

# Decarb Lunch Series

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B2E

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## HomeZero: Clean Energy Retrofits in Vernon

Fri June 28, 2024,  
from 12 - 1pm PST  
Free Webinar | [zebox.org](https://zebox.org)

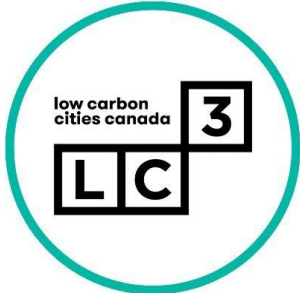


Vancity



# zeic

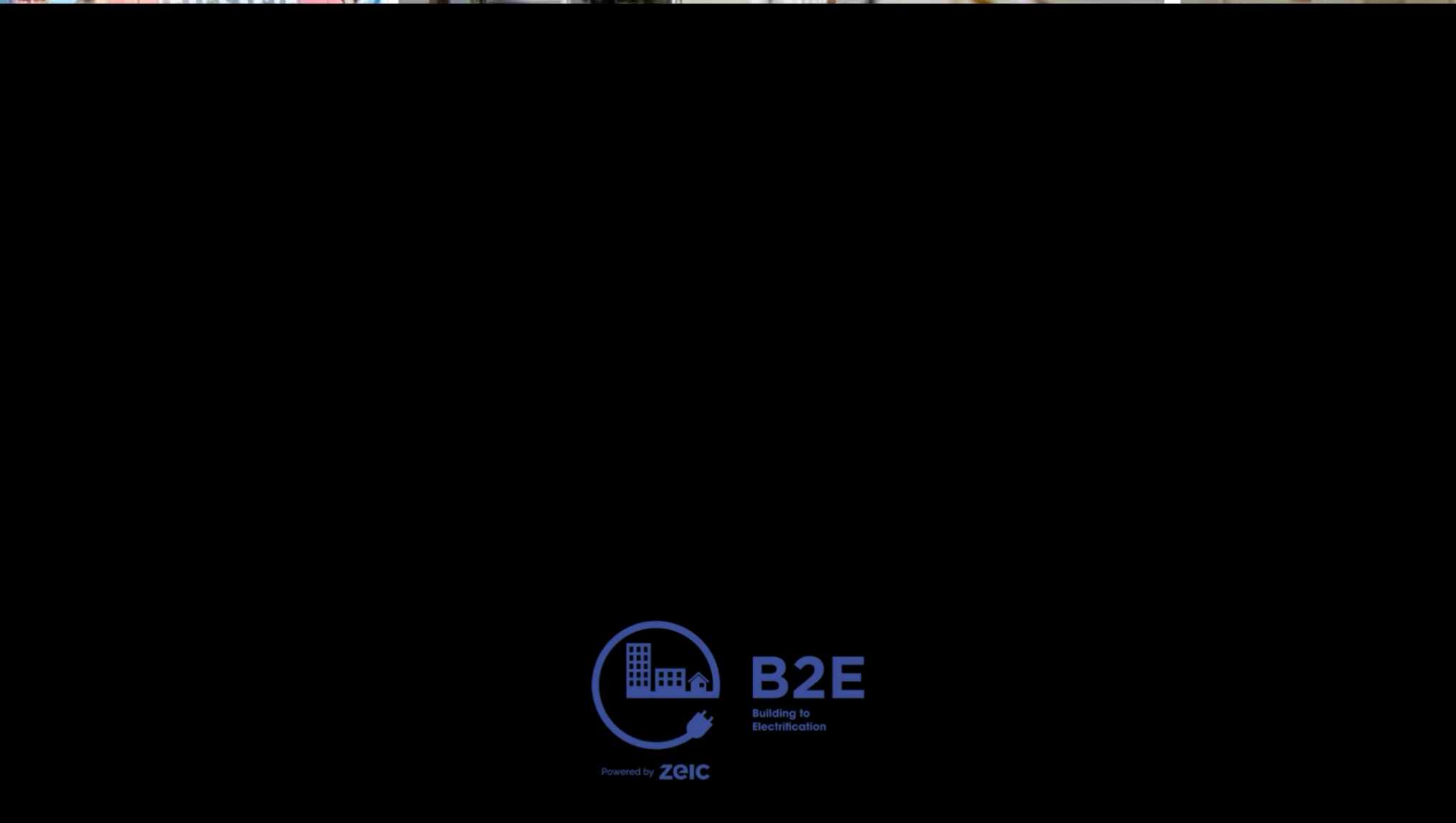
ZERO EMISSIONS INNOVATION CENTRE



**zeic**'S **BUILDING** DECARBONIZATION TEAM

A collection of logos for partner organizations, all contained within a rounded rectangular border. The logos are arranged as follows: "B2E" with a circular icon of buildings and a plug; "NearZero" with a leaf icon; "BC Retrofit ACCELERATOR" in bold text; "CLF" with "Carbon Leadership Forum British Columbia" to its right; and "zebx" in orange and grey text at the bottom center.

We are a broad coalition working together to electrify buildings in British Columbia in order to reduce their climate impacts and reliance on fossil fuels.





# How are B.C.'s homes heated?



Electricity:

Space heating **32%**

Water heating **21%**



Natural gas:

