

Decarb Lunch Series

zeb_x

The New Zero Carbon Step Code



Wed May 24, 2023,
from 12- 1pm PDT
Free Webinar | zeb_x.org

The **Zero** Emissions
Building Exchange

Zeb_x

Podcast



RESOURCES

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20 posts found

Categories

- Articles
- Reports
- Case Studies
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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

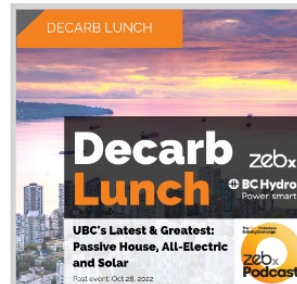
Subjects

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



COLLABORATE
Accelerate Solutions



- Designers
- Builders
- Academia
- Developers
- Manufacturers

zebx

"connecting industry to solutions"

- Government
- Global Experts
- Mission-Aligned Organizations
- Industry Associations

~~ADVANCE~~ ACCELERATE

Remove Barriers & Identify Opportunities



We're in a climate emergency!

SCALE



zeb.org

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.





clfbritishcolumbia.com

ZERO
EMISSIONS
INNOVATION
CENTRE



Renewable Energy



ZERO EMISSIONS BUILDING EXCHANGE



Zero Emissions Vehicles





ZERO CARBON STEP CODE

“By 2030, all new buildings will be zero carbon, and all new space and water heating equipment will meet the highest standards for efficiency.” – *CleanBC Roadmap to 2030*



New Buildings in Victoria to be Zero Carbon by 2025

August 8, 2022

The City of Victoria will require all new construction to be zero carbon by 2025, part of its accelerated climate action plan to achieve an 80% reduction in community greenhouse gas emissions by 2050.

This new requirement will take effect following the introduction of BC Building Code carbon pollution standards later this year. By July 2025, all new buildings in the city will be required to meet a zero carbon standard. This adoption will be about five years ahead of the expected Provincial requirements and is necessary for Victoria to meet the 2030 goals in its Climate Leadership Plan.



SUPPLEMENTARY INFORMATION

Part 9 Energy Step Code Compliance Report

Supplementary information is not required for Code Compliance but may be requested by the local municipality/district.

If required, complete the applicable sections below.

F: OTHER ENERGY MODELLING METRICS

METRIC	UNITS	PROPOSED	AS-BUILT
Airtightness NLA@10Pa	cm ² /m ²		
EnerGuide Rating	GJ/year		
EnerGuide Reference House	GJ/year		
EnerGuide Rating % Lower Than EnerGuide Reference House House with baseloads	%		
Rated Energy Intensity	GJ/m ² /year		
Rated Greenhouse Gas Emissions	kg/year		
Rated Greenhouse Gas Intensity	kg/m ² /year		

