



# Net Zero (“NZ”) Frequently Asked Questions (“FAQs”)

Recommended readings:

**Homeowners** – “FAQs for Homeowners”

**Contractors** – “FAQs for Homeowners” + “FAQs for Contractors”

**Municipalities** – “FAQs for Homeowners” + “FAQs for Contractors” + “FAQs for Municipalities”

## NZ – FAQs for Homeowners

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# Common Terms and Definitions

## **Deep Energy Retrofit (“DER”)**

An advanced application of energy conservation measures to improve overall performance of an existing building.

## **EnerGuide Rating**

Demonstrates a home’s annual energy performance.

## **Energy Advisor (“EA”)**

An individual who evaluates how energy is being used in a home and identifies opportunities to reduce and optimize energy consumption.

## **Energy Efficiency (“EE”)**

Use less energy to provide the same service.

## **Envelope Upgrades**

Includes any retrofits to your home’s physical separation between the conditioned and unconditioned environment, including walls, floors, ceilings, windows, doors, etc.

## **Net Zero Energy (“NZE”)**

A building standard designated to a building that produces as much energy on-site as it consumes annually.

## **Net Zero Energy Ready (“NZE<sub>r</sub>”)**

A building standard designated to a home that could produce as much energy as it consumes annually, if a renewable energy generating system (such as Solar, Wind and/or Micro-hydro) existed on-site.

## **Pan-Canadian Framework**

National framework developed with provinces and territories and in consultation with Indigenous Peoples, to help meet Canada’s emissions reduction targets, grow the economy, and build resilience to a changing climate.

## **Property Assessed Clean Energy (“PACE”) Financing**

Provides homeowners within a participating municipality with financing at low lending rates for energy efficiency upgrades that pay for themselves within a set number of years. Should the home sell, the remaining payments become the obligation of the new homeowner. Specific municipalities may have different requirements.

**Renewable Energy**

Energy generated from a natural resource that is not depleted with use.

**Retrofit**

Addition of a component or accessory to a house after it was first built.

**Return on Investment (“ROI”)**

The timeframe in which the energy savings from an upgrade will equal the capital cost or cost of financing (if financing is required).

**Solar Photovoltaics (“PV”)**

Renewable energy technology that converts sunlight (solar radiation) to direct current (DC) electricity using semiconductors.

## 1. What is a Net Zero Energy (“NZE”) home?

A NZE home is one that generates as much energy as it consumes annually. Energy generation is often performed on-site through available renewable energy producing resources such as sun, wind, biomass and hydro. In some cases, communities provide the opportunity for homeowners to purchase renewable energy off-site.

Note that energy consumption does not refer to electricity alone but refers to all forms of energy fuel types used by a home (renewables, wood, oil, propane, natural gas, etc.).

## 2. How much does a NZE home cost?

A NZE home does not have a definitive cost, although with more energy efficiency rebates available it is becoming increasingly affordable. There are many variables that impact the cost of achieving NZE. For example, the size, layout, and location of the home; renewable resource availability; and the level of deferred maintenance required. Deferred maintenance is work required due to a lack of upkeep such as broken windows, leaking roof and failed mechanical equipment.

It is generally more cost-effective to build a new home and strive for NZE from the start than to fully renovate an existing home to the same standard. Existing homes already have a defined orientation, roof pitch, mechanical system infrastructure, finished interior, layout, windows and more which may limit the types and efficacy of upgrades. Nonetheless, retrofitting existing homes to approach a NZE standard can still be cost effective. NZE upgrades lead to reduced energy consumption, increased home comfort, decreased carbon footprint, and financial savings. Local financing options designed to aid in deep energy retrofits (“DERs”) to homes striving for NZE or Net Zero Energy ready (“NZEr”) are increasingly common. The resulting debt can often be paid for through energy savings achieved.

Note that where DERs can be completed in phases, this approach frequently requires less upfront cost compared to a new build where all work is completed at once.

More information on [affordable NZE homes](#) can be found on the Natural Resources Canada (“NRCan”) website.

