



# NET ZERO ENERGY HOMES CONSTITUTE REVOLUTIONARY CHANGE IN HOMEBUILDING

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Canadian Home Builders' Association



Canada's residential construction industry is in the early stages of a revolutionary change in how homes are built – one that professional real estate appraisers need to know about.

A Net Zero Energy (NZE) home is one that produces the same amount of energy it uses, on an annualized basis. These homes are extremely well built: they need to have very tight building envelopes in order reach high levels of energy efficiency. This means that the wall construction and insulation is superior to code-built homes. In addition to being incredibly efficient, NZE homes have built-in renewable energy generation (like solar panels), and, in some cases, energy storage systems, which allow homeowners to bank energy for future use. A Net Zero Energy Ready home (NZEr) is built to the same level of performance, but installation of the renewable energy component is left to the occupant at a future date, a popular option among NZE builders and home buyers.

In both cases, the result is a home that delivers unrivaled levels of occupant comfort, minimum environmental impacts and utility bills with much lowered consumption.

While the construction costs for NZE and NZEr homes are higher than for homes that only meet the building code, these costs are decreasing as builders learn new efficiencies with the technology and building practices involved. The industry's aim is to tap into building innovations and share efficiencies so that the cost of owning a NZEr home is similar to one built to conventional standards.

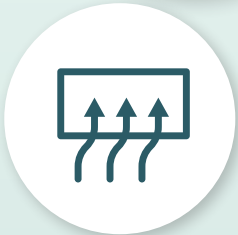
The Canadian Home Builders' Association (CHBA) is leading efforts to bring NZE and NZEr arehomes to market. Backed by Owens Corning Canada and the federal government, the first step was a demonstration program in 2015 that saw the construction of 26 such homes across Canada by five leading residential builders. Based on this success, CHBA launched its Net Zero Home Labelling Program to ensure that each participating home is qualified by a third party to meet the specified technical requirements. The program also includes training requirements for participating builder members and energy advisors.

NZE construction demands a greater level of precision by key trades, combined with a willingness to adopt some new building practices, and the capacity to identify worksite innovations that deliver construction efficiencies.

For many in the home building industry, this is new and exciting territory. It represents a tremendous level of innovation in home building as industry leaders move towards a 'Net Zero Energy' future.



**“AS CANADIANS SEEK HIGHER LEVELS OF PERFORMANCE AND COMFORT, AND ARE WILLING TO PAY FOR IT, THE INDUSTRY CONTINUES TO INNOVATE TO MEET THOSE DESIRES IN THE MOST COST-EFFECTIVE FASHION.”**



### CHBA NET ZERO ENERGY HOUSING COUNCIL

The move to bring NZE homes to the marketplace is being spearheaded by the residential construction industry itself, through the work of CHBA's Net Zero Energy Housing Council.

A broad collaboration involving home builders, manufacturers, utilities, design experts, government agencies and service providers, the Council's primary focus is on how to support innovation in the industry with the goal of creating a market advantage for CHBA builder and renovator members pursuing Net Zero Energy.

To this end, the Council has focused much of its attention on defining the NZE Technical Requirements, and developing a third-party verification and labeling process that will confirm that a home has achieved those Technical Requirements. The program's training requirements are also critical in order to ensure those involved in the design and construction are up to speed, as well as to ensure the lessons learned through innovation are shared across the country to accelerate the diffusion of this know-how among participating builders and renovators.

### WHAT IS A 'NET ZERO ENERGY' HOME?

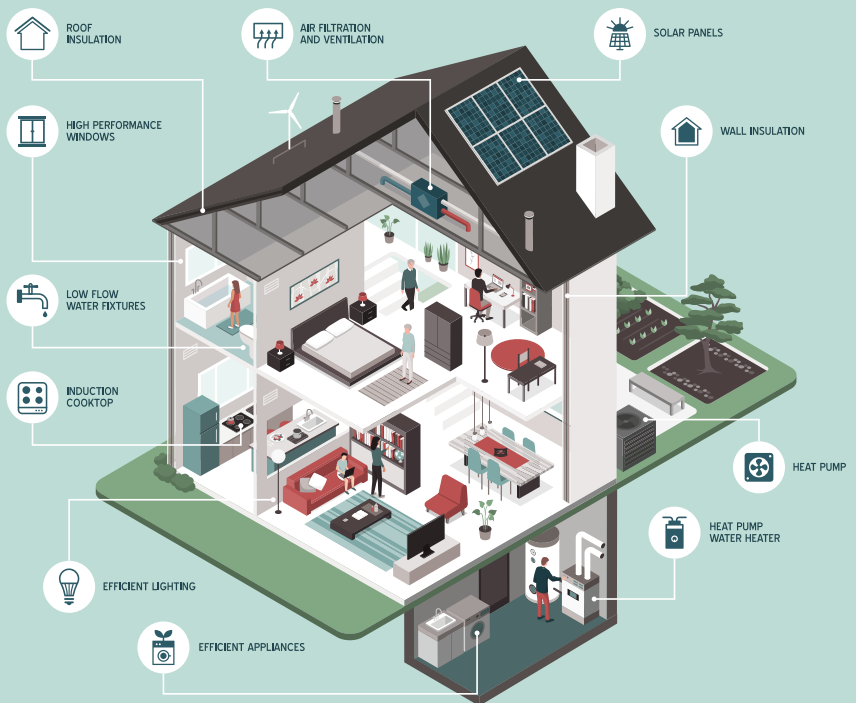
While most-often quite conventional in appearance, NZE homes incorporate a wide range of technical innovations in two areas:

