

Welcome to today's CHBA Net Zero Webinar!

The CHBA Net Zero Team



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Housekeeping

- **This webinar is being recorded.** CHBA Members can access the Net Zero webinar archive (recording + slide deck) at www.chba.ca/NZwebinars.
- **You will be in “listen-only” mode** for the duration of the webinar.
- **After the presentation we will have time for questions. Please use the question section of the dashboard** throughout the webinar and your questions will be relayed to the presenter(s).
- You can **change your screen view** by clicking on the  **View icon** in the top right corner, and by dragging the slider between sections to make the slideshow and webcams smaller/larger.

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- Building Net Zero Energy/Net Zero Energy Ready Homes
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- Eliminating Thermal Bridges and Online Design Tools
- High Performance Building Envelope Solutions



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SILVER



BRONZE





Today's Webinar

May 17, 2023 from 10:30-11:30 PT / 1:30-2:30 ET

Cost-Effective Net Zero Achieved Through Collaboration: A Success Story

Presented by:

- **Luis Faria**, Technical Manager, Western Canada, Building Materials Group, Owens Corning
- **Pretum Narang**, Purchasing & Estimating Manager, Cedarglen Homes
- **Tyler Hermanson**, Director, 4 Elements
- **Ben Hildebrandt**, Principal Investigator, Building and Material Sciences, Green Building Technologies, Applied Research and Innovation Services, Southern Alberta Institute of Technology

Net Zero construction is a crucial step towards reducing our carbon footprint and creating more sustainable communities. However, achieving Net Zero performance requires a collaborative effort from all parties involved. In this webinar, you'll learn about the successful collaboration between Cedarglen Homes, SAIT, 4Elements, and Owens Corning in building a CHBA Qualified Net Zero Home. The construction team faced several challenges during the project, but their commitment to using higher quality insulation materials paid off in the end, and the home received an EnerGuide rating of 0 and a CHBA Net Zero Home label. Our panel of experts will share their insights and experiences in achieving Net Zero, including:

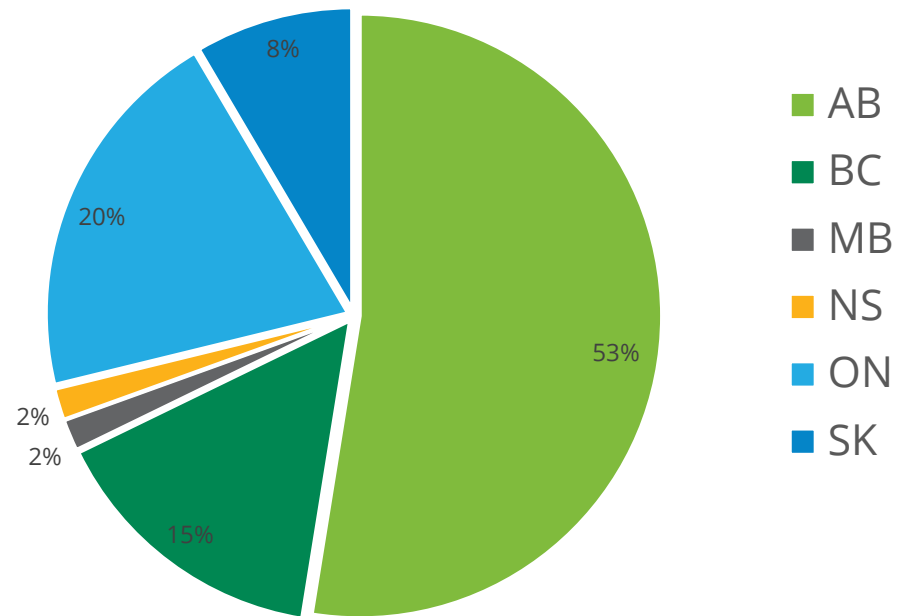
- The importance of collaboration
- The role played by each partner
- The benefits of using high-quality insulation materials
- The challenges faced during the project and how they were overcome
- The economic and environmental benefits of Net Zero

CHBA Members will be able to access the webinar recording and slide deck at chba.ca/NZwebinars