## 3. What if my home is “not well-suited” to be retrofitted to NZE?

If your home is not well-suited to achieve NZE, for example due to poor access to renewable energy resources, you can strive to be Net Zero Energy ready (“NZEr”) through DERs. DERs improve the entire home’s performance and take an integrative approach by considering how the various components making up the home will work with each other when choosing upgrades to improve home comfort levels, reduce energy consumption, and lower utility bills.

While NZE may or may not be possible for a given home, striving for it can be a smart investment in long-term energy savings and in helping the environment.

#### 4. Do I need to change my lifestyle to achieve a NZE home?

A homeowner is not required to make lifestyle changes in order to achieve NZE because the home can still be tied to the local electricity grid through net-metering. This ensures there is access to electricity regardless how much is generated on-site. However, a few small changes to homeowner habits can make a meaningful reduction in energy consumption and make it easier to achieve NZE. Such changes include: use of LED light bulbs, minimizing use of energy intensive appliances (hair dryers, irons, straighteners), turning off lights when unneeded, unplugging electronics when not in use, eliminating biomass (wood) for heating, leveraging natural lighting and passive heating through passive solar (open curtains on south sides of home during the day), and hanging clothes to dry rather than using a dryer.

#### 5. Will heating with wood help my home reach NZE?

Not often. Due to the current definition of NZE, all energy consumed on-site (at the home) should be offset by energy generated on-site. This means the wood used for heating must be harvested within a sustainable wood lot on the property. This is unachievable for most homes.

Wood is often thought to be a renewable resource when in fact this requires the wood be replenished at a rate that is equal to or faster than the rate at which it is consumed.

Please refer to the [Bioenergy section of About Renewable Energy](#) from NRCan for more information.

#### 6. Can I retrofit my existing home to be a NZE home?

Many existing homes can be transformed into a NZE home. The home's total energy consumption should first be reduced through insulation and air sealing improvements. The home's heating and ventilation systems can then be re-sized and upgraded to high-performance systems that will further improve comfort and reduce the home's energy demand. The final step is to design and install a renewable energy system –generally a solar photovoltaic (“PV”) system – that is properly sized for the new energy profile of the home.

## 7. Who can help me reach NZE?

Speak to an Energy Professional by contacting Clean Foundation.

- Click [here](#) for contact information

Search trusted service and trade networks in your area.

- Click [here](#) for Trade Partners of Clean Foundation servicing Nova Scotia.
- Click [here](#) for Trade Partners of Efficiency Nova Scotia.
- Click [here](#) for Service Providers throughout Canada for new homes documented by Natural Resources Canada (“NRCan”).
- Click [here](#) for Qualified Net Zero Service Organizations, NZ Trainers and NZ EAs documented by the Canadian Home Builders Association.
- Click [here](#) for Qualified NZ Builders and NZ Homes throughout Canada documented by the Canadian Home Builders Association.

## 8. What is a deep energy retrofit (“DER”)?

A DER is a large home renovation, requiring thoughtful design and integration of all building systems, resulting in improved comfort and a significant reduction in household energy consumption.

Click [here](#) for information on how to make your home more energy efficient.

## 9. What is Net Zero Energy Ready (“NZEr”)?

NZEr homes are ready for energy generation from renewables. A home that is NZEr has low energy consumption due to conservation and efficiency efforts but does not have energy generation capabilities on-site. This can be due to poor orientation and extensive shading for solar or proximity to neighbours making energy generation from wind unfeasible. Depending on the jurisdiction these homes are within, purchasing community renewable energy to offset the reduced energy consumption may be an option.

## 10. What is a low-emission home?

A threshold for low-emissions was adopted by Clean Foundation for a Net Zero Energy Pilot Project as producing 80% fewer emissions ( $0.0142647 \text{ tonnesCO}_2\text{e/m}^2 = 14.2647 \text{ kgCO}_2\text{e/m}^2$ ) than the average Nova Scotia single family dwelling, as per the National Energy Use Database – Residential Sector – [Nova Scotia 2016 dataset](#).

## 11. What are the benefits of making my home NZEr?

NZEr upgrades can decrease the cost of operating your home and help to protect you from rising energy rates. Carefully planned and integrated energy conservation, efficiency, and generation upgrades can often pay for themselves through reduced energy costs and help a home reach NZE.

