ecoENERGY
an ecoACTION initiative

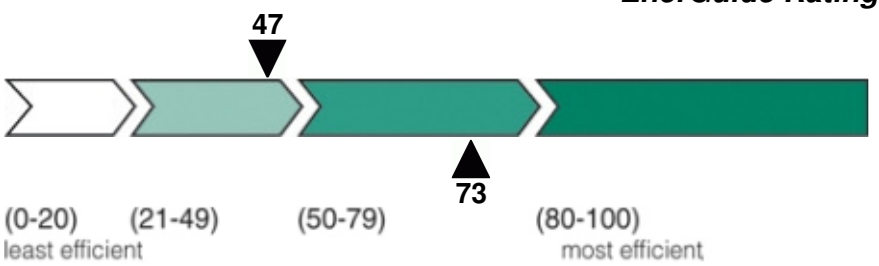
Energy Efficiency Evaluation Report

File number: Sample

Property Owner:

N.R.G. Savings
1234 Comfort St.
Kirkland Lake, Ontario
P2N 1W4

EnerGuide Rating



House type: Single detached

No. of storeys: Two

No. of RO windows: 11
RO = rough opening

Air conditioner: No

Heating system: Natural gas Furnace

Domestic hot water: Electricity

Air leakage rate @ 50 Pa: 14.00 ACH
ACH = number of air changes per hour

Equivalent Leakage Area: 1408 cm^2 / 217 in^2

The results of your pre-retrofit energy evaluation indicate that your home rates 47 points on the EnerGuide Rating System (ERS) scale. If you implement all of the recommendations in this report, you could reduce your energy consumption by up to 48 percent and increase your home's energy efficiency rating to 73 points. The average energy efficiency rating for a house of this age in Ontario is 57, and the highest rating achieved by the most energy-efficient houses in this category is 83.

When you reduce the amount of energy used in your home, you also reduce the production of greenhouse gases (GHG) such as carbon dioxide. By improving your home's energy efficiency rating to 73 points, you could reduce its GHG emissions by 7.7 tonnes per year.

You have until March 31, 2012, to complete your renovations and obtain a post-retrofit evaluation in order to qualify for the federal ecoENERGY Retrofit – Homes grant. Complementary programs may have their own deadlines. The sooner you start your renovations and invest in energy efficiency upgrades, the sooner you will benefit from the energy savings.

Note: If you notice any discrepancies with the above description of your home, contact your service organization immediately.

Service Organization: Green Communities Canada
Telephone: (705)563-2202

Certified Energy Advisor: David Baerg

Date of evaluation: August 12, 2011
Date of report: August 12, 2011

Certified Energy Advisor Signature

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1. YOUR HOME ENERGY ACTION CHECKLIST

This is your checklist of recommended retrofits to improve the energy efficiency of your home. Included below are the federal grant amounts that you could receive through the ecoENERGY Retrofit – Homes program as well as information on the potential for energy savings and EnerGuide rating improvement. You can also choose other eligible measures from the program *Grant Table* (http://oee.nrcan.gc.ca/retrofit/homes/table), even if they do not appear on this list. The more upgrades you choose, the larger the grant and the greater your potential energy savings.

You are solely responsible for researching program requirements, choosing eligible products and keeping all receipts for three years. In many cases, products must appear on specific eligibility lists referred to in the *Grant Table*. For more information on program criteria, visit http://ecoaction.gc.ca/homes or call 1 800 O-Canada.

NRCan transfers file information to complementary programs in certain provinces and territories, which may have their own rules and deadlines. To obtain contact information for these programs, visit http://oee.nrcan.gc.ca/retrofit/homes/regional or call 1 800 O-Canada.

Before undertaking upgrades or renovations, find out about the appropriate products and installation techniques, and ensure that all renovations meet local building codes and by-laws. NRCan does not endorse the services of any contractor, nor any specific product, and accepts no liability in the selection of materials, products, contractors or performance of workmanship.

Note: The Potential Rating Improvement of each upgrade below is an estimate that may not reflect the final rating a home will receive. For more information, please speak with your certified energy advisor.

