

TOWARDS NET ZERO RENOS

netzero home renovations
The ultimate in comfort and efficiency

CASE STUDY



RENOVATOR: Revision Built

ENERGY ADVISOR/SERVICE ORGANIZATION: Homesol Building Solutions

TARGET: Net Zero Ready Home Renovation

ENERGY REDUCTION: 53.3%

YEAR BUILT: 1975

YEAR RETROFIT COMPLETED: 2025

LOCATION: Ottawa, Ontario

HOUSE TYPE: Single Detached

SIZE: 2453 sq.ft.

CLIMATE: Zone 6, 4354 HDD

The Michelangelo Court Project transformed an ordinary 1970's ranch bungalow into a high-performance dwelling with one source of clean energy; Electricity.

PROJECT PRIORITIES

- Fully Electric
- High-performance
- Continual Learning with Trades
- Focus on Building Science

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



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NET ZERO PLAN

	BEFORE	AFTER
ENERGY CONSUMPTION	121 GJ/year	56 GJ/year
COMFORT	Gas burning furnace was inefficient / no A/C installed / drafty rooms with cold areas / basement was damp and cold.	Constant 21.5C in winter, 23C in summer, no cold/warm spots, quiet, cozy, perfect humidity levels, super comfortable.
BUILDING CONDITION	condensation rot, old windows & exterior doors, mice in the walls and attic, carpenter ants, mold behind walls, 2.94 ACH	All new HVAC, wiring and plumbing, windows, doors, walls, roof assembly, insulation, siding, finished basement, etc. 1.14 ACH
RENEWABLES	None	None (yet)
WALL INSULATION	R12 fibreglass batt	R14 mineral batt in existing wall, R32 dense pack cellulose in new outside wall
CEILING INSULATION	R20 fibreglass blown	Hot roof assembly R50 13.5” dense pack cellulose & 3 control layers
FOUNDATION INSULATION	None	R20 interior, R12 exterior for R32 total
WINDOWS	Double Vinyl (U-val=3.04, SHGC=0.44)	U-1.15, 0.42
VENTILATION	None	131 CFM 67% SRE Fresh Air ERV
HEATING	Forced Air Nat. Gas 96% AFUE furnace	Cold Climate Heat Pump; Mitsubishi (model PUZ-HA24NHA1, PVA-A24AA*), backup Electric Furnace
COOLING	None	Central Split Heat Pump; Mitsubishi (model PUZ- HA24NHA1, PVA-A24AA*)
HEAT LOSS & GAIN	HL: 47546 Btu/h, HG: 18957 Btu/h	HL: 18182 Btu/h, HG: 18990 Btu/h
HOT WATER	0.87 EF electric conserver tank	Thermino ePlus on-demand heat battery storage by SUNAMP



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ANNUAL ENERGY USE

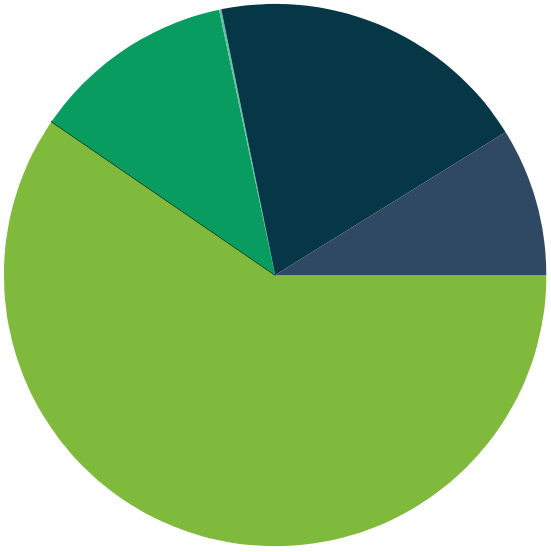
Before Retrofit
121 GJ/year

Typical New Home
98 GJ/year

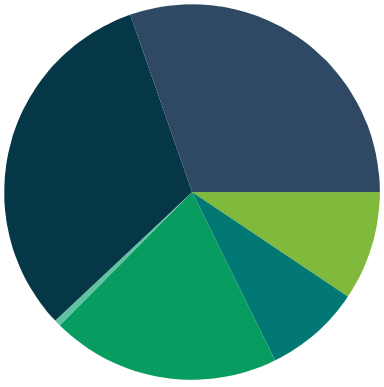
After Retrofit
56 GJ/year

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	53.3%
GREENHOUSE GAS SAVINGS	3.90 Tonnes

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WHY ARE WE RETROFITTING OUR HOME?

1. We discovered mice and bugs were living with us, and wanted to keep wildlife out by building a tight assembly
2. The house was uncomfortable and drafty, and wanted the opposite
3. We believe in doing things properly and only once
4. We want this to be our forever home
5. We deserve it.

WHAT LESSONS DID WE LEARN?

1. The trades are open to learning new things, and were generally excited to work on this project - it has meaning
2. Once the building envelope was completed, the rest of construction was actually easier and faster.
3. We learned how to renovate and build a Net Zero Ready dwelling.
4. We learned that the extra effort is absolutely worth it - we are reminded every single day ..and night.

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

Solar roof panels technology is improving every day - and coming down in price - so we will install solar in a year or two. Once we do that, our southwest facing bungalow will produce enough electricity to power everything in our home. We will have no utility bills!



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PHOTO GALLERY - BEFORE



Home before renovation



Pre-reno living space



Pre-reno kitchen



Pre-reno kitchen



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PHOTO GALLERY - DURING



Exterior work and new façade at mid-construction



Cantilever of main floor



Preparation for dense-packed cellulose on exterior wall assembly



Exterior insulation detail over drainage layer



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PHOTO GALLERY - AFTER



Beautiful living room with bar



Kitchen post-reno



Beautiful living space framed by new windows



Updated ranch - post renovation

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