiant Resident Educational Resources

At Viridiant, we're building the science of sustainability.

environmental sustainability

- When you build a home or commercial structure that's sustainable, you can do a lot of good for the earth.
- Sustainable buildings minimize the use of precious resources including water, energy, wood, and more.

Lower environmental impact

economic sustainability

- The advantages of sustainable homes go much further. Sustainability isn't just good for the earth. It's also good for your wallet.
- In fact, sustainability can make homes and businesses significantly more energy efficient - saving thousands of dollars over time, all while supporting a healthier world.

Lower economic impact

structural sustainability

- And that healthier world? It actually starts inside a sustainable building. Because sustainable structures improve air quality, reduce allergens, and foster a more livable inside environment, one in greater balance with what's just outside the window.

Built soundly to last for generations

Viridiant is a non-profit organization committed to supporting sustainable building processes through education, consultation, and certification. Through certification programs, including EarthCraft and Viridiant's Net-Zero Program™, Viridiant helps to set a path for sustainable, affordable, energy efficient construction. With the development of new innovative services such as energy monitoring and assessment tools, unbiased consultation on emerging energy topics and more, Viridiant continues to educate and promote energy efficiency to builders and residents. At Viridiant, we believe in science that illuminates the immediate, enduring, and undeniably positive benefits of energy efficiency. We hope you use this guidebook to help set and meet your own energy goals.

Learn more about what Viridiant has to offer:

[Join the Home Energy Pledge](#)

[Viridiant Research & Resources](#)

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[Viridiant Events](#)

Heating & Cooling

Maintain comfortable temperatures and reduce energy waste



Space heating and cooling make up nearly half of a home's energy use! There's a huge opportunity to lower energy consumption and utility bills by adjusting how your home stays at a comfortable temperature.

ENERGY IMPROVEMENTS

- **Programmable Thermostat** - You can save significantly by adjusting your thermostat for the seasons, when you are asleep, and when you are away from the home. These changes can occur automatically by using a programmable thermostat, which could save you an estimated 10% on heating and cooling costs. Consider seasonal set points of 78°F in the summer and 65°F in the winter. If these temperatures are too uncomfortable for you, then set your thermostat for the minimum and maximum temperatures that you need to maintain comfort. Keep in mind that portable space heaters are very inefficient; they are a major drain on your electric bill. Instead of using a space heater, turn your thermostat set point up a few degrees.
- **Fans** - Consider replacing your kitchen and bath exhaust fans with low-noise high-efficiency fans. Many ceiling fans have a switch to reverse the direction of air flow. In the summer, set the fan to move air downward, creating a cooling effect. In the winter, reverse the fan to move air upward at a lower speed. This updraft forces warm air near the ceiling down into the occupied space. Do not run fans if no one is around, this adds additional heat with no benefit to resident comfort. If you plan to replace or install ceiling fans, choose ENERGY STAR certified fans.
- **Window Shades** - In the winter keep your drapes or blinds on your south-facing windows open during the day and close your shades at night. On summer days adjust blinds upward to allow light in while reducing heat permeation.
- **Air Sealing** - Improve air sealing around problem areas including windows, doors, baseboards, ducts, plumbing and electrical penetrations. Caulking and weather-stripping are easy air sealing techniques for achieving a quick return on investment. You may need to schedule a home energy audit to help identify problem areas and create a plan to address them.
- **Insulation** - While the majority of insulation types do not stop air flow, they do help slow heat loss or gain. Upgrading your insulation and insuring proper installation could help maintain comfortable temperatures and save energy.

ENERGY EFFICIENT EQUIPMENT

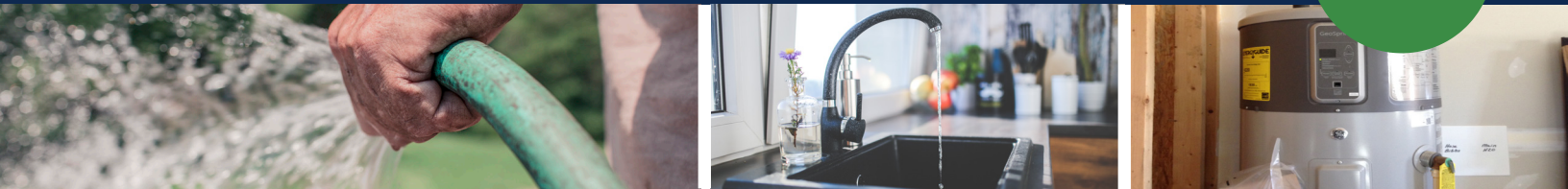
- Before upgrading your HVAC equipment, improve the overall energy efficiency of your home through suggested energy improvements, so you can potentially purchase a smaller unit.
- When you are ready to replace your mechanical equipment, choose energy-efficient models that are sized appropriately for your home.
- Your HVAC filter helps maintain indoor air quality and keep your equipment running smoothly. Filter cleaning or replacement schedules vary from monthly to every six months; it is best to follow the manufacturer recommendations.