IMPORTANT HEALTH INFORMATION

Vermiculite insulation has been detected in your home. Some older vermiculite insulation that was used to insulate homes may contain amphibole asbestos, which can cause health risks if disturbed and inhaled. **Avoid disturbing vermiculite insulation in any way.** If vermiculite insulation is contained in walls or attic spaces and is not disturbed or exposed to the home or interior environment, it poses very little risk. It is important that you read the Health Canada article entitled *It's Your Health - Vermiculite Insulation Containing Amphibole Asbestos* that has been included with your report. For more information, you can also visit Health Canada's web site at http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/insulation-isolant-eng.php or call 1-800-443-0395.

If you plan to undertake renovations (including insulation or air sealing work) on your home that may cause the vermiculite insulation to be disturbed, contact professionals who are qualified to handle asbestos before you proceed with the renovations. For a listing of qualified professionals, look in the Yellow Pages TM under 'Asbestos Abatement & Removal'.

Retrofits **These upgrades qualify for a federal grant up to a maximum total incentive value of $5,000:**	**Federal Incentive**	**Potential for Energy Savings ***	**Potential Rating Improvement**
* One (1) star = lowest savings / five (5) stars = highest savings			
HEATING SYSTEM Replace your heating system with an ENERGY STAR® qualified gas furnace that has a 94.0% annual fuel utilization efficiency (AFUE) or higher and a brushless DC motor (when installing a CONDENSING furnace for the FIRST time).	$790		12.6 points
DOMESTIC HOT WATER SYSTEM (DHW) Replace your domestic hot water heater with an ENERGY STAR® qualified Instantaneous (condensing) gas-fired water heater that has	$375	–	1.5 points

an energy factor (EF) of 0.90 or higher.

ATTIC/ROOF INSULATION		☆	2.2 points
Increase the insulation value of your attic from the current level, which is evaluated at RSI 2.0 (R-11.4), to achieve a total minimum insulation value of RSI 8.8 (R-50). (Refer to "Important Health Information" above.)	$256		
Increase the insulation value of your attic from the current level, which is evaluated at RSI 3.5 (R-19.9), to achieve a total minimum insulation value of RSI 8.8 (R-50). (Refer to "Important Health Information" above.)	$105		
BASEMENT/CRAWL SPACE INSULATION		☆☆☆	6.9 points
Increase the insulation value of the basement walls by a minimum of RSI 1.8 (R-10) to a maximum of RSI 4.1 (R-23). (Refer to "Important Health Information" above.)	$625		
Seal all of your basement header area and increase all of its insulation value by a minimum of RSI 3.5 (R-20). (Refer to "Important Health Information" above.)	$125		
AIR SEALING		☆☆	4.1 points
Improve the air tightness of your house by 26 percent to achieve an air change rate per hour of 10.29 at a pressure of 50 Pa. (Refer to "Important Health Information" above.)	$190		
WINDOWS AND DOORS		☆	1.1 points
Replace 11 window(s) / skylight(s) with models that are ENERGY STAR® qualified for climate zone C.	$440		

Any new equipment must have an efficiency rating that is higher than that of the equipment it is replacing. If replacing two heating systems, both new systems must be in the same "category" in the *Grant Table*. Visit http://ecoaction.gc.ca/homes for the most up-to-date information and other requirements.

NRCan reserves the right to revise the grant amounts and eligibility requirements. Grants are paid at the rate in effect at the time of the post-retrofit evaluation. The payment of the grants is subject to the availability of funds.

2. THE ENERGUIDE RATING SYSTEM (ERS)

The ERS is a standardized method of evaluation that lets homeowners compare their home's energy efficiency rating to similar sized houses in similar regions. The rating considers the house's estimated annual energy consumption based on an in-depth evaluation of its characteristics such as location, size, mechanical equipment and systems, insulation levels and air tightness. In addition, standardized operating conditions are used when calculating the rating in order to compare the efficiency of one house to another. These conditions include: a complete indoor air change approximately every three hours; four occupants; a fixed thermostat setting of 21°C on main floors and 19°C in the basement; average hot water consumption of 225 litres per day; average national electricity consumption of 24 kWh per day; and regional weather data averaged over the last 30 years.

