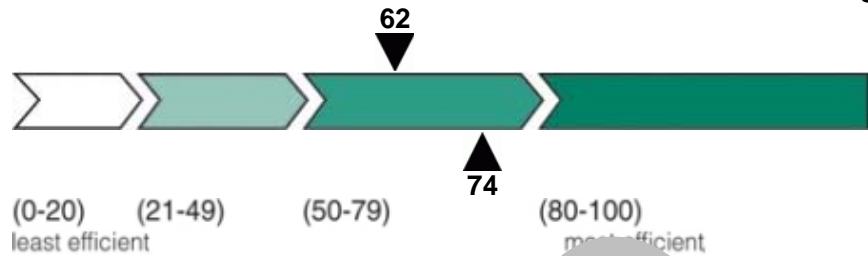


Energy Efficiency Evaluation Report
File number: 4K01D10001

Property Owner:

Misty Woods
777 Maple St
Forest Hill, Ontario
MOM OMO

EnerGuide Rating



House type: Single detached **Heating system:** Natural gas
Furnace

No. of storeys: Two **Domestic hot water:** Natural gas

No. of RO windows: 22
RO = rough opening **Air leakage:** @ 50 Pa: 5.50 ACH
ACH = number of air changes per hour

Air conditioner: No **Equivalent Leakage Area:** 1219 cm²

The results of your pre-retrofit energy evaluation show that your house rates 62 points on the EnerGuide scale. If you implement all of the recommendations in this report, you could reduce your energy consumption by up to 34% and increase your home's energy efficiency rating to 74 points. The average energy efficiency rating for a house of this age in Ontario is 64 which is the highest rating achieved by the most energy-efficient houses in this category is 65.

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 74 points, you can reduce its GHG emissions by 3.4 tonnes per year!

You have until March 31, 2011, at the latest, 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: GreenTech Services Non-Profit
Telephone: 877.876.6555

Certified Energy Advisor: Robin Mahood

Date of evaluation: November 26, 2009
Date of report: December 4, 2009

Email addresses: robin@greentechservices.ca
service@greentechservices.ca

HOT2000v10.50

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 complementary 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 1-800 O-Canada (1-800-622-6232). **The Province of Ontario is currently matching whatever federal incentives are awarded.**

Retrofits	Federal Incentive	Potential for Savings *	Potential Rating Improvement
<p>These upgrades qualify for a federal grant up to a maximum total incentive value of \$5,000:</p>			
* One (1) star = lowest savings / five (5) stars = highest savings			
<p>BASEMENT/CRAWL SPACE INSULATION Increase the insulation value of the basement walls by a minimum of RSI 4.2 (R-24).</p>	\$1,500	★★★	7.2 points
<p>WINDOWS AND DOORS Replace 15 window(s) / skylight(s) with models that are ENERGY STAR® qualified for climate zone B. Replace 2 exterior door(s) with a model that is ENERGY STAR® qualified for climate zone B.</p>	\$600 \$80	★★	2.2 points
<p>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.</p>	\$650	★	1.6 points
<p>ATTIC/ROOF INSULATION Increase the insulation value of your attic from the current level, which is evaluated at RSI 3.8 (R-21.8) to achieve a total minimum insulation value of RSI 8.8 (R-50).</p>	\$375	★	0.9 points
<p>AIR SEALING Improve the air tightness of your house by 10 percent to achieve an air change rate per hour of 4.95 at a pressure of 50 Pa.</p>	\$190	★	0.3 points
<p>WATER CONSERVATION Replace 2 toilet(s) with low-flush or dual flush toilet(s) that meet(s) the minimum requirements.</p>	\$130	—	0 points

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.

Changes made to the structure of a house may alter the grant amounts listed herein. Additions do not qualify for grants. If you plan to build an addition, you may wish to contact us to discuss the potential impacts.

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.