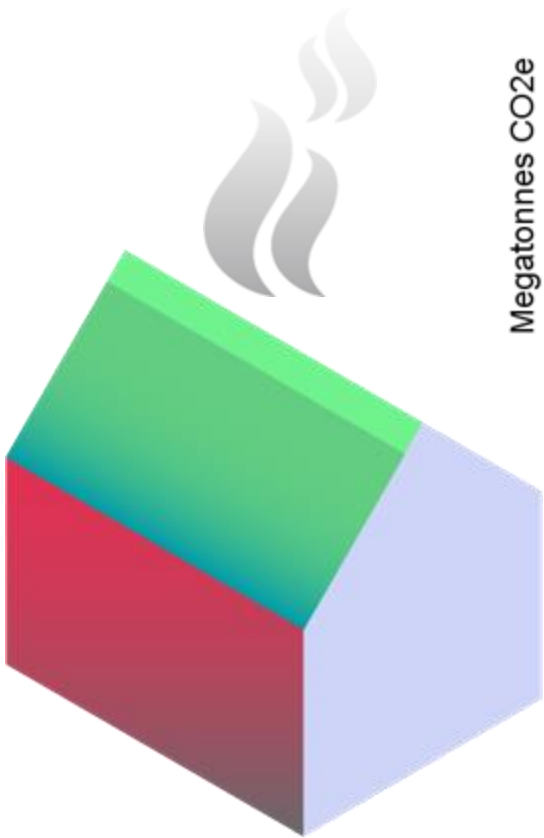
Space heating **58%**

Water heating **79%**