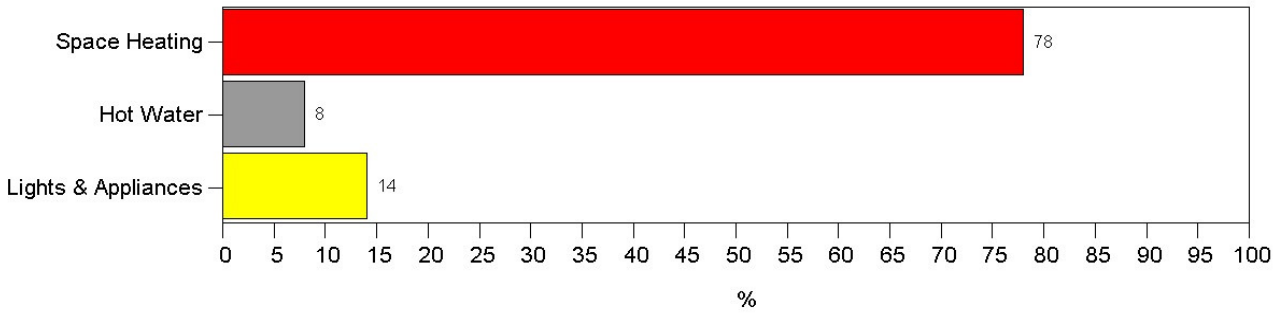
Figures 1 through 3 show the results of your energy evaluation based on the standardized conditions. The results may not entirely reflect your household since your actual energy consumption and future savings are influenced by the number of occupants, their day-to-day habits and lifestyles.

3. ENERGY CONSUMPTION

Houses lose heat to the outdoors during the heating season primarily through air leakage and conduction, such as the transfer of heat through the building envelope (basement and exterior walls, upper floor ceilings, windows and doors). Modifications made to the house, such as drilling holes in walls for new wiring, pipes and lights, all play a part in reducing the efficiency of the building envelope over time. Houses need to be regularly maintained and upgraded to ensure greater energy efficiency, comfort and savings.

Figure 1 breaks down your home's estimated annual energy consumption for space heating, hot water and lights and appliances.

Figure 1. Estimated Breakdown of Energy Consumption



4. SPACE HEATING ANALYSIS

Figure 2 shows the estimated percentage of energy used for the space heating of your home.

- The right side of the top bar shows the percentage of energy you could save if you were to implement all of the upgrades recommended in this report, excluding changes to the space heating equipment. You could save up to 37 percent by performing all of the recommended non-space heating system upgrades.
- The right side of the bottom bar shows the percentage of energy you could save if you were to implement all of the upgrades recommended in this report, including any space heating system upgrades. You could save up to 61 percent by performing all of the recommended upgrades.

