

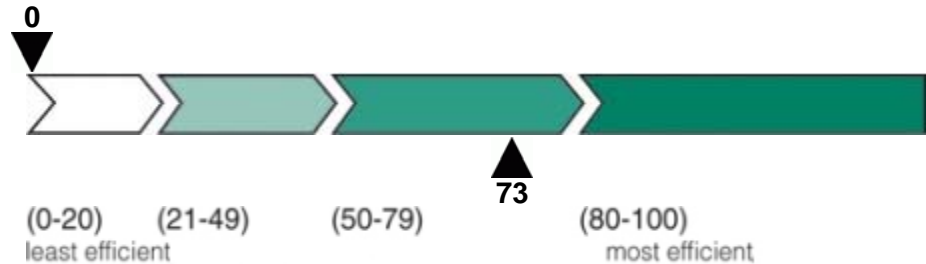
Energy Efficiency Evaluation Report

File number: REPORTSAMP

Property Owner:

Sample House Report
999 Green Energy Drive
Livegreen, Ontario
A1B 2C3

EnerGuide Rating



House type: Single detached

Heating system: Natural gas
Furnace

No. of storeys: Two

Domestic hot water: Natural gas

No. of RO windows: 28
RO = rough opening

Air leakage rate @ 50 Pa: 16.58
ACH

Air conditioner: Yes

ACH = number of air changes per hour

Equivalent Leakage Area: 3642 cm²

The results of your pre-retrofit energy evaluation show that your house rates 0 points on the EnerGuide scale. If you implement all of the recommendations in this report, you could reduce your energy consumption by up to 73% 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 42 whereas the highest rating achieved by the most energy-efficient houses in this category is 83.

Did you know that 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 will reduce its GHG emissions by 20.2 tonnes per year!

You have up to 18 months from the date of this report or until March 31, 2011, whichever comes first, to complete your renovations and qualify for an ecoENERGY Retrofit Homes grant. The sooner you start your renovations, the sooner you will benefit from the energy savings. And let's not forget how reduced energy consumption helps protect the environment.

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

Service Organization: Energy Canada Ltd.
Telephone: 1-888-442-9577

Certified Energy Advisor: Energy Advisor

Date of evaluation: April 3, 2009
Date of report: April 20, 2009




Certified Energy Advisor Signature






1. YOUR HOME ENERGY ACTION CHECKLIST

This is your checklist of recommended retrofits to improve the energy efficiency of your home. Included are the federal grant amounts that you could receive as well as information on the potential for energy savings and EnerGuide rating improvement. **For more information and to ensure that the retrofits you plan on implementing will meet grant eligibility requirements, read carefully the 'Recommended Energy-Saving Measures' section of this report and the Natural Resources Canada (NRCAN) brochure entitled *Grant Table for ecoENERGY Retrofit – Homes found in your ecoENERGY homeowner kit.***

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: Some provinces, territories, municipalities and utilities offer complimentary grants and other incentives for reducing energy use. For information on other energy-saving programs, visit ecoaction.gc.ca and follow the links to ecoENERGY Retrofit's "Grants and Rebates" Web page for consumers or call 1 800 O-Canada (1-800-622-6232).

Retrofits	Federal Incentive	Potential for Energy Savings *	Potential Rating Improvement
These upgrades qualify for a federal grant up to a maximum total incentive value of \$5,000:			
* One (1) star = lowest savings / five (5) stars = highest savings			
HEATING SYSTEM			23.6 points
Replace your wood-burning appliance with a clean-burning model that meets the required performance testing specifications. (2 replaced)	\$565		
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.	\$650		
COOLING SYSTEM (A/C)		—	0 points
Replace your central air conditioning system with an ENERGY STAR® qualified system that has a seasonal energy efficiency ratio (SEER) of 14.5 or higher.	\$250		
WATER CONSERVATION		—	0 points
Replace 3 toilet(s) with low-flush or dual flush toilet(s) that meet(s) the minimum requirements.	\$195		
ATTIC/ROOF INSULATION			16.9 points
Increase the insulation value of your attic from the current level, which is evaluated at RSI 0.0 (R-0.0), to achieve a total minimum insulation value of RSI 8.8 (R-50).	\$750		
WALL INSULATION			24.2 points

