

# CITY OF NEW WESTMINSTER:

## Winter 2021 Virtual Builder & Designer Breakfast

*Prepared by:*

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**February 11<sup>th</sup>, 2021**

# AGENDA

1. New Westminster's Low Carbon Energy System (LCES) Policy for Part 9 Buildings
2. Best Practices in Mechanical Design
3. CleanBC's Better Homes New Construction Program
4. Questions & Discussion





# City of New Westminster's Low Carbon Energy System (LCES) Policy for Part 9 Homes



NEW WESTMINSTER

# Session Objectives

- Overview of New West's Energy Step Code schedule
- New West's Two-Option Part 9 Low Carbon Energy System Framework
- Gather feedback on Energy Step Code schedule & Two-Option LCES framework

# New Westminster's Building & Emissions Profile

FIGURE 3 – PROPORTION OF ENERGY, EMISSIONS, AND COST BY FUELS AND WASTE IN 2017, %

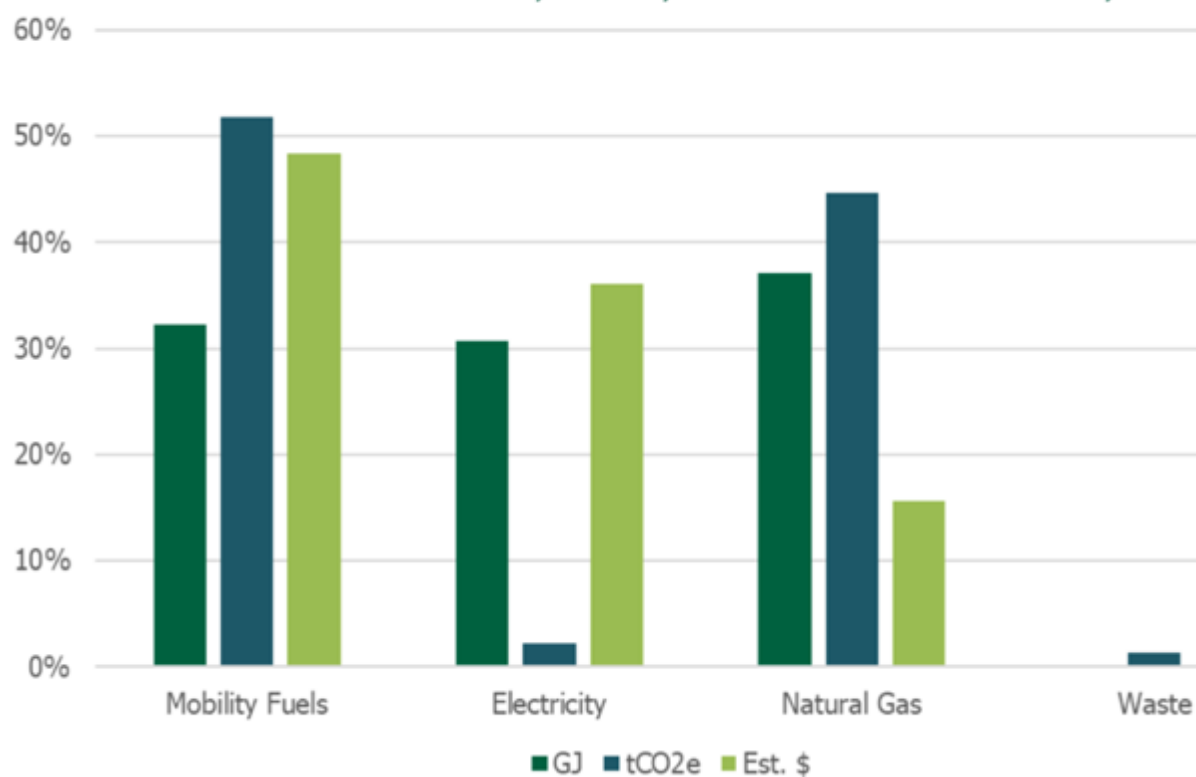
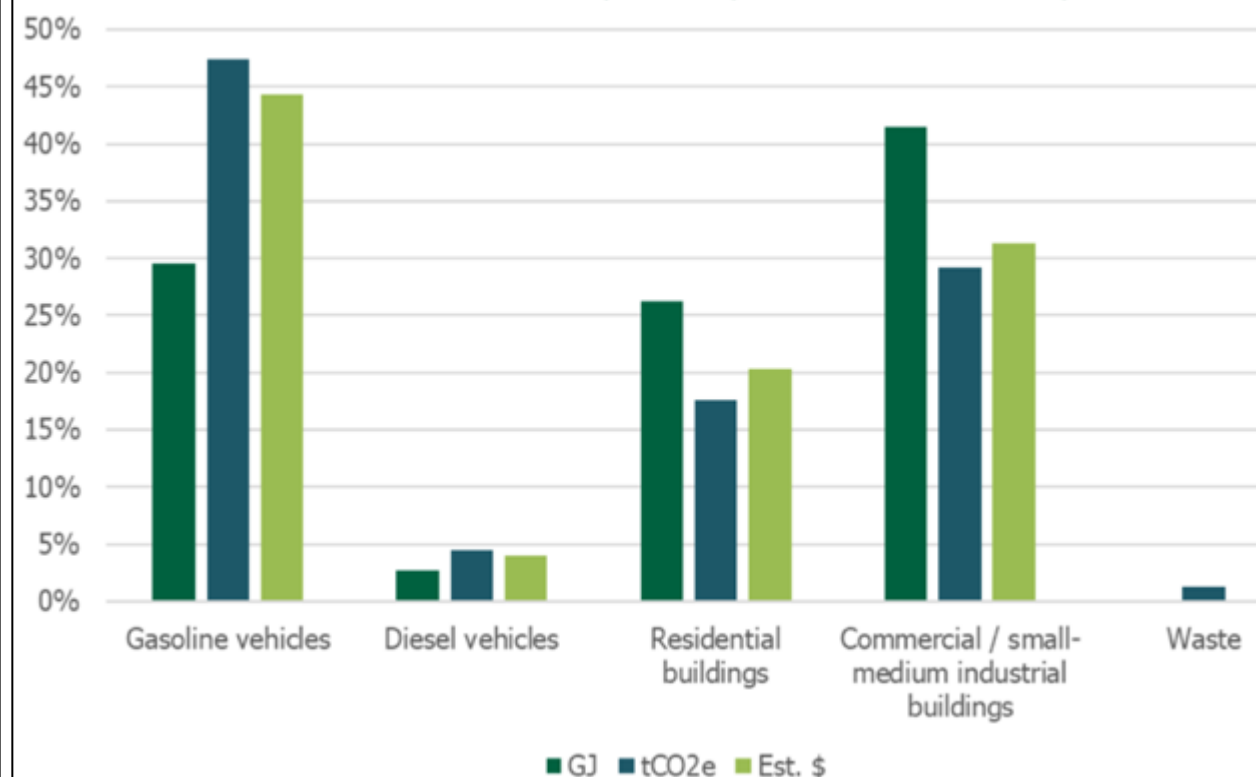
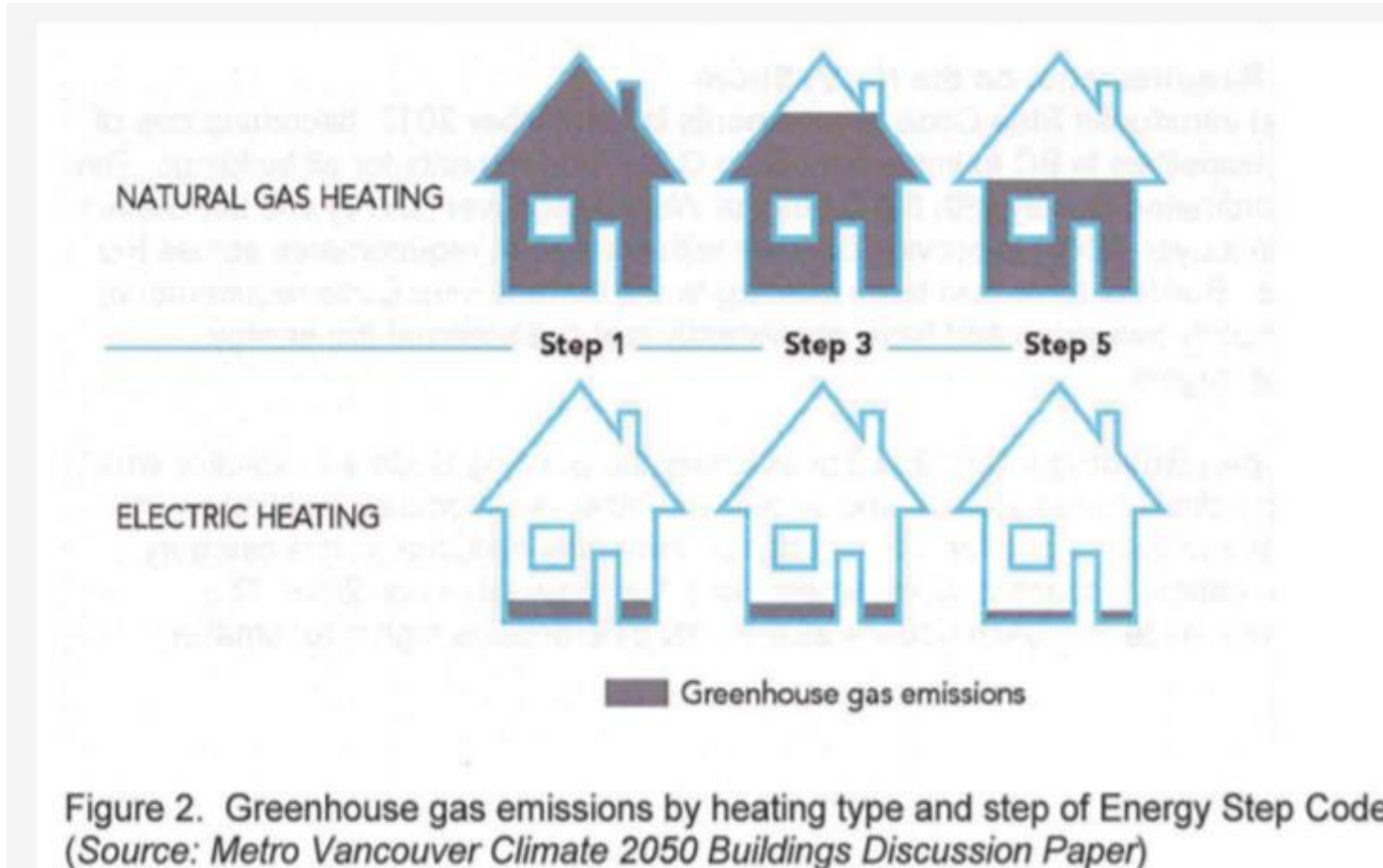