Figure 2. Estimated Percentage of Potential Energy Savings

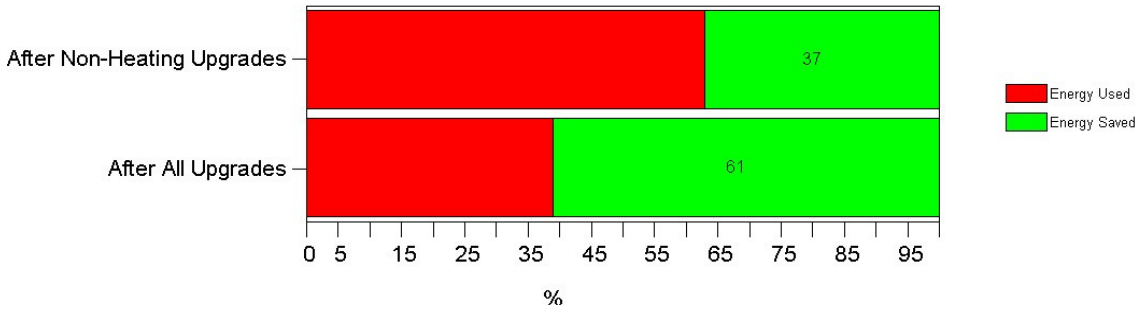
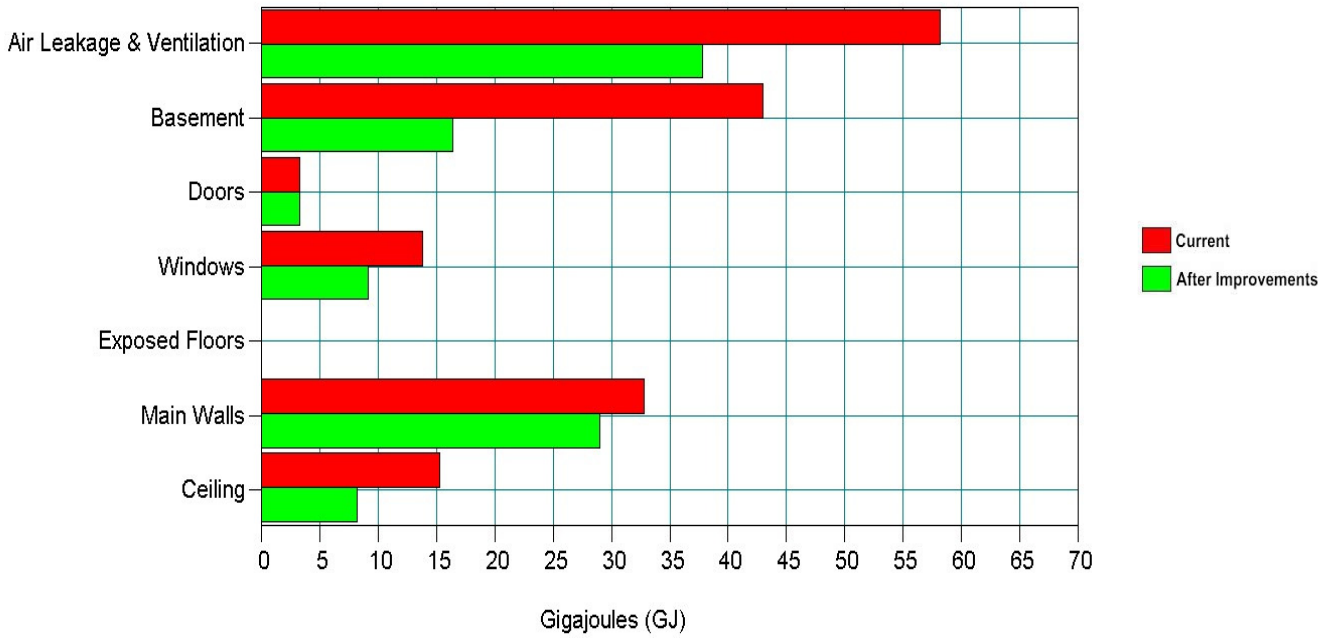


Figure 3 shows where the energy used for space heating is lost from your home. This energy is measured in gigajoules (GJ), where 1 GJ is equivalent to 278 kilowatt-hours (kWh) or 948,000 Btu.

The red bars show the areas where you are losing energy now. The longer the bar, the more energy you are losing. The green bars show the estimated energy loss after you complete your renovations. The larger the difference between the red and the green bars, the greater the potential for energy savings and comfort improvements.

Figure 3. Breakdown of Heat Loss through Building Envelope



5. RECOMMENDED ENERGY-SAVING MEASURES

Basement

The basement walls are completely uninsulated and the headers are insulated with poorly installed R12 batts. As you can see from figure 3, the basement is the second largest area of heat loss in this house. Insulating the walls to R21 with, for example, 3.5" of polyurethane spray foam; and the headers to R32 will make the house more comfortable, cut your heating costs by about 21% (not including its contribution to reducing air leakage) and qualify you for a grant of $750.

If you want to improve comfort and reduce heating costs, this is the place to start.

Before you do this, lay down a sheet of 10 mil polyethylene vapour barrier over the dirt floor to control humidity and prevent condensation on the windows.

Air Leakage and Draftproofing

The air leakage test showed that your house has an air leakage rate of 14.0 ACH50 and an ELA of 218 square inches (see "What Does the Air Leakage Test Mean?" for an explanation of these terms). This is a very leaky house. As you can see from figure 3, air leakage is, by far, the most important component of heat loss in this house. Insulating the basement walls and headers with spray foam and eliminating the chimney will tighten the house dramatically. Replacing windows will also help, but that is expensive draftproofing.

In addition the following air sealing items should be carried out:

- caulk the cracks around the basement windows.
- remove the chimney and seal the top of the chase when you replace the furnace.
- weatherstrip the front door.
- seal the floor joist cavities in the side attics as discussed under "Attics and sloped ceilings".
- seal the attic hatches (let me inspect the attic insulation job first).
- caulk around the duct boots on the second floor (remove the register cover and caulk between the metal and the drywall).

All this should reduce air leakage by at least 26%. This will make the house more comfortable, reduce your

gas bills by about 10% and qualify you for a grant of $190.

Windows
Replacing your older windows will have several benefits. The new windows will look better, improve comfort and may be easier to clean and to open and close.