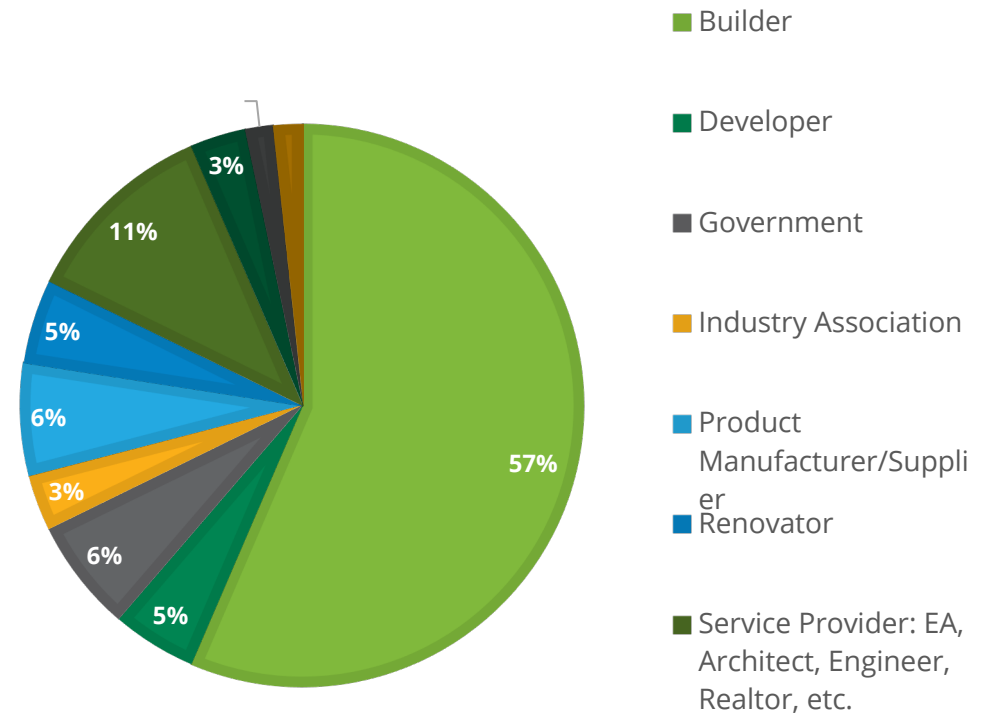


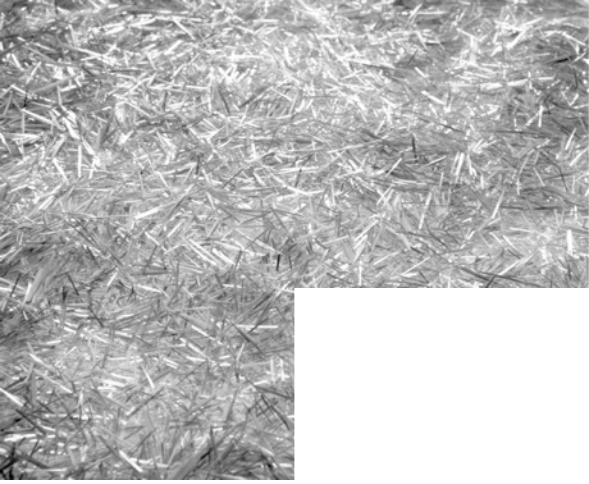
POLLS

WHERE ARE YOU TUNING IN FROM?



WHICH OF THE FOLLOWING BEST DESCRIBES YOU?





Cost-Effective Net Zero Achieved Through Collaboration A Success Story

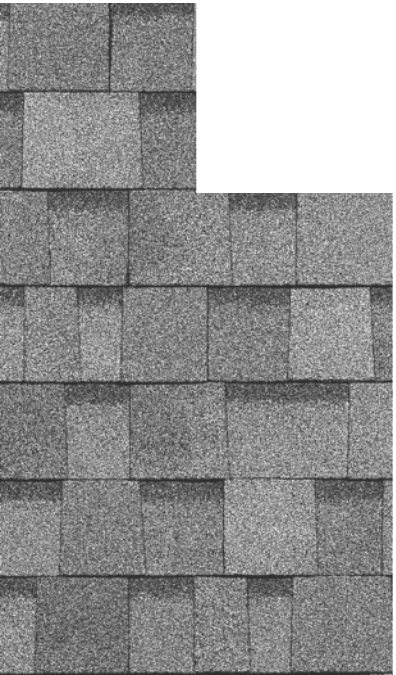


Pretum Narang – Cedarglen Homes

Tyler Hermanson – 4 Elements

Ben Hildebrandt – SAIT

Luis Faria – Owens Corning



THE OWENS CORNING BUILDING SCIENCE TEAM



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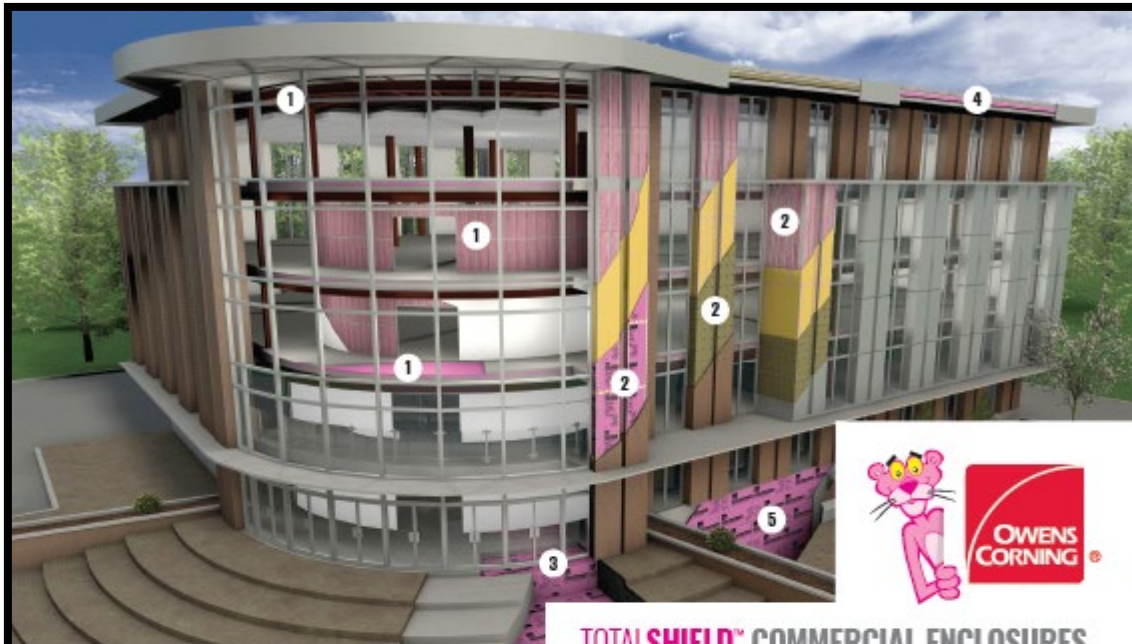
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TOTALSHIELD™ COMMERCIAL ENCLOSURES

DELIVERING A DIFFERENCE

1 INTERIOR WALLS & ACOUSTICS

Thermafiber® SAFB™ Mineral Wool Insulation
Or

EcoTouch® QUIETZONE® **PINK®** FIBERGLAS®
Acoustic Insulation

SelectSound® Black Acoustic Blanket or Board
QUIETZONE® Acoustic Floor Mat

2 EXTERIOR WALLS

Thermafiber® RainBarrier® ci HC 80/110/Max

FOAMULAR® NGX™ CodeBord®/C-200

Extruded Polystyrene Rigid Insulation

EcoTouch® **PINK®** FIBERGLAS® Insulation

JointSealR™ Joint Seal Tape

3 UNDER SLAB

FOAMULAR® NGX™ 400/600/1000 High Density
Extruded Polystyrene Rigid Insulation

4 ROOFING

FOAMULAR® NGX™ 350 Roof Insulation

5 PERIMETER FOUNDATION WALLS

FOAMULAR® NGX™ C-300 Extruded
Polystyrene Rigid Insulation

Using Owens Corning® EcoTouch® **PINK®** FIBERGLAS® Insulation, **FOAMULAR® NGX™** Rigid Foam Insulation and **Thermafiber®** Mineral Wool Insulation helps provide a durable, energy efficient building enclosure. Look to Owens Corning products for energy efficient, acoustically sound and cost efficient solutions in institutional, commercial and industrial buildings.