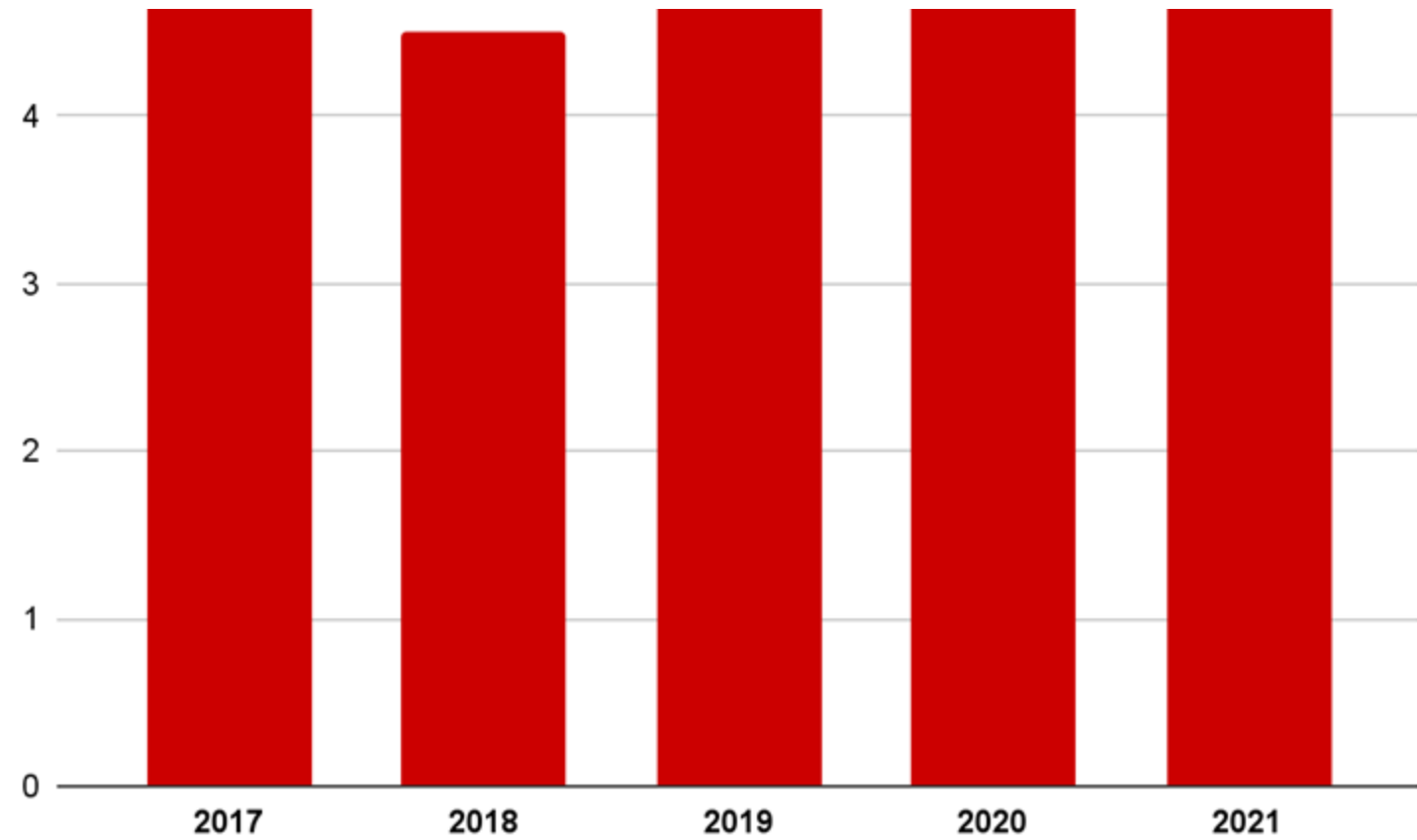
12% of British  
Columbia homes now  
use heat pumps  
**+70% since 2021**



