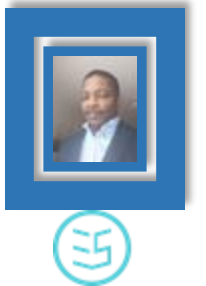


HERO Program

Home Efficiency Retrofit Orientation (HERO) 2024 Handouts

2024

Presented By: Marcus Hinds P.Eng. PMP CEM



HERO Program Goals

01

Motivate
homeowners.
Incorporate Best
Practices.

02

Educate
homeowners.
Introduce
EnerGuide home
energy evaluations.

03

Navigate
homeowners to
sources of
information and
support.

Summary of the Presentation



- Step 1 - Analyzing your home with an EnerGuide Evaluation.
- Step 2 – A blower door test!
- Step 3 – Understanding the evaluation result.
- Step 4 – Apply for Incentives (before any energy upgrades/renovation work).
- Step 5 – Air sealing & Insulation.
- Step 6 – Mechanical Upgrades & Energy Star.
- Step 7 – Extras like Solar Panels & Smart Thermostats.
- Step 8 – Apply for rebates (after any energy upgrades/renovation work).
- Renovation tools to help you!
- Enjoy G.R.E.E.N Benefits.

Step 1 - EnerGuide Energy Evaluation

- Speak with NRCan or Enbridge about Energy Evaluations
- You'll have an audit done and be provided a Renovation Report. Included will be an action plan & recommendations tailored to suit your home!
- You'll get pre & post-renovation EnerGuide Labels.
- You'll get a Housing Information Sheet. It will describe your envelope & Building Systems.
- Pre & Post audits are required by most Rebate & Incentive programs.
- The evaluation compares your home to a typical house.
- Right is an example:

LEARN ABOUT YOUR HOME'S ENERGY rating

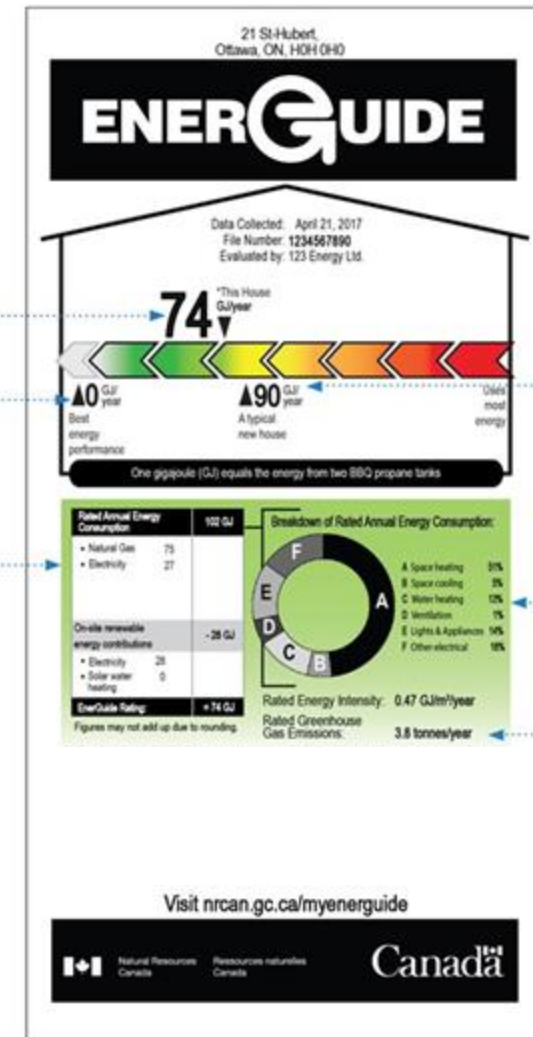
You will receive a rating of the home's energy consumption in gigajoules

AIM TOWARDS zero

The lower the number on the new **EnerGuide** scale, the better the energy performance of your home

UNDERSTAND HOW YOU USE energy

The label breaks down energy consumed by source



COMPARE YOUR HOME'S performance

The label shows how your home's performance compares to a benchmark home

FIND OUT WHERE MOST ENERGY IS consumed

The label shows proportion of energy consumed by heating, cooling, ventilation, etc.