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99% SAFER FIRE PERFORMANCE*
No added fire retardants

PRECISION



FASTER INSTALL AND PASSES INSPECTION

COMFORT



FEELS SOFT AS COTTON

SUSTAINABILITY



MADE WITH 100% WIND-POWERED ELECTRICITY

Introducing the Next Generation of **PINK® FIBERGLAS®**. Owens Corning® **PINK** Next Gen™ FIBERGLAS® insulation is made for a new generation. For people who consider their options carefully when choosing the products they want to build, work and live with every day. For people who insist on safe, proven materials, demand clean, precise results and work to create comfortable indoor environments while respecting the natural environment we all share. It's not just the next generation of **PINK®** insulation — it's the new standard. And the right choice for safety, precision, comfort and sustainability.

www.owenscorning.ca/PinkNextGen



LESS WASTE MORE SUSTAINABLE

Engineered to make a positive impact on environmental and building performance.

MADE WITH 100% WIND-POWERED ELECTRICITY*

HIGHEST RECYCLED CONTENT IN THE INDUSTRY²

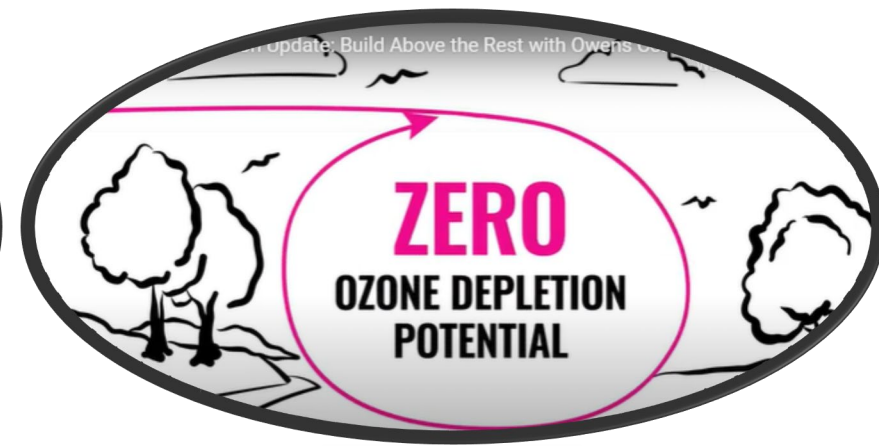
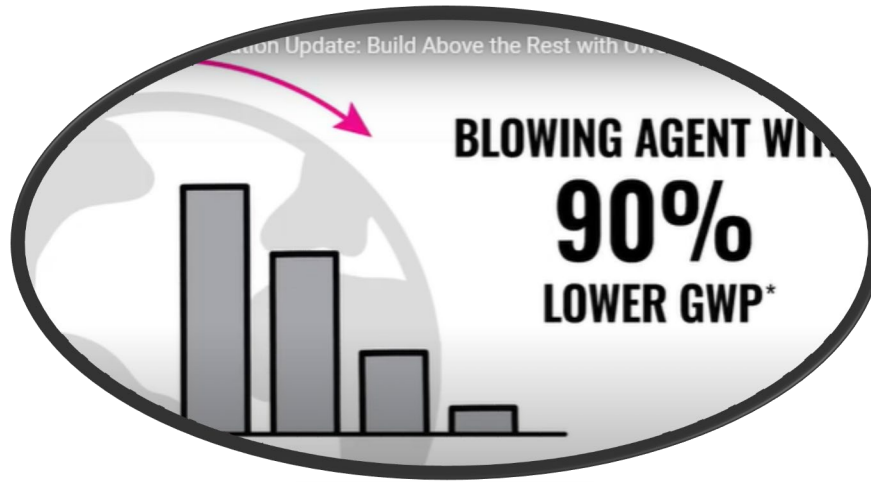
NO MIXING OF HAZARDOUS CHEMICALS ON SITE

SAVES 12X ENERGY
used to produce it in just one year³

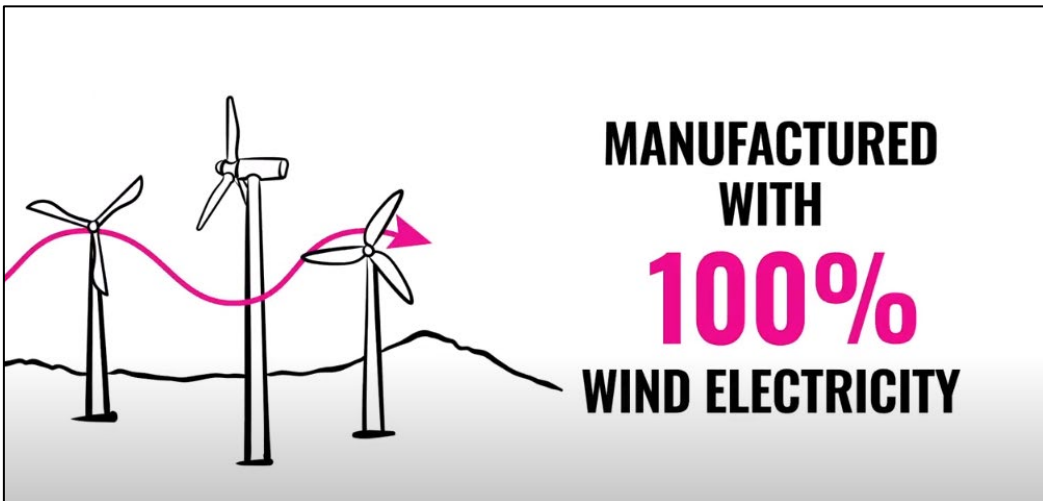
1.3 BILLION POUNDS OF GLASS RECYCLED PER YEAR⁴

NON-COMBUSTIBLE





WITH EVERY 10 BOARDS INSTALLED



ONE COMPANY, ONE PURPOSE, ONE WORLD

2030 SUSTAINABILITY GOALS INCLUDE:

REDUCING OUR ENVIRONMENTAL FOOTPRINT

Reducing GHG
emissions by:

50%

EXPANDING OUR PRODUCT HANDPRINT

Sourcing

100%

renewable electricity to
reduce product embodied
carbon

EXPANDING OUR SOCIAL HANDPRINT

Build Support

inclusive and diverse teams
reflecting the communities
where we live, work, and serve.