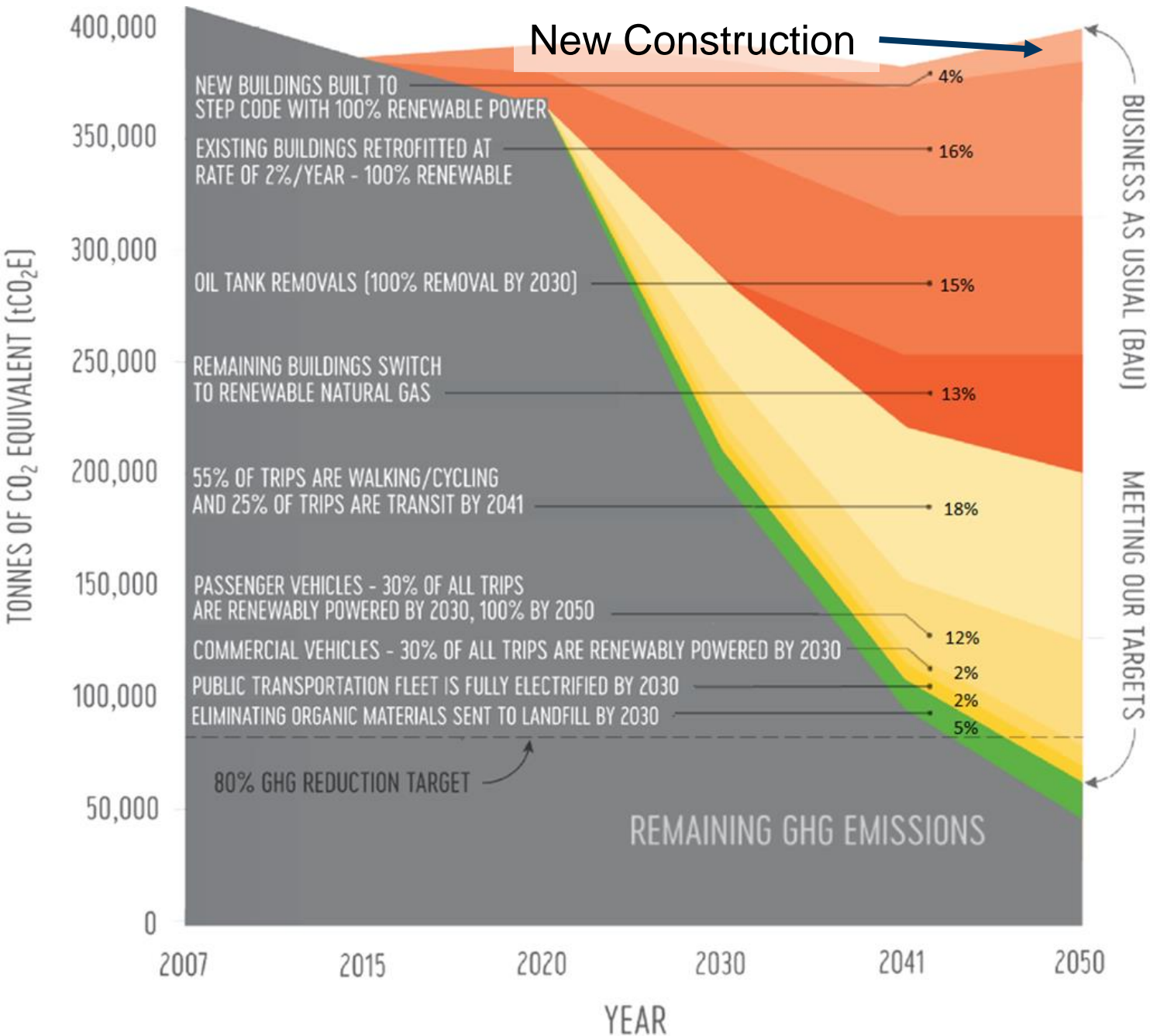




THE ZERO CARBON STEP CODE: IMPLEMENTATION

ZEBX: DECARB LUNCH
DEREK DE CANDOLE
COMMUNITY ENERGY SPECIALIST
CITY OF VICTORIA
MAY 24, 2023

ZERO CARBON
STEPCODE



Emission Reductions Targets

50% GHG emissions reduction by 2030

80% GHG emissions reduction by 2050

100% Renewable Energy by 2050

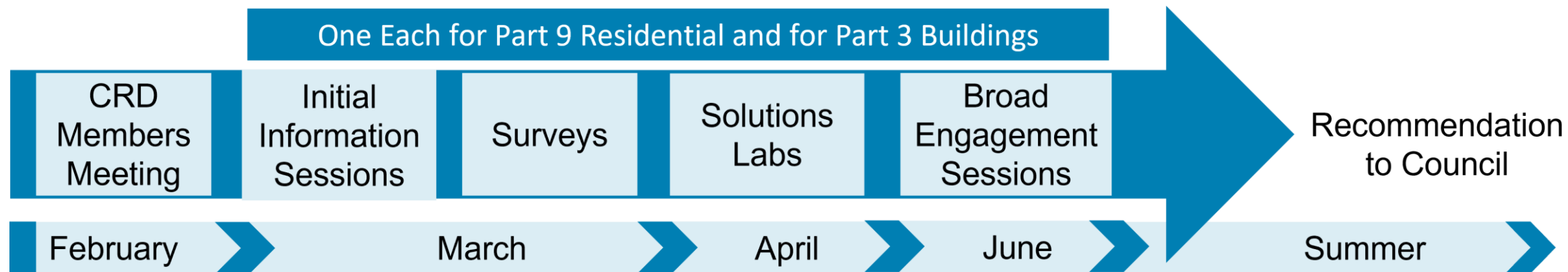
Council Direction

Decarbonize new construction

- Integrate low/zero carbon energy systems into the Step Code approach
- By 2025 for residential less than 6 stories
- By 2027 for greater than 6 stories and commercial