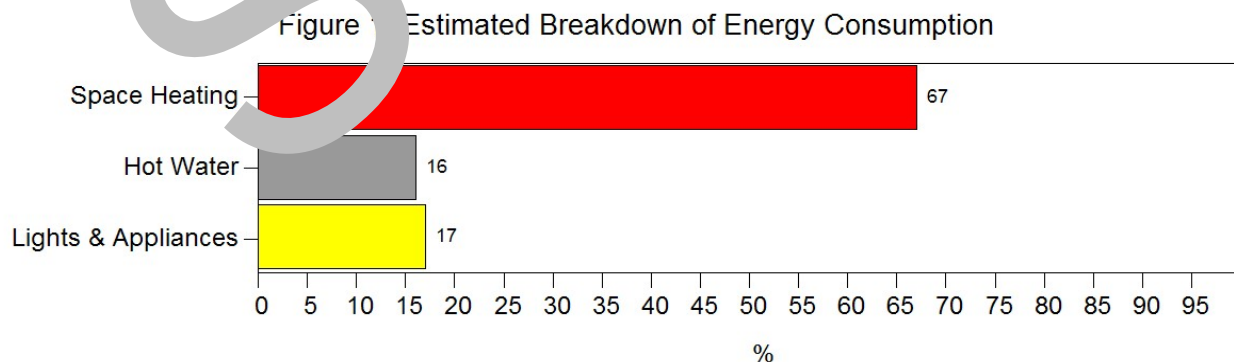
0 - 50:	Old house not upgraded	75 - 79:	Energy-efficient new house
51 - 65:	Upgraded old house	80 - 90:	Highly energy-efficient new house
66 - 74:	Energy-efficient upgraded older house or typical new house	91 - 100:	House requiring little or no purchased energy

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 lifestyle.

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 ducts, 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 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 41 percent by performing all of the recommended upgrades.

Figure 2. Estimated Percentage of Potential Energy Savings

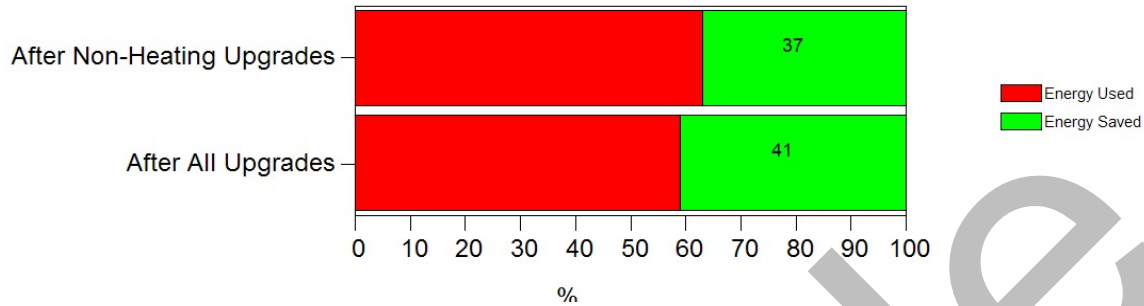


Figure 3 shows where the energy used for space heating is lost from your home. This energy is measured in gigajoules (GJ), where 1 GJ is equivalent to 278 kilowatt-hours (kWh) or 948,000 Btu.

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



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 Amphibole Asbestos. Visit <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/insulation-isolant-eng.php> or call Health Canada at 1-800-443-0395 to order a copy.

5. RECOMMENDED ENERGY-SAVING MEASURES

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; scaling 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 sump pumps and sump pumps, and install sewer backup equipment, if required.

The type and condition of your foundation will determine how 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 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 the ecoENERGY Retrofit - Homes grants. The grant amounts vary depending on the insulation value 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 NRC's publication entitled *Keeping the Heat In* and Canada Mortgage and Housing Corporation's *About Your House* and *Renovating for Energy Savings* fact sheets.

Foundations - Interior Insulation

Before insulating foundation walls from the interior, a moisture barrier is usually applied to the inside face of the walls, up to the grade level. However, the use of foam board, especially in basements and crawlspaces, may act as a moisture barrier and negate the utility of a separate sheet moisture barrier.

The most common methods of insulating foundations from the interior are to install a wood-frame wall and batt insulation or to apply rigid-board insulation directly to the foundation walls, or both. Wood-frame walls allow for wiring and plumbing to be installed and then hidden, plus it provides solid backing for finishing materials. If you use the framed-wall method, it is recommended to build the wall out from the foundation wall by 64 mm (2 ½ in.) so that a horizontal layer of batt insulation can be installed behind the framed wall.

A hybrid system of water-resistant foam board (type IV or V extruded polystyrene, polyurethane or

polyisocyanurate) with RSI values of 0.035/mm to 0.045/mm (R-5 to R-6/inch) glued directly to the foundation wall, and then the installation of a wood frame wall with additional insulation in the stud space is gaining popularity.