SEE YOUR IMPACT ON THE environment

The label shows your home's Greenhouse Gas Emissions

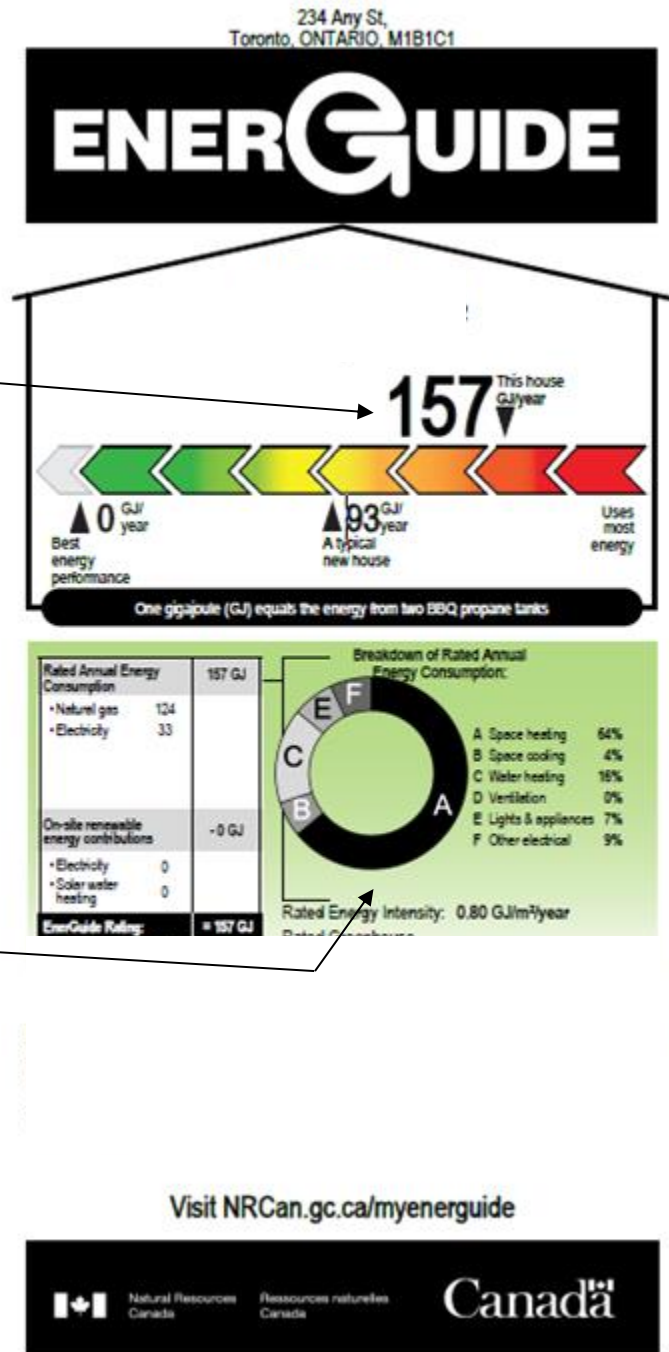
Example House

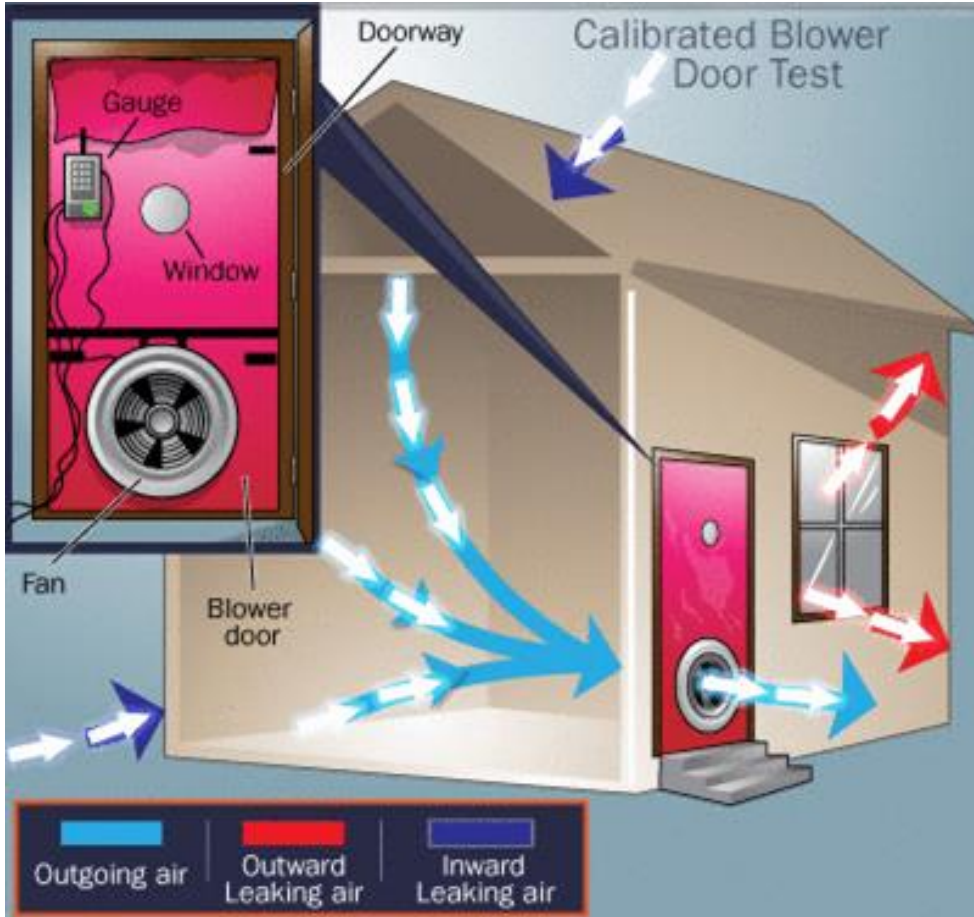
Base EnerGuide Rating Label

- **Age:** 1981
- **Type:**
 - Detached
 - 2-story
 - Single-family house
- **Location:** GTA
- **Condition:**
 - Poor building envelope
 - High air changes
 - Older mechanicals

Gigajoule rating
(Annual consumption)

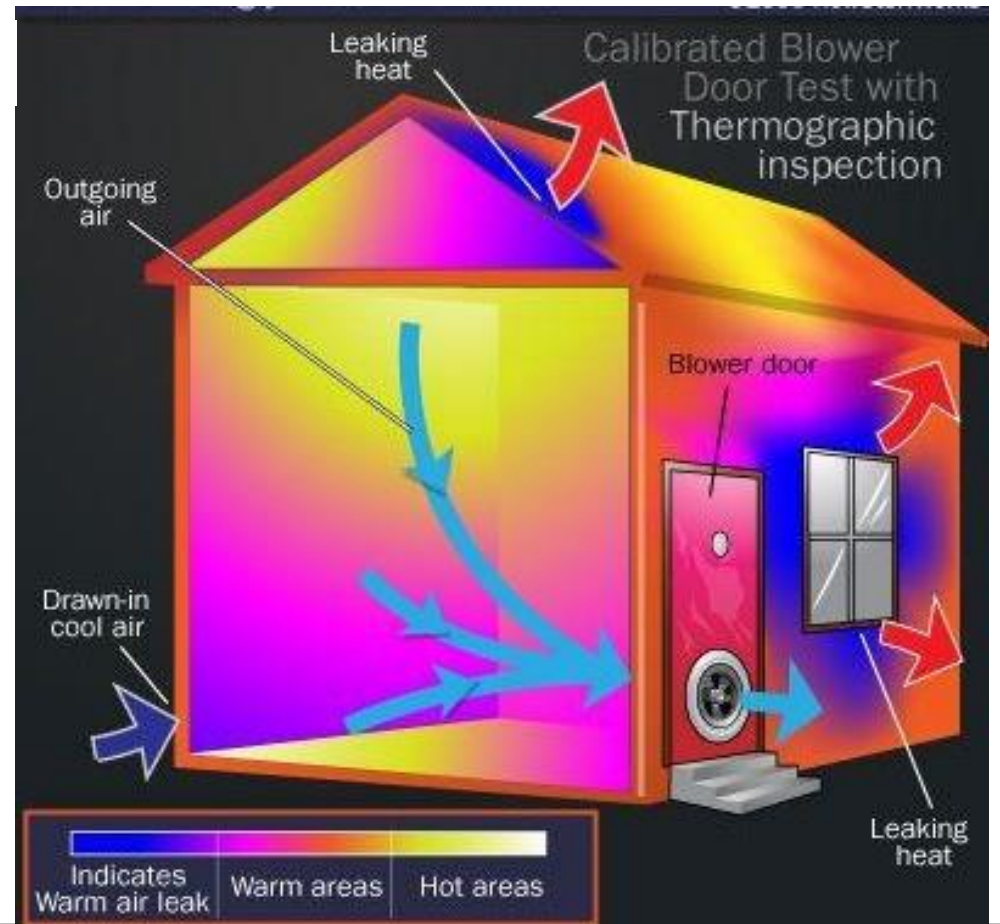
Consumption breakdown





Up to \$600

Analyzes
How Air
Flow
Impacts
Your Home



Step 2 - Blower Door Test

- A blower door test diagnoses & measures how much air filters out of your house (airtightness - ACH). It'll be included with your audit.
- The blower door allows testers to apply a consistent & measurable pressure to the house so that houses can be compared. ACH can be measured.