Increase your exterior wall insulation by an amount greater than RSI 1.59 (R-9).	\$1875		
BASEMENT/CRAWL SPACE INSULATION			12.4 points
Increase the insulation value of the basement walls by a minimum of RSI 4.2 (R-24).	\$1250		
Seal all of your basement header area and increase all of its insulation value by a minimum of RSI 3.5 (R-20).	\$125		
EXPOSED FLOORS			2.1 points
Insulate your exposed floor by adding a minimum insulation value of RSI 3.5 (R-20).	\$190		
WINDOWS AND DOORS			11.7 points
Replace 28 window(s) / skylight(s) with models that are ENERGY STAR® qualified for climate zone B.	\$1120		
Replace 2 exterior door(s) with a model that is ENERGY STAR® qualified for climate zone B.	\$80		
AIR SEALING			5.9 points
Improve the air tightness of your house by 31 percent to achieve an air change rate per hour of 11.38 at a pressure of 50 Pa.	\$190		
DOMESTIC HOT WATER SYSTEM (DHW)			0.4 points
Replace your domestic hot water heater with an ENERGY STAR® qualified instantaneous, gas-fired water heater that has an energy factor (EF) of 0.82 or higher.	\$315		
Install a drain water heat recovery (DWHR) system.	\$165		

Natural Resources Canada (NRCan) reserves the right to revise the grant amounts and eligibility requirements. Visit ecoaction.gc.ca/homes for the most up-to-date information. All grants are paid at the rate in effect at the time of the post-retrofit evaluation. Payment of the grants is subject to the availability of funds.

2. THE ENERGUIDE RATING SYSTEM

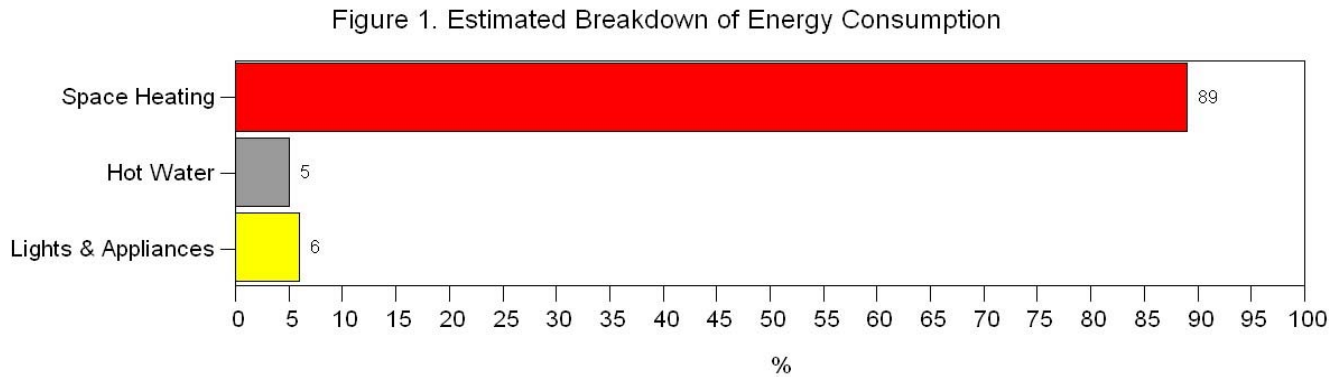
The EnerGuide rating system is a standardized method of evaluation that lets homeowners compare their house's energy efficiency rating to similar sized houses in similar regions. The EnerGuide rating considers the house's estimated annual energy consumption based on an in-depth evaluation of the house's characteristics such as location, size, equipment and systems, insulation levels, air tightness, etc. In addition, standardized conditions are used when calculating the rating in order to compare the efficiency of one house to another. These conditions include: a complete 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 that is 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 basement and exterior walls, upper floor ceilings, windows and doors (the 'building envelope'). Canada's demanding climate and 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 house's estimated annual energy consumption for space heating, hot water and lights and appliances.



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 73 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 81 percent by performing all of the recommended upgrades.