# Why Existing Building Emissions Matter

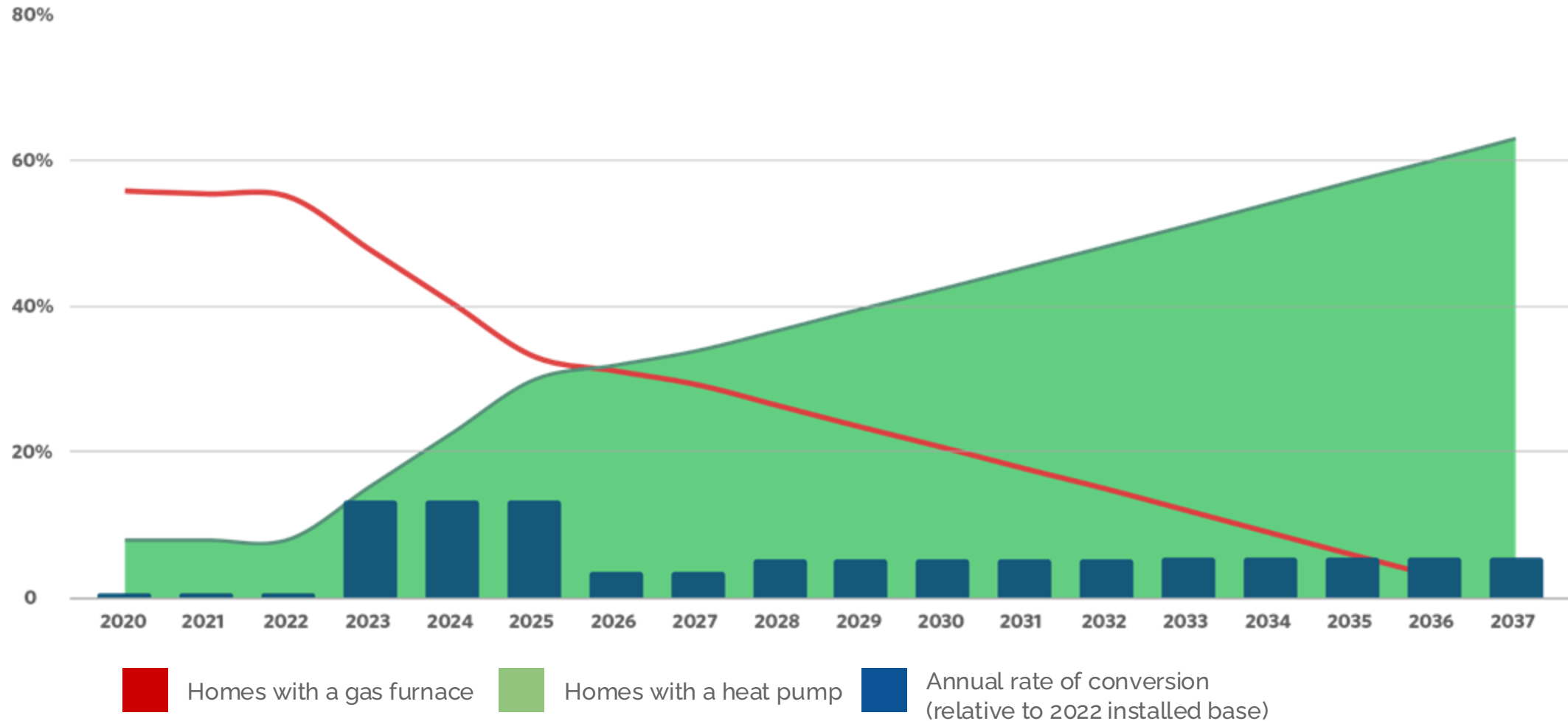


Megatonnes CO2e



# The Scale of Opportunity

Year-by-year market transformation needed to meet provincial climate targets







**Clean Energy Neighborhoods, Vernon BC**

**Retrofitting with Geothermal Heat Pumps**

Presenters: **Amandeep Singh**, HomeZero Collective

**Natalie Appleton**, Homeowner

**Nick Croken**, Okanagan Geothermal

# Homeowner Challenges

## 1. High Cost Barriers for Homeowners are limiting adoption

- Central Air Source Heat Pump: \$15k - \$25k
- Geothermal System: \$50k - \$60k
- Often homeowners sell the home and loans have to be paid off

## 2. Change is complex for homeowner

- Learn about the problem and study various solutions
- Find qualified people to complete the work
- Project managing the change is a significant barrier