Step 3 – Understanding the evaluation result.

This is where you, the homeowner, decides how detailed you'd like to get with future retrofits.

Baseline (basic) measures can help you improve your & meet your energy targets.

Deep Retrofits (full) push the boundaries further & surpass your targets!

Baseline Retrofits

- Complete Home Air Sealing to ON Building Code levels. Target 3 ACH.
- Complete Attic insulation with most suitable materials. Target R 60.
- Complete Basement insulation with most suitable materials. Target R 34.
- Consider Energy Star[®] 2024 rated Windows.

Deep Retrofits

- Complete Home Air Sealing to Passivhaus level. Target 1.5 ACH.
- Complete Attic insulation with best materials. Target R 60.
- Complete Above Grade Walls insulation with best materials. Target R 30.
- Complete Basement & underslab insulation with best materials. Target R 34 for walls & R 15 for underslab.
- Consider Energy Star[®] triple glazed 2024 rated Windows.

Step 4 – Apply for Incentives



Retrofit Incentives

- There may be incentives at your local City Level.
- Home Energy Loans: criteria specific.
- Climate Funds & Not for profits.
- See Federal pages for more: Greener Homes.
- Examples: HELP Toronto, LIC Windsor, HELP Ottawa, Greener Homes Loan
- Also see: [Durham Greener Homes](https://durhamgreenerhomes.ca/) (<https://durhamgreenerhomes.ca/>)

Incentive Sources of Information

- [Federal: Greener Homes](https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/24831) (<https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/24831>)
- Local Utilities & Partnerships
- Local City Website
- (Examples: City of East Gwillimbury, City of Markham, Durham Region)
 - Incentives are paid **before** any energy upgrades/renovation work is complete!
 - Incentives will require **two** home energy audits (pre & post).

Determine Suitable Insulation (in case of retrofit)

➤ Insulating materials are available through contractors:

It's best to call a contractor to properly seal air leaks.

Some of it can be DIY.

Main differences: Installation, location & R Value



Sheep Wool



Rock Wool



Cork



Spray Foam



Fibreglass



Batt



Loose Fill/Cellulose



Cementitious or Pour Foam



Denim

Insulation prevents outdoor air getting in

Insulation prevents indoor air escaping

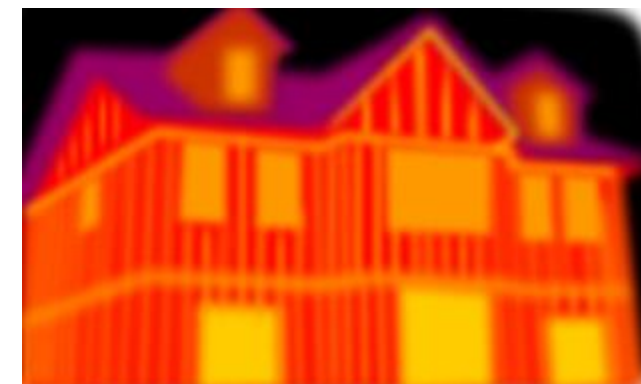
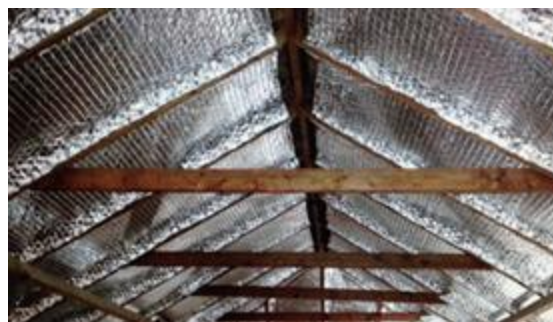
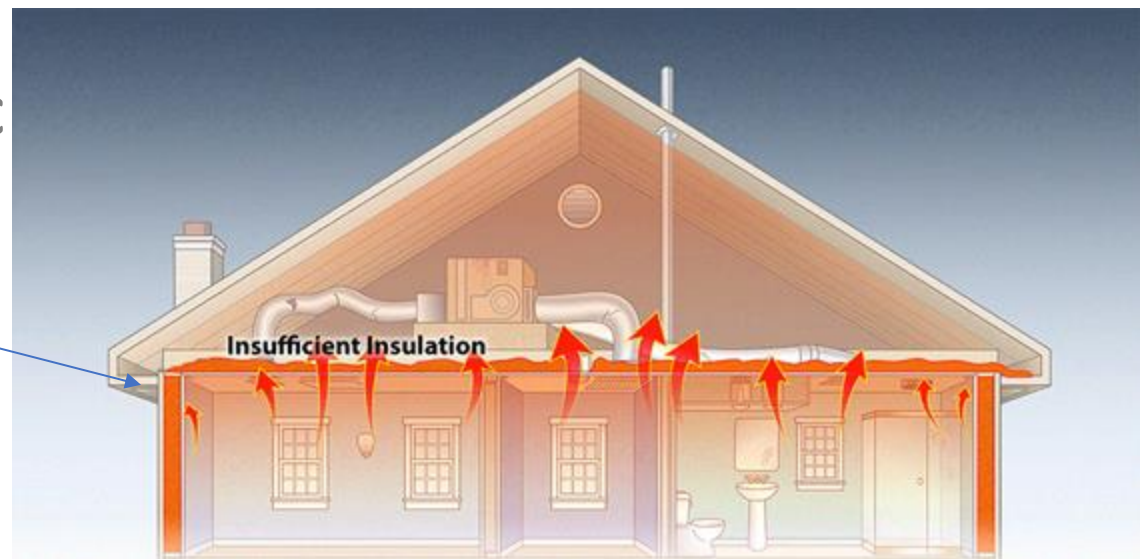
Insulation reduces the rate of heat flow.

Insulation can be permeable or impermeable (permeance).

