Eco-Solar Home Tour 2026

13th June, Saturday 10am to 5 pm

St Albert NZE Retrofit Home

Tour Day: 13th June, Saturday
Address:
Hosts: Homeowners
Parking: on street
Energuide: 5 GJ/year
Actual: slightly net negative

What will people see and learn about at your home?

- LiteZone window assemblies – invented (patented), engineered and produced in Edmonton. LiteZone windows have achieved a European "Passive Home" designation.
- Electrical service upgrade from 100 amp to 200 amp – Leviton panel installed.
- Roof mounted solar array system – Longi, 550-watt panels.
- Ground sourced geo-exchange system – NetZero brand (EcoForest brand in Europe).
- Venmar energy recovery ventilator, auto-balancing.

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Why is this home on the tour?

The home was purchased in 2022 with the intent on retrofitting it to achieve true net-zero (no offsets) energy performance. This 3100 sq.ft (290 sq.m including both levels) walk out bungalow was constructed in 1996 to the then applicable building codes. Our project approach was to, a) reduce the energy required to operate the home, b) install ground sourced geo-exchange HVAC and c) generate as much solar power as practically feasible.

The historical energy consumption was 206 GJ/year compared to the estimated post retrofitting consumption of 64 GJ/yr. – a 69% reduction. The single largest factor contributing to reducing envelope losses was the use of LiteZone glass units installed in Duxton fiberglass framed windows to replaced most of the 26 upgraded window assemblies. High grade triple glazed units with fiberglass were used for the operating windows.

The solar array generates about 59 GJ/year. The combined solar panel maximum rating is 17.6 kW. Actual results over the past two years have been slightly net-negative.

The geo-exchange system has a capacity of 5 tons providing heat for the house and the 450 sq.ft garage. It also generates all the domestic hot water without augmentation. The heat pump unit is a fully variable design and does not require a buffer tank.

What features save on energy costs?

- Attic insulation upgraded from R34 to R56 (R56 effective or R70 nominal).
- Air tightness reduced from 2.6 to 1.7 air exchanges per hour.
- All windows and one of five doors were replaced.
- All HVAC functions which include air handlers, hydronic lower-level heating, garage heat and domestic hot water are provided by the heat pump system – overall average COP of 4.4:1 (actual per system meters).
- The solar generation is sufficient to fully offset electrical energy consumption.
- The garage retrofits included upgraded triple glazed window, insulted pony walls, and 2” thick polyurethane filled overhead doors (2)
- There is no longer any gas service to the property which eliminates all gas utility charges and associated taxes.

What features save on water costs?

- All toilets rated at 4.8L/flush.
- Rainwater capture into 450 litre tank.