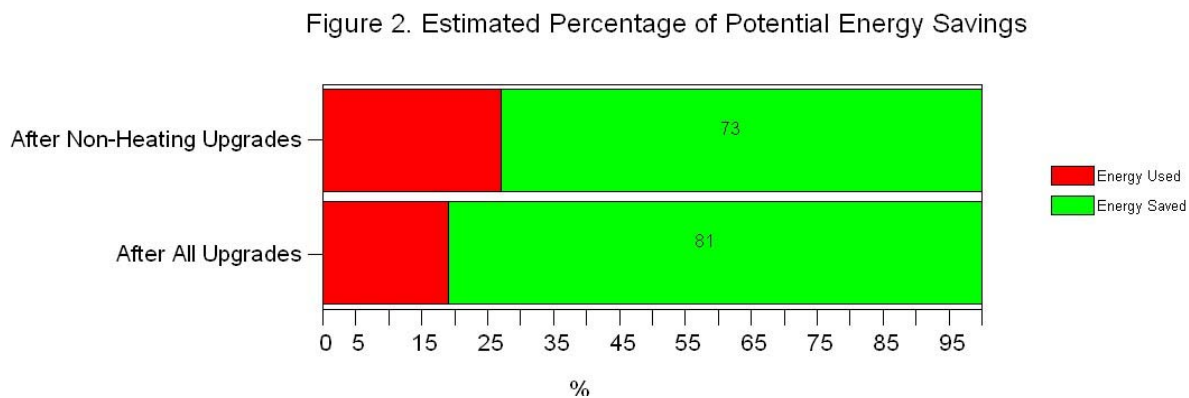
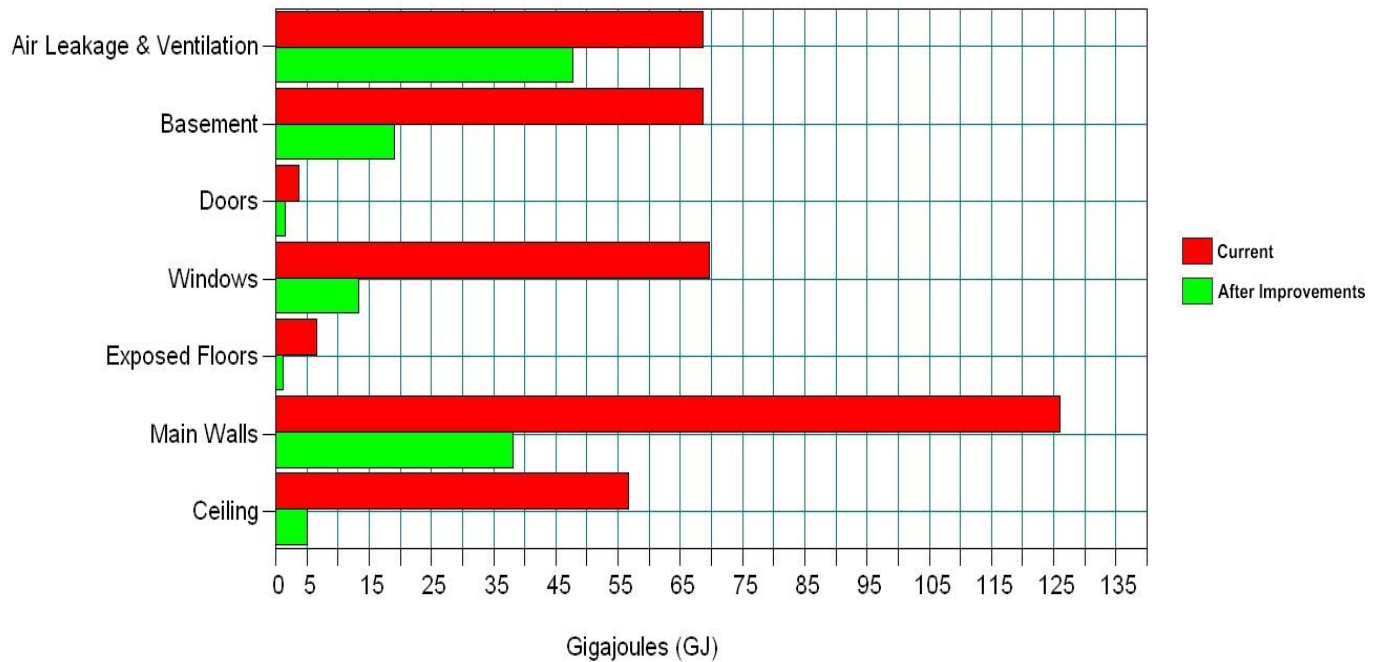


Figure 3 shows where the energy used for space heating is lost from your home. This energy is measured in gigajoules (GJ), where 1 GJ is equivalent to 278 kilowatt-hours (kWh) or 948,000 Btu.

