

Easy Ways To Save Energy, Water, and Money In Your Home

This document was produced by Croton's Sustainability Committee in June 2017. The Committee strongly recommends that residents seek the advice and or services of qualified professionals before undertaking some energy-saving measures. Certain home improvements can have unforeseen consequences. If, for example, a home is very tightly insulated, it may require more ventilation and more fresh air intake to its furnace or boiler for proper combustion.

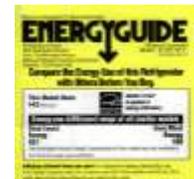
We all want to save money and make our world more sustainable. Below find a variety of ways to cut energy and water bills and waste, many of which involve only small investments. For a more comprehensive approach, a free energy assessment (also called an energy audit) is available through the **EnergizeNY** program (find details at http://croton.energizeny.org/how_it_works). It includes a blower door test to gauge how much air leaks from a home, and may be lost via its exhaust fans and heating system. To learn more about how energy assessments are done, view short videos about them at http://energizeny.org/ask_the_energy_coach .

1. Water

- a) Many people are surprised at how much water they use. In water bills, note the typical consumption (in hundreds of cubic feet as CCF. To convert CCF to gallons, multiply it by 748. While 50 gallons per person per day is not unusual, 30 (or less) may be achievable via the actions suggested below.
- b) Check for leaks around sinks, toilets, exposed pipe valves, and the main water shutoff valve. A major jump in usage may, however, indicate a non-visible leak (e.g., piping in an underground sprinkler system) and should be checked by a licensed plumber. Check your toilets for leaks by putting a few drops of food coloring in the tank. Watch for a few minutes to see if the color shows up in the bowl. Such leaks can lose as much as 100 gallons a day.
- c) Typical sink faucets may allow water to flow at 2.2 gallons per minute (gpm), which is rarely needed when washing hands. At a hardware or plumbing supply store, find sink aerators that screw into your faucet's spout and trim that flow down to .5 or .35 gpm. Instead of a full stream, they create a spray of droplets (see photo) that get the job done just as well. The lower flow saves water and reduces the load on your hot water heater, especially if you let the faucet run while shaving or washing. You can also turn the faucet completely off for a minute or so while brushing your teeth or washing your face in the morning and evening—surprisingly that can save hundreds of gallons a year. 
- d) A typical shower head may allow flow up to 5 gpm, which is much more than needed for a good shower. Low-flow shower heads (down to 1.5 gpm) may be found from a variety of on-line hardware and bath suppliers. Add an in-line shutoff (see photo) to allow easy temporary shutoff without adjusting the shower valves. Have family members take consecutive showers to save on the initial hot water running to reach the desired temperature. Together, these devices may save many gallons of hot water every year. Seek the EPA's 'Water Sense' label as an assurance of a quality product. 
- e) Low flush toilets may cut a flush from 5 gallons down to 1.6 gallons, which is now mandated by law. Some newer models use as little as 1.28 gallons. To save even more, some units have separate flush buttons for liquid and solid waste. To ensure a complete flush, pressure-assisted models are available that keep toilet bowls clear, even during a Super Bowl party.
- f) Water your lawn only as needed. Such prudent watering may be the biggest water saver of all: a sprinkler can easily consume 1-6 gallons per minute. When running for several hours each day during the summer, it could more than double your water bill.
- g) Fully load washing machines and dishwashers. When it's time to replace them, choose Energy Star® models.

2. Electricity/Lighting

- a) When replacing light bulbs, choose fluorescent or LED units, instead of the old-style incandescents (i.e., those with glowing filaments). While saving electricity, LEDs may also last 20,000 hours versus 1,000 hours for a typical incandescent. To ensure the 'soft white' look of incandescents (instead of a hard bluish-white light), look on the lamp's packaging for a Kelvin temperature of 2700-3000 K or less. Lamps with a 'warmer' look have a lower Kelvin (K) temperature than the bluer 'cool' ones.
- b) To avoid wasted lamp burn hours in exterior lighting (especially overnight), use light timers, motion detectors, and/or photocell-controlled lighting fixtures (see photocell control at right). Timers may also be used on air filters, dehumidifiers, humidifiers, and other devices not used to refrigerate food.
- c) Instruct family members to shut off appliances and indoor lights when not in use.
- d) When it's time to replace old electric appliances (e.g., dryers, washers, dishwashers, dehumidifiers, and refrigerators) choose Energy Star® models. Read the yellow Energy Guide stickers to see which units may use less electricity.
- e) Heat rejection coils beneath or on the backs of refrigerators and freezers should be kept clean for those units to operate efficiently.
- f) Install inexpensive outlet and switch gasket covers which can reduce air leakage.