Maximize product sustainability,
Reduce consumption of virgin materials
Increase end-of-life reuse and recycling

Integrated Design Process **Team**



Pretum Narang
Cedarglen Homes



Tyler Hemerson
4 Elements



Ben Hildebrandt
SAIT

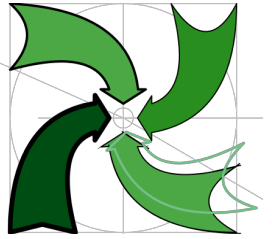


Luis Faria
Owens Corning

Cedarglen Homes

The importance of Partnership

cedarglen HOMES



4 Elements



Applied Research
and Innovation Services

**Green Building
Technologies**





Net Zero Energy Construction: Overview

The emergence of Net Zero Energy Construction is a truly revolutionary way to build homes that helps minimize energy usage and carbon emissions. By taking a comprehensive approach to residential construction, this process offers a range of potential long-term benefits.

Benefits of **Net Zero** Energy Construction



Reduced Carbon Footprint

Net Zero Energy Construction reduces the amount of carbon emissions released into the atmosphere.



Lower Utility Bills

Net Zero Energy Construction reduces the amount of energy needed to power a home, resulting in lower utility bills*.



Increased Home Value**

Net Zero Energy Construction increases the value of a home due to its energy efficiency.

* Savings may vary based on various factors ** source: www.chba.ca/netzero

Net Zero Energy Construction is an effective way to reduce carbon emissions, lower utility bills, and increase the value of a home. It is an important part of Canada's Residential Construction Revolution!

Importance of Insulation in **Net Zero** Construction



- **Minimizes heat loss in winter and heat gain in summer**
- **Reduces energy consumption**
- **Improves indoor air quality**
- **Reduces noise pollution**
- **Provides a comfortable living space**
- **Resiliency... and much more!**

Cedarglen Homes

Net-Zero Project Overview

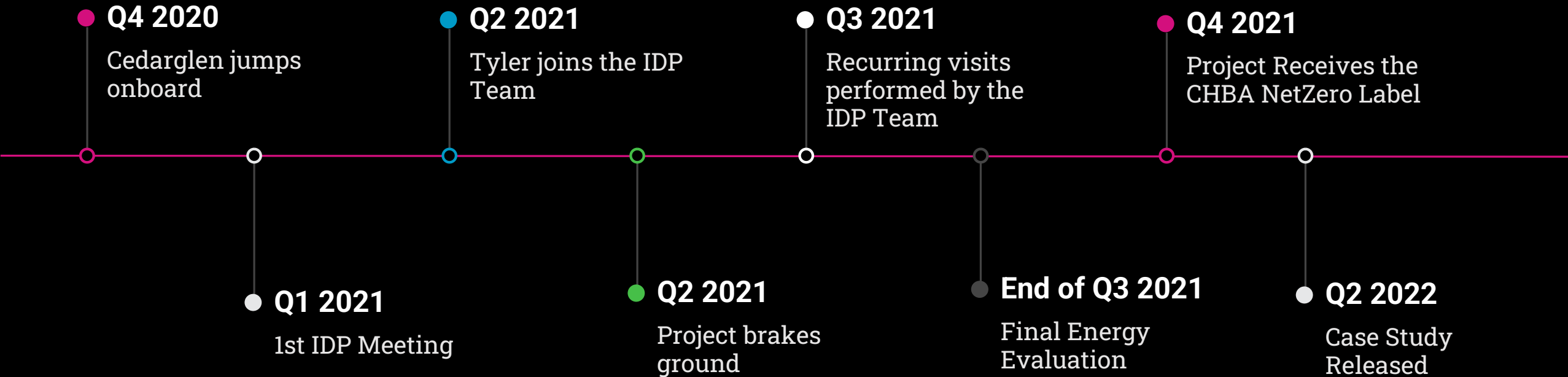
Project Overview

- Cedarglen's 1st NetZero Project
- 1000 sq.ft (93 m²) bungalow with detached garage
- Climate Zone 7A: Central-North Calgary
- The home is oriented with the front door facing directly north - This site was intentionally selected as it presented non-ideal conditions for solar energy generation which typically reduce the Net-Zero potential of a home.



One of the key goals of this case study was to demonstrate that a high efficiency, or in this case Net-Zero, home can be achieved on a less-than-ideal site

Cedarglen Homes NetZero Home Project Timeline



Cedarglen Homes – NetZero Approach

ASSEMBLY	BENCHMARK HOME	NET-ZERO HOME
Roof Assembly	Asphalt shingles, OSB, insulation (type not specified), polyethylene vapour barrier, interior insulation Nominal R-value: R-42.74	Asphalt shingles, OSB, fiberglass insulation (type not specified), polyethylene vapour barrier, interior gypsum Effective R-value: R-58.43
Exterior Wall Assembly	Vinyl cladding, OSB exterior gypsum, batt insulation, polyethylene vapour barrier, interior gypsum Nominal R-value: R-22.97	Vinyl cladding, strapping, Thermafiber® RainBarrier® ci High Compressive Plus (110) Mineral Wool Insulation, OSB or exterior gypsum, fiberglass batt insulation, polyethylene vapour barrier, interior gypsum Effective R-value: R-30.31
Below Grade Foundation Assembly	Concrete, batt insulation, polyethylene vapour barrier Nominal R-value: R-13.4	Dimple membrane, FOAMULAR® C-300 Extruded Polystyrene Rigid Insulation, concrete, fiberglass batt insulation, polyethylene vapour barrier Effective R-value: R-27.16
Basement Slab Assembly	Polyethylene vapour barrier, concrete Nominal R-value: R-2	Spray foam insulation, concrete Effective R-value: R-13.17



