

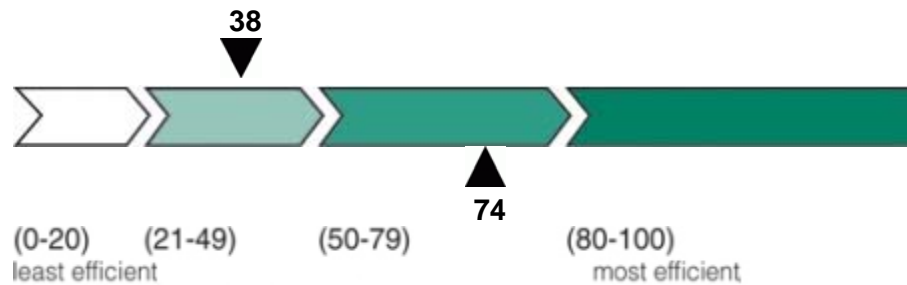
Energy Efficiency Evaluation Report

File number: 4UXXD00001

Property Owner:

Joe Smith
123 Main Street
AnyTown, Ontario
A1A 2B2

EnerGuide Rating



House type: Single detached

Heating system: Natural gas Furnace

No. of storeys: Two

Domestic hot water: Natural gas

No. of RO windows: 10
RO = rough opening

Air leakage rate @ 50 Pa: 8.51 ACH
ACH = number of air changes per hour

Air conditioner: Yes

Equivalent Leakage Area: 1422 cm²

The results of your pre-retrofit energy evaluation indicate that your home rates 38 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 58 percent 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 42, 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 74 points, you could reduce its GHG emissions by 8.1 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: Carson Dunlop & Associates
Telephone: 1-877-326-8770

Certified Energy Advisor:

Date of evaluation: November 22, 2011
Date of report: November 23, 2011

Certified Energy Advisor Signature

HOT2000v10.51

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.

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
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* One (1) star = lowest savings / five (5) stars = highest savings

WALL INSULATION

Increase your exterior wall insulation by an amount greater than RSI 1.59 (R-9).



16.8 points

\$1874

HEATING SYSTEM



14.3 points

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

BASEMENT/CRAWL SPACE INSULATION



7.3 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).

\$187

Increase the insulation value of the basement walls by a minimum of RSI 4.2 (R-24).

\$875

WINDOWS AND DOORS



1.7 points

Replace 10 window(s) / skylight(s) with models that are ENERGY STAR® qualified for climate zone B.

\$400

Replace 2 exterior door(s) with a model that is ENERGY STAR® qualified for climate zone B.

\$80

AIR SEALING



1.5 points

Improve the air tightness of your house by 14 percent to achieve an air change rate per hour of 7.30 at a pressure of 50 Pa.

\$190

ATTIC/ROOF INSULATION



0.8 points

Increase the insulation value of your flat roof, which is evaluated at RSI 3.5 (R-19.9), to achieve a total minimum insulation value of RSI 5 (R-28).

\$210

DOMESTIC HOT WATER SYSTEM (DHW)



1.0 points

Replace your domestic hot water heater with an ENERGY STAR® qualified Instantaneous (condensing) gas-fired water heater that has an energy factor (EF) of 0.90 or higher.

\$375

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 1 toilet(s) with low-flush or dual flush toilet(s) that meet(s) the minimum requirements.

\$65

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.

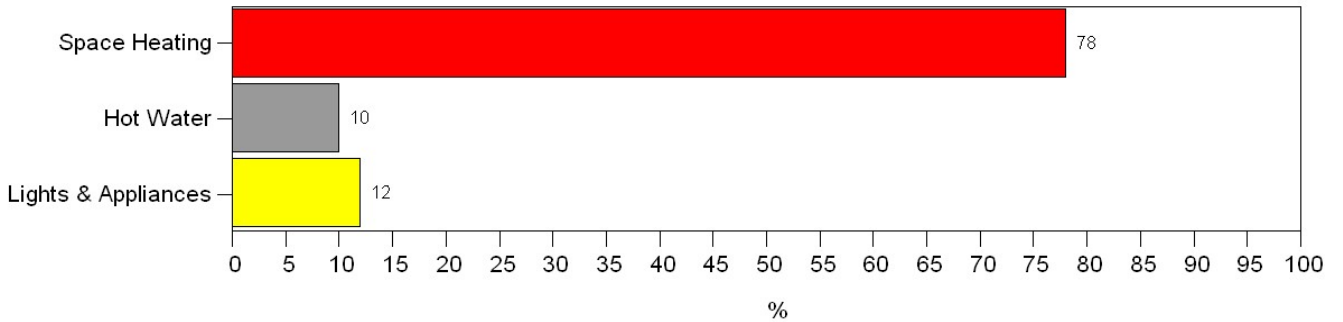
Figures 1 through 3 show the results of your energy evaluation based on the standardized conditions. The results may not entirely reflect your household since your actual energy consumption and future savings are influenced by the number of occupants, their day-to-day habits and lifestyles.