# HomeZero Solution

## 1. Retrofit at a Neighborhood Scale to reduce costs

Pilot project offers a subsidy in addition to existing government rebates

<b>Air Source Heat Pump Package 85% - 95% Emissions Reductions</b>	<b>Geothermal Heat Pump Package 100% Emissions Reductions</b>
<u>Subsidy offered: \$10,000</u>	<u>Subsidy offered: \$30,000</u>
Cold climate air source heat pump	Geothermal heat pump
Heat pump water heater	Heat pump water heater
Solar panels	Solar panels
EV charging receptacle	EV charging receptacle
Electrical and building envelope upgrades (if required)	Electrical and building envelope upgrades (if required)

# HomeZero Solution

## Monthly Costs



Utility costs go down, save money

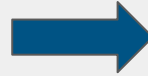


Amortize the cost over 10 years, interest free

Use monthly savings to pay down the loan



Costs roughly balance each other out



New Equipment

Protection from rising utility costs

Reduction of emissions at a low cost



# HomeZero Solution

## **2. Offer a complete turnkey solution**

- Community based education on clean energy systems
- Project management with highly qualified installers
- 3-way contract
- Ensure quality work – we hold back funds until all projects are complete
- Navigate homeowner through all applicable rebates for their retrofit

**Maximize benefits, minimize friction, increase adoption**



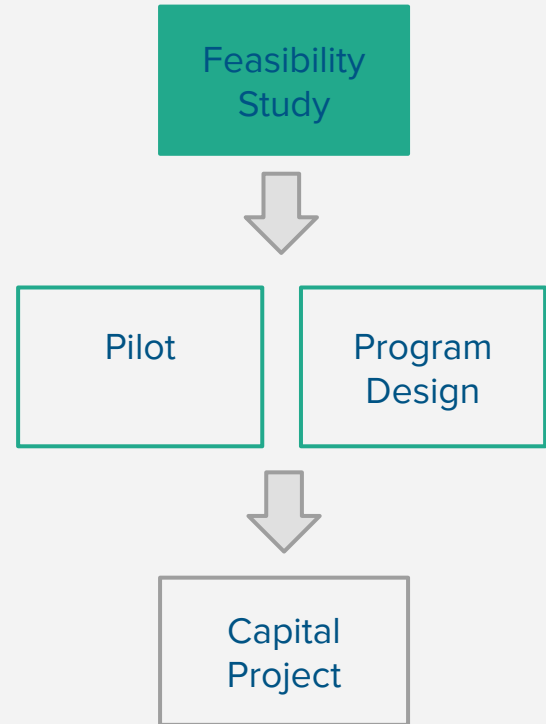
Federation of Canadian Municipalities

Administers \$1.6 billion Green Municipal Fund

Goal: Develop Bold, Transformative, Replicable Building Retrofit Programs

FCM Pilot Funding: \$500,000

BC Hydro **Low Energy Efficiency Partnership (LEEP)** program participant



# Pilot Project

## Deep Energy Retrofits

7 Homes with Air Source Package

4 Homes with Geothermal Package

May 2024 - September 2024



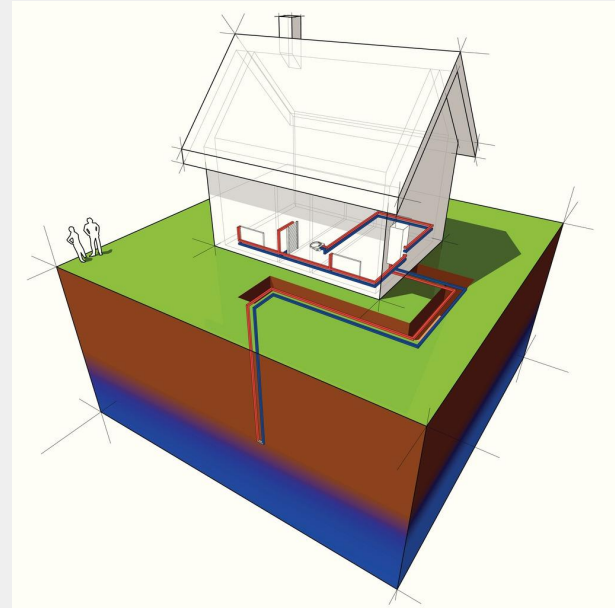
# Geothermal Systems – Ground Source Heat Pumps

The ground maintains a steady temperature through the seasons.

