

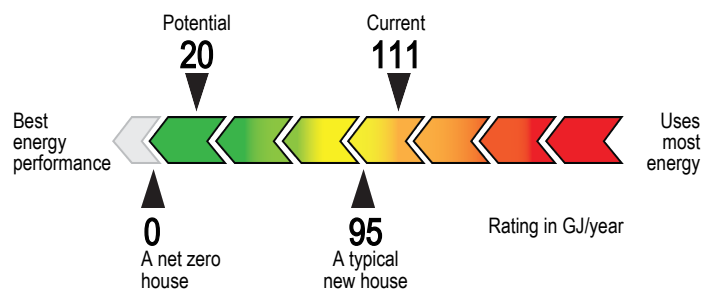
RENOVATION UPGRADE REPORT



522 Rougemount Cr
Ottawa, ON K1K 2W2



Year built: 1985



Assessment date:
September 16, 2019

Evaluated by:
AL

Quality assured by:
EnviroCentre

This report identifies your home's energy savings opportunities by providing you with recommended renovation upgrades. It complements your EnerGuide label and your Homeowner Information Sheet and includes:

- 🏠 Your customized action plan to improve the energy efficiency of your home;
- 🏠 Information on your rating and potential contribution to greenhouse gas (GHG) emission reductions;
- 🏠 Before and after heat loss and energy use estimates;
- 🏠 Important health and safety information; and
- 🏠 Additional energy savings tips.

YOUR ENERGY EFFICIENCY ROADMAP

Your energy advisor has prioritized your recommended upgrades based on the potential energy savings, the life expectancy of your home components, the interactions between systems, your potential renovation plans and the costs to perform the upgrades.



1. Upgrade heating system

[Save 23 GJ/year]

2. Perform air sealing

[Save 2 GJ/year]

3. Insulate foundation

[Save 12 GJ/year]

4. Insulate attic

[Save 2 GJ/year]

Additional recommendations on next pages



By implementing all upgrades, you are helping to fight climate change and could reduce GHG emissions by up to 4.3 tonnes per year.

RECOMMENDED ENERGY EFFICIENCY UPGRADES

A customized plan to improve the energy efficiency of your home is found below:



1. Upgrade heating system

- ❑ Install a new ENERGY STAR certified air-source heat pump that has a heating seasonal performance factor (HSPF) of 8.

This upgrade could reduce the energy consumption of your house by 23 gigajoules per year.

Did you know?

Space heating accounts for 61 percent of the estimated annual energy use of your house.

Useful tips

Perform any planned building envelope upgrades before your heating contractor begins work since a more energy efficient building envelope may mean that a smaller heating system could be installed. The contractor should first conduct a heat loss calculation before deciding on the capacity and model of your heating system.

Your *Homeowner Information Sheet* provides important details and a reference for this calculation. Inform your heating contractor of any building envelope upgrades performed since your evaluation, or that will be undertaken since these may render certain details in your *Homeowner Information Sheet* inaccurate.

Consider purchasing a system that is ENERGY STAR certified when available. Consult Natural Resources Canada's website at <https://www.nrcan.gc.ca/energy/products/categories/heating/13740> for information on choosing a heating system.

Your energy advisor's comments



When you change your air conditioner, ensure that you replace it with a cold-climate air-source heat pump (ASHP). An ASHP is a super-efficient system that takes extra energy from outside air, even at cold temperatures, and uses it to heat your home. This extra energy cuts your heating energy requirements in half. ASHPs also provide efficient cooling in the summer.

Because Ontario's grid has low carbon emissions this is an excellent way to reduce your carbon impact. By reducing your use of Natural Gas, these machines can drop your GHG emissions by 75%.

To work effectively, an ASHP needs to be well sized for your house; at least 25% larger than the design cooling load (see the Space Cooling section of your Homeowner Information Sheet) (1 kW = 3,400 BTU/h).

You can keep your existing gas furnace as a backup system, but for even greater savings consider replacing it with an electric backup furnace and closing your gas account entirely.



2. Perform air sealing

- ❑ Improve the airtightness of your house by 10% to achieve 3.55 air change(s) per hour at 50 pascals.

This upgrade could reduce the energy consumption of your house by 2 gigajoules per year.

Did you know?

Air leakage accounts for 19 percent of the estimated annual heat loss of your house.