A very effective, but more expensive, insulation-treatment is spray-on, closed-cell polyurethane foam applied by a contractor. It has excellent insulating qualities of RSI 0.042/mm (R-6/inch) and is very effective in retarding moisture that may penetrate through the foundation wall and would normally evaporate into the room. In addition, it will not support mould growth. Finally, an air- and vapour-barrier is then installed on the warm side of the insulation, followed by an interior finish. If a foam product is used, building codes require that it be covered with a fire-resistant material, such as drywall.

Grant Eligibility: The insulation of foundation walls is eligible for an ecoENERGY Retrofit - Homes grant. The grant amount varies depending on the insulation value added and the percentage of the wall surface that is insulated. Note that in order to qualify you must insulate a minimum of 20 percent of the basement exterior wall area or 100 percent of the crawl space exterior wall area, including the header. For more information, refer to the brochure entitled *Grant Table for ecoENERGY Retrofit - Homes*.

It is recommended to take photos of your home while the foundation walls are being insulated, showing the amount of insulation being installed, and to show them to the energy advisor during the pre-retrofit evaluation. This will ensure that you receive full credit for the insulation.

Recommendation:

I recommend that you insulate your foundation walls from the interior and increase their insulation value by a minimum of R-24, providing that there are no serious moisture or structural problems. If you choose to increase your insulation by a lesser value - from between R-10 to R-23, you would qualify for half the grant amount listed on the report.

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 heavy 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 seal 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.

Maintaining Attic Ventilation

Even in new homes, moisture can still find its way into your unconditioned attic space. Air sealing these leakage locations is an important first step in minimizing this moisture infiltration, but proper attic ventilation can provide an effective second line of defence. Well-ventilated attics are less prone to ice-damming at the eaves in the winter, and will remain cool in the summer, helping keep the rooms below it cooler and consequently decreasing air conditioning loads.

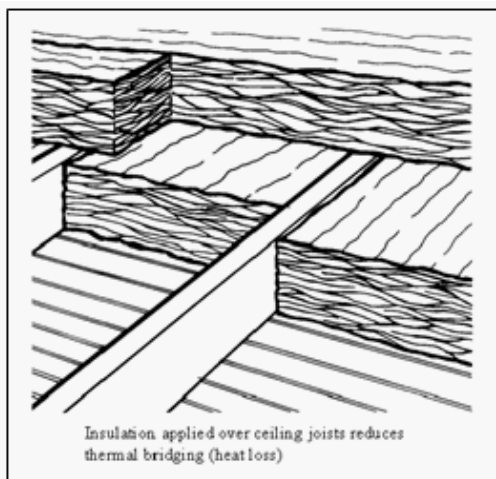
Gable and hip attic spaces are the easiest to vent, since the amount of ventilation is directly related to the

ceiling area. In most cases, the ratio of unobstructed, free ventilation area to ceiling area should be approximately 1 to 300. Since all vents are in some way obstructed (either with screening or baffles) their area should be increased.

Ideally, ventilation should be allowed to occur from end to end and from top to bottom of the attic. This means placing vents at the eaves and at the peak. Any of these are adequate when used in conjunction with soffit vents. When choosing a roof vent, avoid using an electric exhaust fan (or whirly-bird). If improperly calibrated it can pull conditioned air from the home into the attic. This in turn can lead to moisture problems and an increased heating load.

See the NRCan publication *Keeping the Heat In* for detailed information on attic ventilation and other attic insulation considerations.

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 door, and use hooks with eye bolts or a latch to hold the hatch firmly against the weatherstripping.

Ensure that soffit vents are 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 level of your attic to a minimum of R-50.

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*.

Instantaneous Gas-Fired Water Heaters

Instantaneous gas-fired water heaters (also known as "tankless", "demand" and "point-of-use water heaters") have extremely limited or no storage capacity. A natural gas or propane burner rapidly heats the flowing water when a faucet is turned on. Since there is limited or no water storage, standby losses associated with regular DHW tanks are eliminated and overall efficiency is higher.

A single, gas-fired instantaneous water heater has the capacity to meet the hot water needs of most homes. Flow rates, based on specified inlet and delivery water temperatures, are crucial for assessing the type of unit required for a home. It is recommended to look for models rated at over 12.25 litres per minute (3.5 U.S. gallons per minute) based on a temperature rise of 42.8° C (77° F). Otherwise, cold water inlet temperatures and high-demand faucets can result in low flow rates or reduced hot water temperatures.