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 53 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 70 percent by performing all of the recommended upgrades.

Figure 2. Estimated Percentage of Potential Energy Savings

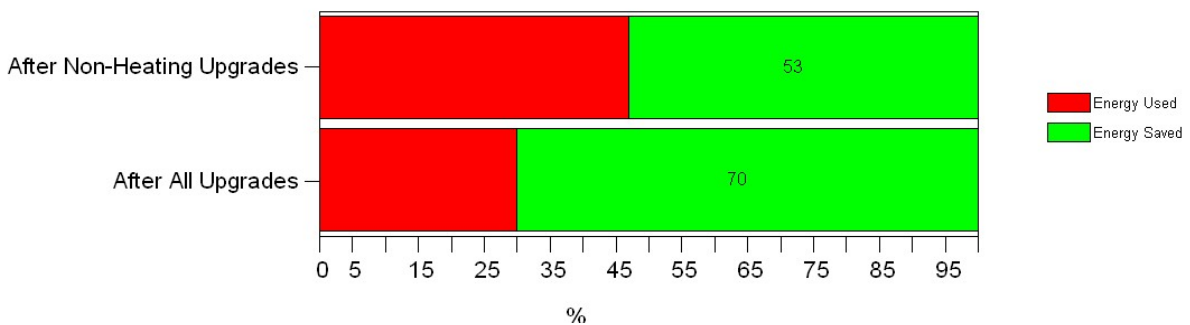
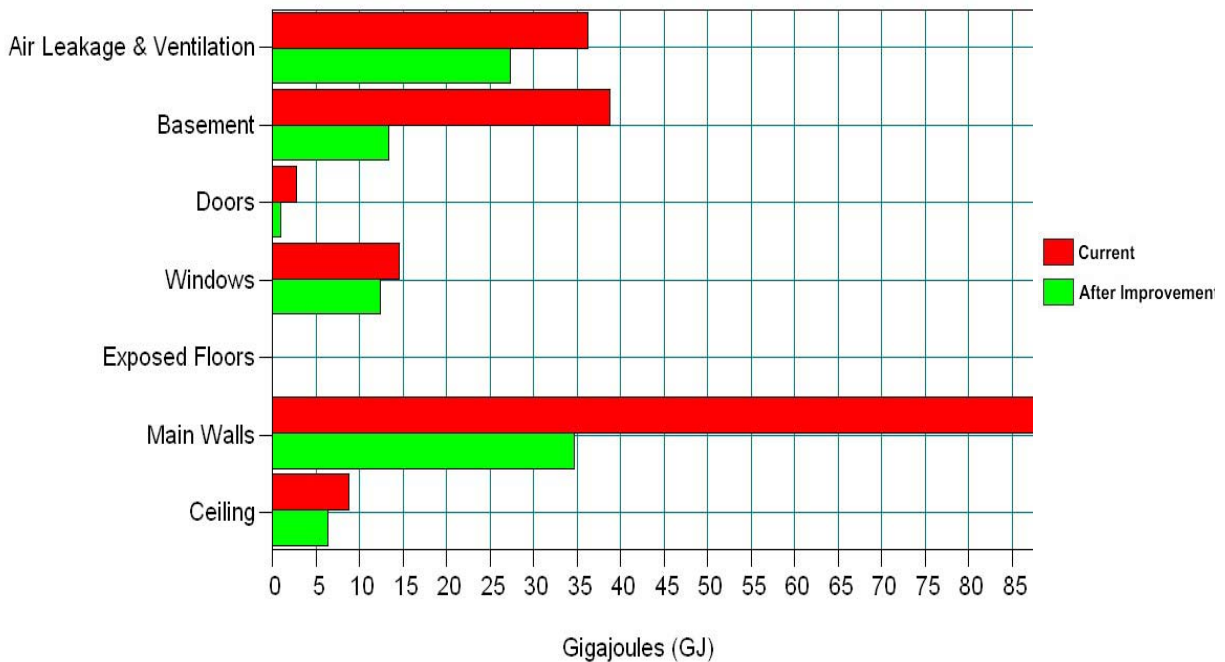


Figure 3 shows where the energy used for space heating is lost from your home. This energy is measured in gigajoules (GJ), where 1 GJ is equivalent to 278 kilowatt-hours (kWh) or 948,000 Btu.