Useful tips

RECOMMENDED ENERGY EFFICIENCY UPGRADES - CONTINUED

Air sealing is one of the most cost-effective energy-saving measures you can undertake. It is typically performed before and during other upgrades to ensure optimal benefit. Air sealing can help to minimize potential moisture damage and improve comfort by reducing drafts, heat loss, dust and outdoor noise in your home.

Consult chapter 4 of [Keeping the Heat In](#) to learn more and take action.

Air leakage locations identified by your energy advisor are listed below:



- ☐ Your house is at a good level of air tightness. If you install an HRV you will be able to seal all the drafts while maintaining good air quality. (See HRV section for more details)
- ☐ Air seal the following locations:
- ☐ Remove your combustion air supply in your basement, your furnace and your hot water tank both have dedicated Combustion Air supplies, so you can remove and seal the metal pipe duct that is not sealed.
- ☐ Remove, air seal and insulate the old hot water exhaust metal pipe, it is up in the corner of your basement room near where the fireplace is located.
- ☐ The wood burning fireplace is drafty. Consider building an insulated plug which sits in front of your fireplace when you are not using it. When you do use it, make sure that you open both the top damper and the bottom damper to get the best burn as well as adding heat to your home.
- ☐ Your drier flap is drafty, consider replacing it with one that seals better.
- ☐ Your exhaust fan flap is drafty on the second level, consider removing the flap and installing a new one. Also your ducts from your exhaust fans are not insulated in the attic, consider replacing them with insulated pipe or adding insulation on top of the piping.
- ☐ Your plumbing stack is drafty. Considered going into the attic and clearing around where your plumbing stack exits the ceiling. Seal it thoroughly and replace the insulation present here.
- ☐ Garage door is drafty at the corner.
- ☐ Your bedroom window is drafty and doesn't close properly, sealing/fixing this window is a priority.
- ☐ Your front second level heat ducts have some air leaks coming from around them. This could mean there are some drafts coming from the first level roof into your second level floor. To check this, go through your porch soffit or your garage attic and make sure the header and the wall connected to your house are well sealed.



3. Insulate foundation

- ☐ Increase the insulation value of 100% of your basement walls (Foundation - 1) from the interior by RSI 1.78 (R-10.1).

This upgrade could reduce the energy consumption of your house by 12 gigajoules per year.

Did you know?

Your foundation accounts for 30 percent of the estimated annual heat loss of your house.

Useful tips

Assess the status of your foundation for water leaks, cracks and flooding and remediate these issues before beginning any insulation job. Foundations can be insulated from the interior, exterior or a combination of both depending on accessibility and the complexity of the building. Refer to your energy advisor's comments to determine which would be best suited for your foundation.

Consult chapter 6 of [Keeping the Heat In](#) to learn more and take action.

Your energy advisor's comments

RECOMMENDED ENERGY EFFICIENCY UPGRADES - CONTINUED



As far as we can tell, the bottom half of your foundation is not insulated in the majority of your basement. I have modeled an upgrade to both areas, as described above. Due to the high energy savings, this is a cost effective upgrade for you to consider.



4. Insulate attic

- ❑ Increase the insulation value of your attic (1stLVL Ceiling) by RSI 4.98 (R-28.3).
- ❑ Increase the insulation value of your attic (2ndLVL Ceiling) by RSI 4.98 (R-28.3).

This upgrade could reduce the energy consumption of your house by 2 gigajoules per year.

Did you know?

Ceilings account for 5 percent of the estimated annual heat loss of your house.

Useful tips

The following are some of the items to consider before insulating the attic:

- ❑ Ensure the roof does not leak.
- ❑ Ensure electrical work is up-to-date and that all desired ceiling fixtures have been installed.
- ❑ Look for opportunities to air seal before insulation is added.
- ❑ Ensure adequate attic venting is installed and that it is not blocked by insulation.
- ❑ Ensure all exhaust fans and ducts penetrating the attic are sealed and vented to the outside.

Consult chapter 5 of [Keeping the Heat In](#) to learn more and take action.

Your energy advisor's comments



Air seal your attic floor before adding insulation to reach an R60 level.



5. Upgrade doors

- ❑ Replace 3 doors with ENERGY STAR certified models for zone 2.

This upgrade could reduce the energy consumption of your house by 5 gigajoules per year.

Did you know?

Doors account for 7 percent of the estimated annual heat loss of your house.