They will also be less prone to condensation. However, the first step in reducing condensation is to control humidity. Cover the basement floor with a vapour barrier and install a good quality bathroom fan and use it whenever you shower and run it for 20 minutes after (you can use a timer for this). Yoy should also minimize the use of window coverings as excessive use of blinds and curtains will trap moisture against the windows.

Energy savings, will be small (~3% of your annual gas bill) compared to the cost of the new windows. You will qualify for a grant of $40 from the federal government for each window replaced with an Energy Star window.

Furnace
Your furnace is over thirty years old and operates at about 80% efficiency. A new furnace will be 92-96% efficient. Your new furnace will cut your gas bills by about 31% and qualify you for a grant of as much as $790. See the grant table for more details on grants for furnaces.

Attics and Sloped ceilings
The attic spaces on either side of the second floor are insulated with 6" vermiculite (R12) on the floor and R12 batts on the kneewalls. The sloped ceilings on the second floor are insulated with R12 batts.

The first item to address in the side attics is to seal the open floor cavities as described in "Keeping the Heat In" (page 64). Upgrade the kneewalls with 6" Roxul batts held in place with housewrap and the attic floors with enough cellulose to bring the R value up to R50. The upper attic can be done by feeding the blower hose in through the gable vents.

All work done in the attic spaces must be done with regard to the fact that there is vermiculite insulation on the floor. See the attached article on vermiculite insulation containing asbestos.

The sloped ceilings could be upgraded by adding 1.5" (or whatever thickness you can put on without lowering the ceiling height too much) isocyanurate (foil faced yellow foam) board, strapping and drywall.

Upgrade the attic over the kitchen and bath to R50 by blowing in cellulose.

All this will make the house more comfortable (warmer in winter and cooler in summer) reduce the incidence of ice damming, cut your heating costs by 8% and qualify you for a grant of $361.

6. ENERGY-SAVING TIPS

Although these actions may not be eligible for an incentive, they may help you save energy and money:

- Install and use a programmable electronic thermostat (set the heating temperature to 20°C while you are at home and 17°C at night and when you are away). For each degree of setback, you can save up to 2 percent on your heating bills.
- Insulate the first two metres of the hot and cold water pipes with insulating foam sleeves or pipe wrap insulation. By doing so you will save on your water heating costs and will reduce your water consumption. Besides saving energy, water will arrive at the faucets warmer or colder. Insulating cold water pipes will also avoid condensation from forming on the pipes. This prevents dripping on the ceiling finish or the basement floor. For a fuel-fired water heater, maintain a 15-centimetre (6-inch) clearance between the water piping insulation and the vent pipe.
- Use a timer for your car's block heater. Set the timer so that it turns on two hours before you start your vehicle.

- Plug your TV and home office equipment into a power bar that can be easily turned off when equipment is not in use. Refer to the fact sheet *Standby Power - When "Off" Means "On"* for information on standby losses.

7. INFORMATION RESOURCES

Home Energy Efficiency
Natural Resources Canada (NRCan) publishes a variety of publications that can help you improve the energy efficiency of your home. These publications are available online at http://oee.nrcan.gc.ca/publications or by calling the publications order desk at 1-800-387-2000.

For example, *Keeping the Heat In* at http://oee.nrcan.gc.ca/retrofit/homes/keeping is a booklet on basic principles of building science and provides guidance for home retrofit projects such as insulation and air sealing improvements.

Health and Safety
NRCan also produces a brochure called *Planning Your Energy Efficiency Retrofits* at http://oee.nrcan.gc.ca/retrofit/homes/planning, which includes important information on health and safety issues, as well as links to related documents from Health Canada and the Canadian Mortgage and Housing Corporation (CMHC).

Renovation Publications
Canada Mortgage and Housing Corporation (CMHC) publishes a large number of renovation planning fact sheets that are available at no cost. There are also some excellent in-depth publications for sale. Visit http://cmhc-schl.gc.ca or call 1-800-668-2642 to order your material of interest.

Hiring a Contractor
Before you have any work done, request quotations in writing from several professional contractors and obtain a written contract. CMHC has a very useful fact sheet on this subject, *Hiring a Contractor*, which includes a draft contract. Visit http://cmhc-schl.gc.ca or call 1-800-668-2642 to order.