RESOURCES

- [Energy Saver 101: Home Heating](#)
- [ENERGY STAR Heating & Cooling Brochure](#)
- [Choose an ENERGY STAR certified room air-conditioner](#)

Water

Reduce water heating costs and overall home water consumption



Water is one of Earth's most precious resources. It is more important than ever to reduce our water consumption and live more sustainably. Furthermore, water heating is the second highest utility expense, making up about 1/5th of your bill. Several low cost changes could have a large impact on your water use and utility bills.

WATER EFFICIENCY IMPROVEMENTS

- **Reduce Hot Water Usage** – There are a number of ways to reduce your home's hot water usage. The cheapest way is to change your behavior. Consider washing clothes in cold water. Take shorter showers. Use an efficient dishwasher instead of hand washing, plus scrape off food before washing. Set your water heater to vacation mode when you travel. Fix leaks immediately; beware of unknown plumbing leaks in crawlspaces. If your water heater tank leaks then it needs to be replaced.
- **Low-Flow Fixtures** – Americans use an average of 100 gallons of water a day at home. Simple adjustments can make a significant impact without breaking the bank. Low-flow means less water without compromising performance. Save water by choosing WaterSense labeled products. WaterSense certifies showerheads, toilets, urinals, sink faucets and accessories, irrigation controls, new homes, and more. By installing WaterSense fixtures, residents can save \$170 per year on average. Upgrading to low-flow faucets, toilets, and showerheads is a great investment. By purchasing \$10-20 low-flow fixtures you could have water savings of 25-60%. Existing faucets can also be retrofitted with low-flow aerators and toilets can be improved with low-flow valves.
- **Water Heater Set Point** – By lowering your water heating temperature setting you can lower your water heating costs while also maintaining comfort as well as health and safety. The recommended range for water heating is 120-140°F. Maintaining a temperature above 120°F decreases the slight risk of bacteria growth while maintaining a temperature below 140°F will lower costs, reduce the risk of scalding, and slow mineral buildup and corrosion. Insulating your water heating and hot water pipes will also help lower energy costs. Consult Energy.gov for more instructions on these DIY tips.
- **Landscaping & Irrigation** – Plan landscaping to fit your microclimate and soil. Plant native drought-resistant plants. Limit turf areas and irrigation. Using mulch will minimize evaporation and help maintain a healthy landscape. Avoid locating plants close to the home that need frequent watering and group plants with similar water needs together. Water plants in the morning when it is cooler and the evaporation rates are lower. A longer lawn helps retain water in the summer. A well-designed landscape can save enough water to pay for itself in less than eight years.

EFFICIENT WATER HEATING

- The life expectancy of a water heater is about 8-12 years varying with the type, quality of design and installation, maintenance, etc. When choosing a new water heater for your home, select an energy-efficient system and a model that is properly sized for your home.
- Your selection criteria should include fuel type, cost, size, and energy efficiency. Tax credits should also be researched for energy-efficient, geothermal, or solar water heating.

RESOURCES

- [Energy Saver 101: Water Heaters](#)
- [Renewable Water Heating Tax Credit](#)
- [ENERGY SAVER 101: Landscaping](#)

Appliances, Electronics, & Lighting

Basic usage adjustments and system upgrades to reduce energy consumption



Energy-efficient options and behavioral changes will help reduce electricity costs and usage. Decreasing energy use at home saves money and lessens pollution. Reducing electric loads starts with resident choices.