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



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 38854 Btu/hour (11387 Watts) and its design cooling load would be 19717 Btu/hour (1.6 tons). If you are considering replacing your space heating and/or cooling system, provide this information to your heating/cooling contractor to help ensure a properly-sized system. However, the figures will only serve as 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, have 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. It is advisable to hire a contractor that is certified in heat loss and heat gain calculations by an industry-recognized organization, such as the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI), which is also recognized by your local jurisdiction. For a list of HRAI certified contractors, visit www.hrai.ca and under *Home & Building Owners*, click on *Find a Contractor*. Click on *3. Locate an HRAI Member Company contractor* and fill out the required information and then click on *Search The Database* 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 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

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.

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.

Grant Eligibility:

The insulation of exterior walls is eligible for an ecoENERGY Retrofit – Homes grant. Note that you must insulate a minimum of 20 percent of the total exterior wall area and add a minimum insulation value of RSI 0.7 (R-3.8) to qualify. The grant amount differs according to the additional insulation that you install. The grant is also pro-rated based on the percentage of wall area that is insulated compared to the total wall area after the retrofits. For more information, refer to the brochure entitled *Grant Table for ecoENERGY Retrofit – Homes*.

It is recommended to take photos of the walls while the insulation is being installed and to show them to your energy advisor, during the post-retrofit evaluation, to ensure that you will get full credit for your newly-installed insulation.

Main Walls - Interior Insulation

You can choose between these two methods to insulate your main walls from the interior: remove the existing wall finish and insulate the wall cavity or add insulation over the existing wall finish.

Remove the Existing Wall Finish and Insulate the Wall Cavity

This labour-intensive but effective method includes some or all of the following steps, depending

on your house:

- Remove the existing wall trim, mouldings, baseboards, interior finish, and vapour barrier;
- Build up the wall frame to accommodate more insulation;
- Extend the window and door frames, and move electrical outlets in so that they are flush with the new wall finish (Note: ensure that any water and plumbing pipes are on the warm side of the insulation to prevent freezing);
- Replace or upgrade old insulation in the cavities (Note: pay special attention not to compress the insulation and make sure that no air spaces are left in the wall cavities.);
- Apply rigid-board insulation continuously over the framing to reduce thermal bridging;
- Install an air- and vapour-barrier, ensuring that the air barrier is continuous and sealed at joints, around window and door frames, electrical outlets, etc.; and
- Install strapping and a new interior finish.

Add Insulation over the Existing Wall Finish

This less labour-intensive method includes some or all of the following steps, depending on your house:

- Remove all wall trims, mouldings and baseboards;
- Extend the window and door frames, and move electrical outlets in so they are flush with the new wall finish (Note: ensure that any water and plumbing pipes will be on the warm side of the insulation to prevent freezing);
- Glue or fasten rigid-board insulation directly to the existing wall finish;
- Add an air- and vapour-barrier, making sure that the air barrier is continuous and sealed at joints, around window- and door-frames, electrical outlets, etc.; and
- Install strapping and a new interior finish.

For both of these methods, foam insulation materials must be covered with a fire-resistant material, such as drywall. Hiring an electrician is recommended for any required electrical work.

Recommendation:

Insulate the main walls of your home from the interior and increase their insulation value as noted in the section of this report entitled *Your Home Energy Action Checklist*.

Main Walls - Exterior Insulation

When you plan to replace your exterior wall surfacing, it is a good time to increase the insulation value of the main walls.

Vapour barrier properties of the exterior walls

Before you insulate the walls, assess the vapour barrier properties of the interior side of the wall. A vapour barrier film that is installed behind the interior surface of a wall or a paint that has vapour barrier properties applied to the interior surface can be an effective barrier to the migration of water vapour into the wall structure.

Water vapour permeability of the insulation

When you choose rigid board insulation to insulate the walls from the exterior, consider the water vapour permeance (i.e. breathability) of the material. The installation of insulation or cladding that has vapour barrier characteristics (such as extruded polystyrene board) on the exterior side of a wall can cause condensation problems within the wall if no vapour barrier exists on the interior side. Follow the manufacturer's recommendations and building code

requirements for your area concerning the installation of low-permeance insulation on the exterior side of existing walls.

Airtightness of the exterior walls

Before you install strapping and the exterior wall surfacing, consider installing a sheet-type air barrier over the insulation. The air barrier must be continuous and well sealed at joints and along its edges, such as around windows and doors.

If you do not install an air barrier from the exterior, it is recommended that you seal the interior surface of the wall, although this method is not as effective as an exterior air barrier. Seal the interior wall along the perimeter of doors and windows and seal all other cracks and openings, such as along baseboards, header joists, etc. Install gaskets around electrical outlets and switches.