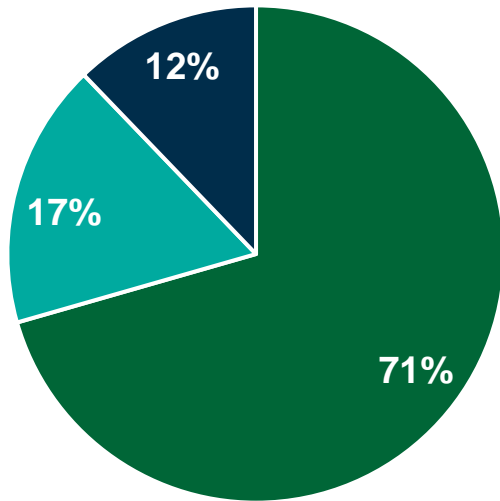
2022 Engagement Summary



2022

Compliance Approaches to Date (regional)

Space Heating by Fuel Type

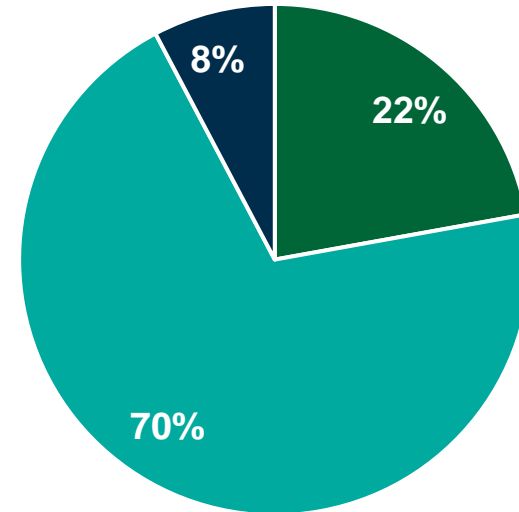


■ Electric ■ Gas ■ Electric and Gas

Common Space Heating Equipment

- Air Source Heat Pumps 57%
- Electric Baseboards: 13%
- Combination NG: 12%

Water Heating by Fuel Type



■ Electric ■ Gas ■ Electric and Gas

Common Hot Water Heating Equipment

- Natural Gas On-demand: 70%
- Electric tanks: 20%

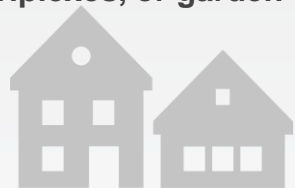
Implementation: District of Saanich + City of Victoria

November
2023



TODAY

Houses, townhouses, duplexes, triplexes, or garden suites.



July 2024



Condos +
Apartments 6
storeys or fewer



November
2024



Offices



All Condos +
Apartments





Zero Carbon Step Code

ZEBx – Decarb Lunch

Scott Williams P.Eng, Senior Code Engineer,
BSSB

May 24, 2023

ZERO CARBON
STEPCODE

Today's Presentation

- Commitments
- Overview of the regulation
 - Part 3
 - Part 9

Origin of the new regulation

“By 2030, all new buildings will be zero carbon, and all new space and water heating equipment will meet the highest standards for efficiency.”