Extract heat from the ground in the winter

Push heat to the ground in the summer

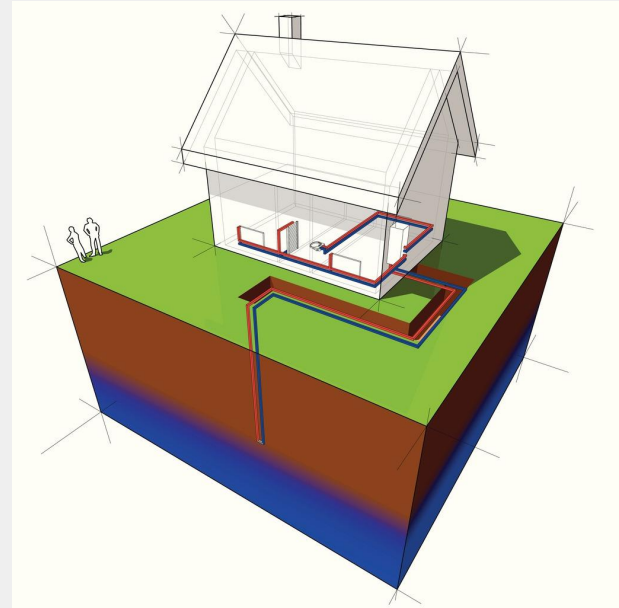
Mild temperature makes heat extraction very efficient



# Geothermal Systems – Ground Source Heat Pumps

System has two components:

1. Ground Loop
2. Geothermal Heat Pump





## Pilot Home 2

- 2500 Square Feet
- Built 1979
- 100 AMP service

**100% emissions reduction**  
**100% solar coverage**

- Geothermal heat pump
- EV Charger with load management
- Solar PV 10.4 KW
- Heat pump hot water system



# Drilling

## Pilot Home 2







Excavation

Landscape

Restoration





# Geothermal Heat Pump Installation



# Peak Load Management

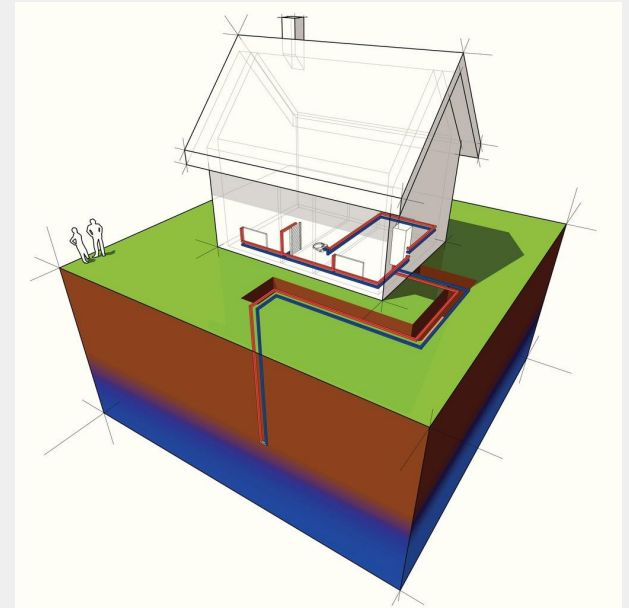
Efficiencies of a Cold Climate Air Source decrease as the temperature gets extreme.

Ground temperature does not fluctuate as the ambient temperature.

Ground source heat pumps can continue maintaining a high level of efficiency even when there is an extreme temperature outside.