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



Your Home's Estimated Design Heating and Cooling Loads

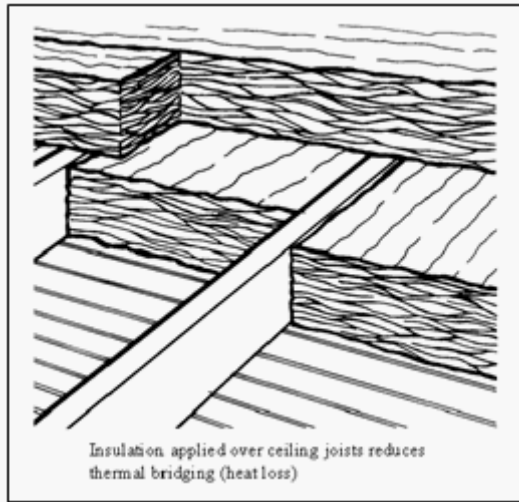
If you were to implement ALL of the building envelope retrofits recommended in the section of this report entitled 'Your Home Energy Action Checklist', it is estimated that your home's design heat loss would be 52984 Btu/hour (15528 Watts) and its design cooling load would be 25061 Btu/hour (2.1 tons). If you are considering replacing your space heating and/or cooling system, it is recommended that you provide this information to your heating/cooling contractor to help ensure a properly-sized system. However, this is only an estimate based on the data that was collected on your home at the time of the pre-retrofit evaluation. The design heat loss and cooling load can vary depending on different factors, such as the retrofits that you implement and other changes you may make to your home. Prior to having a new heating/cooling system installed, it is recommended that your heating/cooling contractor perform a heat loss/heat gain calculation on your home to determine the capacity and distribution flows for the new equipment. The contractor should hold current certification for Heat Loss/Heat Gain Calculations from the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI). For a list of certified contractors, visit www.hrai.ca and click on "Homeowners and Building Owners" and "SkillTech Academy Canadian Certification Listing", or call 1-800-267-2231.

Important Information Concerning Vermiculite Insulation

Older vermiculite insulation installed in homes may contain amphibole asbestos, which can cause health risks if disturbed and inhaled. If the insulation is contained in the walls or attic spaces and is not disturbed or exposed to the home or interior environment, it poses very little risk. Vermiculite insulation was not detected during the energy evaluation of your home. However, if you find vermiculite insulation during renovations, avoid disturbing it in any way. If you suspect it might be in your home and you plan to undertake renovations (including insulation or air sealing work) 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™ under 'Asbestos Abatement & Removal'. For information on vermiculite insulation that contains amphibole asbestos, refer to the Health Canada fact sheet *It's Your Health - Vermiculite Insulation Containing*

5. RECOMMENDED ENERGY-SAVING MEASURES

Attic Insulation



In addition to reducing energy use, increasing the insulation level of your attic will keep your house warmer during the winter and cooler during the summer. Effective insulation and air sealing slow the movement of heat and air, and help prevent moisture accumulation in the attic.

When insulating attics, the importance of air sealing cannot be overstated. Before insulating, seal all openings and penetrations to stop interior air from entering the attic. Seal gaps around ceiling light fixtures, plumbing stacks, wiring, chimneys and the tops of interior walls. Install weatherstripping around the hatch or door, and use hooks with eye bolts or a latch to hold the hatch firmly against the weatherstripping.

Ensure that soffit venting is not blocked by the insulation.

Baffles may need to be installed against the underside of the roof along the soffits to ensure proper ventilation.

For more information on insulating attics, consult NRCan's publication entitled *Keeping the Heat In*, Chapters 1–4, and Canada Mortgage and Housing Corporation's *About Your House* and *Renovating for Energy Savings* fact sheets.

Grant Eligibility: Attic insulation upgrades are eligible for an ecoENERGY Retrofit – Homes grant. The grant amount differs according to the existing insulation value and the total insulation value achieved. Information on the eligibility requirements when insulating attics can be found in the brochure entitled *Retrofit Your Home and Qualify for a Grant!*

Recommendation:

Increase the insulation value of your attic to the insulation value noted in the section of this report entitled 'Your Home Energy Action Checklist'.

Main Walls - General

Retrofitting walls can help save energy, since walls can account for 10 to 30 percent of heat loss in a house. Depending on the house, and its characteristics, exterior walls can be insulated by filling the wall space (the wall cavity) with blown-in insulation, by adding insulation from the interior or exterior, or a combination of any of these methods.

Before you begin, first check the walls from the interior and exterior for evidence of moisture damage: stains, mould, rotten wood, flaking brick and peeling paint. Also, make sure that damage to the walls is not being caused by problems with the roof and that all flashings are secure. All these problems must be fixed before proceeding. Seal gaps and cracks in the exterior wall-finish, and around window and door frames to prevent water from penetrating into the walls. Do not seal, however, any drainage holes at the bottom of brick-veneer walls or window frames, as these holes are necessary to minimize the impact of water penetration on the wall assembly. Consider additional upgrades related to the walls before retrofitting them, such as electrical wiring, and the installation of air- and vapour-barriers.

Wall insulation upgrades are eligible for an ecoENERGY Retrofit - Homes grant. The grant amount differs, based on the insulation values installed, and the wall surface-area covered. A minimum of 20% of the total exterior wall surface must be insulated to qualify for a grant. Taking photos of the walls while

the insulation is being installed then showing them to your energy advisor, during the post-retrofit evaluation, is recommended to ensure that you will get full credit for your newly-installed insulation.