Step 5 – Seal your Envelope – The Attic

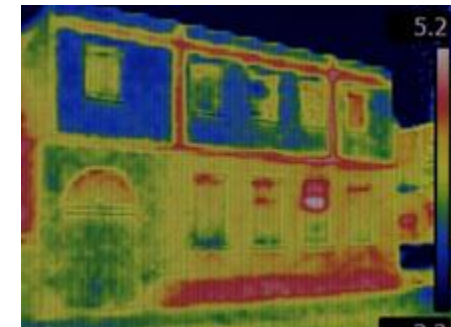
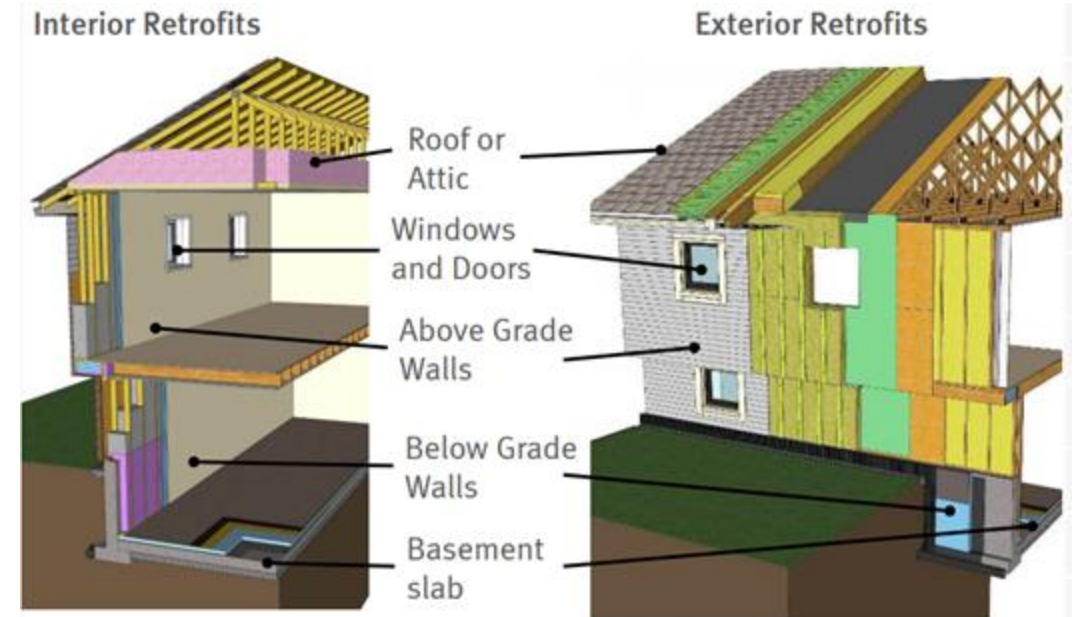
- Hot air rises
- Reduce thermal bridges. Areas where your home leaks energy!
- Other options:
 - Spray foam
 - Blow in cellulose
 - Batts
 - Fiberglass
 - Consider a radiant heat barrier
- Target R-value for attic is **R-50 to R-60** (ft²°F/Btu).

Icicle



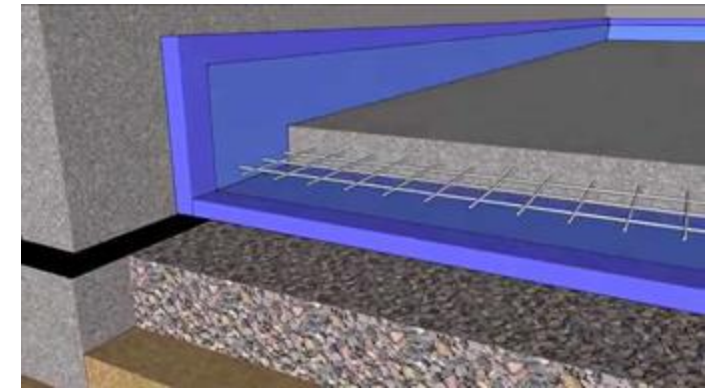
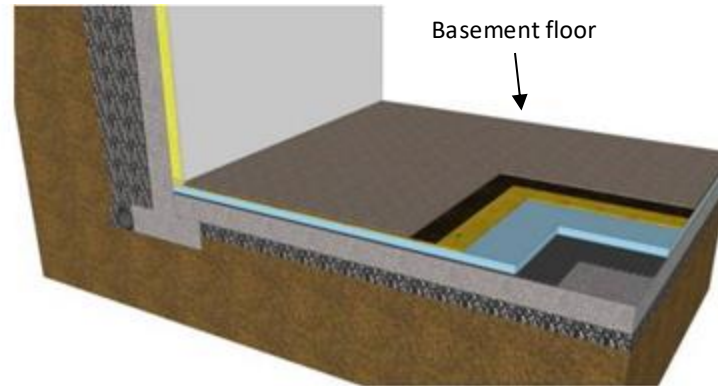
Step 5 – Seal your Envelope – The Walls

- Insulation depends on the type of walls, construction, cost & energy efficiency criteria.
- Reduce thermal bridges in above grade exterior walls.
- Other options:
 - Batt
 - Spray foam / Injection foam
 - Blown-in Cellulose
 - Rigid board
 - Pour foam
 - Cementitious
- Target R-value for AG walls is between **R-20 to R-30**.
- Even if your home is older or made of brick, there are viable options.

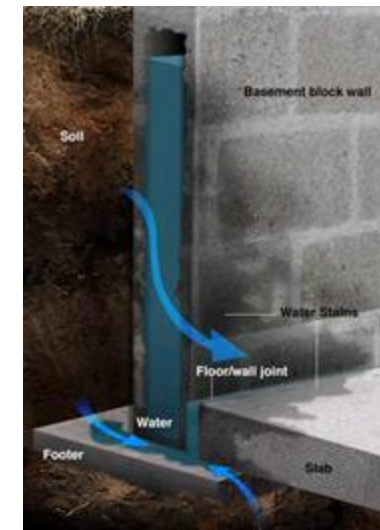


Step 5 – Seal your Envelope – The Basement

- Below grade wall Insulation takes moisture into account.
- Reduce moisture transmission. This is the vapour barrier.
- Other options:
 - Batt
 - Spray foam / Injection foam
 - Blown-in Cellulose
 - Rigid board
 - Basement blankets



- Target R-value for BG walls is between **R-12 to R-34**.
- Target R-value for basement floor/slab is between **R-10 to R-15**.



Basement insulation

Some of your home's heat loss occurs through the basement.

Up to \$3,500

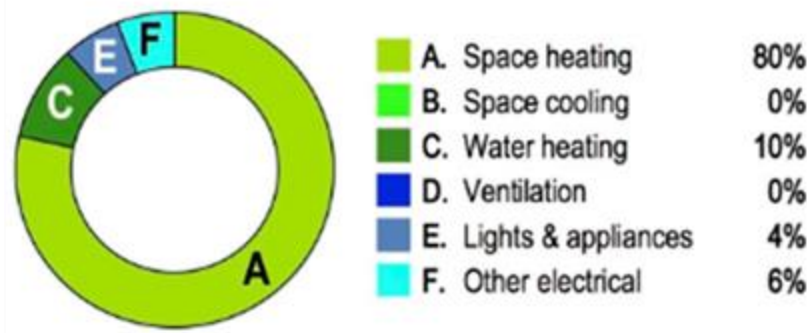
Step 6 – Mechanical upgrades to consider

- Mechanicals use both natural gas & electricity to heat & cool our homes.
- Outside air Infiltration makes mechanicals work harder.
- Windows, doors & skylights can lose up to 35% of home’s energy.
- Energy Star® windows can save more than 8% on energy bills.
- Energy Star 2024 windows are ~40% more efficient than standard windows.
- Strong air sealing may mean you can go with less powerful mechanicals.