## Ontario Clean Air Alliance Research

Having geothermal systems in the mix makes it possible to reduce peak loads



**Coefficient of Performance (COP)**

# Pilot Project Lessons Learned

1. Homeowners are willing to spend money to retrofit when you present a simple fully managed process.
2. 50% of homeowners prefer geothermal systems over air source heat pumps, if the price difference is reasonable
3. Community engagement and simplified offerings are key to signing up homeowners

# Homeowner Experience

## Natalie Appleton



### What makes an average homeowner take the leap?

- Aging infrastructure
- Logistics & funding support
- Climate change action

### What has been her experience so far?



# Natalie Appleton's Yard

## During Loop Installation



## After Loop Installation



# Contact Us:

## Financial Institutions, Government, Utilities, and Educational Institutions

Amandeep Singh: [amandeep@homezerocollective.com](mailto:amandeep@homezerocollective.com)



## Home Builders, Contractors, Homeowners

Nick Croken: [nick@okanagangeothermal.net](mailto:nick@okanagangeothermal.net)







# RESOURCES

Enter your search

20 posts found

### Categories

- Articles
- Reports
- Case Studies
- Videos & Slides
- Podcasts

### Series

- Deep Emissions Retrofit Dialogues
- CleanBC Net Zero Energy-Ready Challenge Playbook
- CleanBC Net Zero Energy-Ready Challenge Winners
- Decarb Lunches
- Tech Demo Workshops
- Decarbonization Planning

### Systems

- Mechanical
- Building Enclosure
- Solar Energy
- Geothermal
- Domestic Hot Water Heat Pump

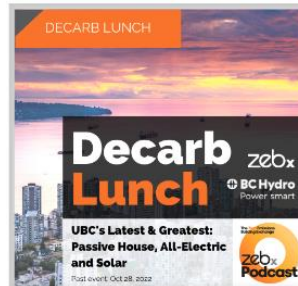
### Subjects

[Reset all](#)

[Podcasts](#) x



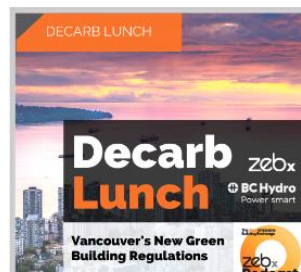
Decarb Lunch: Nov 2022, The OSO Residential Development



Decarb Lunch: Oct 2022, UBC's Latest & Greatest: Passive House, All-Electric and Solar



Decarb Lunch: Sep 2022, Getting Unstuck: Homeowner and Contractor perspectives on home electrification





RESOURCES

ZEBx TV

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### NearZero: Reaching the Top Step

How are homeowners, builders and designers already reaching the highest step of emission reduction requirements? We found some of them from ZEBx's NearZero program, listen to them here.

Overview

Playbooks & Winners



### Is BC Ready for Electrification? B2E w BC Hydro, Sep 2023

B2E, a program alongside ZEBx and part of the ZEIC family, collaborated with BC Hydro in Sep 2023 to help answer the question 'Is BC Ready for Electrification?'

Overview

B2E Resources



### Life Cycle Assessment Process to Estimate Embodied Carbon in Buildings

From ZEBx's Net-Zero Energy-Ready Playbook Series

Overview

Read This Playbook



### Planning Airtight Buildings

From ZEBx's Net-Zero Energy-Ready Playbook Series

Overview

Read This Playbook





NearZero

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## Embodied Emissions

 **Stream 2**

**An applied research project for low-rise homes that minimize embodied emissions.**

## Utility Data

**Stream 4**

**A ZEBx utility data collection initiative to determine the real emissions and energy profiles of BC homes.**

[nearzero.ca](http://nearzero.ca)

zeb<sup>x</sup>



2024 Annual Survey  
We want your feedback!  
Enter to win!

- 1 Complete our 10 minute survey.
- 2 Enter draw to win \$250 (3 prizes).

**Deadline: Jul 14, 2024**

**zeic** 's Building Decarbonization Programs



# zebx

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Working to rapidly accelerate the knowledge, capacity and passion for zero-emissions buildings in Vancouver and British Columbia

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Resources

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