

SECTIONS

Ramping up your energy efficiency

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Christopher Straka of Vert Design, which designed Canada's first certified passive solar house, is seen in the crawlspace for heating units. The Ottawa house uses about one-tenth the energy that a conventional Canadian house does. *WAYNE CUDDINGTON / OTTAWA CITIZEN*

It's a given that you're not King Midas. So where exactly should you invest when it comes to ramping up your home's energy efficiency?

BUILDING ENVELOPE

People want a "one-size-fits-all solution and that doesn't exist," says Christopher Straka, principal with Ottawa's Vert Design, a residential and commercial planning, design and development firm. Straka's company designed Canada's first certified passive home, which uses about one-tenth the energy for heating and cooling that a conventional Canadian house does.

Every home has its own energy strengths and weaknesses, he explains, based on age, construction and other factors. Only an energy audit, which you'll need to tap into federal grant programs for upgrades, can pinpoint your individual energy issues (information on audits and grants: <http://oee.nrcan.gc.ca/residential/personal/2299> (<http://oee.nrcan.gc.ca/residential/personal/2299>)).

Even so, Straka says that unless you're building a custom home and can orient it for free heating from solar gain, your best bet is still tightening up the building's envelope: caulking and weather stripping to reduce leakage, more insulation, and better windows and doors.

Plugging air leaks and topping up insulation can save over \$400 a year, according to energy provider Direct Energy. Upgrading insulation in a 1,200-squarefoot attic costs about \$1,200, but government grants would cover a good chunk of that.

For insulation, anything less than R12 in the walls and basement, R20 for exposed floors and cathedral ceilings and R40 in the attic calls for upgrading, says Ross Elliott of Ottawa's Homesol Building Solutions and a veteran home energy auditor and energy designer. "Going from R10 to R20 gives you the biggest boost: it's the first few inches that are most important." After that, the law of diminishing returns sets in.

Adding rigid Styrofoam to the outside walls can bridge thermal gaps, which are heat leaks where the fibreglass insulation is

interrupted by studs, although you may need to remove the exterior cladding to do so.

If you are replacing windows, opt for triple-glazed with low-E coatings and argon between the panes, says Elliott. They cost between 20-and 30-per-cent more but greater comfort and resale value are among the benefits.

Forward-thinking builders have long opted for tighter building envelopes. Matthew Sachs, general manager of Ottawa's Urbandale Construction, which builds to the high standards of R-2000, says that while they use double-pane, not triple-pane, Energy Star windows, they use the ones recommended for climate Zone C, which is colder than the Zone B in which Ottawa is located.

MONSTER IN THE BASEMENT

After the building envelope comes mechanical systems.

A high-efficiency furnace costs \$3,000 to \$6,000 installed, but can shave more than \$500 a year on heating bills if your current furnace is more than 20 years old, according to Direct Energy. Federal government grants could cover up to \$790 of your investment.

Natural Resources Canada's Home Heating System Cost Calculator

(<http://oee.nrcan.gc.ca/residential/personal/tools/calculators/heatingcalc/invest.html>)

(<http://oee.nrcan.gc.ca/residential/personal/tools/calculators/heatingcalc/invest.html>) lets you compare your existing system to other heating systems and fuel sources.

An aging air conditioning system can also suck up energy dollars and replacements are eligible for government grants.

Switching from a standard hot water system to a tankless (ondemand) type can slash \$150 or more from annual costs for a family of four. The systems cost about \$3,000 installed.

Elliott suggests checking out condensing hot water heaters, which capture heat from burned gases for reuse, achieving more than 90-per-cent efficiency in the process. Like tankless systems and even Energy Star-rated conventional water heaters, they are eligible for government grants.

He also ranks a heat recovery ventilator or other ventilation system as an essential investment for humidity control and healthy indoor air.

Despite the range of upgrade possibilities, "the answers aren't that complicated," says Straka.

"It's a matter of looking at three or four different options and then reshuffling your deck of cards till you get what you want."

Coincidentally, a recent study by the United States' Shelton Group, a U.S.-based advertising agency specializing in green products and services, found the average homeowner needs to make about four improvements in energy efficiency for bills to drop.

If you are planning to retrofit your home or are considering buying a resale home, NR-Can and Canada Mortgage and Housing Corp. have produced fact sheets that include recommended upgrades for 11 housing types in five regions of Canada: cmhc-schl.gc.ca/en/co/renoho/reensa/reensa_001.cfm (http://cmhc-schl.gc.ca/en/co/renoho/reensa/reensa_001.cfm).

OTHER USEFUL PUBLICATIONS

- Planning Energy Efficiency Renovations for Your Home (<http://oee.nrcan.gc.ca/residential/personal/retrofit/4062>) (<http://oee.nrcan.gc.ca/residential/personal/retrofit/4062>) covers products, hiring contractors and the like.

- Keeping the Heat In

(<http://oee.nrcan.gc.ca/publications/residential/8584>
(<http://oee.nrcan.gc.ca/publications/residential/8584>)) includes advice on how to retrofit.

EMERGING TECHNOLOGIES

The National Research Council and NRCan are studying a raft of new energy-efficiency products including ultra-efficient Vacuum Insulated Panels (VIPs) with R values about five times that of conventional insulation.