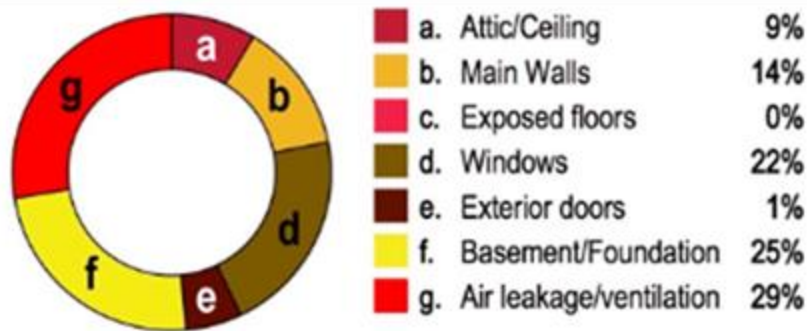


Windows/doors/sliding doors/skylights
 For ENERGY STAR® certified models.
 \$50 each

HOW YOUR RATED ENERGY IS USED:



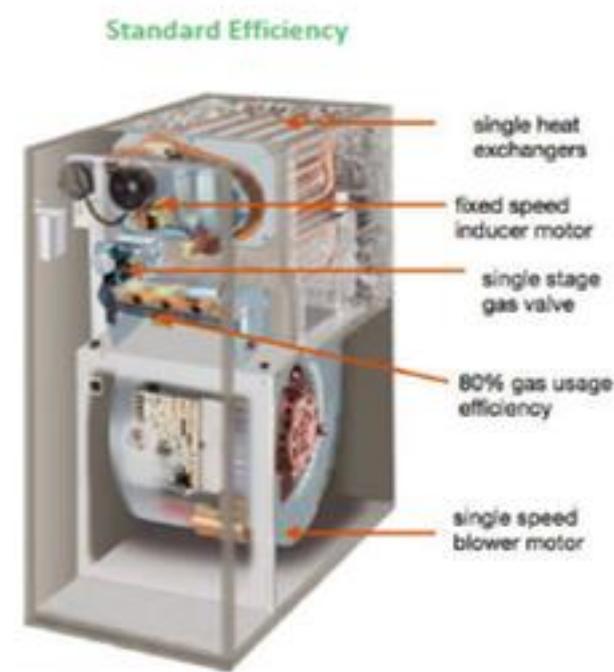
WHERE YOUR HOME LOSES HEAT:



*EnerGuide is an official mark of Natural Resources Canada.
 Refer to the glossary section for an explanation of relevant terms.

Step 6 – Mechanical upgrades – Furnaces

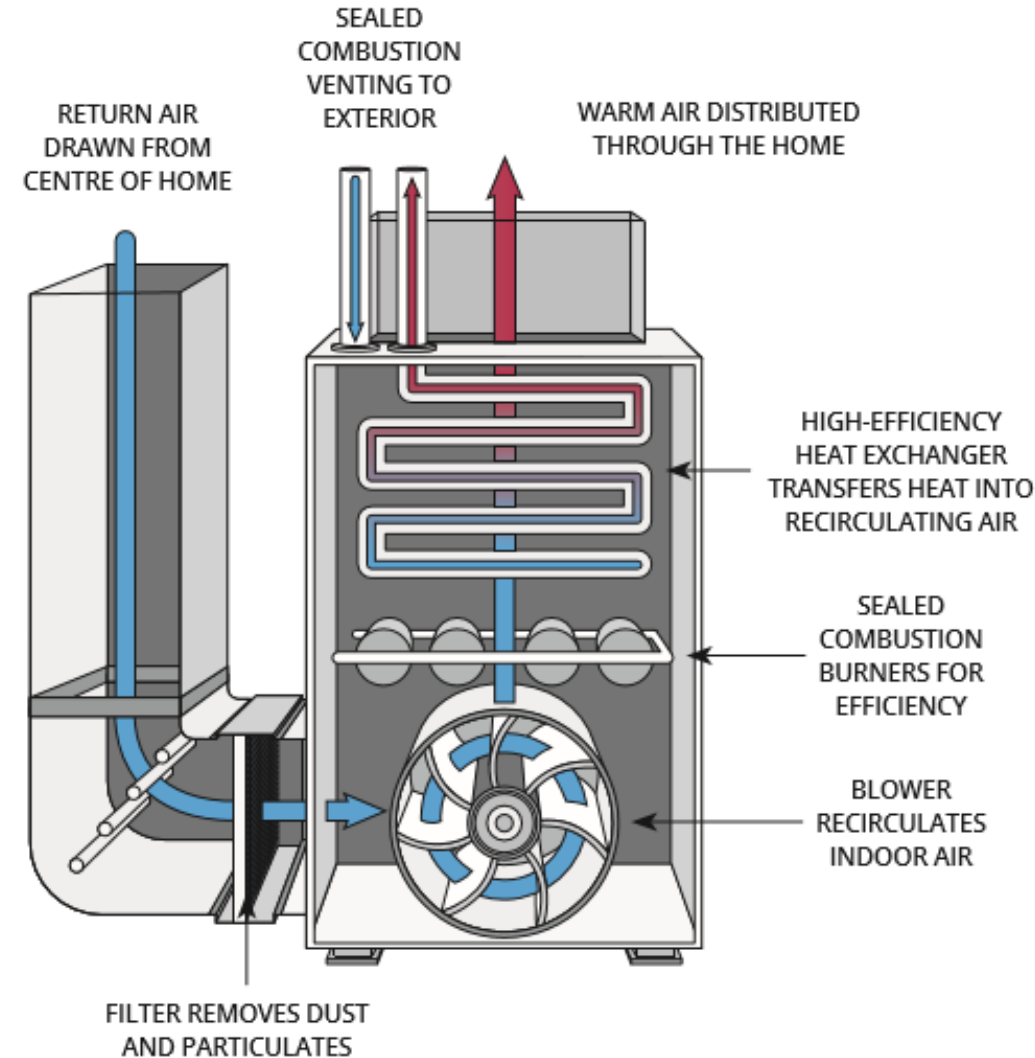
- Select **Energy Star**[®] Furnaces. Energy Star 2024 is even more efficient.
- Furnaces 9 years or older can be mid-efficiency. 60% AFUE.
- Ask your contractor to do a **Heat Loss Calculation** to size the furnace. CSA F280-12(CSA Standard & Right-Sizing HVAC Systems)
- Target an (AFUE) above 95%.



Step 6 – Mechanical upgrades – Furnaces

➤ Energy Star® 2024 furnaces have features like:

- Increased Efficiency Rating +15%
- 2 Heat Exchangers vs 1
- Exhaust fan for more efficient combustion.
- Sealed combustion for better air quality.
- Better filtration from improved filters.
- Flame modulation to vary the amount of heat produced.