Useful tips

ENERGY STAR certified doors are rated for three climate zones in Canada and are among the most energy efficient in the marketplace. If there is a window in the door, consider units with low-E coatings and inert gas fills.

Consult chapter 8 of [Keeping the Heat In](#) to learn more and take action.

Your energy advisor's comments

RECOMMENDED ENERGY EFFICIENCY UPGRADES - CONTINUED

The front, garage mandoor, and rear entrance doors are in poor condition and poorly insulated. We recommend replacing these doors with high performance insulated doors to reduce heat losses.



6. Insulate main walls

- ❑ Increase the insulation value of your main walls (Second level VINYL) by RSI 2.64 (R-15.0).
- ❑ Increase the insulation value of your main walls (Main floor VINYL) by RSI 2.64 (R-15.0).
- ❑ Increase the insulation value of your main walls (Main floor BRICK) by RSI 2.64 (R-15.0).
- ❑ Increase the insulation value of your headers (MW hdr-02) by RSI 1.76 (R-10.0).

This upgrade could reduce the energy consumption of your house by 12 gigajoules per year.

Did you know?

Main walls account for 24 percent of the estimated annual heat loss of your house.

Useful tips

Main walls can be insulated from the interior, exterior or both using a variety of materials and methods. Refer to your energy advisor's comments to determine the best approach.

Consult chapter 7 of [Keeping the Heat In](#) to learn more and take action.

Your energy advisor's comments



Consider adding a layer of rigid foam, as described above, when you replace your siding.



7. Upgrade hot water system

- ❑ Install a new ENERGY STAR certified, electric heat pump water heater with an energy factor (EF) of 0.00.
- ❑ Install a drain-water heat recovery system with an efficiency of 60.3%.

This upgrade could reduce the energy consumption of your house by 9 gigajoules per year.

Did you know?

Water heating accounts for 13 percent of the estimated annual energy use of your house.

Useful tips

The efficiency of fuel-fired water heating equipment is expressed as the energy factor (EF), uniform energy factor (UEF) or thermal efficiency. The higher the number, the more efficient the water heater. The efficiency of storage-tank electric water heating equipment is expressed in watts of standby loss, where the lower the number, the more efficient the water heater.

Look for an energy-efficient model and ensure it is properly sized for your needs. Use manufacturers' sizing charts available from your contractor or retailer. See Natural Resources Canada's website at <https://www.nrcan.gc.ca/energy/products/categories/water-heaters/13735> for more information.

Your energy advisor's comments

RECOMMENDED ENERGY EFFICIENCY UPGRADES - CONTINUED

Upgrade your water heater as recommended above. Also consider that because Ontario's grid has low carbon emissions, this is an excellent way to reduce your carbon impact. By reducing your use of Natural Gas, an electric tank can drop your GHG emissions by 15%.

As recommended above, install a Drain-Water Heat Recovery unit on a vertical plumbing stack that also drains at least one shower. By recovering up to 60% of the heat in your shower water, they can reduce your total water heating energy by 15% or more. For best results, the water heater should be located quite close to the plumbing stack.



8. Upgrade windows

- ❑ Replace 14 windows with ENERGY STAR certified models for zone 2.

This upgrade could reduce the energy consumption of your house by 5 gigajoules per year.

Did you know?

Windows account for 15 percent of the estimated annual heat loss of your house.

Useful tips

Replacing windows can improve aesthetics, reduce noise from outside, reduce maintenance, increase property resale value, improve comfort and reduce condensation during cold weather. ENERGY STAR certified windows, patio doors and skylights are rated for three climate zones in Canada and are among the most energy efficient in the marketplace.

Consult chapter 8 of [Keeping the Heat In](#) to learn more and take action.

Your energy advisor's comments



Consider upgrading your windows to triple pane, low e, argon gas filled windows. For south facing windows consider windows with low solar heat gain to reduce the chance of overheating your bedroom or the lounge on your main level.

Also consider insulating blinds, which can add R4 to windows when drawn (nightly and during work-days when occupants are not home). These can reduce heat losses in the winter when window energy losses are most significant.

Insulating blinds are so effective that we recommend west and south facing blinds remain slightly open at all times to prevent overheating. A small 2" wooden block at either end of the window will positively fix them open in the summer.