Load Short Form **Entire House** 4 Elements Intergrated Design LTD

Job: 42119
Date: Jun 07, 2021
By: Cooper Le
Plan: 29LucasRiseFinalPlan.pdf

Project Information

For: Pretum Narang, Cedarglen Homes
4771 110 Avenue SE, Calgary, AB T2C 2T8
Phone: 403-212-8640
Web: www.cedarglenhomes.com Email: Pretum.Narang@cedarglenhomes.com

Design Information

	Htg	Cig	Infiltration	
Outside db (°F)	-22	82	Method	F280-12
Inside db (°F)	70	75	Expos. categ	Heavy shielding
Design TD (°F)	92	7	Const. categ	Energy Tight (ACH=1.5)
Daily range	-	M	Number of stories	1.0
Inside humidity (%)	50	50		
Moisture difference (grlb)	53	0		

HEATING EQUIPMENT

Make	Mitsubishi
Trade	
Model	Zuba Central 3 Ton
AHRI ref	
Efficiency	0 HSPF
Heating input	0 Btuh @ 47°F
Heating output	0 °F
Temperature rise	0 °F
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	
Capacity balance point = 0 °F	

Backup: Elec baseboard
Input = 24576 Btuh, Output = 24576 Btuh, 100 EFF

ROOM NAME	Area (ft²)	Htg load (Btuh)	Cig load (Btuh)	Htg AVF (cfm)	Cig AVF (cfm)
1F	p	891	11582	7431	0
2F	p	798	12994	901	0
Entire House	d	1689	24576	8332	0
Other equip loads			0	0	
Equip. @ 1.00 RSM			8332	0	
Latent cooling			2500	0	
TOTALS		1689	24576	10832	0

COOLING EQUIPMENT

Make	Mitsubishi
Trade	
Cond	Zuba Central 3 Ton
Coil	
AHRI ref	
Efficiency	0 SEER
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	367 cfm
Air flow factor	0.044 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.77



Building Analysis **Entire House** 4 Elements Intergrated Design LTD

Job: 42119
Date: Jun 07, 2021
By: Cooper Le
Plan: 29LucasRiseFinalPlan.pdf

Project Information

For: Pretum Narang, Cedarglen Homes
4771 110 Avenue SE, Calgary, AB T2C 2T8
Phone: 403-212-8640
Web: www.cedarglenhomes.com Email: Pretum.Narang@cedarglenhomes.com

Design Conditions

Location:	Calgary, AB, CA	Indoor:	Indoor temperature (°F)	70	Heating	70	Cooling	75
Elevation:	3556 ft	Design TD (°F)	92	7				
Latitude:	51°N	Relative humidity (%)	50	50				
Outdoor:		Moisture difference (grlb)	53.5	0				
Dry bulb (°F)	-22	Infiltration:						
Daily range (°F)	-	Method	F280-12					
Wet bulb (°F)	-	Expos. categ	Heavy shielding					
Wind speed (mph)	9.3	Const. categ	Energy Tight (ACH=1.5)					
		Number of stories	1.0					

Heating

Component	Btuh/ft²	Btuh	% of load
Walls	1.4	8816	35.9
Glazing	15.3	2755	11.2
Doors	20.5	1019	4.1
Ceilings	1.6	1304	5.7
Floors	7.0	7253	29.5
Infiltration	14.6	3339	13.6
Ducts		0	0
Hydronic		0	0
Humidification		0	0
Ventilation		0	0
Adjustments		0	0
Total		24576	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	0.1	376	4.5
Glazing	20.1	3611	43.3
Doors	1.6	79	0.9
Ceilings	0.6	521	6.3
Floors	0	0	0
Infiltration	0.3	59	0.7
Ducts		0	0
Ventilation		0	0
Internal gains		3686	44.2
Blower		0	0
Adjustments		0	0
Total		8332	100.0



Latent Cooling Load = 2500 Btuh
Overall U-value = 0.028 Btuh/ft²-°F

Data entries checked.



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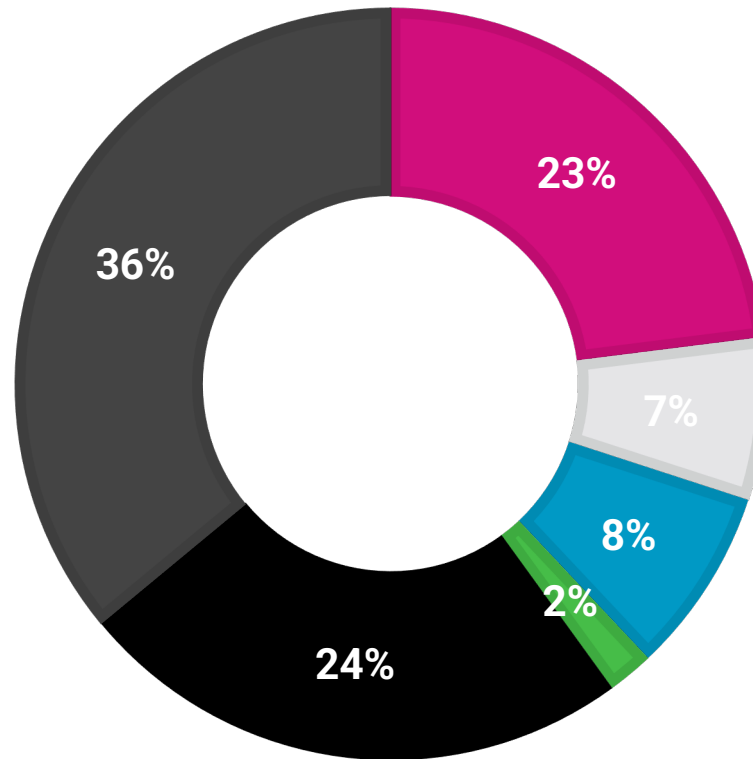