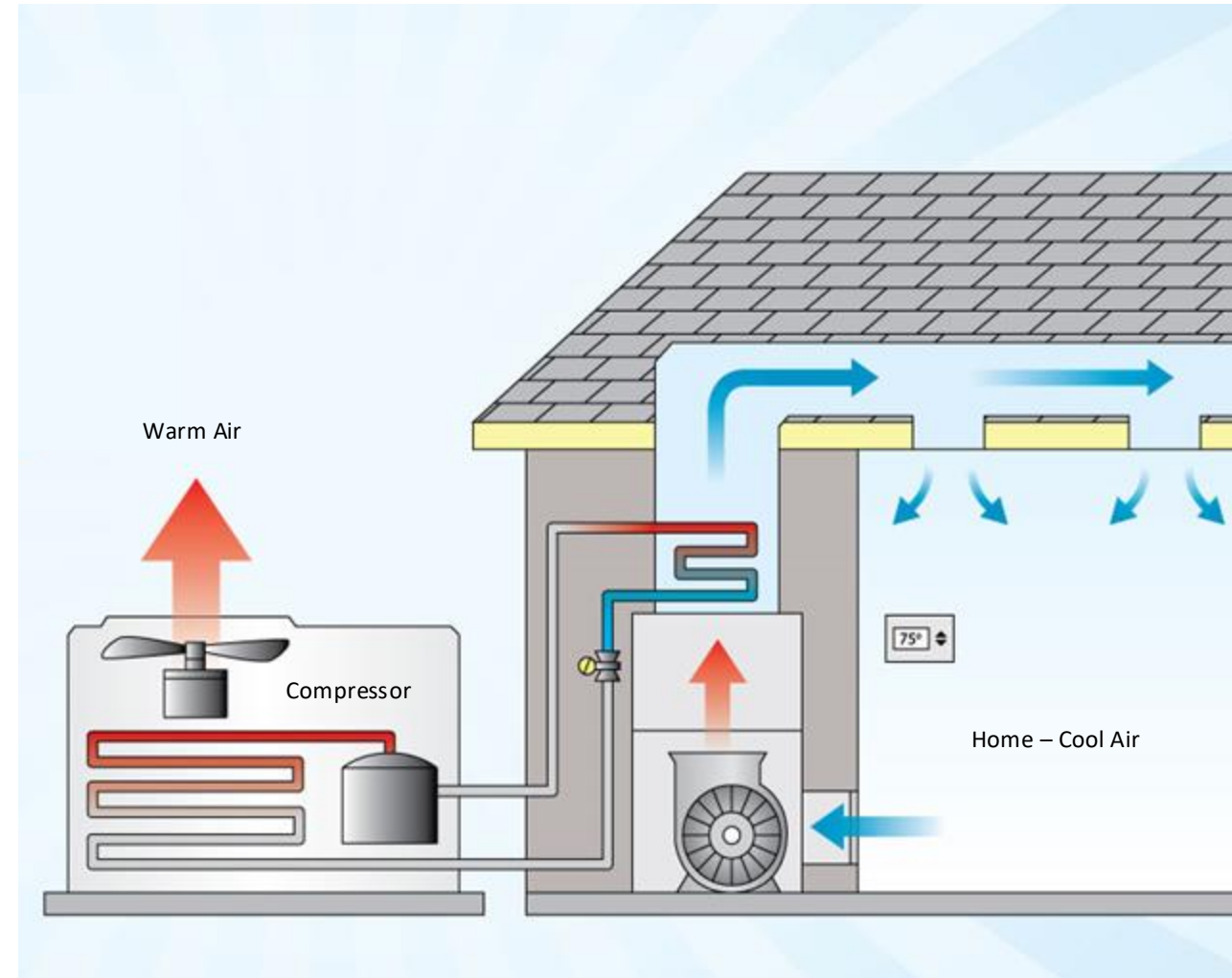


Step 6 – Mechanical upgrades – Air Conditioning



➤ Energy Star 2024 AC units have features like:

- Increased Efficiency Rating +30%
- High efficiency compressor
- Variable fan speed
- Longer warranty
- More sustainable refrigerants
- Older units carry R - 410 vs R - 32
- Better BTU per watt rating
- R32 has a lower GWP – Global Warming Potential
- Target an EER or SEER > 20



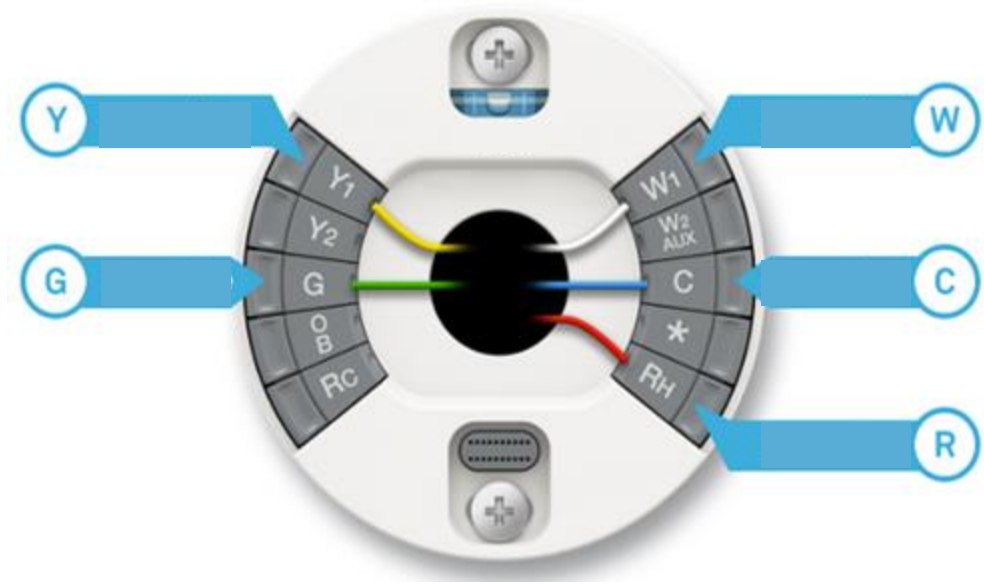
Step 6 – Mechanical upgrades – Air Conditioning

- Select Energy Star Cooling equipment.
- Energy Star® certified products can save up to 30% on energy costs.
- Higher EER & SEER indicate better Performance.
- Air conditioning draws large amounts of power & contribute to the summer peak GHG emissions.



Step 6 – Mechanical upgrades – Thermostat

- Power is useless without control.
- Thermostats control your mechanicals.
- Wi-Fi integrated models can help you track your usage.
- You can program it to suit your schedule.
- There are **rebates** for this!