A NZE home will have zero energy bills (except for local utility service fees when using net-metering). NZE upgrades will also make your home more comfortable by reducing drafts while improving temperature regulation and indoor air quality with high efficiency mechanical equipment. NZE upgrades help combat climate change, because having a more efficient home minimizes your ecological footprint and carbon emissions.

## 12. How do I decide which retrofits should be installed?

An EA can assess your home and help you to decide which upgrades would provide the most energy savings or the best value for your investment.

In many areas of the country there are rebates and financing options available to facilitate energy efficiency and/or renewable energy upgrades to your home. An EA can also help you navigate the rebates available in your area.

Click [here](#) to speak with a Clean Foundation Energy Professional, or click [here](#) for a list of other qualified NZ Energy Advisors throughout Canada, compiled by the Canadian Home Builders' Association ("CHBA").

## 13. What is net metering?

Net metering requires a special electrical utility meter be installed in your home which measures energy in (consumed) and energy out (generated). This meter allows a home to send excess electricity to the local utility to manage energy demand and serve as an energy credit for that home. Contact your local utility for net-metering requirements in your area.

## 14. What happens when my renewable energy system produces more electricity than my home needs? Or what if it is not producing enough?

It is unlikely a home's renewable energy generation system will ever be sized to match exactly 100% of the home's energy consumption. With changing weather and occupancy, the systems are sized on best estimates. Your system could over produce one year and under produce the next.

If the renewable energy system produces more energy than the home consumes, there is typically an agreed upon leniency between the homeowner and utility prior to having a net metering device installed. If the home produces more than the agreed upon leniency, the utility often has the right to stop energy crediting the home until adjustments have been made to conform to the agreement.

If the renewable energy system produces less energy than the home consumes, the utility charges for the energy delivered to the home from the grid, measured by the net metering device.

## 15. Are there alternative renewable energy sources to solar PV?

Yes. Solar PV is a common renewable energy generation system for on-site production due to its scalability, low maintenance requirements, and affordability – but there are alternatives. Wind and micro-hydro energy generators are also useful as on-site produces; both can produce energy throughout the night when solar PV does not.

What makes other renewable energy sources such as wind and micro-hydro less popular for residential on-site energy production is the size, noise, and maintenance accompanying wind generation, while maintenance and resource availability is a limiting factor for micro-hydro installations.

## 16. Do you need a special roof to attach solar panels?

No special roof is required to attach a solar PV system. There are a variety of attachment techniques. The weight of the proposed solar PV system should be calculated and a load analysis performed to ensure this added weight (plus estimated snow and wind loads) will not cause structural issues.

## 17. What level of maintenance is required with a NZE home?

Often less maintenance is required for a NZE home compared to a traditionally built home. More care is taken during the design stages of a NZE home to ensure the home's envelope is thermally strengthened, permitting less heat loss and requiring smaller and more efficient mechanical equipment. Less interaction with thermostats is necessary due to smaller temperature swings from improved thermal performance. When a solar PV system is used for energy generation, it has no moving parts and warranties often last upwards of 20-25 years.

## 18. What if I still have questions regarding NZE?

Please feel free to contact an Energy Professional with the Clean Foundation to discuss your questions.

- Click [here](#) for contact information

# Resources

## **Canadian Home Builders Association (“CHBA”)**

The voice of Canada’s residential construction industry.

<https://www.chba.ca>

## **CanmetENERGY**

Canada’s leading federal research and technology organization in the field of clean energy.

<https://www.nrcan.gc.ca/energy/energy-offices-and-labs/canmetenergy/5715>

## **Natural Resources Canada (“NRCan”)**

The ministry of the Canadian government for natural resources, energy, minerals and metals, forests, earth sciences, mapping and remote sensing.

<https://www.nrcan.gc.ca/home>

## **SolarAssist**

A user interface developed by Nova Scotia Department of Energy and Mines and Clean Foundation, used to quickly estimate a home’s solar potential.

<https://www.solarassist.ca/>

## **SolarHomes**

A program offering rebates to Nova Scotia homeowners for installing eligible solar photovoltaic systems. Efficiency Nova Scotia administers the program.

<https://www.energycyns.ca/service/solarhomes/>