



First Net-Zero Energy Ready building in north/central BC and First Nation community

December 18, 2017. Prince George, British Columbia – Alkali Lake is home to the first building in a northern climate and the first in a First Nation community to qualify under the CHBA Net Zero Home Labelling Program.

Sam Zirnhelt, owner of Zirnhelt Timber Frames Ltd. and a member of CHBA Northern British Columbia, worked with the Esk'etemc First Nation to build a new Alkali Lake Recovery Centre in 2017. The project goals included how the Net-Zero Energy Ready (NZEr) approach could cost effectively improve occupant comfort, improve indoor air quality, ensure a durable building that would last for generations, and decrease the building's overall energy consumption and electricity costs to operate the 6,800-square-foot centre.

"The client goals of energy efficiency, durability, aesthetics and value were our focus from the preliminary design phase. We also pre-crafted the timber frame and panelized walls in our shop, which helped to lower costs and decrease the on-site construction time to only four months," says Sam Zirnhelt.

The Recovery Centre has a high-performance exterior insulated panelized wall system to lower energy use, advanced heat pumps for space and water heating, high performing fresh air heat recovery machines (Heat Recovery Ventilation), and designated space in its design to install future solar panels. The centre also tested at 0.5 air changes per hour (ACH), and tested at 68.4% better than a building built to code, which demonstrates its high level of energy efficiency and superior performance.

"The learning experience of creating this Net-Zero Energy Ready building was enhanced by the collaboration of the Esk'etemc First Nation, our team of subtrades, and many government agencies through Natural Resources Canada's Local Energy Efficiency Partnerships (LEEP) initiative. We're thankful for the efforts of everyone involved," says Zirnhelt.

The new building will not only benefit the Esk'etemc First Nation, but also future buildings that strive to meet similar levels of energy performance. Natural Resources Canada and BC Hydro will be monitoring the performance of the building's systems to demonstrate how the NZEr approach could apply to other projects. The goal is to understand how these solutions can benefit other communities across British Columbia and Canada in reducing energy consumption.

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Quotes

"The Canadian Home Builders' Association works closely with industry stakeholders to provide builders with the support and opportunity to build for the future and this includes building to Net Zero standards. We are proud of Sam Zirnhelt, for taking the lead through a partnership with the Esk'etemc First Nation. He is a trailblazer in our region."

-Joe Hart, President, Canadian Home Builders' Association of Northern British Columbia



“British Columbia is home to all of Canada’s climate zones. The knowledge from this local project will have pan-Canadian benefits in the development of more voluntary Net Zero Energy homes and buildings.”

-Neil Moody, CEO, Canadian Home Builders’ Association of British Columbia

“CHBA congratulates the team at Zirnhelt Timber Frames Ltd., a member of CHBA Northern British Columbia, for being the first in a northern climate and the first in a First Nation community to achieve this prestigious recognition under our program. We would also like to thank CHBA BC and Energy Advisor Rod Croome, for the third-party testing and inspections that supported Zirnhelt Timber Frames Ltd. Together, the builder and their team of professionals have achieved an impressive milestone in Canadian housing.”

-Kevin Lee, CEO, Canadian Home Builders’ Association.

Project Background Information

This project is the first Net-Zero Energy Ready (NZEr) building on First Nation land in Canada. The intent is to lower the operating costs and monitor the technology performance for inclusion in future capital projects.

The Net Zero Home Labelling Program is owned and operated by the Canadian Home Builders’ Association. It is a voluntary standard that provides the industry and consumers with a clearly defined and rigorous two-tiered technical requirement that recognizes Net Zero and Net Zero Ready Homes, and identifies the builders and renovators who provide them. A Net Zero Ready home’s energy performance is up to 80 per cent better than a home built to the building code.

Natural Resources Canada’s Local Energy Efficiency Partnerships (LEEP) initiative was supported in Northern British Columbia by BC Housing, BC Hydro, Fortis BC, and CHBA Northern BC. LEEP is designed to reduce builder time and risk in finding and trying innovations for building higher performance homes better, faster and more affordably. Builder groups use the LEEP process to work together to consider their opportunities and find innovations they believe are most feasible for the homes they build in their markets.

Project supporters were BC Housing, BC Hydro, Esk’etemc First Nation, First Nations Health Authority (FNHA) and Indigenous and Northern Affairs Canada (INAC).

Technical Details

Building Envelope: The thermal resistance of the walls was upgraded from an effective RSI of 3.72 (R-21) to RSI 5.86 (R-33). This was accomplished through the addition of 2” of graphite infused expanded polystyrene (EPS) insulation. The air tightness test exceeded 0.5 air changes per hour (ACH).

Heating System: The previous heating system was electric resistance heating. The upgraded system is a central Cold Climate Air Source Heat Pump (CCASHP). The heat pump will also include a centralized air distribution system which will include heat recovery ventilation (HRV).

Domestic Hot Water: A Heat Pump Water Heater was used to achieve the required level of performance.

PV Solar Ready Design: To meet NZEr, a system design for future solar panels and all necessary installation components were included.