Protection from water penetration

Install flashing above the doors and windows and at the point of contact between the foundation wall and the above-grade wall. Use flashing that is suited for the type of exterior cladding that is used. Flashing prevents water from penetrating the joints between various materials and can redirect water from within the wall structure to the outside.

Note: Any insulation or insulated siding must be fastened tightly to the wall, with no air circulating behind it.

Recommendation

Insulate the main walls of your house from the exterior and increase their insulation value as noted in the section of this report entitled 'Your Home Energy Action Checklist'.

Foundations - Exterior Insulation

The preferred method to insulate foundation walls is to do so from the exterior. Insulating foundation walls from the exterior keeps the walls warm, which moderates interior temperatures and reduces frost damage caused by freeze-thaw cycles. Also, while the foundation walls are exposed, waterproofing and weeping tile improvements can be made.

Foundation walls that are made of mortared materials such as brick, concrete block and stone should ideally be insulated from the exterior because they are porous and susceptible to frost damage.

There are limitations to insulating from the exterior, such as disturbing landscaping, sidewalks, driveways and additions to the original building. For areas that are difficult or impossible to insulate from the exterior, insulate from the interior.

Before excavating around a foundation, determine if there is a risk of foundation wall failure, especially in the case of foundations made of mortared materials. Foundation failure may occur if the soil is supporting the foundation or if heavy equipment traffic causes stresses on the wall. Keep in mind that this type of renovation is best suited to dry, warm seasons so the products will be well applied and to avoid unnecessary costs associated with freezing and wet weather.

The most common types of insulation used to insulate foundations from the exterior are rigid-type extruded polystyrene, polyurethane and polyisocyanurate foam boards. These insulation materials have RSI values of 0.035/mm to 0.045/mm (R-5/inch to R-6/inch).

Insulation must extend to the above-grade walls and be properly fastened, flashed and covered to protect the walls from physical and weather damage.

When the excavation is filled, ensure that the ground slopes away from the foundation to direct excess surface water away from the house. The usual slope is 10 percent or 20 cm (8 in.) for the first 2 m (6 ft.) to allow for settling.

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 post-retrofit evaluation. This will ensure that you receive full credit for the insulation.

Recommendation:

Insulate your foundation walls from the exterior and increase their insulation value as noted in the section of this report entitled *Your Home Energy Action Checklist*.

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 weeping tiles and 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.

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.

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 1/2 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 also popular.

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 may be required on the warm side of the insulation, depending on the type of insulation products used, followed by an interior finish. If a foam product is used, building codes may 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 post-retrofit evaluation. This will ensure that you receive full credit for the insulation.

Recommendation:

Insulate your foundation walls from the interior and increase their insulation value as noted in the section of this report entitled *Your Home Energy Action Checklist*, providing that there are no serious moisture or structural problems.

Doors

Old and ill-fitting exterior doors can contribute significantly to heat loss and drafts. Heat and air escape through and around the door, the frame, weatherstripping and other fitting and structural components.

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 a tight, energy-efficient fit, as well as the proper installation of the door and the air sealing around the doorframe.

For information on energy-efficient doors, refer to NRCAN's publication entitled *Energy-Efficient Residential Windows, Doors and Skylights* at <http://oee.nrcan.gc.ca/publications/infosource/home/index.cfm>. For information on ENERGY STAR® qualified windows, doors and skylights, go to www.energystar.gc.ca, and click on *Information for general consumers* and then *Windows, doors and skylights*.

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. Keep the ENERGY STAR label(s) and invoice as proof of the door's ENERGY STAR qualification for your climate zone and show them to the energy advisor during the post-retrofit evaluation of your home. For more information on eligible models or to determine your climate zone, visit oee.nrcan.gc.ca/retrofit/questions#windows or refer to the brochure entitled *Grant Table for ecoENERGY Retrofit – Homes*.

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. Low-E coatings, triple glazing, inert gas fills, and better edge spacers and frames offer 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 year-round and reduce noise from the outside. Depending on the amount of humidity in your home, there may be less condensation on your windows during cold weather.

For information on purchasing energy-efficient windows, refer to NRCAN's publication entitled *Energy-Efficient Residential Windows, Doors and Skylights* at <http://oee.nrcan.gc.ca/publications/infosource/home/index.cfm>. For information on ENERGY STAR qualified windows, doors and skylights, go to www.energystar.gc.ca, and click on *Information for general consumers* and then *Windows, doors and skylights*.