LIGHTING

- Turn Off Lights - The cost effectiveness of turning off the lights will depend on the type of bulb. Incandescent and halogens should be turned off whenever they are not needed. Since CFLs are more efficient, they should be turned off if you leave a room for more than 15 minutes. The operating life of a LED is unaffected by turning it on and off. LEDs have an advantage when used in conjunction with occupancy sensors or daylight sensors.
- Lighting Controls & Dimmers - Lighting controls like timers and photocells turn off lights when not in use, saving electricity. Dimmers save electricity by lowering the light levels. Make sure your energy-efficient bulbs are compatible with these products.
- LEDs - In contrast to traditional technologies, light emitting diodes (LED) turn on at full brightness almost instantly. LEDs use at least 75% less energy and last 25 times longer than incandescent lights. A number of online calculators can be used to estimate your return on investment for switching to interior, exterior, and holiday LEDs.
- Solar Outdoor Lighting - Outdoor solar lights are easy to install and low maintenance. Solar cells convert sunlight into electricity and store for use at night. It is important that solar cells receive the manufacturer's recommended hours of sunlight. Also check that the manufacturer offers replacement bulbs and batteries.

APPLIANCES & ELECTRONICS

- Plug Loads - Unplug electronics when not in use. Using an advanced power strip can save up to \$100 per year by reducing energy waste.
- Energy-Efficient Appliances & Electronics - ENERGY STAR certifies kitchen and laundry appliances as well as many electronics. Help cut down on luxury loads by choosing energy-efficient products. Use a small toaster or convection oven for small meals rather than the full-sized oven; this will use 30-50% less energy. If you upgrade your laundry machines, remember to use detergent labeled high-efficiency. Top or bottom freezer models are more efficient than side models. Hand washing dishes costs \$40 more annually than using an ENERGY STAR qualified dishwasher.
- Usage Habits - Adjusting usage habits is one of the easiest and cheapest ways to decrease energy consumption and waste. Using rechargeable batteries is more cost effective than disposable ones and then you do not need to worry about safe disposal. Be sure your dishwasher is full, but not overloaded. Let your dishes air dry instead of using a heat dry setting, opening the door after the dishwasher finishes will help the dishes dry faster. Set your refrigerator temperature between 35-38°F and the freezer temperature at 0°F. Use cold water for washing clothes and adjust the water-level for the correct load size. If your dryer has a moisture sensor, you should use it. Clean the dryer lint screen after every load. Turn off computers or switch to low power mode when not in use, this could save you \$30/year.

NEXT STEPS

- Renewable Energy Systems - Have you followed all the guidance to improve your homes energy-efficiency, but you want to go further? Consider installing a renewable energy system like geothermal hot water, solar PV, or wind. By first lowering your home's energy use, you can now invest in a smaller system.
- Benchmarking & Smart Tools - Consider using a web-based utility tracking tool or smart meter to better understand your energy usage. These tools can help you find ways to save energy and money, plus track progress as you make energy-efficiency and lifestyle changes.

RESOURCES

- [Home Energy Calculator](#)
- [ENERGY STAR Certified Products](#)
- [ENERGY STAR Home Virtual Tool](#)

Resources

Tax Credits and Rebates



TAX CREDIT AND REBATES

1. [U.S. Department of Energy - Tax Credits, Rebates, & Savings](#)
2. [Residential Energy Efficiency Tax Credit](#) (\$500 cap)
3. [Sales Tax Exemption for Energy-Efficient Products](#) (Sales Tax Holiday)
4. [RESNET - Home Improvement Tax Credits](#)
5. [Database of State Incentives for Renewables & Efficiency](#)

DOMINION PROGRAMS AND REBATES*

1. [Residential Energy Efficiency Rebate Program](#)
2. [Smart Cooling Rewards](#)
3. [Income & Age Qualifying Home Improvement](#)
4. [Home Energy Check-Up](#)
5. [Heat Pump Tune-Up](#)
6. [Heat Pump Upgrade](#)
7. [Duct Sealing](#)
8. [Appliance Recycling](#)
9. [EnergyShare](#)

*Not a Dominion customer? Check your utility providers' websites for energy improvement and rebate programs

SOURCES

Viridiant - Building Sustainability
www.viridiant.org



U.S. Department of Energy - Energy Saver
www.energy.gov/energysaver/energy-saver



Dominion - Energy Saving Tips

www.dom.com/residential/dominion-virginia-power/ways-to-save/energy-saving-tips



ENERGY STAR - Ways to Save

www.energystar.gov/campaign/waysToSave



EPA WaterSense
www3.epa.gov/watersense/



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