These units are commonly mounted on the interior surface of exterior walls and vented directly out the wall. For higher efficiency, look for heaters without pilot lights that are mounted inside the home.

High efficiency, condensing instantaneous water heaters recover heat from the water vapour in the combustion gases. Besides higher levels of energy efficiency, condensing instantaneous units are capable of meeting higher flow rates than non-condensing units. Condensing heaters require a drain or condensate pump to remove the water produced.

Some utilities rent instantaneous water heaters.

Grant Eligibility: The replacement of your domestic hot water heater with an ENERGY STAR qualified instantaneous gas-fired water heater is eligible for an ecoENERGY Retrofit - Homes grant. Note that the water heater must have a minimum energy factor (EF) and be on the ecoENERGY Retrofit - Homes list of eligible domestic hot water heaters (visit ecoaction.gc.ca/homes). The grant amount varies depending on the EF and whether or not the heater is a condensing type. Boilers that provide domestic hot water on an instantaneous basis are not eligible for a domestic hot water system grant. In addition, instantaneous water heaters that also provide space heating are not eligible for a heating system grant. Refer to the brochure entitled *Grant Table for the ecoENERGY Retrofit - Homes* for further information on the eligibility requirements.

Recommendation:

I recommend that you replace your hot water heater with an ENERGY STAR qualified instantaneous gas-fired water heater, as noted in the section of this report entitled, 'Your Home Energy Action Checklist'.

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.

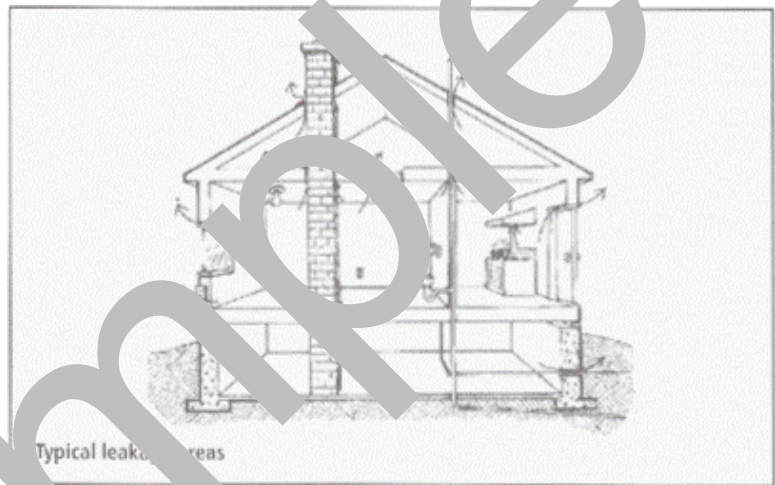
The **Air Leakage Rate at 50 Pascals (ACH)** is the number of complete air changes per hour that occurs in your house when a pressure difference between the inside and outside of the home is set at 50 Pascals (Pa). A 50-Pa pressure difference simulates wind blowing at 56 kilometers per hour on your home.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



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 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 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.

Critical Month (October) Ventilation = 0.19 ACH

The air changes per hour (ACH) measurement indicates the number of times in 1 h that all of the air in the home is exchanged with exterior air.

If, during the month of October (the month in which natural air flow between the inside of the home and the outside is at its lowest), the natural air change rate is less than 0.3 ACH, mechanical ventilation would be required in the home to reduce the potential for conditions such as stale air, high humidity levels, and condensation on windows.

A natural air change rate over 0.5 is usually an indication that the house is drafty and has a large amount of uncontrolled air leakage and unnecessary energy loss. Natural Resources Canada suggests levels of between 0.25 and 0.30 ACH (natural and mechanical combined) as a good rate to ensure good indoor air quality is maintained in the home.

If you decide to perform air sealing on your home, your total critical month ventilation rate may not meet this ventilation requirement.