Grant Eligibility:

The replacement of windows with models that are ENERGY STAR qualified is eligible for an

ecoENERGY Retrofit – Homes grant. Grants for windows are based on the number of rough openings (RO) in which windows were replaced between the pre- and post-retrofit evaluations. The first page of this report indicates how many ROs are in your home (*No. of RO windows*), including those for windows and skylights. You must choose models that are ENERGY STAR qualified for your climate zone. Keep the ENERGY STAR label(s) and invoice as proof of the window's ENERGY STAR qualification for your climate zone and show them to the energy advisor during the post-retrofit evaluation of your home. For more information on eligible models or to determine your climate zone, visit oee.nrcan.gc.ca/retrofit/questions#windows.

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, energy-saving measure a homeowner can undertake; the leakier the home, the greater the savings! It is not unusual for air leakage to account for up to 35 percent 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. Air sealing can also reduce air conditioning loads and energy costs.

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 sq. in.).

Air Sealing Locations in Your Home

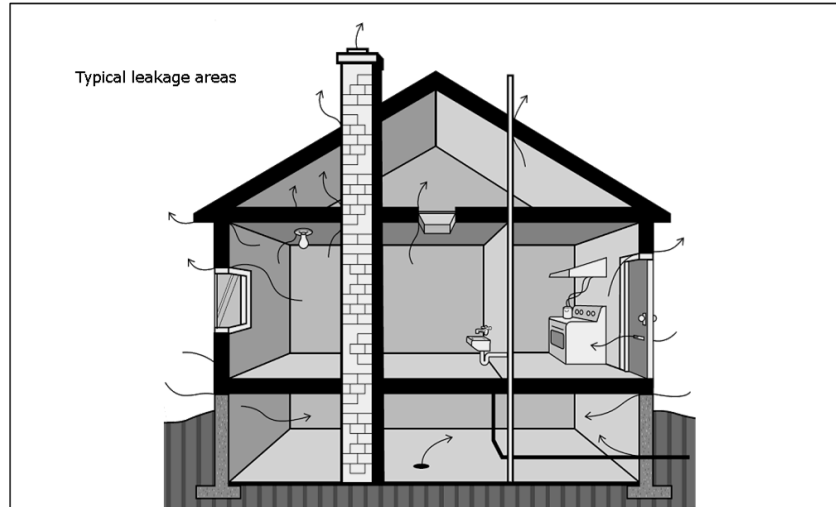
Listed below are the most common air leakage areas in a house. Leaks observed during the blower door test are noted. This list will help guide your air-sealing work:

- electrical outlets -Install foam gaskets and use baby plugs in outlets
- electrical ceiling fixtures -Seal around all upper level ceiling fixtures
- electrical box and wire penetration -Seal all exterior wire penetrations from exterior
- exterior pipe penetration -Seal all exterior pipe penetrations from exterior
- baseboard trims and mouldings -Install foam backer rod behind baseboards to reduce airflow and leakage
- window frames -Seal around all window frames and casings with caulk
- door frames -Install new weather stripping

- fireplace
- chimney -Keep damper closed when not in use
- attic hatch -Seal with foam tape or caulk
- basement header (rim joists) -Seal around basement header where possible

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, high quality weatherstripping is a cost-effective way to reduce air leakage. Check weatherstripping annually and replace worn materials before the cold weather sets in.

Interior-grade caulking is used on the interior to seal small cracks and penetrations on the inside surface of your walls, ceilings and floors. Exterior-grade caulking is 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 but must be protected from the elements and flame sources.

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.

Grant Eligibility:

Air sealing can be eligible for an ecoENERGY Retrofit – Homes grant. You must meet or exceed the goal indicated at the beginning of this report, in the section entitled *Your Home Energy Action Checklist*. The results of the air sealing work will be measured at the time of your post-retrofit evaluation. The grant amount differs according to the percentage by which you have reduced your home's air leakage rate. For more information, refer to the brochure entitled *Grant Table for ecoENERGY Retrofit – Homes*.

Recommendation:

Air seal your home to achieve the air leakage rate indicated at the beginning of this report in the section entitled *Your Home Energy Action Checklist*.

Insulating Flat Roofs

Insulating a flat roof is not a simple undertaking and usually requires the services of a qualified contractor. The main challenge is the limited space for insulation and ventilation.

When insulating a flat roof, it is crucial to minimize air leakage from the house into the roof space, which can lead to moisture problems, reduce the effectiveness of the insulation and damage interior finishes and the roof structure. Therefore, ensure that all air leaks into the ceiling are sealed and any existing moisture problems are corrected before insulating.