– *CleanBC Roadmap to 2030*



Effective May 1, 2023

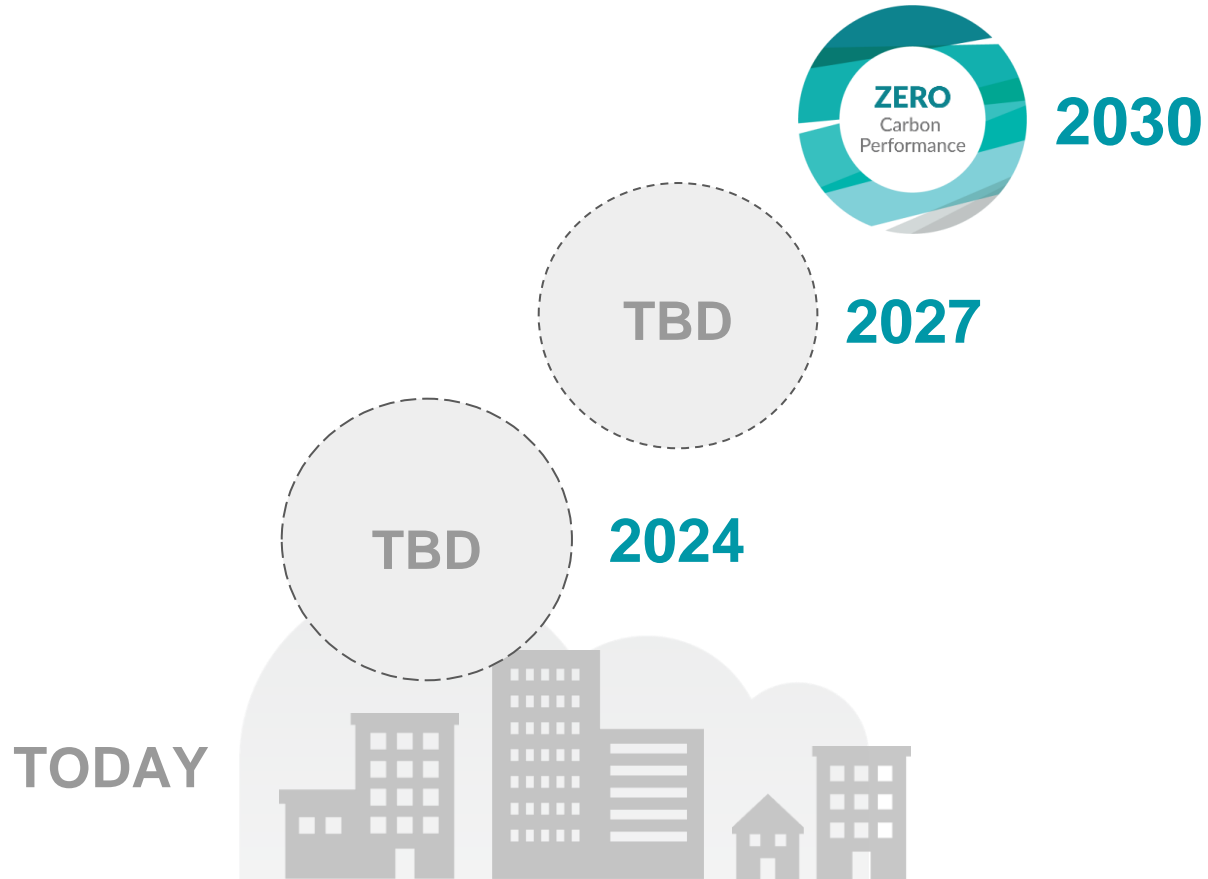


cleanBC
our nature. our power. our future.

Roadmap to 2030



Provincial Pathway: Stepping up to 2030





ZERO CARBON

STEP CODE

Many types of buildings can be regulated under the **Zero Carbon Step Code**

Part 9: Residential



“House”

Part 3:

Larger and more complex buildings – Major Occupancies C, D and E



Offices



Condos +
apartments



Financial
institutions



Retail +
grocery stores

Zero Carbon Step Code

Emissions Factors

- Electricity
- Natural Gas
- Others – Bulletin B23-03
 - National Inventory Report
- District Energy Systems
 - Determined by LG in discussion with utility



Compliance options and
sample projects: **Part 3**

Industry compliance: Developers and the performance approach

Table 10.3.1.3.
Greenhouse Gas Emissions
Forming Part of Sentence 10.3.1.3.(1)

<u>GHG Emission Level</u>	<u>Maximum GHGI of the Building, Expressed in kgCO_{2e}/m²/year</u>			
	<u>Residential Major Occupancy</u>		<u>Business and Personal Service and Mercantile Major Occupancies</u>	
	<u>Hotels and Motels</u>	<u>Other Residential Occupancies</u>	<u>Offices</u>	<u>Other Business and Personal Service and Mercantile Occupancies</u>
<u>EL-1</u>	<u>measure only</u>			
<u>EL-2</u>	<u>9.0</u>	<u>7.0</u>	<u>5.0</u>	<u>6.0</u>
<u>EL-3</u>	<u>4.0</u>	<u>3.0</u>	<u>3.0</u>	<u>3.0</u>
<u>EL-4</u>	<u>2.0</u>	<u>1.8</u>	<u>1.5</u>	<u>2.0</u>

Maximum GHG intensity per building per year



Moderate Carbon Performance: First Avenue Supportive Housing, Prince George


Four stories
48 units
3,037 square metres
Climate zone 6

Natural gas hot water, through-wall electric heat pumps in each unit, induction cooktops

3.9

kgCO₂e
M²/year

Image + credit
to follow



Compliance options
and sample projects:
Part 9

Industry compliance: Homebuilders and the performance approach

Quantity of carbon pollution



Maximum GHG emissions per house per year

Intensity of carbon pollution



Maximum GHG intensity per house per year



Zero Carbon Step Code

What's Included?

