



TOWARDS NET ZERO RENOS



CASE STUDY



After moving into their home in the 1980s, the homeowners made few upgrades over the years. Now, with retirement behind them and their family well established, they decided it was time to invest in themselves—modernizing their home to reflect today's standards and prepare for the future.

PROJECT PRIORITIES

- Function/Accessible
- Comfortable
- Integrate Indoor/Outdoor Environments
- Aging in Place

RENOVATOR: Lagois Design Build Renovate

ENERGY ADVISOR/SERVICE ORGANIZATION:

Homesol Building Solutions

TARGET: Net Zero Ready Home Renovation

ENERGY REDUCTION: 73.7%

YEAR BUILT: 1952

YEAR RETROFIT COMPLETED: 2023

LOCATION: Ottawa, Ontario

HOUSE TYPE: Single Detached

SIZE: 4429 sq.ft.

CLIMATE: Zone 6, 4354 HDD

UPGRADES INCLUDE

Above Grade Walls / Garage Wall

Ceiling with Attic Space

Cooling & Heat Pumps

Domestic Water Heater

Foundation Wall

On-site Generation and Storage

Principle Ventilation

Space Heating

Windows & Sliding Glass Doors



TOWARDS NET ZERO RENOS



NET ZERO PLAN

BEFORE

ENERGY CONSUMPTION

253 GJ/year

COMFORT

Dated interior, not functional space, drafty.

BUILDING CONDITION

Much of the home has been updated; insulation, windows, all new mechanical systems. 3.7 ACH.

RENEWABLES

None

WALL INSULATION

R10 batt

CEILING INSULATION

R20 blown mineral fibre

FOUNDATION INSULATION

R0 (100%)

WINDOWS

Double glazed (U-val=2.21, SHGC=0.47)

VENTILATION

None

HEATING

96.1% AFUE furnace

COOLING

10.00 SEER A/C

HEAT LOSS & GAIN

HL: 106435 Btu/h, HG: 46325 Btu/h

HOT WATER

0.56 EF natural gas direct vent (sealed)

AFTER

67 GJ/year

Comfortable environment, layout that flows, much improved living space.

New interior brought up to date. 1.28 ACH.

None

R-22 + R-10ci

R-60 cell

R-20 + R-12ci

U 1.02 SHGC 0.29

81.0% SRE HRV

Cold Climate Heat Pump; Mitsubishi (model PUZ-HA36NKA, PVA-A36AA*), Backup; natural gas fireplace

Central Split Heat Pump; Mitsubishi (model PUZ-HA36NKA, PVA-A36AA*)

HL: 29515 Btu/h, HG: 26529 Btu/h

Electric Conserver Tank; Rheem (model PROE60 T2 CN80)



TOWARDS NET ZERO RENOS

ANNUAL ENERGY USE

Before Retrofit
253 GJ/
year

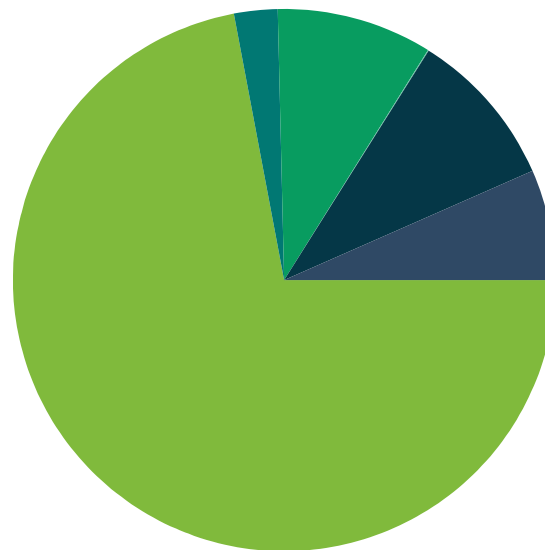
Typical New Home
98 GJ/
year

After Retrofit
67 GJ/
year

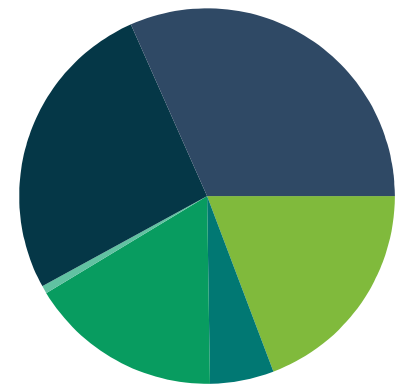


ENERGY CONSUMPTION BREAKDOWN

BEFORE RENOVATION



AFTER RENOVATION



- Space Heating
- Other Electrical
- Water Heating
- Light and appliances
- Ventilation
- Space Cooling

AS BUILT ENERGY PERFORMANCE

ANNUAL ENERGY SAVINGS	73.7%
GREENHOUSE GAS SAVINGS	10.60 Tonnes
ESTIMATED COST SAVINGS	\$449.94/y



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WHY ARE WE RETROFITTING OUR HOME?

The Homeowners had a vision for their dated home. They were looking for a modern, updated, comfortable home while also working with a leading NZ builder to achieve much greater sustainability targets.

WHAT LESSONS DID WE LEARN?

Our goal for this project is to accomplish Ottawa's first net-zero-ready renovation. To do this, we had to take a holistic approach, renovating a home for today while creating one for the future. Insulation, windows, mechanical systems, and ventilation upgrades are for the most part simple to accomplish. The biggest challenge was creating an air-tight build with the existing envelope.

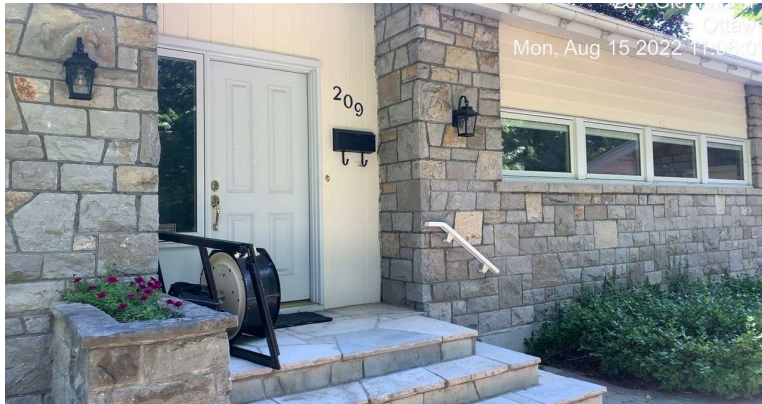
WHAT ELSE NEEDS TO BE DONE TO GET TO NET ZERO?

We just need to hook up solar, but the home is ready for that upgrade as well.



TOWARDS NET ZERO RENOS

PHOTO GALLERY - BEFORE



Front of home before renovation



Living and Dining space before



Kitchen Before



Rear of home before reno



TOWARDS NET ZERO RENOS



PHOTO GALLERY - DURING



Fully reimagined main level



Sealing for insulation



Exterior insulation mid-construction



New windows going in



TOWARDS NET ZERO RENOS



PHOTO GALLERY - AFTER



Rear of home after



Dining/Living after



The kitchen after



Achieving indoor/outdoor living space, enjoying the outdoor setting