Insulating blinds also work well in preventing heat from reaching the window, which can result in condensation. If the house or room (bathroom or kitchen) is significantly humidified (above 25% relative humidity) condensation (sweating) can occur, potentially damaging windowsills and other nearby window and wall components. We therefore recommend avoiding the use of insulating blinds in humid areas, such as washrooms with showers or the kitchen.



9. Upgrade ventilation system

- ❑ Install a heat recovery ventilator or energy recovery ventilator certified by the Home Ventilating Institute (HVI) or that is ENERGY STAR certified.

This upgrade could increase the energy consumption of your house by 2 gigajoules per year.

RECOMMENDED ENERGY EFFICIENCY UPGRADES - CONTINUED

Did you know?

Upgrading your ventilation system can improve indoor air quality and comfort. A heat recovery ventilator (HRV) or energy recovery ventilator (ERV) saves energy compared to conventional ventilation systems by recovering heat from stale indoor air as it is exhausted. An HRV/ERV simultaneously exhausts stale indoor air and brings in outdoor air by passing the two separate airflows through a heat exchanger.

Useful tips

When purchasing an HRV or ERV, choose a model that is certified by the Heating and Ventilating Institute (HVI) and consider models that have a high efficiency motor to help reduce electrical consumption. Ensure that the HRV or ERV system is designed, installed and balanced by a technician certified by a recognized mechanical organization. Select equipment tailored to your needs.

Keep contaminants away from the fresh air intake when your HRV/ERV is operating. For example, avoid putting trash next to the air intake, do not use pesticides and herbicides nearby and keep your barbecue downwind. If you must generate pollutants near the air intake temporarily, turn the HRV/ERV off until you complete the activity.

Consult Natural Resources Canada's publication about Heat Recovery Ventilators at www.nrcan.gc.ca/energy/products/categories/cooling-ventilating/ventilating/hrv/16197

Your energy advisor's comments



The Heat Recovery Ventilator modeled as an upgrade here allows good ventilation while using much less energy than exhaust fans or an open window..



10. Upgrade cooling system

- ❑ Install a new ENERGY STAR certified air conditioner.

This upgrade could increase the energy consumption of your house by 0 gigajoules per year.

Did you know?

Space cooling accounts for 2 percent of the estimated annual energy use of your house.

Useful tips

Perform any planned building envelope upgrades before your contractor begins work since a more energy efficient building envelope may mean that a smaller cooling system could be installed. The contractor should first conduct a heat gain calculation before deciding on the capacity and model of your cooling system.

Your *Homeowner Information Sheet* provides important details and a reference for this calculation. Inform your contractor of any building envelope upgrades performed since your evaluation, or that will be undertaken, since these may render certain details in your *Homeowner Information Sheet* inaccurate.

Consider purchasing a system that is ENERGY STAR certified. Consult Natural Resources Canada's web site at <https://www.nrcan.gc.ca/energy/products/categories/cooling-ventilating/13756> for more information.

Your energy advisor's comments



When you change your air conditioner, ensure that you replace it with a cold-climate air-source heat pump (ASHP). See the section on heating for more details.



11. Add a renewable energy system

- ❑ Install a photovoltaic system designed to deliver 7136.0 kilowatt-hours per year.

This upgrade could reduce the energy consumption of your house by 26 gigajoules per year.

Did you know?

Solar and wind energy can be used for electricity generation.

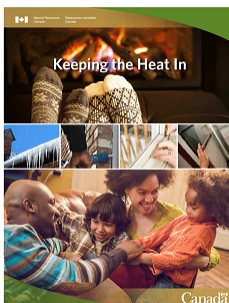
Useful tips

Installing renewable energy systems will offset some or potentially all of the purchased energy required to operate your home while decreasing the greenhouse gas emissions generated.

Your energy advisor's comments



Once all other Energy Conservation Measures (ECMs) have been applied, a large part of your annual energy requirements can be met by solar (PV) panels. Although the initial costs are high, they pay for themselves over time and are even cleaner than using electricity supplied by the grid.



Learn more about energy efficiency upgrades

Natural Resources Canada has developed [Keeping the Heat In](#), a guide that explains basic principles of building science and offers guidance on home renovation projects such as adding insulation and air sealing.

NOTES:

- 🏠 Energy use reductions are calculated with each upgrade taken on its own. Combinations of upgrades may produce slightly different results.
- 🏠 If negative savings are shown, please see your energy advisor's comments for an explanation.