1. They are incredibly energy efficient, with high levels of insulation in all exterior surfaces including below grade, high performance windows and right-sized mechanical systems, as well as fresh air ventilation. With these improvements, the typical NZE/NZE<sub>r</sub> home is on average 66% more energy efficient than a new home built to current building codes.
2. For the remaining energy that is required, NZE homes incorporate renewable energy generation, most often solar-generated electricity, to offset this load. In so doing, over the course of the whole year they generate

**“EIGHT OUT OF 10 NEW HOME BUYERS BELIEVE THAT HIGHER ENERGY PERFORMANCE SHOULD COME WITH A HIGHLY RECOGNIZED, INDEPENDENTLY VERIFIED LABEL THAT CERTIFIES THE HOME MEETS HIGHER STANDARDS.”**

## ENERGY EFFICIENT HOUSE

### ZERO NET BUILDING FOR GREEN TECHNOLOGY



**“THE INDUSTRY’S AIM IS TO TAP INTO BUILDING INNOVATIONS AND SHARE EFFICIENCIES SO THAT THE COST OF OWNING A NZER HOME IS SIMILAR TO ONE BUILT TO CONVENTIONAL STANDARDS.”**

as much energy as they consume (hence the ‘net zero’ in their name). Increasingly, NZE homes also incorporate in-home energy storage systems (much like an electric car) that allow them to function more autonomously from the electrical grid – a big advantage when the power goes out!

In order to meet the rigorous NZE Technical Standard, a wide range of innovative construction practices are used by NZE builders. This can involve important detailing to traditional wood frame construction techniques to meet the higher levels of air tightness and insulation required. In order to achieve this, everyone involved in the construction process needs to understand what is required and collaborate to make it happen. NZE homes



mean innovative times for the skilled workers in residential construction.



#### **ADDRESSING THE MARKETPLACE**

CHBA has identified that energy efficiency is near the top of the ‘must have’ list for today’s new home buyer. The Association’s annual survey of new homebuyers, conducted with Avid Ratings Canada, gathers opinions from thousands of recent homebuyers each year. Over the last several years, the findings were clear – nearly 90% wanted an energy efficient home, and, for two thirds of those surveyed, this means energy performance beyond basic levels.

It’s important to note that today’s homes are already very energy efficient compared to the past. A code-built home today is a very good home that is 37% more efficient than a home built in 1990. But, as Canadians seek higher levels of performance and comfort, and are willing to pay for it, the industry continues to innovate to meet those desires in the most cost-effective fashion.

Eight out of ten new home buyers believe that higher energy performance should come with a recognized, independently verified label that certifies the home meets higher standards, according to CHBA’s findings. For homebuyer confidence, a label confirming that the home has been built to meet this high level of performance can be found on the home’s electrical panel.

#### **NET ZERO ECONOMICS**

CHBA carried out a cost analysis for Net Zero Ready homes in 2018 looking at both the initial cost premium involved, and the impact on ownership costs when energy savings were considered. While there is no ‘set price’ given Canada’s varied climate regions and the many different ways builders can achieve NZEr construction, incremental costs for a 2,100 square foot home varied between \$19,000 in Victoria, BC and \$36,000 in

Edmonton, AB. Energy savings covered between 12% and 49% of the additional monthly mortgage costs, depending on local energy prices and climate.

As noted previously, the incremental cost of moving to NZE or NZEr construction is dropping quite quickly, as more builders involved develop new design and construction innovations.

For appraisers encountering a NZE or NZEr home in their work, the first and most important step is to verify that the home is labeled. This third-party label attests that the builder was qualified to design and build the home, and that it was constructed to meet all applicable requirements.

For more information on Net Zero and Net Zero Ready homes, visit: [www.NetZeroHome.com](http://www.NetZeroHome.com) and [www.chba.ca/nze](http://www.chba.ca/nze).

#### **ABOUT CHBA**

Representing more than 9,000 member companies across Canada, CHBA is the “voice of the residential construction industry.” CHBA members include home builders, renovators, land developers, trade contractors, product and material manufacturers, building product suppliers, lending institutions, insurance providers, service professionals, municipalities and more. 🏠

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