Performance Pathways – GHG and GHGI

- MEUI
 - Space Conditioning
 - DHW
 - Ventilation
- Includes supplementary equipment

Prescriptive Pathway

- All building systems including equipment and appliances
- **Back-up or redundant equipment is permitted to be excluded**

Industry compliance: Homebuilders and the performance approach

Table 9.37.1.3.
Greenhouse Gas Emissions
 Forming part of Sentence 9.37.1.3.(1)

GHG Emission Level	GHG Emission Compliance Options					
	Maximum GHG Emissions by House, Expressed in kg CO _{2e} /year	or	Maximum GHG Emissions by House ¹		Reduction of GHG Emissions by Energy Source of Building Systems ²	
	Maximum GHGI of the House, Expressed in kgCO _{2e} /m ² /year		Maximum GHG Emissions by House, Expressed in kgCO _{2e} /year			
EL-1	measure only	or	measure only		N/A	
EL-2	1050		6.0	2400	or	Energy sources supplying heating systems have an emissions factor ≤ 0.011 kgCO _{2e} /kWh
EL-3	440		2.5	800		Energy sources supplying heating and service water heating systems have an emissions factor ≤ 0.011 kgCO _{2e} /kWh
EL-4	265		1.5	500		Energy sources supplying all building systems, including equipment and appliances, have an emissions factor ≤ 0.011 kgCO _{2e} /kWh

Notes to Table 9.37.1.3.:

(1) Compliance for this option is demonstrated by meeting both the GHGI and the GHG emission requirements for each house.

(2) Redundant or back-up equipment for the systems and equipment listed in Sentence 9.36.5.4.(1). is permitted to be excluded, provided it is equipped with controls and is not required to meet the space-conditioning load of the house.

Zero Carbon Performance: Westside Residence, Invermere

Four bedrooms
143 square metres
Climate zone 6

All electric systems:
Air source electric heat
pump, conventional
electric hot water tank.

248

Kg/CO₂e/yr



Courtesy thinkBright

Existing Buildings

Application to Existing Buildings

- Bulletin 23-01:
Information for Planners about 20% Better Energy Efficiency and Zero Carbon Step Code
- Division A of the BC Building Code
- Retrofit Code
- Local Government Peer Network
- Building Official Handbook
- LG Best Practice Guide

Compliance Tools

Compliance tools for ESC and ZCSC

- Part 9 and Part 3

- Beta versions now available on the Step Code website
- Beta period ends at end of June

-<https://energystepcode.ca/compliance-tools-part9/>

-<https://energystepcode.ca/compliance-tools-part3/>

- Please provide feedback to:
 - building.safety@gov.bc.ca

Thank you!