For more information on insulating walls, as well as insulation materials, their properties and installation methods, consult NRCan's *Keeping the Heat In* and Canada Mortgage and Housing Corporation's *About Your House* and *Renovating for Energy Savings* fact sheets.

Recommendation:

I recommend that you insulate your main walls.

Foundations - General

Foundation heat loss can account for 20 to 35 percent of a home's heat loss. A well-insulated foundation can improve home comfort, air quality, structural integrity, and energy efficiency.

Before insulating, first check for moisture in your foundation walls. Tell-tale signs are: staining or mould growth; blistering, peeling paint; efflorescence, a whitish deposit on the surface; spalling or surface deterioration; condensation on walls and metal objects; and a musty smell.

Repair water leaks through the floor and walls, caused by cracks, holes and construction joints. You should also control humidity levels and there should be appropriate damp-proofing or waterproofing on the foundation walls to prevent moisture from wicking through the foundation wall.

To prevent moisture problems, slope the ground away from the house exterior and direct eavestrough downspouts away from the foundation. Maintain and seal sumps and sump pumps, and install sewer backup equipment, if required.

The type and condition of your foundation will determine if you can insulate from the outside or from the inside. Exterior insulation is the preferred but more costly method. Foundations of rubble, brick, stone and concrete block are best insulated from the exterior. However, you may wish to have an engineer verify your foundation's structural integrity before undertaking any work.

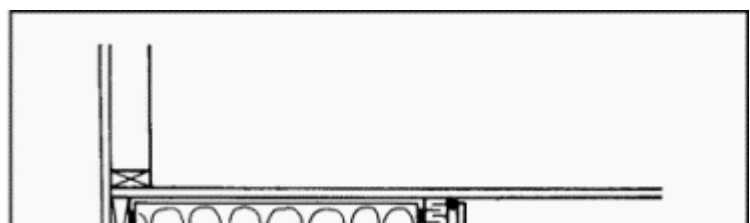
Poured-concrete foundations can be insulated from either the outside or inside, providing there are no serious water or structural problems. Preserved-wood foundations, made with sheathing and studs, are generally insulated by filling in the stud space. Slab-on-grade foundations are typically insulated on the exterior edge. Occasionally, they are insulated on top of the slab and under the floor finish. Basement- and crawl-space insulation upgrades are eligible for ecoENERGY Retrofit - Homes grants. The grant amounts vary depending on the insulation values added and the surface area insulated. Go to *Your Home Energy Action Checklist* in this report to see the recommended insulation value for your foundation and the eligible grant amount. Taking photos of the foundation during installation and showing them to the energy advisor during the post-retrofit evaluation is recommended, to ensure that you receive full credit for your installed insulation. For more information about insulating foundations, as well as insulation materials, their properties and their installation methods, consult NRCan's publication entitled *Keeping the Heat In* and Canada Mortgage and Housing Corporation's *About Your House* and *Renovating for Energy Savings* fact sheets.

Exposed Floors and Overhangs

Air seal and fully insulate your exposed floors and overhangs to reduce heat loss, improve home comfort and protect plumbing in the floor space. Rooms above attached garages also require air sealing and insulation.

When possible, remove the finish from underneath the exposed floor or overhang to seal air leaks and install a vapour barrier.

First, place a vapour barrier against the



underside of the floor between the joists.

Do not place the vapour barrier around and under the joists because it can trap moisture inside the joists. A vapour barrier is not required for painted floors and floors made of plywood-like materials because they can act as a vapour barrier.

Next, seal openings in the floor.

Fill the entire space between the joists with insulation such as batts and ensure that no air space remains between the underside of the floor and the insulation.

For overhangs, install foam board insulation vertically between the joists at the top of foundation walls or other exterior walls to restrict air movement and heat loss between the joists (see the figure). Air seal the foam board with caulking on all edges.

Tape the seams in heating ducts and insulate all ducts that run through overhangs or exposed floors.

Ensure water and drainage pipes are located on the warm side of the insulation and are protected from freezing.

Another very effective insulation method is to have a contractor apply spray foam insulation to the underside of the floor and fully or partially fill the joist space. This also effectively seals air leaks through the floor.

Attach a layer of rigid board insulation to the underside of the floor joists to reduce thermal bridging through the joists. Thermal bridging occurs when solid building materials conduct heat because the materials have a relatively low insulation value. Alternatively, install heavyweight building paper or a polyolefin air barrier before installing the finish underneath the floor or overhang.

Cover all exposed foam board with drywall or other suitable material.

If the exposed floor or overhang is not accessible, a contractor can blow insulation in between the joists. The insulation must be blown in at a high density to prevent air spaces between the insulation and the floor above.