ENERGY EFFICIENCY FORECAST

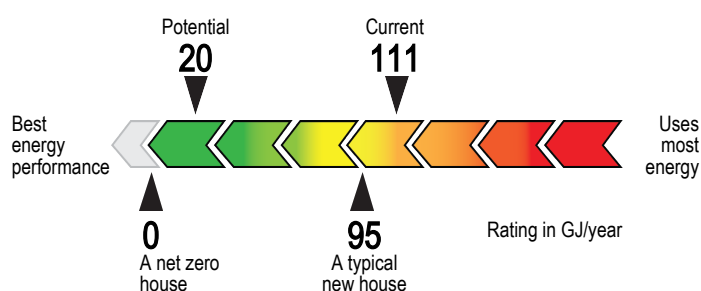
YOUR HOME'S ENERGY POTENTIAL



By implementing the recommended upgrades, you will not only see an improvement in your EnerGuide Rating but you might also reduce greenhouse gas (GHG) emissions.

Note that the energy consumption indicated on your utility bills may be higher or lower than your EnerGuide Rating. This is because the EnerGuide Rating is based on standard assumptions regarding how many people live in the home and how it is operated. Refer to your *Homeowner Information Sheet* for details on the EnerGuide Rating System standard operating conditions.

EnerGuide Rating



A **gigajoule (GJ)** is a unit of energy that can represent all energy sources found in Canadian homes such as electricity, fossil fuels and wood.

A **typical new house** is a reference point for comparing your rating to a similar house built to current energy efficiency standards.

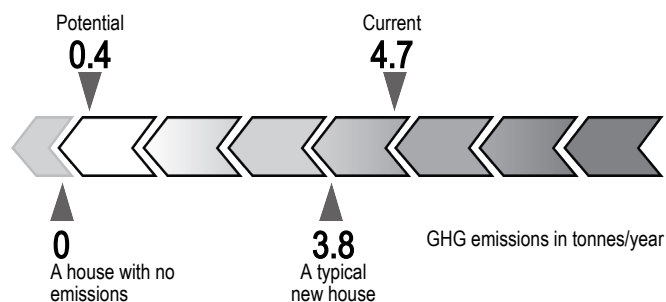
Rated energy intensity

Potential: 0.2 GJ/m²/year

Current : 0.49 GJ/m²/year

The **Rated energy intensity** is an estimate of your home's annual energy use relative to its size. It allows you to compare the energy used by homes of different sizes on a "per square metre" basis.

