



TOWARDS NET ZERO RENOS



CASE STUDY



This retrofit aims to improve comfort, accessibility and energy performance in a 1957 home the owners have lived in for more than 35 years. The project adds living space, upgrades insulation, reduces drafts and prepares the home for long term usability and future mobility needs.

PROJECT PRIORITIES

- Improved comfort & even temperatures
- Aging in place & accessibility
- Better air quality
- Add usable space (entry, primary suite)
- Reduce drafts
- Increase efficiency & modernize mechanical systems

RENOVATOR: Jason Hoover - Habitat Studio

ENERGY ADVISOR/SERVICE ORGANIZATION:
Jesse Thomas / Homesol Building Solutions

TARGET: Net Zero Home Renovation

ENERGY REDUCTION: 58.7%

YEAR BUILT: 1957

YEAR RETROFIT COMPLETED: 2025

LOCATION: Edmonton, AB

HOUSE TYPE: Single Detached

SIZE: 2456 sq.ft.

CLIMATE: Zone 7a, 5668 HDD

UPGRADES INCLUDE

Above Grade Walls - Modified Larson Truss

Increased attic insulation to R60 with air-sealing

Heat Pump for Heating/Cooling w/ Gas backup

Natural gas condensing hot water system

Foundation Wall Exterior Insulation

Planned Solar PV System (2026)

Heat Recovery Ventilation System

Addition (Front & Rear) including foundation

Triple Pane, Low E Windows & EnergyStar Doors

Accessibility features (bathroom, entry access)

Service upgrade to 100 Amps



TOWARDS NET ZERO RENOS



NET ZERO PLAN

BEFORE

ENERGY CONSUMPTION

149 GJ/year

COMFORT

Noticeable drafts, cool walls.
Rooms vary in temp. Summertime
leads to overheating on main floor.

BUILDING CONDITION

Single-detached bungalow (1956),
light wood frame, min. envelope
improvements ACH 4.51.

RENEWABLES

None

WALL INSULATION

2x4/R8B/16"OC/Vin

CEILING INSULATION

2x4/3.5WS/17BFG/24"OC

FOUNDATION INSULATION

R11 (80%), R0 (20%)

WINDOWS

Metal window with storm

VENTILATION

None

HEATING

80.0% AFUE furnace

COOLING

10.00 SEER A/C

HEAT LOSS & GAIN

HL: 41505 Btu/h, HG: 16375 Btu/h

HOT WATER

0.55 EF natural gas conventional
tank (pilot)

ELECTRICAL PANEL SIZE

100 A

AFTER

62 GJ/year

Home maintains consistent
temperatures. Exterior walls no
longer cool. Main floor does not
overheat.

Exterior larsen-truss wall system, air-
sealing, new windows/doors, heat
pump for heat/cooling & PV. ACH 0.61.

None

2x4/R8/8"DPCell/LarsenTr

2x4/3"SF/18"Bcell/24"OC-1

R38 (15%), R34 (64%), R27 (3%),
R24 (18%)

Tr2U.97S.24H

81.0% SRE HRV

3.08 COP air source heat pump,
97.5% afue furnace backup,
ENERGY STAR® certified

3.19 COP air source heat pump

HL: 14557 Btu/h, HG: 11179 Btu/h

0.88 UEF natural gas condensing

200 A



TOWARDS NET ZERO RENOS

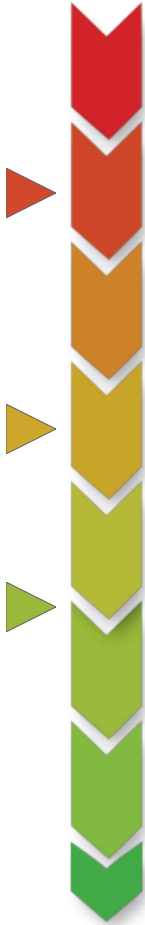


ANNUAL ENERGY USE

Before Retrofit
149 GJ/
year

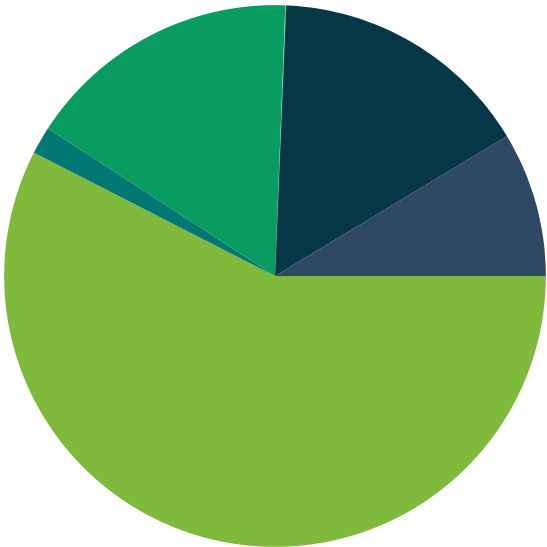
Typical New Home
98 GJ/
year

After Retrofit
62 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	58.7%
GREENHOUSE GAS SAVINGS	4.50 Tonnes
ESTIMATED COST SAVINGS	\$289.25/y
ESTIMATED UPFRONT (EMBODIED) CARBON FROM RETROFIT	18.30 Tonnes
CARBON PAYBACK* (EMBODIED INCREASE/OPERATIONAL REDUCTION)	30.50 Years



TOWARDS NET ZERO RENOS



WHY ARE WE RETROFITTING OUR HOME?

The home was retrofitted to improve comfort, efficiency and accessibility after the homeowners have lived in the home for 35 years. The house has drafts, temperature differences, a musty room, while AC struggles to cool the home in the summer. An accessible bathroom was added as well as expanding the entry to prepare for future mobility needs. Upgrading the envelope improves comfort & energy goals while staying within budget. PV was also added.

WHAT LESSONS DID WE LEARN?

In renovations, the small details matter, and a dedicated site lead is essential. Unlike new construction where trades know the sequence and details are predictable, a project like this needs someone who can guide timing, catch gaps and ensure tasks happen in the right order, such as sealing before insulation or finishing mechanical work before attic spray foam. Renovations demand both planning and hands-on oversight.

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

We need to install electric backup (instead of gas) for the heat pump, as well as an integrated heat pump DHW system, removing gas completely. Upgrade the solar from 12 to 15 kW.



TOWARDS NET ZERO RENOS



PHOTO GALLERY - BEFORE





TOWARDS NET ZERO RENOS



PHOTO GALLERY - DURING





TOWARDS NET ZERO RENOS



PHOTO GALLERY - AFTER