It is also useful to reduce thermal bridging, which is caused when the ceiling joists - because of their relatively low insulating value - conduct heat directly from the ceiling to the exterior of the house. In addition to heat loss, thermal bridging can cause staining or condensation on the ceiling finish along the joists.

Here are three methods for insulating flat roofs:

1. Insulating from the Exterior

This is the preferred method if your roof needs to be repaired or replaced but it is also one of the most labour intensive. It usually requires the removal of the roof surface to expose the roof space.

2. Insulating from the Interior

This method is also labour intensive since it involves installing a new ceiling throughout the house. It may also be difficult to properly insulate and seal the areas on top of interior partitions.

3. Blowing Loose-Fill Insulation into the Existing Roof Space

This method, which is better performed by an insulation contractor, may eliminate ventilation, depending on the type of roof. It is generally not recommended unless extra care is taken to reduce air leakage into the roof space and prevent potential moisture damage. However, air leakage areas in a flat roof - such as openings and penetrations for electrical wiring, plumbing stacks and the tops of partition walls - may not be easily accessible for sealing. In addition, it may be difficult or impossible to reduce thermal bridging, depending on the type of roof.

Do not install insulation or flammable material against or over heat sources, such as masonry or metal chimneys, and recessed lighting fixtures. Consult with chimney experts regarding appropriate barriers to keep adequate clearance to these structures before beginning air sealing and insulating the attic area.

For more information, consult NRCan's publication entitled *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 a flat roof is eligible for an ecoENERGY Retrofit – Homes grant. Note that you must insulate a minimum of 20 percent of the total ceiling area and add or reach a minimum insulation value to qualify. The grant amount differs according to the existing insulation value of your roof and the total insulation value achieved. For more information, refer to the brochure entitled *Grant Table for ecoENERGY Retrofit – Homes*.

Recommendation:

Hire a qualified contractor to insulate your flat roof to the insulation value noted in the section of this report entitled *Your Home Energy Action Checklist*.

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 percent 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. The efficiency of electric DHW equipment is expressed in Watts of standby loss, where the lower the number, the more efficient the water heater.

If you are replacing your DHW equipment, 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.
- For plastic water piping, insulate with approved compatible insulation products.

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 domestic tank-type water heaters 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 critical for assessing the type of unit required for a home. It is recommended to look for models rated at over 13.25 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. The grant amount varies depending on the Energy Factor (EF) or whether or not the heater is a condensing type. To be eligible, models must appear on the list for this equipment and meet the eligibility requirements; visit oee.nrcan.gc.ca/retrofit/table to find the appropriate list. Refer to the brochure entitled *Grant Table for ecoENERGY Retrofit – Homes* for further information on the eligibility requirements.

Note: 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.

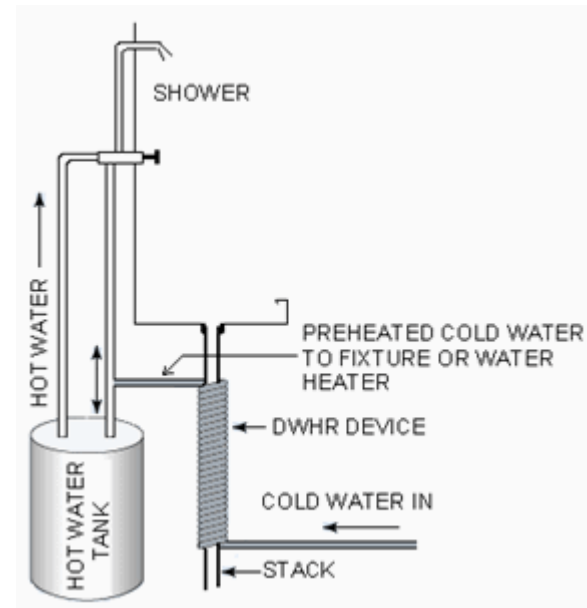
Recommendation:

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*.

Drain-Water Heat Recovery Systems

A drain-water heat-recovery (DWHR) system provides a simple, maintenance-free way to reclaim some of the heat primarily from shower-water lost down the drain. These systems can save up to 40 per cent on water heating costs.

Here's how it works: In a conventional system, cold water enters a hot water heater where it is turned into hot water. When someone showers, the hot water proceeds from the heater to the shower where it is then lost down the drain. In a DWHR system, cold water first runs through copper coils wound tightly around the vertical plumbing drain that serves the shower. Copper is an excellent heat conductor that conducts the warmth of the drain water to the cold water in the coils without mixing the water sources. As the cold water continues to wind up through the coils around the plumbing drain, it becomes pre-heated. The pre-heated water continues to the hot water heater. Alternatively, the preheated water can be diverted to the cold-water line that also serves the shower. The amount of hot water required from the water tank can then be reduced.