Rated greenhouse gas (GHG) emissions

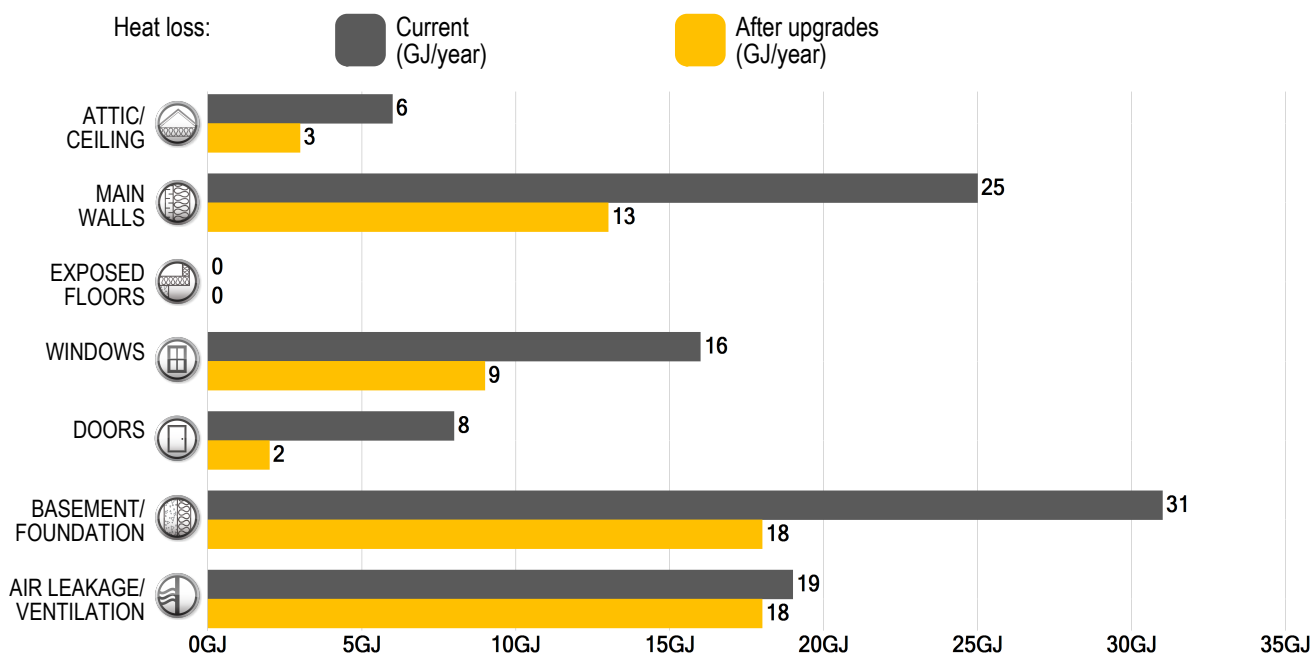


Every time we use energy from fossil fuels such as oil and gas, we produce **greenhouse gas (GHG) emissions** that contribute to climate change. We can reduce these emissions by making homes more energy efficient and lowering energy use.

ENERGY EFFICIENCY FORECAST - CONTINUED

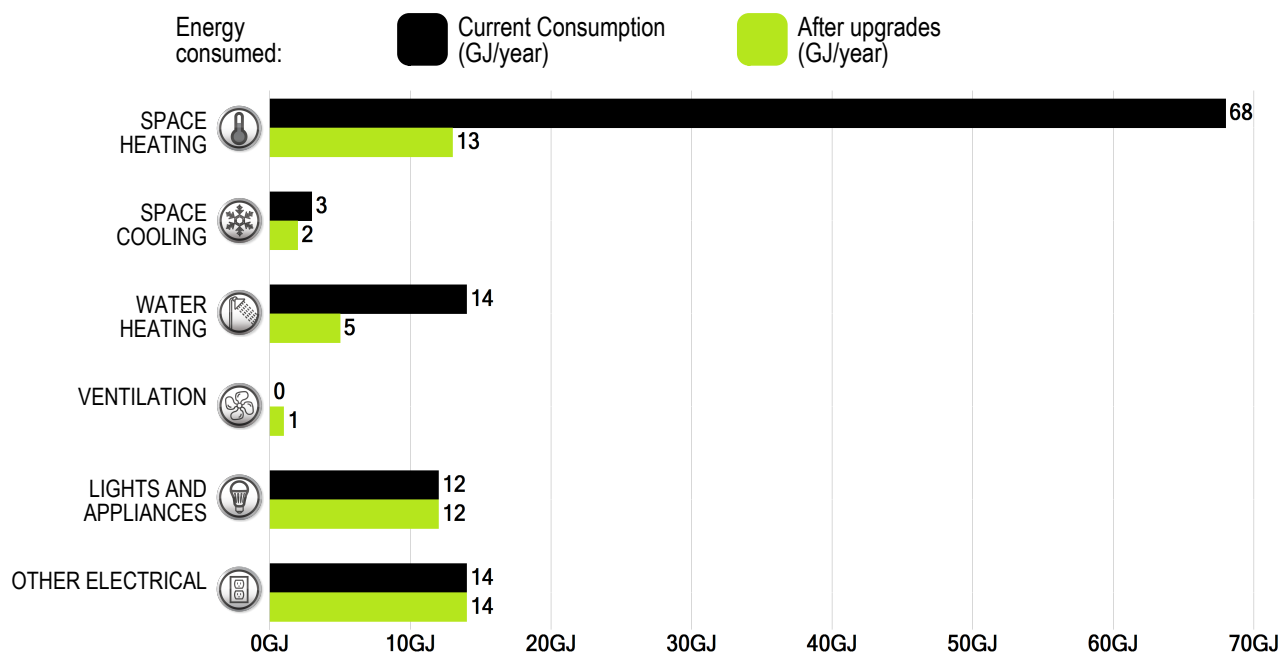
BEFORE AND AFTER: Estimated heat loss through the building envelope*

This bar chart shows where heat is lost from your house. The dark bars show the areas where you are currently losing heat. The longer the bar, the more heat you are losing. The light bars show the estimated heat loss if you were to complete all the recommended upgrades as outlined.