For more information about installation methods, insulation values and air sealing, consult NRCan's *Keeping the Heat In* and Canada Mortgage and Housing Corporation's *About Your House* and *Renovating for Energy Savings* series of fact sheets.

Grant Eligibility:

The insulation of exposed floors is eligible for an ecoENERGY Retrofit – Homes grant. For more information about the eligibility requirements, refer to the *Retrofit Your Home and Qualify for a Grant!* brochure.

Recommendation:

Air seal and increase the insulation level of your exposed floors, as noted in the section of this report entitled “Your Home Energy Action Checklist.”

Door Upgrades

Old and ill-fitting exterior doors can contribute significantly to heat loss and drafts. Heat escapes through the door, the frame and other materials. Air leaks through the door-window seals and between the door and frame and also the doorframe and the rough opening.

Energy-efficient exterior doors reduce heat loss, save energy and improve comfort. Metal and fiberglass

insulated doors, for example, are far more efficient than hollow or solid wooden doors. High-quality, durable weatherstripping and door hardware are also crucial to ensure energy-efficient doors, as well as the proper installation of the door and the air sealing around the doorframe.

For information on energy-efficient doors, consult NRCan's publication entitled *Consumer's Guide to Buying Energy-Efficient Windows and Doors*. For information on ENERGY STAR®-qualified windows, doors and skylights, go to www.energystar.gc.ca.

Grant Eligibility: The replacement of exterior doors with models that are ENERGY STAR-qualified is eligible for an ecoENERGY Retrofit – Homes grant. However, you must choose models that are ENERGY STAR-qualified for your climate zone.

Recommendation:

Replace selected exterior doors with ENERGY STAR-qualified models that match your climate zone. Refer to the section of this report entitled 'Your Home Energy Action Checklist' for information on your climate zone and the number of doors recommended for replacement.

Windows

You may be considering replacing some or all of your windows for various reasons, such as to improve aesthetics, reduce maintenance, increase house resale value, improve comfort, energy efficiency or safety, or to replace broken or inoperable windows. Remember that the selection of new windows for your home will affect energy efficiency and comfort levels for years to come. Technical breakthroughs such as low-E coatings, triple glazing, inert gas fills, and better edge spacers and frames have improved window technology in recent years, offering improvements in solar control, thermal comfort and energy efficiency.

ENERGY STAR®-qualified windows, which are rated for four climate zones, are among the most energy efficient in the marketplace. They will help keep your home comfortable all year-round and reduce noise from the outside. Depending on the amount of humidity in your home, there will be less condensation on your windows during cold weather.

For information on purchasing energy-efficient windows, refer to NRCan's publication entitled *Consumer's Guide to Buying Energy-Efficient Windows and Doors*. For information on ENERGY STAR-qualified windows, doors and skylights, go to www.energystar.gc.ca.

Grant Eligibility: The replacement of windows and skylights with models that are ENERGY STAR-qualified is eligible for an ecoENERGY Retrofit – Homes grant. However, you must choose models that are ENERGY STAR-qualified for your climate zone. Keep proof of the ENERGY STAR qualification of the windows for your climate zone and show it to the energy advisor during the post-retrofit evaluation of your home. A window is defined as the rough opening (RO) in the wall under ecoENERGY Retrofit – Homes. The RO is the opening in the wall when the entire window unit is removed. The first page of this report indicates how many ROs are in your home.

Recommendation:

Replace selected windows with ENERGY STAR-qualified windows. When replacing your windows, make sure that the models you select match your climate zone. Refer to the section of this report entitled 'Your Home Energy Action Checklist' to determine your climate zone and the number of windows recommended for replacement.

Air Sealing

Reducing air leakage is usually the most cost-effective measure a homeowner can undertake; the leakier the home, the greater the savings! It is not unusual for air leakage to account for 35% of the heat loss in a home. In addition to reducing heat loss, air sealing improves comfort, protects the building structure and other materials from moisture damage, and reduces the amount of dust and noise that enters from the outdoors.

A blower door test was performed on your home to measure the amount of air leakage, and to identify the main air leakage locations. The blower door test results are shown on the first page of this report and are explained below.