Humidity Control
A relative humidity (RH) level of between 30 and 55 percent is recommended in the home. If you have a humidifier or dehumidifier, ensure that it is regularly cleaned and maintained, and that the humidistat is set at an appropriate humidity level. You can use a hygrometer to measure relative humidity and the CMHC fact sheet *Measuring Humidity in Your Home* at http://www.cmhc-schl.gc.ca/en/co/maho/yohoyohe/momo/momo_002.cfm gives good advice. In addition, dehumidifiers can help reduce moisture levels especially in basements.

Mold
If you suspect mold growth in your home, it is recommended that the mold damaged area(s) be cleaned thoroughly or removed and properly disposed of. To control and reduce the potential for mold growth, maintain indoor humidity at appropriate levels (see Humidity Control, above), and remedy water infiltration and leakage issues. Refer to the CMHC fact sheet *About Your House: Fighting Mold – The Homeowner's Guide* for information on proper mold identification and cleaning procedures. Visit http://cmhc-schl.gc.ca or call 1-800-668-2642 to order.

Radon
Radon is a radioactive gas that is colourless, odourless and tasteless. Radon is formed by the breakdown of uranium, a natural radioactive material found in soil, rock and groundwater. When radon is released from the ground into the outdoor air, it gets diluted to low concentrations and is not a concern. However, in enclosed spaces, like houses, it can sometimes accumulate to high levels, which can be a risk to the health of you and your family. For more information, refer to the CMHC publication *Radon – A Guide for Canadian Homeowners* or visit the Health Canada web site at http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/index-eng.php.

GET STARTED TODAY!

Now that you have the tools to improve your home's energy efficiency, you can look forward to enjoying the added comfort of your ecoENERGY improved home. Not only will you benefit from increased comfort, you will also save on your energy bills year after year. Your retrofits can also contribute to a better environment through clean air and a reduction in emissions.

Remember, you need to adhere to all program requirements and deadlines of ecoENERGY Retrofit – Homes, as well as those of any complementary regional program, in order to qualify for the grant(s).

For more information or links to complementary regional programs, visit http://ecoaction.gc.ca/homes or call 1 800 O-Canada.

Final Comments

Please do feel free to contact me if I can provide any further advice during your work. The grants are available to you only until March 2011. When your work is done I will return for a shorter visit to measure the improvements and process your grant application for $149. The Ontario Government is currently matching the federal incentives, and I will process that application at the same time. I enclose your Energuide rating label. Please post it on your electrical panel over the small one I left during the visit. Thank you for your business!

Air Leakage Report

Air Leakage Test Results: 14.0 ACH_{50}

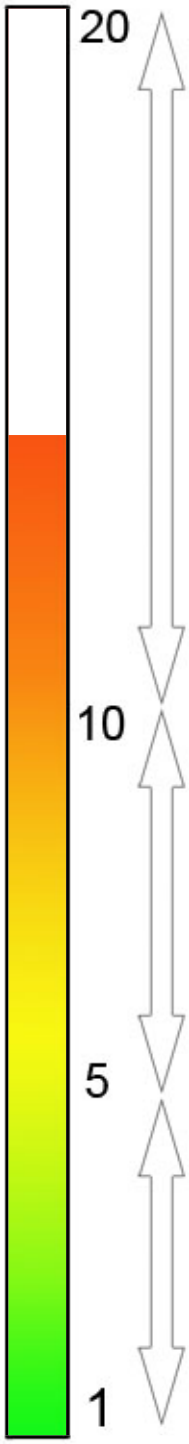
Address: 1234 Comfort St., Kirkland Lake
NRCan File ID: Sample

A blower door test measures how much air leaks through the envelope of a house. What do the numbers mean? The chart explains.

Equivalent Leakage Area

If you were to add up all of the cracks and holes in your house, it would be comparable to having a hole that is **38cm x 38cm** or, **15in x 15in**.

All houses need mechanical ventilation.
Consult your ecoENERGY Report for information.



Leaky

Readings above 10 Air Changes per Hour mean a house is too leaky. Will likely have high heating bills and be uncomfortable.

Moderate

Some work needs to be done to make houses in this range comfy and efficient.

Energy Tight

Most efficient. New houses are typically 4 ACH_{50}. Very efficient houses are 1.5 or less.

ACH_{50} - Air Changes per Hour at 50 Pascals of depressurization. This is comparable to a 56km/h wind blowing at your house.