DWHR systems should only be installed vertically or they will not perform as intended. Install systems only where there is adequate room on vertical stacks below showers.

Grant Eligibility:

The installation of drain-water heat recovery systems is eligible for an ecoENERGY Retrofit grant. Eligible systems must be installed vertically and must have been tested by an independent testing facility recognized by Natural Resources Canada. To be eligible, models must appear on the list for this equipment and meet the eligibility requirements; visit oee.nrcan.gc.ca/retrofit/table to find the appropriate list. For information on the grant amounts, refer to the brochure entitled, *Grant Table for ecoENERGY Retrofit – Homes*.

Recommendation:

Install a drain-water heat recovery system in your home.

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 building envelope 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.
- 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. A properly sized heating system will reduce on/off cycling, energy use, wear and tear on parts, and improve comfort. It is advisable to hire a contractor that is certified in heat loss and heat gain calculations by an industry-recognized organization, such as the Heating,

Refrigeration and Air Conditioning Institute of Canada (HRAI), which is also recognized by your local jurisdiction. For a list of HRAI certified designers and installers, visit www.hrai.ca and under *Home & Building Owners*, click on *Find a Contractor*. Click on 3. *Locate an HRAI Member Company contractor* and fill out the required information and then click on *Search The Database* or call 1-800-267-2231.

Forced-Air, Condensing Gas Furnaces

A new high-efficiency, condensing gas (natural gas or propane) 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 older 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 or condensate pump. 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 approved 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-fired furnace's energy-efficiency performance over a heating season is called the Annual Fuel Utilization Efficiency (AFUE) rating. This AFUE is expressed as a percentage where the higher the percentage, the greater the efficiency. In addition, to reducing fuel consumption, modern furnaces can be equipped with high efficiency, direct current (DC) fan motors that consume considerably less electricity than standard alternating current (AC) motors. High efficiency motors are also sometimes referred to as DC brushless motors.

For information on ENERGY STAR®, go to www.energystar.gc.ca and click on *Information for General Consumers* then follow the *Heating equipment* link, 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 a gas furnace that has a 92 percent AFUE or higher is eligible for an ecoENERGY Retrofit – Homes grant. Note that the grant amounts differ based on the presence or not of an energy-efficient, brushless DC fan motor. To be eligible, models must appear on the list for this equipment and meet the eligibility requirements; visit oee.nrcan.gc.ca/retrofit/table to find the appropriate list. For more information, refer to the brochure entitled *Grant Table for ecoENERGY Retrofit – Homes*.

Recommendation:

Replace your heating equipment with a gas furnace model that meets the requirements as described above.

Cooling System (Air Conditioner)

Air conditioning increases home comfort by lowering both air temperature and humidity levels in the home.

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

- Complete all of the other building envelope energy efficiency upgrades, such as air sealing and insulation.
- Next, ensure that your heating/cooling contractor performs a heat gain calculation on your home to determine the capacity and distribution flows for the new equipment. A properly sized cooling system will reduce on/off cycling, energy use, wear and tear on parts, and improve comfort. It is advisable to hire a contractor that is certified in heat loss and heat gain calculations by an industry-recognized organization, such as the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI), which is also recognized by your local jurisdiction. For a list of HRAI certified designers and installers, visit www.hrai.ca and under *Home & Building Owners*, click on *Find a Contractor*. Click on 3. *Locate an HRAI Member Company contractor* and fill out the required information and then click on *Search The Database* or call 1-800-267-2231.

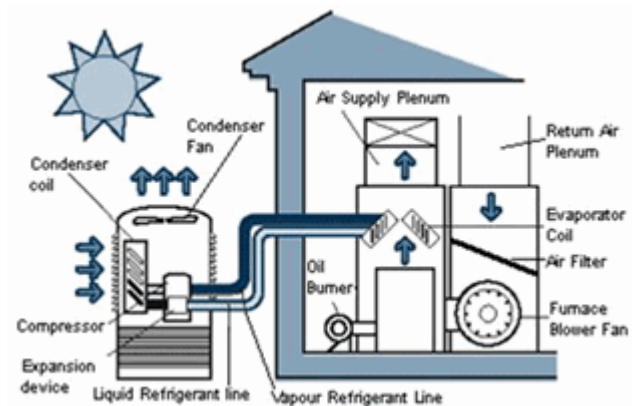
Air conditioners should be serviced and maintained regularly, since they can become inefficient when dirty or when the refrigerant runs low. You can do some of the simple maintenance yourself (e.g., clean or change the air filter), but you may also want to have a competent service contractor do a periodic inspection of your unit. Check your owner's manual for information on maintaining your air conditioning system.