3. Insulation

- a) Much heat may be lost from a home in ways that are obvious. When fireplaces are not in use, for example, they are notorious for allowing indoor air to escape. Even when shut, an old and/or leaky fireplace flue damper may allow a lot of air to escape up the chimney, taking with it heat in winter and air-conditioned air in summer. Have a certified chimney sweep install a damper at the top of the fireplace chimney flue (not to be confused with the flue of your boiler or furnace). A good top chimney damper has a chain that reaches the bottom of the chimney, allowing you to easily open the damper when using the fireplace. Don't forget to CLOSE the damper after the fire is completely extinguished and OPEN it before using the fireplace again.
- b) Doors, windows, and attic hatches may routinely leak air around their edges. Adding weatherstripping and door sweeps (kits are available on-line or at hardware stores) will cut such leaks at a very low cost.
- c) The blower door test (see photo at right) during an energy assessment quantifies how leaky a home may be, and help pinpoint the worst leakage spots that may then be weatherstripped.
- d) To keep heat or cool air inside a home, make sure your windows are closed all the way and locked. Where windows are singled-glazed (i.e., one layer of glass) and/or leaky, temporary interior window kits (using plastic stripping and clear sheeting) may be added in winter to cut heat loss, and later removed.
- e) When adding or replacing vinyl siding, insulate behind it with at least ¾" styrofoam rigid insulation.
- f) Where accessible (e.g., attics and basements), A/C ducts and heating pipes should be insulated (see photo at right).



Note: Before replacing an old boiler, furnace, or central air conditioning system, have an energy assessment performed (see above). It will show where best to weatherstrip and add insulation and/or sealing to your attic

(floor or ceiling), gable walls, and basement rim joist. A variety of products, including spray foam, dense pack cellulose, fiberglass, and rock wool, are available to suit every need.

Once the obvious sources of heat loss have been addressed, an HVAC contractor can appropriately calculate heat loss or cooling load to properly size the new heating or cooling equipment. Doing so may cut the size and cost of such equipment, and make it run more efficiently by avoiding the oversizing that is common without such an analysis.

4. Space Heating

- a) Many hot water or steam heating systems have a room or two that can overheat, even if the system has been balanced. When installed, a thermostatic radiator valve (TRV, see picture at right) acts like a local thermostat to adjust a radiator's heat downward. They should not, however, be placed in bathrooms or the same room as the heating system's own thermostat. TRVs may also be misled by proximity to drafty windows, and a TRV is no substitute for having a balanced heating system.

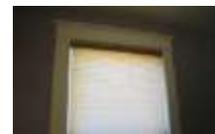


- b) One of the most cost-effective upgrades in a home is replacement of a standard round thermostat with a programmable unit that automatically raises and lowers temperatures based on a home's occupancy and sleeping schedules. The US Department of Energy estimates that 1% savings on heating may be achieved for every 1 F setback for an 8-hour period, if performed each winter day.



How far you may comfortably set back a home's temperature, and for how long, depends on factors such as age and health of the occupants, how fast heat is lost, and how quickly the heating system is able to return the temperature to normal. For the average home, a daily setback of 3-4 F (reset to normal about an hour before people arise or return from work to allow warmup) is often acceptable. Deep setbacks (i.e., over 10 F) may be acceptable while a home is unoccupied for an extended period (e.g., vacation), but temperatures below 55 F may encourage mold formation.

- c) In winter, a ceiling fan can be set to run clockwise (as seen from below) at low speed to increase warm air circulation in the room. Do not run while not in the room.
- d) Thick thermal window shades can reduce drafts in winter and heat gain in summer (see thermal shade on window at right).
- e) Annually (or more often, as needed) replace furnace filters.
- f) To allow thermostats to be kept at 68 F or lower, wear a sweater or layers of warm clothing while indoors.



5. Domestic Hot Water

Water used for washing (instead of heating) is called "domestic hot water" (DHW). Many of the recommendations made above under "1. Water" also significantly reduce energy used to make DHW.

While DHW is stored in a tank, heat is routinely lost through the tank's jacket. The hotter DHW is kept, the faster that heat is lost. Insulating kits are available to cover DHW heaters, and may be especially appropriate where such tanks are in unheated spaces.

Many new homes are equipped with on-demand DHW systems that do not utilize the tanks discussed above. While an efficient way to heat DHW, converting an existing home to such systems may be expensive due to the need to run gas or electric lines to the kitchen, laundry, and each bathroom in a home.

For a more detailed discussion of DHW heating options, see our Committee's "Alternative Heating Sources for Homes" posting at www.crotononhudson-ny.gov/Public_Documents/CrotonHudsonNY_BComm/alternativeheatingsourcesforhomes.pdf

6. Air Conditioning (A/C)

- a) Annually (or seasonally) maintain such systems by:
 - cleaning or replacing air filters
 - for central A/C systems, have a trained professional clean and inspect both the inside air handler (i.e., the evaporator) and the outdoor condenser.
- b) For window air conditioners, install indoor and outdoor unit covers (see photo at right) during the winter. If not an insulating cover, an indoor cover may also allow a rigid piece of insulation to be placed under it. Keep the A/C's unit vent in the closed position unless fresh air is needed (e.g., due to cooking or smoking). 
- c) Running a ceiling fan counter-clockwise in summer – thereby blowing air downwards – can allow residents to raise their cooling thermostats a little higher (around 78°) because the air flow causes skin to feel cooler. Every 1° F higher saves about 3% of an A/C's electrical use. (The direction of the fan movement is determined from the viewpoint of looking up at the fan.)
- d) Ensure that a central A/C system's trunk ductwork, horizontal feeds and vertical ducts are all well insulated, and the duct and register dampers are set appropriately balance for each room size (i.e., do not over or under heat it on a cold day). Ensure attic ducts are angled well, rather than being kinked, which could disrupt air flow.
- e) To minimize heating and cooling costs, plant and nourish deciduous trees (i.e., those that lose their leaves in winter) that provide shade in summer and sun in winter.