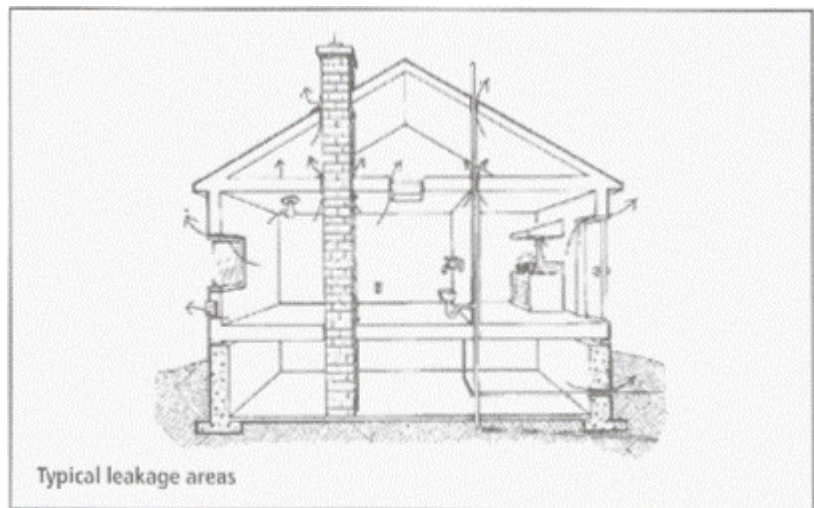
The **Air Leakage Rate at 50 Pascals (ACH)** is the number of complete air changes per hour that occurs in your house when a pressure difference between the inside and outside of the home is set at 50 Pascals (Pa). A 50-Pa pressure difference simulates wind blowing at 56 kilometers per hour on your home. The higher the ACH, the leakier the house.

The **Equivalent Leakage Area (ELA)** represents the total air leakage area. It's like taking all of the air leakage areas (e.g., cracks, holes, etc.) in the home and putting them together to create one large hole in the building envelope. The larger the ELA, the leakier the house. An energy-efficient house might have an ELA as low as 258 cm² (40 square inches) while a leaky house may have an ELA of more than 3226 cm² (500 square inches)

Air Sealing Locations in Your Home

Listed below are the most common air leakage areas in a house. Leaks observed during the blower door test are noted. This list will help guide your air-sealing work:

- electrical outlets
- electrical ceiling fixtures
- electrical box and wire penetration
- exterior pipe penetration
- baseboard trims and mouldings
- window frames
- door frames
- fireplace
- chimney
- attic hatch
- basement header (rim joists)
- other



Air Sealing Options

Air sealing can be a do-it-yourself option. Another option is to hire a qualified, professional, air sealer who can locate and seal leaks in your home and likely do a more thorough job. This may be an important consideration if you want to air seal your house to meet a specific air leakage goal, and be eligible for a grant. Professional whole-house air sealing costs vary, depending on the size and complexity of the work.

Air Sealing Materials

Weatherstripping reduces air leakage by sealing gaps around moveable parts of windows and doors. Correctly installed, good quality weatherstripping is a cost-effective way to reduce air leakage. Check weatherstripping annually and replace worn materials before the cold weather sets in.

Caulking is used on the interior to seal small cracks and penetrations on the inside surface of your walls, ceilings and floors. Caulking is also used on the exterior to keep out rain, snow, wind as well as insects and rodents. Urethane foam is very good for filling larger joints and cavities.

For information on air sealing your home, consult NRCan's publications entitled *Air-Leakage Control, Improving Window Energy Efficiency and Keeping the Heat In*, and Canada Mortgage and Housing Corporation's *About Your House, and Renovating for Energy Savings* fact sheets.

Recommendation:

I recommend air sealing your home to achieve the air-leakage rate indicated at the beginning of this

report, in the section *Your Home Energy Action Checklist*. You must meet or exceed the goal indicated to be eligible for an ecoENERGY Retrofit grant for air sealing. The results of the air sealing work will be measured at the time of your post-retrofit evaluation.

Domestic Hot Water Systems (DHW)

After space heating, water heating is the second largest user of energy in most Canadian homes, accounting for some 20% of total annual energy consumption. Part of this energy consumption is wasted through standby heat loss and wasted hot water. Standby heat loss is usually heat lost through tank walls and water piping. For fuel-fired tank water heaters, it also includes heat loss up the chimney.

The efficiency of fuel-fired DHW equipment is expressed as the energy factor (EF) or thermal efficiency. The higher the number, the more efficient the water heater will be. The efficiency of electric DHW equipment is expressed in Watts of standby loss, where the lower the number, the more efficient is the water heater.

If you are replacing your DHW heater, look for an energy-efficient model and make sure it's not oversized for your needs. Use manufacturers' sizing charts available from your contractor or retailer. For tank water heaters, look for models that have an external cold-water inlet at the bottom of the tank and integral heat traps. Also look for high overall insulation values.

Water- and Energy-Saving Tips:

- Fix dripping taps.
- Install low-flow showerheads, with ratings of less than 9.5 litres per minute.
- Install faucet aerators.
- Wash laundry with cold water.
- Insulate metallic, hot and cold water pipes with pipe insulation. Water will arrive at the faucets closer to the desired temperature, either warmer or cooler. This reduces tap running time and reduces water wastage. Insulating cold-water pipes also reduces condensation on the pipes that can cause water stains on surrounding areas.