Wire

Yellow

Green

White

Blue/Cyan

Red

Use

Cooling / AC

Fan / Air

Heat / Furnace

Humidity

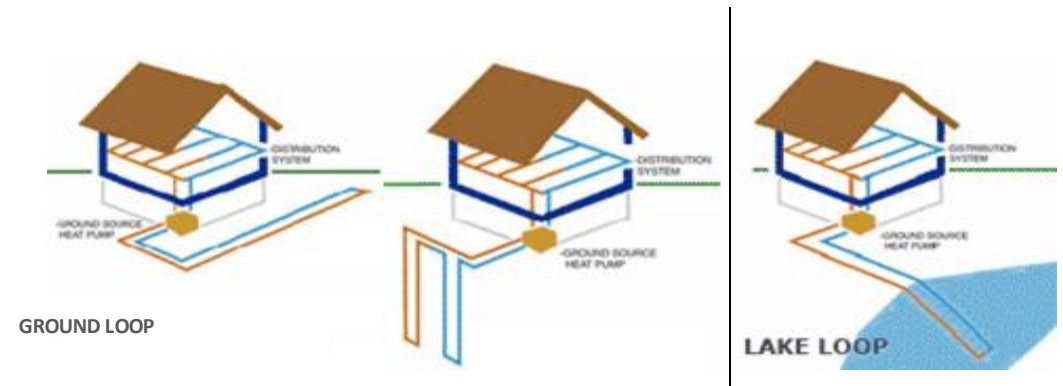
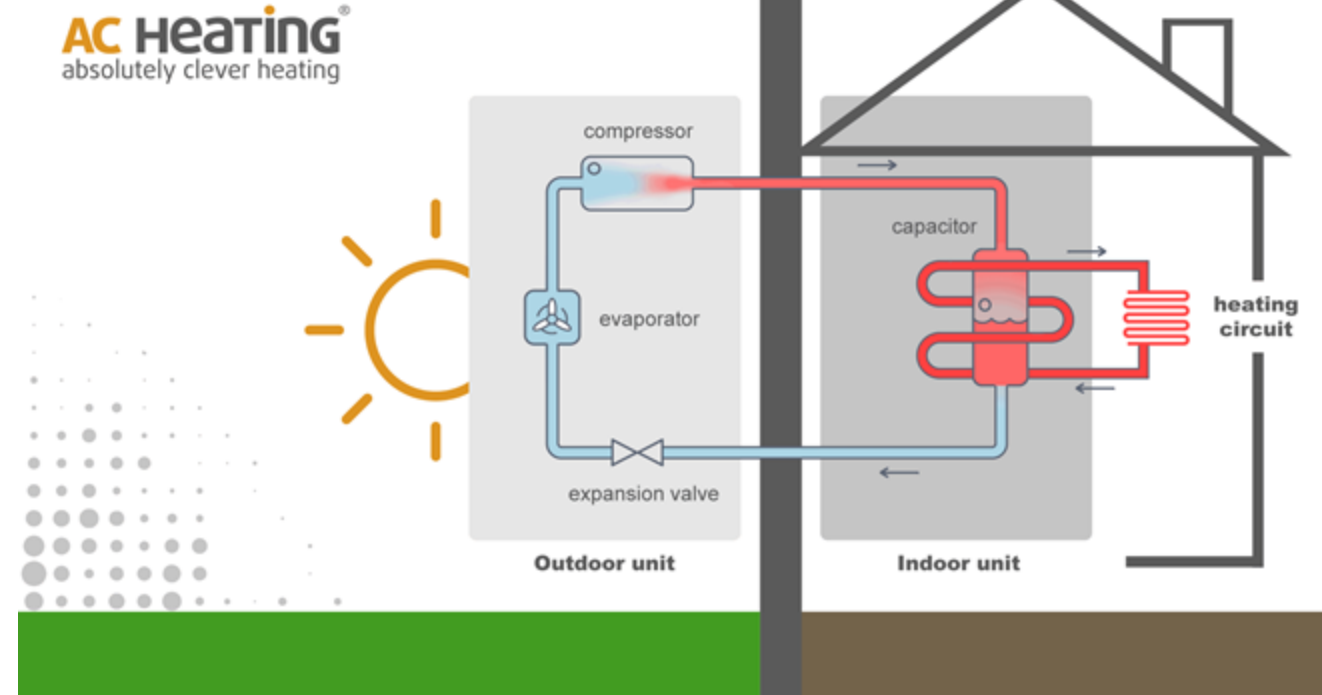
Power

Step 6 – Mechanical upgrades – Heat Pumps & water heaters

- Consider a heat pump upgrade.
- While furnaces produce heat, heat pumps transport heat from point A to B.
- There are alternative sources of heat like:
 - The Air
 - The Ground
 - Nearby Bodies of Water
- This is perfect for cottages & off grid homes.
- Also consider Tankless style water heaters with heat pumps.



Heat pumps
Including ground source heat pumps, air source heat pumps, cold climate air source heat pumps, and heat pump water heaters.
Up to \$3,000



Step 6 – Mechanical upgrades – Baseline vs Deep

Remember, you the homeowner decides how detailed you'd like to get with retrofits.

Baseline (basic) measures can help you improve your & meet your energy targets.

Deep Retrofits (full) push the boundaries further & surpass your targets by far!

