



TOWARDS NET ZERO RENOS



CASE STUDY



The homeowners planned a metal roof installation and solar panels. During the evaluation, they also chose to update the front entrance and install new windows to reduce air leakage.

PROJECT PRIORITIES

- solar panels and battery storage
- replace roof and increase attic insulation
- add crawlspace insulation and vapour barrier
- replace front windows and remove four windows
- increase air tightness

RENOVATOR: Homeowner Organized

ENERGY ADVISOR/SERVICE ORGANIZATION: Shawn Sales

TARGET: Net Zero Home Renovation

ENERGY REDUCTION: 64.5%

YEAR BUILT: 1989

YEAR RETROFIT COMPLETED: 2025

LOCATION: Nanaimo, British Columbia

HOUSE TYPE: Single Detached

SIZE: 3232 sq.ft.

CLIMATE: Zone 4, 2572 HDD

UPGRADES INCLUDE

Crawlspace

Windows & Sliding Glass Doors

Floor Airtightness

On-site Generation and Storage

Doors

Ceiling with Attic Space

Skylights



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NET ZERO PLAN

BEFORE

ENERGY CONSUMPTION

67 GJ/year

COMFORT

Upstairs is too cold in winter and too hot in summer.

BUILDING CONDITION

Roof needed replaced, and some windows were showing wear. 6.7 ACH.

RENEWABLES

None

WALL INSULATION

R20 batt

CEILING INSULATION

R24 batt

FOUNDATION INSULATION

None

WINDOWS

Double glazed (U-val=2.00, SHGC=0.64)

VENTILATION

None

HEATING

9.00 HSPF air source heat pump, baseboards backup

COOLING

17.00 SEER air source heat pump

HEAT LOSS & GAIN

HL: 62976 Btu/h, HG: 37692 Btu/h

HOT WATER

0.87 EF electric conserver tank

PROPOSED

24 GJ/year

Added insulation and replacing two skylights with skylight tubes has made a substantial difference.

The home now has a new metal roof, and has replaced windows that were due to be replaced.

12.29 kW Solar PV, battery storage

No Change

R50 blown blown cellulose

R18 Rigid Insulation

Triple glazed x 8 windows and replace 2 skylights with tubes

No Change

No Change

No Change

HL: 54431 Btu/h, HG: 33973 Btu/h

No Change



TOWARDS NET ZERO RENOS

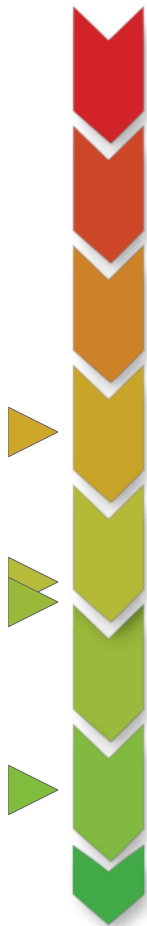
ANNUAL ENERGY USE

Typical New Home
98 GJ/
year

Before Retrofit
67 GJ/
year
After Retrofit

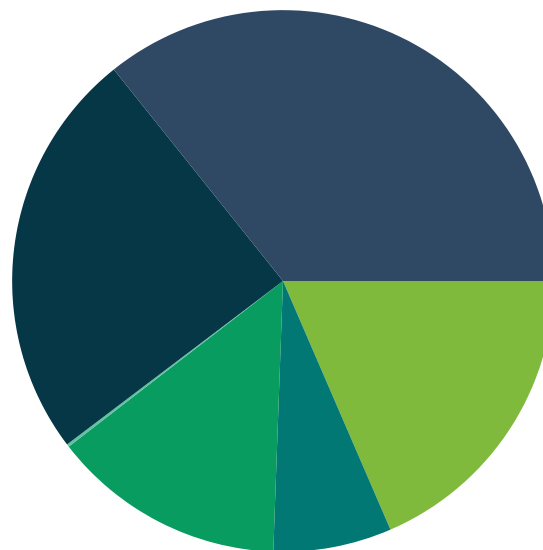
63 GJ/
year

PV Production
24 GJ/
year



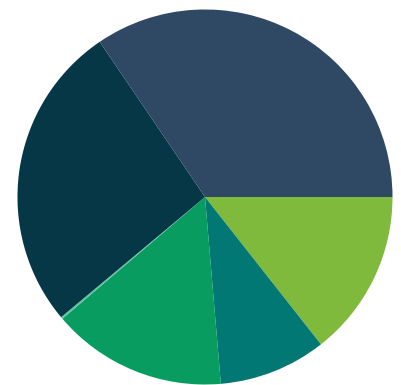
ENERGY CONSUMPTION BREAKDOWN

BEFORE RENOVATION



Space Heating
Other Electrical
Water Heating

AFTER RENOVATION



Light and appliances
Ventilation
Space Cooling

AS BUILT ENERGY PERFORMANCE

ANNUAL ENERGY SAVINGS	64.5%
GREENHOUSE GAS SAVINGS	-0.22 Tonnes
ESTIMATED COST SAVINGS	\$1461.53/y



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WHY ARE WE RETROFITTING OUR HOME?

During renovations, the homeowners learned the importance of a holistic approach to comfort and efficiency. Choosing the right renovator and maintaining clear communication were essential. They saw how unbalanced heating and cooling, energy use, and outages highlighted the value of integrated solutions, solar panels, insulation, and long-term planning for a resilient forever home.

WHAT LESSONS DID WE LEARN?

The homeowners learned the value of a holistic approach to comfort and efficiency. Unbalanced heating and cooling showed the need for integrated solutions. Solar panels and battery storage provide backup power, while small upgrades like insulation and window improvements boost comfort and lower bills, ensuring their forever home is efficient and sustainable.

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

The home's energy use dropped from 67 GJ/year to 24 GJ/year. To reach net zero, remaining upgrades could include triple-pane windows, added wall insulation, improved airtightness, an HRV, a heat pump water heater, and a few solar panels to offset the remaining energy consumption.



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PHOTO GALLERY - BEFORE





TOWARDS NET ZERO RENOS



PHOTO GALLERY - AFTER