As an upgrade option, you may consider the installation and use of a heat recovery ventilator (HRV). An HRV is a balanced mechanical central ventilation system that continuously replaces stale indoor air with pre-heated outdoor air. HRVs differ from other mechanical ventilation systems in the ability to exchange heat between the supply and exhaust air streams, that in turn reduces the ventilation cost of heating or cooling the outdoor air that circulates through the home. This upgrade would enhance indoor air quality and maintain comfort without a noisy fan running in your bathroom. Refer to chapter 8 of the publication *Keeping the Heat In* for additional information.

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 *Skilled Tech Training*. In Québec, contact la Corporation des maîtres mécaniciens en tuyauterie du Québec (CMMTQ) at 1-800-465-2668 or visit www.cmmtq.org.

Forced-Air, Condensing Gas Furnaces

A new high-efficiency condensing gas furnace will heat your home efficiently and save you money and energy.

Because of their increased efficiency, condensing gas furnaces use, on average, 35 percent less energy than old models and 10 percent less energy than a standard-efficiency model. High-efficiency furnaces use additional heat exchange surfaces to cool the combustion gases to a point at which the water vapour condenses, thus releasing additional heat into the home. The small amount of wastewater produced by this process is piped to a floor drain. This condensing process has another important benefit in addition to producing more heat. It reduces the temperature of the flue gases to the point where they can be vented through a PVC or ABS plastic pipe out a side wall of the house. This eliminates the need for a chimney, which is a major source of heat loss in homes with old furnaces.

A gas- or propane-fired furnace's energy-efficiency performance over a heating season is called the Annual Fuel Utilization Efficiency (AFUE). This AFUE is expressed as a percentage, with the higher the percentage, the greater the efficiency. Residential gas furnaces must have an AFUE rating of 90 or higher to be ENERGY STAR® qualified.

For more information on ENERGY STAR, go to www.energystar.gc.ca and click on 'Qualified Products' and 'Heating, Cooling and Ventilation', or call 1-800-387-2000. For more information on gas-fired heating systems, refer to NRCan's publication entitled *Heating with Gas*.

Grant Eligibility: The replacement of your heating equipment with an ENERGY STAR-qualified gas furnace is eligible for an ecoENERGY Retrofit - Homes grant. Note that the grant amounts differ based on the AFUE rating of the furnace and the presence of an energy-efficient direct current (DC) variable-speed motor. For further information on the eligibility requirements, refer to the brochure entitled *Retrofit Your Home and Qualify for a Grant!*

Recommendation:

Replace your heating equipment with an ENERGY STAR-qualified gas furnace, as noted in the section of this report entitled 'Your Home Energy Action Checklist'.

Water Conservation

Water conservation is an important part of a home energy saving plan. Whether you use municipal water or a well, water conservation can lessen your impact on the environment by reducing the energy use associated with water treatment and delivery, including the electricity used for pumping water and sewage.

Toilet usage can account for approximately 30 percent of indoor water use. The amount of water used depends on several factors: the flush volume, how often the toilet is flushed and the toilet's condition (adding dye to the tank water can reveal a leaky flush valve if the colour shows up in the bowl without flushing). For example, if you replace a toilet that flushes with 13 litres of water with a 6-litre model, you will save more than half of the water you and your family use. And additional water economy can be achieved by installing a dual-flush toilet designed to save about 25 percent more water than a 6-litre toilet.

Grant Eligibility: The replacement of existing toilets with low- or dual-flush toilets is eligible for an ecoENERGY Retrofit - Homes grant. New toilets must meet three performance criteria for water savings sustainability and long-term water saving performance. The new model must:

1. be rated at 6 litres per flush or less;
2. meet the Los Angeles Supplementary Purchase Specification (referred to as SPS); and
3. have a flush performance of 350 grams or more.

Information on qualified makes and models is available at www.veritec.ca. Click on "Reports" and select "ecoENERGY Eligible".

Important: To ensure compliance, you must keep sufficient documentation on the make and model number of the replacement toilet(s). Show this information to the energy advisor during your post-retrofit evaluation.

Recommendation

When replacing your toilet(s), purchase low- or dual-flush models that meet the requirements described above.

6. ENERGY-SAVING

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.

Sample

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 areas 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.health.gc.ca/health-semt/radiation/radon/index-eng.php>.

Humidity Control

A relative humidity (RH) level of between 30 and 50 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 until March 31, 2011, at the latest, 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

Please keep all invoices, receipts, brochures, stickers, etc. from any items that you purchase that you intend to apply for a grant for. These may be required for verification at the time of your post-retrofit evaluation.

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