Scott Williams, Senior Codes Engineer, BSSB
scott.b.williams@gov.bc.ca



ZERO CARBON STEP CODE

NORTHERN BUILDERS PERSPECTIVE

Spring 2023

Joe Hart

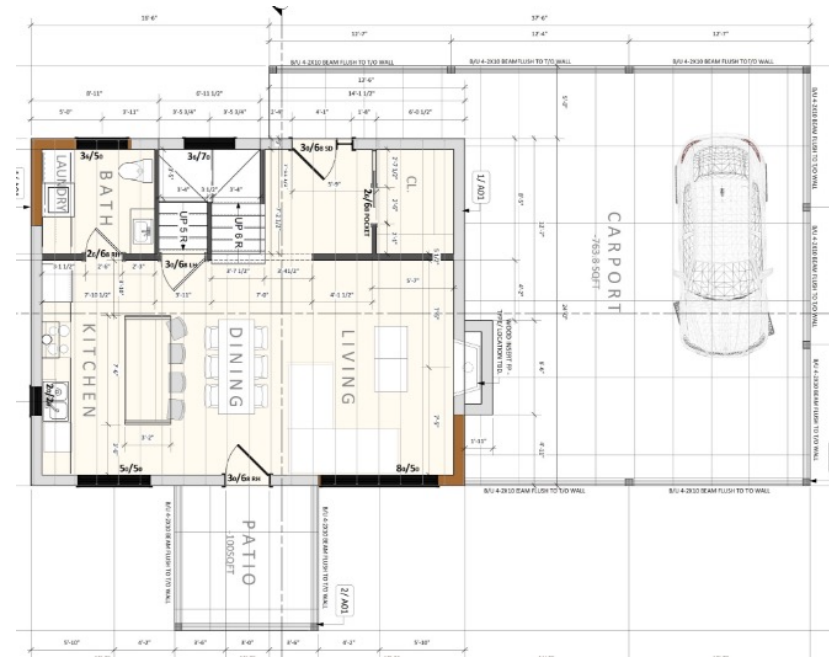
- CHBA BC Technical Research Committee, Chair
- CHBA BC Step Code Task Force member
- CHBA BC Past President
- BC Energy Step Code Committee Member
- Licensed builder and Certified Net Zero builder
- Developer



MIND THE GAP

Winter 2023

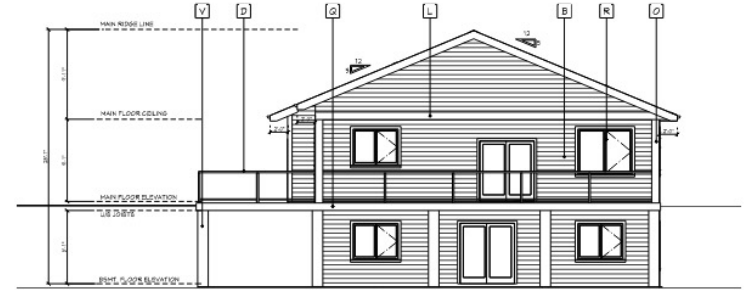
Net Zero example



Net Zero Example



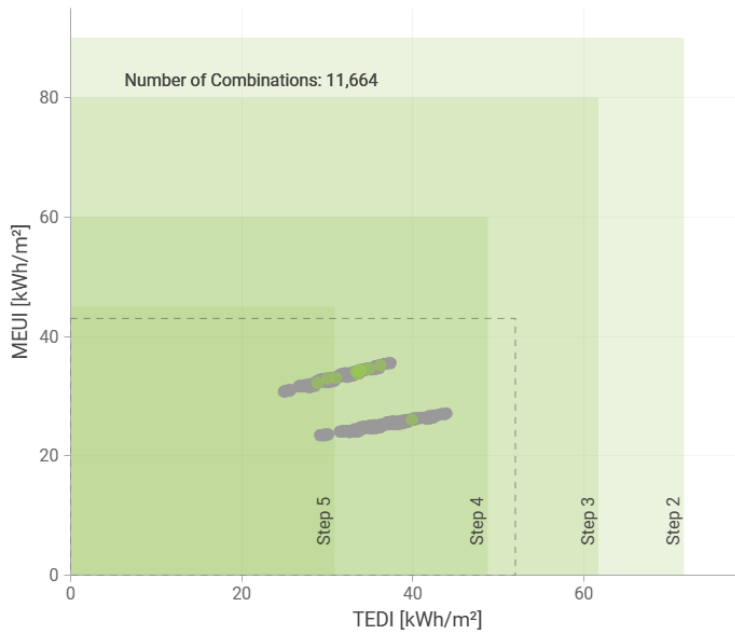
Hurko Residence Carbon Step Code Example