Note: For fuel-fired water heaters, maintain a 15-centimetre (six-inch) clearance between the pipe insulation and the vent pipe.

For more information on domestic hot water heaters, consult NRCan's publications entitled, *Heating with Gas; Heating with Electricity; and Heating with Oil*.

Earth-Energy Systems

An earth-energy system uses earth or ground water or both as the sources of heat in the winter, and as the "sink" for heat removed from the home in the summer. Earth-energy systems can be used with forced-air and hydronic (hot water) heating systems.

The heating and cooling efficiency ratings for earth-energy systems use different terminology. For example, the heating rating is the coefficient of performance (COP) and the cooling rating is the energy efficiency ratio (EER). The higher the ratings, the more energy efficient the earth-energy system.

Some earth-energy systems are ENERGY STAR® qualified. Requirements vary depending on the heat pump category, but an ENERGY STAR model must be from 10 percent to 50 percent more efficient than a conventional model.

Grant Eligibility: The installation of an earth-energy system is eligible for an ecoENERGY Retrofit – Homes grant. The system does not have to be ENERGY STAR qualified, but must be designed and installed according to the Canadian Standards Association's CAN/CSA C448 standard. The system installer must complete a copy of the *Application Form for GeoExchange System Certification* (available from the Canadian GeoExchange Coalition) and provide a copy to the Canadian GeoExchange Coalition and you. You must show this form to the energy advisor during the post-retrofit evaluation.

In addition, as of April 1, 2008, all systems must be certified by the Canadian GeoExchange Coalition to qualify for the grant, which will be attested by a sticker from the Coalition.

Direct expansion (DX) systems are not currently eligible under the ecoENERGY Retrofit – Homes program. DX systems, which use refrigerant in the ground-heat exchanger instead of an antifreeze solution, are not covered by the CSA C448 installation standard.

For more information about earth-energy systems or for a list of accredited installers, designers and drillers, visit the Canadian GeoExchange Coalition Web site at www.geo-exchange.ca or call 514-807-7559.

Recommendation:

Have an earth-energy system installed by a professional accredited by the Canadian GeoExchange Coalition.

Heating System

If you are considering replacing your heating system, it is strongly recommended that you follow these important steps first:

- Complete all of the other energy efficiency upgrades, such as air sealing and insulation, because this will likely result in the need for a smaller and less expensive heating system. It will also help prevent potential discomfort in your home caused by oversized equipment.
- Next, ensure that your heating contractor performs a heat loss calculation on your home to determine the capacity and distribution flows for the new equipment. The contractor should hold current certification for Heat Loss/Heat Gain Calculations from the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI). For a list of certified contractors, visit www.hrai.ca and click on "Canadian Certification List" under *SkillTech* Training. In Québec, contact la Corporation des maîtres mécaniciens en tuyauterie du Québec (CMMTQ) at 1-800-465-2668 or visit www.cmmtq.org.

6. ENERGY-SAVING TIPS

Although these actions may not be eligible for an incentive, they will 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.
- When replacing lighting, appliances, electronics and office equipment, look for ENERGY STAR® qualified products. ENERGY STAR® qualified products use less than half as much energy in standby mode (i.e. when they are turned "off"). For more information, go to <http://energystar.gc.ca>. You can also look for the EnerGuide label to help you select the most energy-efficient model.
- Replace your light bulbs with energy-efficient ones, such as compact fluorescents. They last longer and reduce electricity consumption.
- 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.
- Install an ENERGY STAR® qualified kitchen or bathroom exhaust fan.

- Install a timer on your bathroom exhaust fan(s).
- Install low-flow showerheads (rated at less than 9.8 litres per minute [L/min]) and faucet aerators.
- Fix leaky faucets and outside hose bibs.
- Plug your 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 oee.nrcan.gc.ca/publications or by calling the order desk at 1-800-387-2000.

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 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 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 cmhc-schl.gc.ca or call 1-800-668-2642 to order.

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, 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 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>.

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* gives good advice. In addition, dehumidifiers can help reduce moisture levels especially in basements.

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. And let's not forget your reduction of greenhouse gases!

Remember, you have up to 18 months from the date of this report or until March 31, 2011, whichever comes first, to complete your retrofits and have a post-retrofit evaluation performed on your building to qualify for an ecoENERGY Retrofit - Homes grant.

A Note from your Energy Advisor

The incentives listed on this report are only Federal Rebates.

~Reminder~

Currently, the Ontario Provincial Government is matching these Federal Grant amounts.