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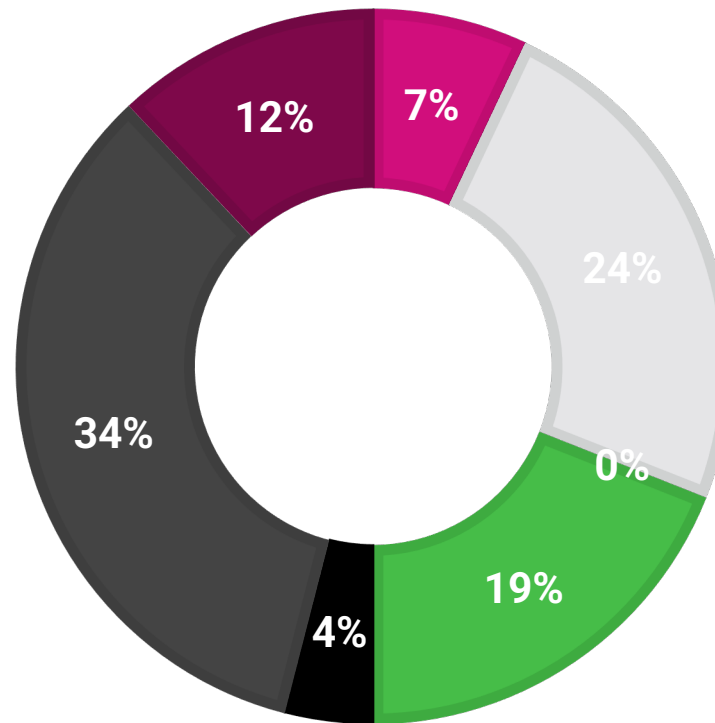
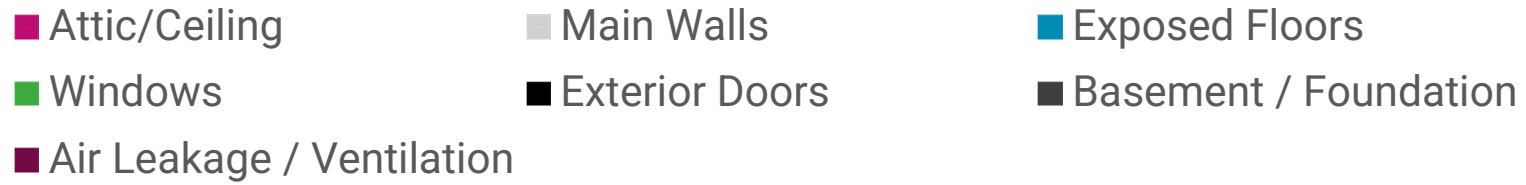
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Page 1

Cedarglen's Net Zero Home Energy Consumption

■ Space Heating ■ Space Cooling ■ Water Heating
■ Ventilation ■ Lights and Appliances ■ Other Electrical Loads



Heat Loss





THIS LABEL IS FOR THE FOLLOWING HOME:

BUILDER/RENOVATOR:

Cedarglen Homes Inc.

ENERGY ADVISOR:

Cooper Le, 9402

SERVICE ORGANIZATION:

4 Elements Integrated Design LTD.

CHBANZH ID#:

114-00015

DATE APPROVED:

12/15/2021

This label indicates that this home is recognized by the Canadian Home Builders' Association (CHBA) based on the attestations by the builder, its Net Zero Qualified Service Organization and a Net Zero Qualified Energy Advisor, that the home has met CHBA's Net Zero Home Program Technical Requirements, including the energy performance rating according to the Government of Canada's EnerGuide Rating System.

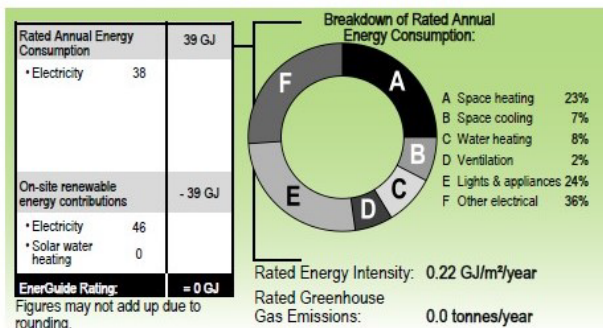
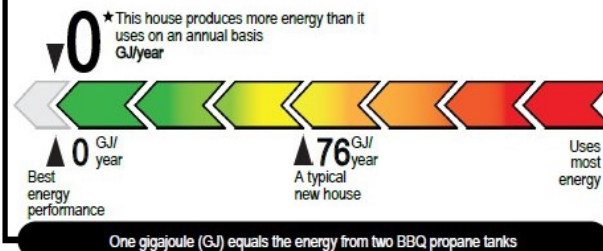
More information is available at www.NetZeroHome.com

ENERGUIDE

Data collected: December 9, 2021

File number: 9402N00654

Evaluated by: Cooper Le



The energy consumption indicated on your utility bills may be higher or lower than your EnerGuide rating. This is because standard assumptions have been made regarding how many people live in your house and how the home is operated. Your rating is based on the condition of your house on the day it was evaluated.

Quality assured by: 4 Elements Integrated Design LTD

Builder: Cedarglen Homes Inc.

Visit NRCan.gc.ca/myenerguide



Natural Resources
Canada

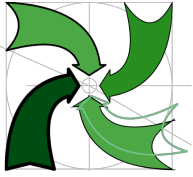
Ressources naturelles
Canada

Canada

Partners Contribution

- The Southern Alberta Institute of Technology's Green Building Technology Department is contributing to building net-zero homes in Alberta through research, development, and training programs.
- The department's research focuses on developing new technologies and building design strategies that can help to reduce energy consumption and increase renewable energy production in homes.
- The department's training programs provide education and certification opportunities for industry professionals, helping to build capacity in the green building sector.
- The department also collaborates with industry partners to test and implement new technologies in real-world settings, helping to ensure that net-zero homes are practical and affordable for homeowners.





4 Elements

- An energy advisor plays a crucial role in ensuring that the building envelope of a high-performance building meets the energy efficiency standards set by various building codes and regulations.
- The energy advisor conducts energy audits to identify areas where energy efficiency can be improved, such as through better insulation or sealing air leaks.
- The energy advisor also works closely with architects, engineers, and contractors to ensure that energy-efficient materials and systems are selected and properly installed during construction.
- After the building is complete, the energy advisor continues to monitor energy usage to identify areas where further improvements can be made and recommends ways to optimize energy efficiency over the building's lifetime.