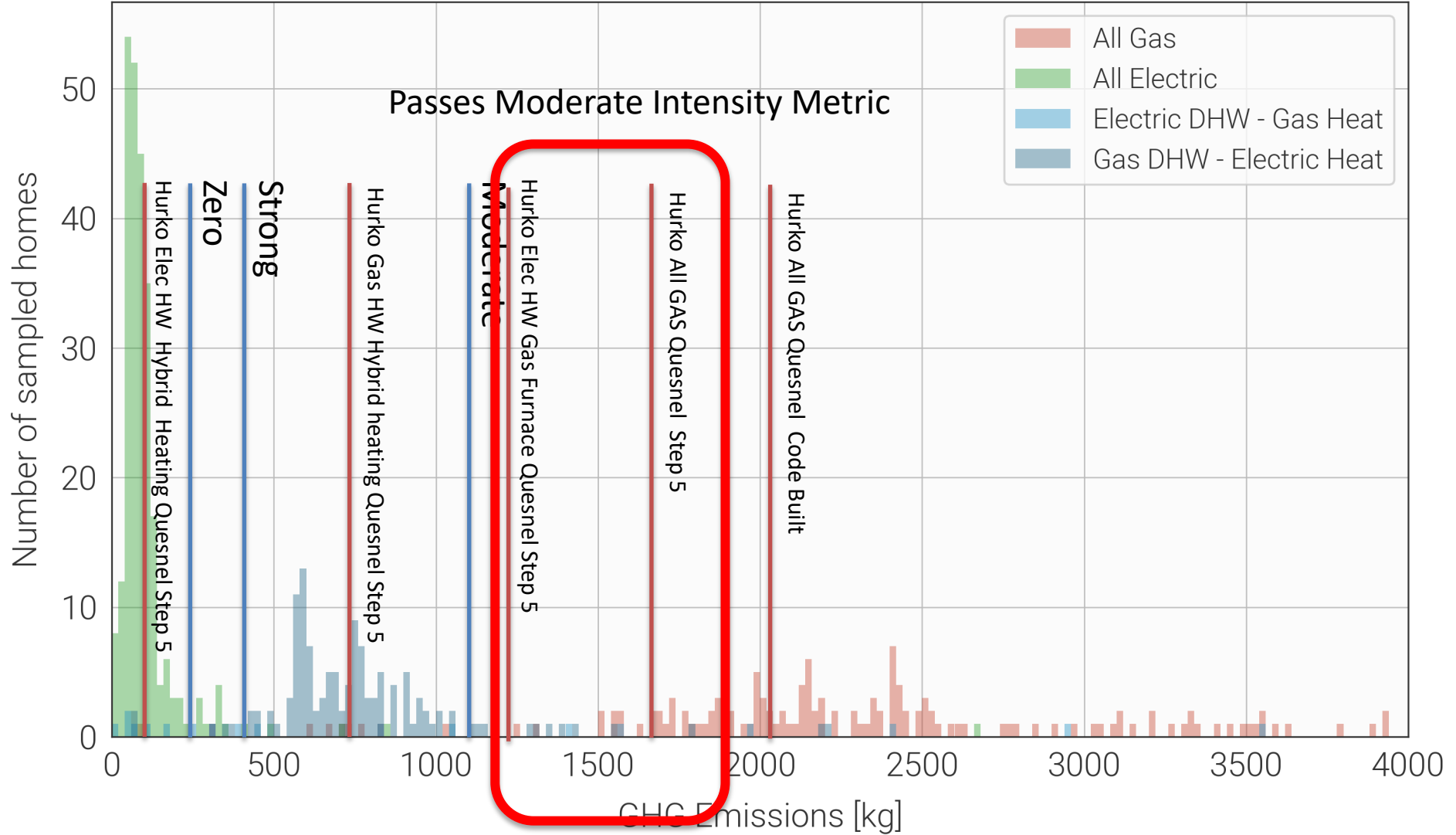


REAR ELEVATION
 MIN. # TO GRADE FROM ANY UN-TREATED POOLS
 NOTE: THIS MODEL, INCLUDING POOLS, TO BE CORRELATED ALONG STREET SIDE WALLS.



RIGHT ELEVATION
 MIN. # TO GRADE FROM ANY UN-TREATED POOLS
 NOTE: THIS MODEL, INCLUDING POOLS, TO BE CORRELATED ALONG STREET SIDE WALLS.





Key Considerations for the North

- **Trade Knowledge**

- Lack of clear market direction for trades means few have taken training
- Lack of trades leads to very high costs
 - EG Cold climate heat pump in Victoria is 20% more in Quesnel is 100% more

- **Home owner Knowledge**

- Home owners don't know how to operate new systems and are worried about it
 - This means it is hard for the builder to convince them to install an all electric system

- **Grid Connection Fees and reliability**

- In many Northern areas grid connection fees are extreme for high amp services
- Reliability can also be poor so there is a need for alternatives.



Recommendations for the North

- **Slow and steady**
 - The south may be ready to take jumps but the north needs more time to develop industry and tech to make it work.
- -----





“Do or do not. There is no Try”
- Yoda