For more information on air conditioners, refer to NRCan's publication entitled *Air Conditioning Your Home*.

Split-System Air Conditioners

Your central air conditioner is a split system, which means it has both an outside and an inside component. The outside component contains the condenser coil and the inside, the evaporator coil.

The evaporator coil is typically hidden in the plenum attached to the furnace, and refrigerant tubing connects the two cooling components. The furnace blower fan circulates the cooled air throughout the home via the heating ducts.



A mini-split (ductless) air conditioner is similar to a split-system but contains one or several indoor coils connected to one outdoor unit. Some mini-split units have as many as three indoor units. These units are ideal for homes that don't have a forced air heating system, as there is no need for ductwork. The indoor section simply mounts on an inside wall, the ceiling or the floor. The outdoor and indoor units generally have a very slim profile compared to conventional split-systems.

The energy efficiency of air conditioners is measured by a Seasonal Energy Efficiency Ratio (SEER) and an Energy Efficiency Ratio (EER). The higher the rating, the more energy efficient is the air conditioner. ENERGY STAR® qualified central air conditioning systems are about 8 percent more efficient than standard models. To ensure maximum specified efficiency and

uncompromised longevity of the new system, replace both of the matched indoor and outdoor units at the same time.

Many manufacturers voluntarily submit their products for testing by the Air Conditioning, Heating and Refrigeration Institute (AHRI) to assure consumers their energy efficiency claims have been verified by an independent, third-party laboratory. However, AHRI does not certify individual units, but matched indoor and outdoor units of central air conditioning systems, which work together to achieve the given SEER rating. In addition to matching indoor and outdoor units, some manufacturers test their air-conditioning systems with a specific furnace model to increase their SEER value by using the energy-efficient motor of the furnace. In these cases, the AHRI number will reference an outdoor unit, indoor unit and a furnace model.

You can verify that the system your contractor is proposing is a matched system by asking for an AHRI Certificate of Product Rating or an AHRI Certified Reference number (also known as ARI number). The reference number can be entered into the ENERGY STAR database at <http://oee.nrcan.gc.ca/residential/business/manufacturers/search/central-air-conditioners-search.cfm> to verify that the system is matched (e.g., AHRI # 1278951 references outside unit YZE03611 and indoor unit AV*36+TXV) and is ENERGY STAR compliant. If you do not have an AHRI Certified Reference Number, to find the equipment in the ENERGY STAR database you will need the manufacturer's name and model number for both the indoor and outdoor units. Ask your contractor to indicate the AHRI Certified Reference number on your invoice, as well as the indoor and outdoor unit model numbers (and furnace model number, if applicable) and provide this information to your energy advisor at the time of the post-retrofit evaluation.

Grant Eligibility:

The replacement of a central air conditioning system with an ENERGY STAR qualified air conditioning system is eligible for an ecoENERGY Retrofit – Homes grant. The new air conditioning system must have matched condenser and evaporator coils with a SEER rating of 14.5 or higher, an EER of 12.0 or higher, and an AHRI number for the matched indoor unit and outdoor unit (and furnace if the AHRI number references one). To be eligible, models must appear on the list for this equipment and meet the eligibility requirements; visit oee.nrcan.gc.ca/retrofit/table to find the appropriate list. For more information on the eligibility requirements of central air conditioning systems, refer to the brochure entitled *Grant Table for ecoENERGY Retrofit – Homes*.

Recommendation:

Replace your split-system air conditioner with an ENERGY STAR qualified air conditioner that meets the requirements above.

Water Conservation

Water conservation is an important part of a home energy saving plan. Whether you are on 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. 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 models must meet the Unified North American Requirements (UNAR) for toilets. Information on qualified makes and models is available at www.map-testing.com. Click on *MaP SEARCH* and select the *Meets UNAR/ecoEnergy requirements* check box under the section labeled *Toilet Fixture Criteria/Ratings* and click *Search*.

Important: To ensure compliance, you must keep sufficient documentation on the make and model number of the replacement model(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 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.
- 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. For more information, visit <http://energyguide.gc.ca>.
- Replace your light bulbs with ENERGY STAR® qualified 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 one to two hours before you start your vehicle.
- Install an ENERGY STAR® qualified kitchen or bathroom exhaust fan vented to the outside.
- 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 entertainment system(s) and home office equipment into power bars that can be easily turned off when equipment is not in use. Refer to the fact sheet

Standby Power - When "Off" Means "On" at <http://oee.nrcan.gc.ca/residential/business/manufacturers/standby-power-fact.cfm> 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.