Baseline Retrofits

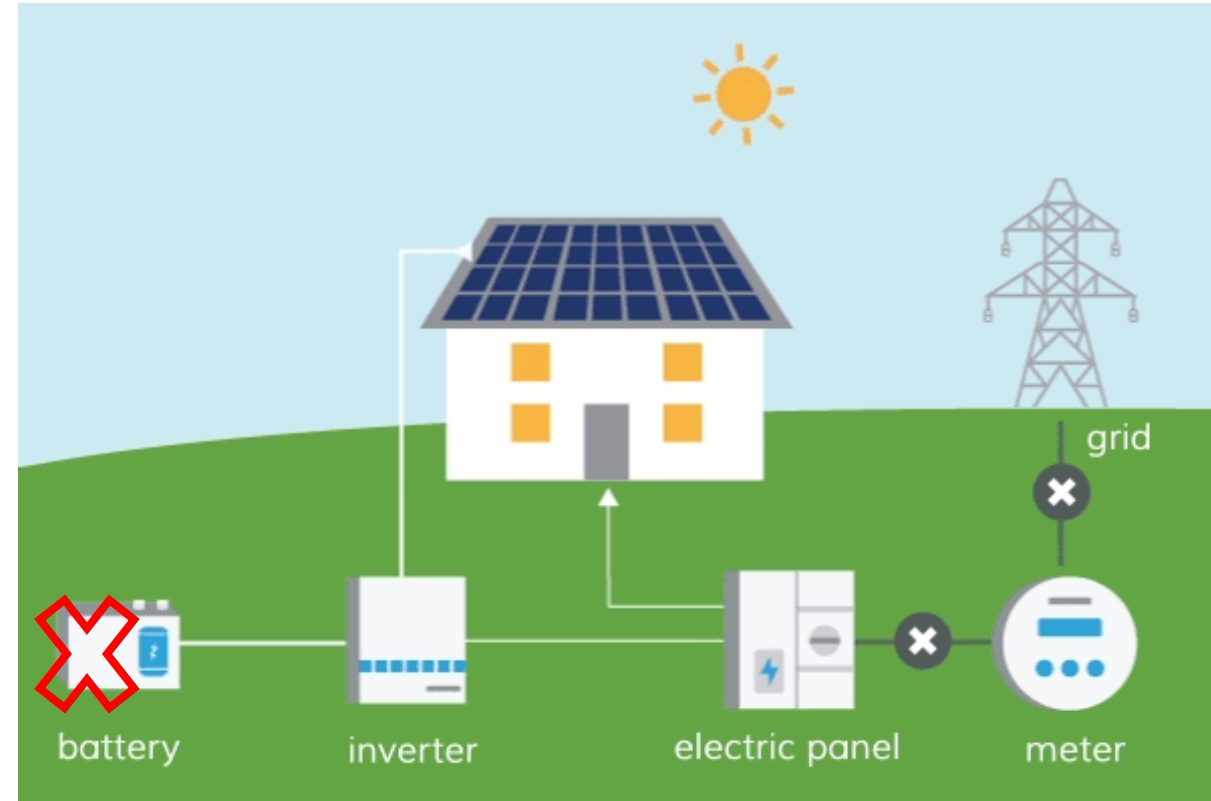
- Energy Star® furnace or boiler Replacement
- Energy Star® Central AC Replacement
- Smart Thermostats with zone control

Deep Retrofits

- Energy Star® Heat Pumps with alternative heat sourcing:
 - Air source heat pumps
 - Ground source heat pumps
 - Water source heat pumps
- Smart Thermostats with zone control

Step 7 – Consider renewable energy with solar PV Panel Integration

- Photovoltaic or PV Panels give you **FREE** electricity.
- It pays for itself as you reduce electricity costs.
- Stable dependable investment.
- You can become off grid, Net Zero / Net Energy +ve.
- There is the possibility to use batteries for your home at night!



Step 8 – Apply for Rebates



Attic Insulation
Up to \$1,500



Exposed Floor
\$300



Exterior Wall Insulation
Up to \$3,600



Air Sealing/Draft Proofing
Up to \$180



Heat Pumps
AS/GS/WH
Up to \$3,000



Basement
Insulation
Up to \$3,500



Windows
Doors
Skylights
Insulation
\$50 each

Retrofit Rebates

- There may be rebates at your local City Level.
- There may be rebates from your utility providers.
- There are also HER rebates.
- Examples:
 - CMHC Eco+ – Canada Mortgage & Housing Corporation
 - saveONenergy

Rebates Sources of Information

- Home Efficiency Program (Smart Savings)
- Energy Affordability Program - saveONenergy
- **Federal: Greener Homes** (<https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/24831>)
- **Regional: Durham Greener Homes** (<https://durhamgreenerhomes.ca/>)
 - Rebates are paid **after** any energy upgrades/renovation work is complete!
 - Rebates will require **two** home energy audits (pre & post).

Updated Nov 2024



Don't forget to Manage your Renovation.

- Carefully planned reno management increases success rate > 80%.
- When you incorporate energy saving measures into your next reno, careful planning can help!

Home Energy Trackers & Smart Fittings and other online tools can help create a detailed picture before renovations



Home Energy Trackers & Smart Fittings and other online tools can help create a detailed picture before renovations

Information & Resources

STEP 1

Set retrofit **Goals**.

- NRCan – Apply for Eligible grants for my home retrofit

<https://www.nrcan.gc.ca/energy-efficiency/homes/canada-greener-homes-grant/start-your-energy-efficient-retrofits/plan-document-and-complete-your-home-retrofits/eligible-grants-for-my-home-retrofit/23504>

- Canadian Home Builder's Association – Rolodex of Contractors

<https://www.chba.ca/CHBA/Renovating/Renovating.aspx>

Step 2

Research

- NRCan Energy Efficient Product Info
- NRCan Energy Efficiency measures for Ontario Homes
- Durham Greener Homes

<https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/canada-greener-homes-grant/canada-greener-homes-grant/how-the-grant-process-works/eligible-products-for-my-home-retrofit/eligible-products-for>

<https://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-homes/make-your-home-more-energy-efficient/20550>

<https://durhamgreenerhomes.ca/>

Step 3

Evaluate Home via EnerGuide

- HER Program
- NRCan EnerGuide

<https://www.enbridgegas.com/ontario/rebates-energy-conservation/home-efficiency-rebate>

<https://www.nrcan.gc.ca/energy-efficiency/energuide-canada/energuide-energy-efficiency-home-evaluations/20552>

Information & Resources

For Step 4 - 7

Hire Contractors

- Heating Refrigeration & AC Institute Canada **HRAI** – Consumer tips
- Better Homes Toronto – Green Resources for Residents
- Tips for persons Hiring Contractors

<https://www.hrai.ca/consumer-tips>

<https://www.toronto.ca/services-payments/water-environment/net-zero-homes-buildings/better-homes-green-resources-for-residents/>

https://www.toronto.ca/wp-content/uploads/2017/11/9644-A1507567_ChoosingAContractor_WebVersion_V3_accessible.pdf

For Step 8

Track your project

- Use Retrofit Planning Tools (Ask Energy Advisor)
 - Complete Post-Retrofit **EnerGuide Evaluation**
 - Apply for Rebates
-
- Manage your reno & enjoy GREEN Benefits.

Information & Resources

Other Info

City Specific Rebates & Incentives

- City of East Gwillimbury - Environment

<https://www.eastgwillimbury.ca/en/municipal-services/environment.aspx>

- City of Markham Municipal & Regional Energy Plan

<https://www.markham.ca/about-the-city-of-markham/sustainability/energy-and-climate/markham-municipal-energy-plan>

- Greener Homes Landing / Home Page (Sign in with GC Key)

<https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/canada-greener-homes-grant/canada-greener-homes-grant/23441>

Enjoy G.R.E.E.N Benefits



- GHG Reductions – reduce your greenhouse gas emissions footprint.
- Resale value of an energy tight home increases.
- Energy savings pay for themselves and can reduce energy costs up to ~50%.
- Economic benefits like tax credits can pay you dividends immediately.
- Non Energy Benefits:
 - Increased comfort in your home.
 - Well-ventilated, well-insulated, air-tight home makes for WELLNESS!
 - Less dust & pollen infiltration with better air quality!
 - Better peace of mind knowing your home is resilient!
 - A liveable place to call home, work, play & rest!