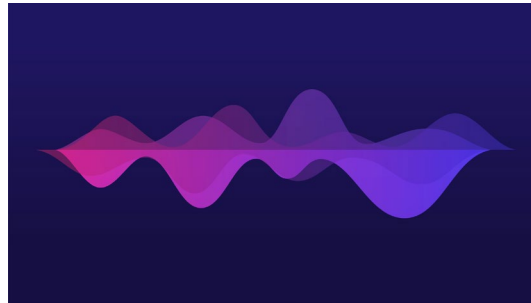


Cedarglen Homes Net-Zero Project: Insulation Choices



Fire Resistance

Thermafiber provides fire resistance, helping to protect against the spread of flames and smoke.



Sound Absorption

Thermafiber helps reduce sound transmission, helping to create a quieter environment.



Mold Resistance

Thermafiber is mold and mildew resistant, helping improve indoor air quality.

Owens Corning Thermafiber provides superior fire resistance, sound absorption, and mold resistance, making it an ideal choice for insulation.

Cedarglen Homes Net-Zero Project: Insulation Choices

Owens Corning®

FOAMULAR® NGX™

HIGH-PERFORMANCE XPS INSULATION



Energy Efficiency

"Foamular® NGX™ provides superior moisture resistance and is designed to help improve energy efficiency"



Durability

Foamular® NGX™ is designed to withstand harsh conditions and provide long-term proven performance.



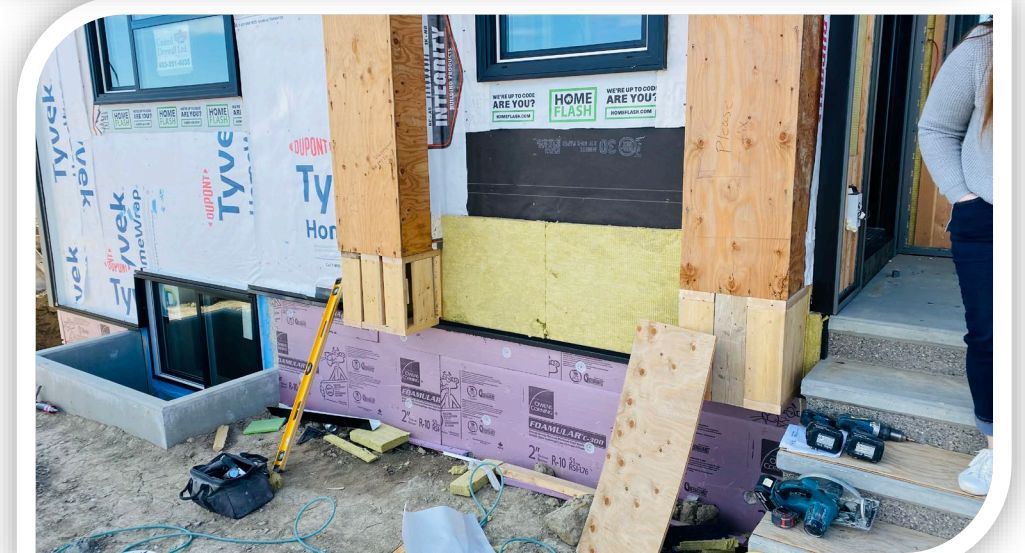
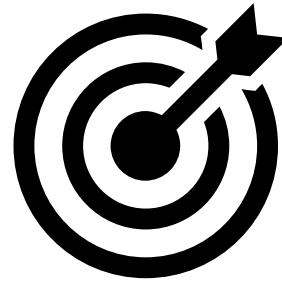
High R-Value

Foamular® NGX™ provides a thermal performance of R-5 per inch

Foamular® NGX™ is an excellent choice for insulation, providing superior moisture resistance with proven performance .

