



TOWARDS NET ZERO RENOS



CASE STUDY



The Homeowner planned on installing a heat pump to make the rooms in the home more comfortable, and also decided to add insulation to the attic / air seal pot lights on the second floor.

PROJECT PRIORITIES

- Heat Pump for both heating and cooling
- Insulation for comfort on the second floor
- air sealing to reduce air leaks in the pot lights

RENOVATOR: Homeowner Organized

ENERGY ADVISOR/SERVICE ORGANIZATION: Shawn Sales

TARGET: Net Zero Home Renovation

ENERGY REDUCTION: 7.1%

YEAR BUILT: 2013

YEAR RETROFIT COMPLETED: 2025

LOCATION: Nanaimo, British Columbia

HOUSE TYPE: Single Detached

SIZE: 1398 sq.ft.

CLIMATE: Zone 4, 2572 HDD

UPGRADES INCLUDE

Cooling & Heat Pumps

Ceiling with Attic Space

Airtightness



TOWARDS NET ZERO RENOS



NET ZERO PLAN

BEFORE

ENERGY CONSUMPTION

53 GJ/year

COMFORT

The home was too hot during the summer, especially on the second floor.

BUILDING CONDITION

The home was built in 2013 and is in good condition. Future plans include adding solar panels. 3.7 ACH.

RENEWABLES

None

WALL INSULATION

R20 batt

CEILING INSULATION

R24 batt

FOUNDATION INSULATION

None

WINDOWS

Double glazed (U-val=1.97, SHGC=0.33)

VENTILATION

None

HEATING

Baseboards

COOLING

None

HEAT LOSS & GAIN

HL: 22328 Btu/h, HG: 15243 Btu/h

HOT WATER

0.87 EF electric conserver tank

AFTER

49 GJ/year

A heat pump, as well as added attic insulation has made the second floor more comfortable.

Home performs well, and PV will be a welcome addition in the future. 3.6 ACH.

No Change

No Change

R60 blown cellulose

No Change

No Change

No Change

3.08 COP cc air source heat pump

3.60 COP cc air source heat pump

HL: 21106 Btu/h, HG: 14445 Btu/h

No Change

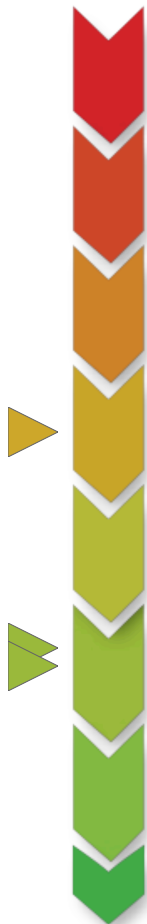


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ANNUAL ENERGY USE

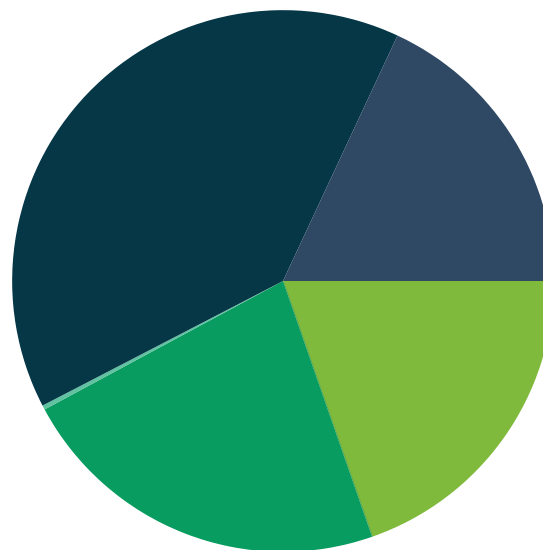
Typical New Home
98 GJ/
year

Before Retrofit
53 GJ/
year
After Retrofit
49 GJ/
year



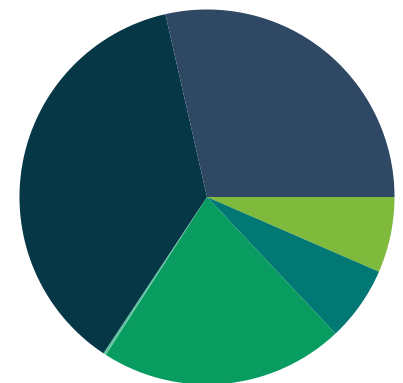
ENERGY CONSUMPTION BREAKDOWN

BEFORE RENOVATION



■ Space Heating
■ Other Electrical
■ Water Heating

AFTER RENOVATION



■ Light and appliances
■ Ventilation
■ Space Cooling

AS BUILT ENERGY PERFORMANCE

ANNUAL ENERGY SAVINGS	7.1%
GREENHOUSE GAS SAVINGS	-0.02 Tonnes
ESTIMATED COST SAVINGS	\$136.32/y



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WHY ARE WE RETROFITTING OUR HOME?

The homeowner was retrofitting the home to address comfort issues experienced during the summer months.

WHAT LESSONS DID WE LEARN?

The homeowner learned that combining a heat pump with added insulation can work together to significantly improve comfort.

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

The home's energy use decreased from 53 GJ/year to 49 GJ/year. To move toward net zero, remaining up grades could include triple-pane windows, improved air tightness, an HRV, a heat pump water heater, and solar panels to offset the remaining energy consumption.



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PHOTO GALLERY - BEFORE





TOWARDS NET ZERO RENOS



PHOTO GALLERY - AFTER