Other items on the test bench include mini-split heat pumps for heating and cooling. Unlike standard air-source heat pumps, which are only effective to about -5 C, these will produce heat at -20 C or colder.

NRCan and CMHC also recommend old-school technology such as awnings and roll shutters for south-and west-facing windows as a very effective way of reducing cooling costs.

And, as we all know, turning down the thermostat in the winter and turning it up during air conditioning season can save a bundle.

ENERGY-GOBBLING GIZMOS

We are buying more Energy Star devices, like televisions and computers, but a recent Shelton Group study found that while Americans believed they were using less power than they were five years earlier, consumption has actually grown 10 per cent in the last decade.

The culprits? Everything from energy-gobbling appliances, like old beer fridges, to our bottomless appetite for more electronic devices in our homes. Many of those devices also have "alwayson" features like clocks and instant-on capability that suck up power 24/7, accounting for five to 10 per cent of the power consumed in a typical Canadian home, according to NRCan.

Among the biggest energy wasters are charging stations for cellphones and the like, says Hydro Ottawa spokeswoman Linda Bruce. "People plug them in and go to bed, but they keep drawing power all night." Since it only takes three or four hours to charge a device, she suggests using a timed power bar (\$24.99 at Canadian Tire) to cut power to the charging station entirely.

For more energy saving ideas, visit Ontario Power Authority's site at saveonenergy.ca (<https://saveonenergy.ca/>).

Also, check out NRCan's online calculator for energy consumption by appliances

(<http://oee.nrcan.gc.ca/equipment/appliance/15751> (<http://oee.nrcan.gc.ca/equipment/appliance/15751>); look for "Calculating the second price tag").

Using Hydro Ottawa's current electricity rates, the calculator shows, for example, a saving of more than \$700 over 14 years by switching from a mid-to a highefficiency clothes washer and using it during off-peak hours (7 p.m. to 7 a.m.).

Even with the higher cost of an ultra-efficient appliance, rising electricity rates will mean increased savings. You'll also use less water.

GREEN GLOSSARY

If you see a bold word in a Going Green story, check page i10 for more information on what it means

BEST BETS TO IMPROVE ENERGY EFFICIENCY

In the absence of an energy audit to determine your home's energy weaknesses, you'll get the most bang for your buck in tightening the building's envelope. CMHC's website offers recommended upgrades for 11 housing types in five regions of Canada. Here's what to expect for a bungalow built in the '60s or '70s.

FINDING YOUR ENERGY HOGS

Yes, little things do add up to big things when it comes to energy conservation. Here are some little energy-saving tips.

- Electronic devices continue to consume "phantom" or standby power even when not being used, adding five to 10 per cent to your energy bill. Culprits include televisions and home theatre systems, computers (including monitors and printers), cellphone and other chargers and game consoles.

Solution: Plug the devices into power bars that cut the electricity supply when it's not needed.

- Set-top boxes that bring cable and other services to your television are among the worst phantom power hogs. Depending on the number and configuration, they can consume more power than a central air conditioning system, according to a detailed New York Times article.

They often can't be unplugged because they take forever to reboot. Look for Energy Star models with the lowest phantom power consumption and minimize the number you own.

- When using a dishwasher, Ontario Power Authority suggests air drying your dishes, using the air-dry setting (or energy saver) option, or just leaving the door open. Visit saveonenergy.ca (<https://saveonenergy.ca/>) for more tips.

- Think twice before you buy a digital picture frame or at least either unplug it when no one's home or put it on a power bar with a timer.

The Electric Power Research Institute, a non-profit research group, estimates that if every household in America ran one digital picture frame around the clock, five additional power plants would be needed to operate them.

- Air conditioners are among a home's biggest energy hogs and units from the 1970s can use up to 50-per-cent more power than

today's models, according to the United States Department of Energy. Even 10-year-old systems can be 20-to 40-per-cent less efficient than new models. Look for Energy Star-certified units. As well, shade the condenser from the sun and keep it free from leaves and other debris to achieve maximum efficiency. Air conditioners are eligible for a rebate under the federal ecoEnergy program (oee.nrcan.gc.ca (<http://oee.nrcan.gc.ca/>)).

- Cut heating costs up to five per cent by changing furnace filters every one to three months.

- You know that old beer fridge may be wasting up to \$125 a year in electricity. You also know that Ontario Power Authority will haul it away for free. But did you realize that dirty coils on the back or bottom of your fridge or freezer make it work harder? Vacuum them every couple of months, more often if you have a pet that sheds hair.

Check the seal on your refrigerator or freezer. Close the door on a piece of paper. If you can pull the paper out easily, replace the gasket.

- Incandescent light bulbs are being phased out in Canada and elsewhere. To maximize the life of CFL bulbs, leave them on at least 15 minutes, but then turn them off when you leave the room.

Contrary to what you may have heard, re-energizing bulbs uses minimal electricity.

For a guide to buying CFL bulbs, which is as complicated as choosing wine, see

hydroottawa.com/residential/saveonenergy/tips-andtools/lighting/

(<http://hydroottawa.com/residential/saveonenergy/tips-and-tools/>).

- Winter vacation? Consider un-plugging your refrigerator and using timers on your indoor lights.

SEO Ottawa Flyers



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