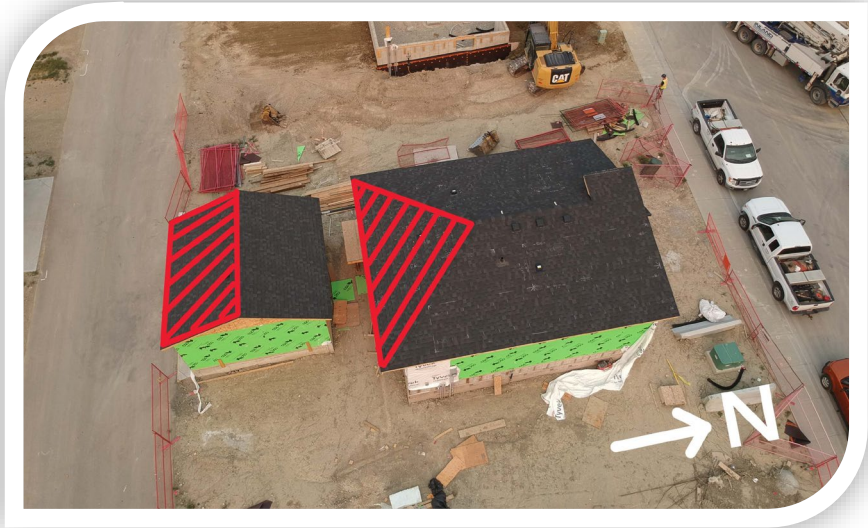
Foamular® NGX™ and Thermafiber

A powerful combination



Lessons Learned

Challenges



Lot Orientation



Alignment with Trades Partners



Trades Learning Curve



Trades involvement during the IDP



Increased Testing and Verification during construction

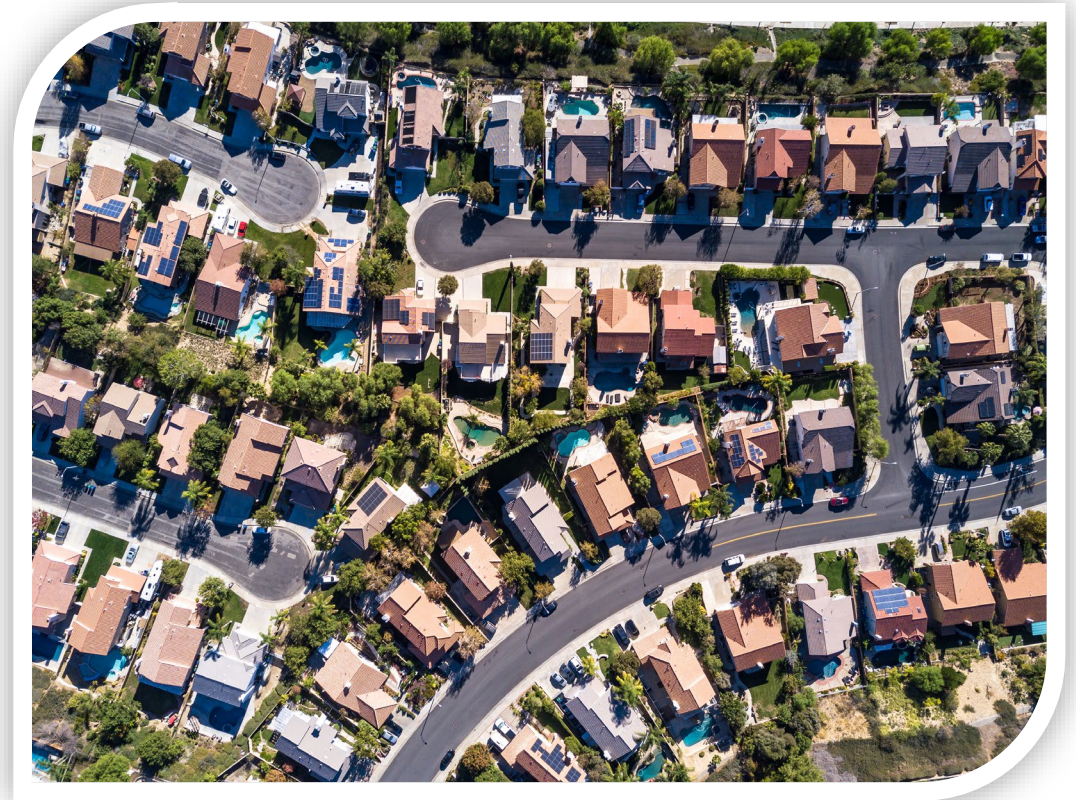


Mechanicals: data for Climate zone 7A

4 Elements's team contribution was key to achieving the Netzero target with the products & equipment available

Partnering for Net-Zero Construction

Collaboration between energy advisors, builders, trades course providers, and manufacturers is essential to achieve net-zero ready constructions, as it allows for the integration of innovative building practices and the implementation of new technologies that can reduce energy consumption and greenhouse gas emissions in the construction industry



Key Takeaways



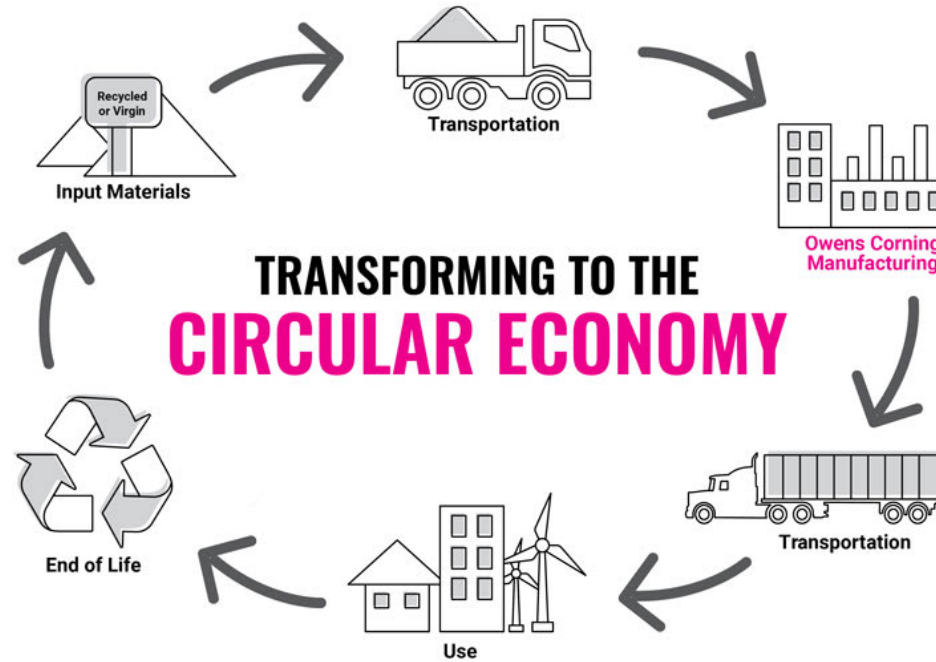
The demand for net-zero homes is increasing as people become conscious and seek to help reduce their carbon footprint.

Insulation is a crucial component of net-zero construction and plays a significant role in maintaining consistent indoor temperatures, reducing energy consumption and enhancing indoor air quality.

High-quality insulation products, such as Owens Corning's Thermafiber RainBarrier ci High Compressive Plus (110) Mineral Wool Insulation and FOAMULAR® NGX™ C-300 Extruded Polystyrene Rigid Insulation, are essential for achieving net-zero construction.

Owens Corning Environmental Commitment

**Avoid the use of virgin raw materials
whenever possible.**



**Source materials and serve
customers in ways that minimize
transportation and its impact.**

**Ensure that materials used in our
products and packaging remain in
the economy indefinitely.**

**Manufacture products in ways
that reduce the amount of waste
generated and ensure the least
negative environmental impact**

We envision a world in which every raw material or resource, extracted for our products and processes, remains in the economy indefinitely. We recognize the level of collaboration this requires, involving all our partners throughout our value chain. The work we do today will have an impact that will last far beyond 2030.

HIGH PERFORMANCE BUILDING ENVELOPES



WESTERN CANADA

Luis Faria, B.Eng, PMP, CMgr MCMI
Technical Sales Manager, Western
Canada

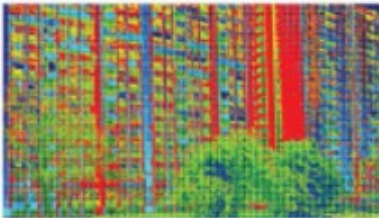
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THANK YOU !



Fire



Thermal



Acoustics



Moisture



Questions

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