BEFORE AND AFTER: Estimated energy use*

This bar chart shows the potential for improving the energy performance of your house. The dark bars show your current rated consumption. The longer the bar, the more energy you are using. The light bars show the rated energy consumption if you were to complete all the recommended upgrades as outlined.



*Calculated using standard operating conditions. Refer to your *Homeowner Information Sheet* for more information.

HEALTH AND SAFETY INFORMATION

If your energy advisor has identified a potential health or safety concern related to insufficient outdoor air, risk of combustion fumes being drawn into the home or the presence of vermiculite, a warning has been included in your *Homeowner Information Sheet*. However, energy advisors are not required to have expertise in health and safety matters, and it is the sole responsibility of the homeowner to consult a qualified professional to determine potential hazards before undertaking any upgrades or renovations. Visit Natural Resources Canada's webpage *Health and safety considerations for energy-efficient renovations*.

Humidity control

A relative humidity level of between 30 and 55 percent is recommended for optimal health and comfort. For more information on assessing moisture levels in your house, visit the Canada Mortgage and Housing Corporation's website.

Radon

Radon is a naturally occurring radioactive gas that is colourless, odourless and tasteless. It is formed from the radioactive decay of uranium, a natural material found in some soil, rock and groundwater. When radon is released 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 pose a risk to both your or your family's health. For more information, visit Health Canada's website.

Asbestos and vermiculite insulation

Vermiculite insulation installed in homes may contain asbestos. This can cause health risks if inhaled. If you find vermiculite insulation during renovations, avoid disturbing it. If you suspect the presence of asbestos in your home and plan to undertake renovations (including insulation or air sealing work) that may cause the vermiculite insulation or asbestos to be disturbed, contact professionals who are qualified to handle asbestos before you proceed with the renovations.

Combustion gases

The use of fuel-burning heating equipment can inadvertently lead to hazardous combustion gases being drawn into your home. Always consult a qualified heating and ventilation contractor when servicing or replacing this type of equipment and ensure you have a functioning carbon monoxide detector. Refer to the publication entitled *Combustion gases in your home: What you should know about combustion spillage* on Natural Resources Canada's website to learn more about combustion spillage.

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Natural Resources Canada does not endorse or make any representation of warranty as to the accuracy or applicability of the energy advisor's comments with respect to your particular home.

Natural Resources Canada does not endorse the services of any contractor, nor any specific product, and accepts no liability in the selection of materials, products, contractors nor the performance of workmanship.

The rating and potential savings in this report are based on the conditions of your home at the time of the evaluation and the use of EnerGuide standard operating conditions.

ADDITIONAL INFORMATION - CONTINUED

Along with the upgrade recommendations, here are some simple actions you can take to be more comfortable, save money and reduce GHG emissions:

ENERGY-SAVING TIPS

- ☐ Install and set-up programmable electronic thermostats to reduce the heating temperature 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 appliances, electronics and office equipment, look for ENERGY STAR® certified products. ENERGY STAR certified products are among the most efficient and use up to less than half as much energy in standby mode (i.e. when they are turned "off") than non-certified products. You can also look for the EnerGuide product label to help you select the most energy efficient model. For more information, go to energystar.gc.ca.
- ☐ Replace your light bulbs with ENERGY STAR certified ones, such as light emitting diodes (LEDs). They last longer and use less electricity.
- ☐ Insulate the first two metres of the hot and cold water pipes starting from the water heater with insulating foam sleeves or pipe wrap insulation. By doing so, you will save on your water heating costs and reduce your water consumption. For a fuel-fired water heater, maintain a 15 cm (6 in.) clearance between the water piping insulation and the vent pipe.
- ☐ If you use a block heater for your car, use a timer. Set the timer to turn on one to two hours before you plan to start your vehicle.
- ☐ Replace your kitchen and bathroom exhaust fans with ENERGY STAR certified exhaust fans vented to the outside.
- ☐ Install a timer on your bathroom exhaust fans so that the fans are not left running for extended periods of time.
- ☐ Install low-flow shower heads (rated at 7.6 litres per minute or less) and faucet aerators.
- ☐ Fix leaky faucets and outside hose bibs.
- ☐ Plug your entertainment systems and office equipment into power bars that can be easily turned off when equipment is not in use.

NOTES:

Questions about this report?

Please contact your energy advisor.

NRCan.gc.ca/myenergiguide