

Houses, Blackholes and GHG

This article is one of a series looking at island solutions to greenhouse gas emissions (GHG) and climate change. The One Tonne Challenge, part of the island's Community Energy Strategy, invites everyone to participate in identifying and reducing their individual contributions to GHG. This weekend you can visit the Earth Festival Society Booth at the Fall Fair to sign up for the Challenge. Visit the website at www.saltspring-onetonnechallenge.org

Winter is coming, fuel prices are rising, and BC Hydro is charging over 7 cents per kWh (up from just under 6 cents). Now is a good time to winterize your home and fix those 'blackholes' of energy loss. Saving electricity not only saves dollars, it also reduces GHG. Although ninety percent of BC's electricity is currently generated from hydro power and produces few GHG emissions, when a light bulb is turned off on Salt Spring, less fossil fuel is needed to generate electricity somewhere else on our interconnected North American grid system. BC Hydro plans to increase its use of fossil fuels to generate electricity and this change could result in a four-fold increase in emissions per person by 2012.

Firewood is a readily available and renewable fuel. One of the advantages of using firewood is that it is locally grown and supplied – heating dollars are kept on-island. However, firewood is responsible for much of the local air pollution, producing large quantities of carbon monoxide, methane (which is a potent GHG), volatile organic compounds and particulate matter. To reduce pollutants, ensure your wood is dry—it should be seasoned under cover for at least one full year—and that you are using an EPA-rated low-emission, high-efficiency wood stove. Other options for efficient, clean burns include pellet stoves, which can reduce air pollution by up to 90%, and contraflow masonry heaters, which burn hot, clean and fast and then slowly radiate the stored heat.

What is the best way to save dollars and energy, and cut GHG? An EnerGuide for Houses energy assessment is a useful way to answer these questions. The ideal time for an assessment is before any major planned change, such as renovations, window upgrades, or heating system replacement. Grants are available to homeowners who improve the energy performance of their homes through the federal government's EnerGuide for Houses program, which provides homeowners with a subsidized energy evaluation. The EnerGuide for Houses service includes a 'blower door' test to find air leaks, a report that shows where your energy dollars are being spent and what you can do to improve your home's efficiency, and a rating that shows you how efficient your home is compared with others. A second visit after improvements reevaluates the home and establishes the amount of the government rebate.

Below are three stories from Salt Springers who have participated in the EnerGuide for Houses assessment program, to show what sort of changes people are making to their homes.

The Rainbow House was built in the late 60s, when single-paned windows were the norm, not a lot of insulation was used and people didn't worry about drafts. The house had an oil furnace. The house was being renovated which provided the opportunity to improve energy-efficiency at the same time. The main motivation for making improvements was to reduce fuel bills. The peak bill in the winter of 2003 was \$500 for a 4-6 week period.

The Rainbow House received a "really poor" energy efficiency rating, partly because of the large expanse of north-facing single glazing. During the 'blower door' test, the owner was "staggered by where the air was coming from -- corners and cracks you wouldn't even think of as drafty..." The test shaped a few of the renovations: gaps were filled and caulked, and insulation in the attic will be tripled. The interior finish in the living room was being replaced, so more insulation was added behind the new drywall. Eventually all of the windows will be upgraded to low-E sealed units, and some will be argon-filled. Where they were not necessary, operable windows have been replaced by fixed glass to reduce air leakage, and window areas have been reduced. Special heat-saving blinds will be purchased for the larger windows. At some point, the old oil furnace will be replaced with a more efficient unit.

The Sunset House The owners built the Sunset House in 1979. The house has good solar exposure, has a metal roof, and stucco exterior. Windows are sealed double units. Six inch thick walls provide good

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insulation. The home is heated primarily with firewood, with electric baseboards for extra comfort. Fireplaces are found in the living room, bedroom and each of the downstairs rooms. A wood cookstove in the kitchen also provides space heating. The owners are now in their 70s, and don't want to rely on hauling and chopping wood.

The Sunset House was rated "a bit above average" for its energy performance. To reduce heating costs and eliminate the need to burn firewood, the owners decided to install a heat pump. Upgrading their heating system will also improve the resale value of the house. The EnerGuide advisor described the various heat pump options. Their new air-source heat pump is about three times more efficient than baseboard heating. The owners also upgraded the insulation and drywall in the basement at the advisor's recommendation.

The Cottage was built in the 1950s. The owner, a builder, says it was totally inefficient from an energy standpoint. The two level, stick-frame house had single-glazed aluminum windows, an oil furnace and an open fireplace. Attic and walls had minimal insulation. The owner had plans to do a 'gut' renovation on the home. He was motivated to have an EnerGuide assessment to recuperate some of the money invested in the renovation. Furthermore, since he was doing a 'gut' renovation anyway, the owner wanted to learn which options would keep operating costs to a minimum: "Why pay more energy costs than necessary?"

The old oil furnace was removed, as were all oil heat sources, single-paned windows, insulation, wiring and old plumbing. New low-E plus argon vinyl windows were installed. The EnerGuide kit provided guidelines for proper installation of insulation. Horizontal strapping was attached to the walls and additional inches of insulation were added, bringing the insulation up to R20. The roof will be insulated to a minimum of R28. A concrete slab was poured for radiant heating, a more efficient heating method than forced air. A propane fireplace (with a direct vent from the outside) provides additional heating. The wood-burning fireplace will be closed off to reduce heat loss. The incremental costs of the energy measures are a fairly small part of the total renovation, and will be recouped over time through lower operating costs.

Individual needs and circumstances determine the investments that we make in energy efficiency. You may not be able to afford to switch to wind power, solar power, or radiant heating systems, but simple lifestyle choices, such as switching off lights and turning down thermostats, go a long way. When choosing a major appliance, look for an Energy Star-rated model. Today's energy-efficient refrigerators use 50% less energy than models made ten years ago, while today's dishwashers are 95% more energy efficient than those bought in 1972. Low flow shower heads save as much as 60% of the water used by a conventional fixture.

If Salt Springers get serious about saving energy at home, we will have gone a long way towards meeting our Kyoto commitments and we'll have made a long-term investment that will save us a lot of money!