FIGURE 4 – PROPORTION OF ENERGY, EMISSIONS, AND COST BY SECTOR IN 2017, %



# The Case for Electrifying



# Building By-Law: Definition of LCES

- **“Low Carbon Energy System”** means the space heating, cooling and domestic hot water heating mechanical systems in a building that is supplied energy through a connection to a district energy utility, or a building-scale or site-scale thermal energy system, that is designed to meet a minimum of 70% of the building’s annual heating, cooling and domestic hot water from a renewable energy source, as approved by the City.

**- BUILDING BYLAW NO. 8125, 2019**



# A Two-Option Energy Step Code Framework

- A two-option Energy Step Code framework offers builders choice, while encouraging low-GHG development:

**Option A:** Step X [or]

**Option B:** Step (X – n) with a low-carbon energy system

Building Type	Building Permit Application				
	<i>Estimated Timetable for Future Consideration</i>				
<b>Smaller Part 9 Residential</b>	Late 2018	Early 2020	2021	2022	2025
Townhomes & Apartments	Step 1	Step 3	Revise to include step-down low carbon energy system options		
Single Family, Duplex & Other Residential	Step 1	Step 3			

Staff propose that there would be two Energy Step Code compliance options for all Part 9 buildings



# New Westminster's Two-Option Energy Step Code Schedule – Current & Future '*anticipated*' Requirements for Part 9 Residential

Building Type	Building Permit Application				
	<i>Estimated Timetable for Future Consideration</i>				
Smaller Part 9 Residential	Late 2018	Early 2020	Mid/late 2021	2022 (TBD)	2025 (TBD)
Townhomes & Apartments	Step 1	Step 3	Step 3 or Step 2 with LCES	Step 5 or Step 3 with LCES	Step 5 or Step 4 with LCES
Single Family, Duplex & Other Residential	Step 1	Step 3	Step 3 or Step 2 with LCES	Step 5 or Step 3 with LCES	Step 5 or Step 4 with LCES

# Local Government Part 9 LCES Performance Metrics

Local Government	Definition of LCES
	Part 9 Buildings Performance Metrics
City of Vancouver	<ul style="list-style-type: none"> <li>Vancouver Building Bylaw (effective Jan 2022) <ul style="list-style-type: none"> <li>i) GHGI of 5.5 kg CO<sub>2</sub>e/m<sup>2</sup>/year <ul style="list-style-type: none"> <li>l.e.: a 300 m<sup>2</sup> building cannot emit more than (300 x 0.0055 = 1.65 tonnes GHG per year</li> </ul> </li> <li>ii) Will be reduced to 3 kg CO<sub>2</sub>e/m<sup>2</sup>/year* in 2022.</li> </ul> </li> </ul> <p>Vancouver will also be using a <b>fixed limit</b>:</p> <ul style="list-style-type: none"> <li>2 tonne GHG per year limit on homes larger than 3,500ft<sup>2</sup>(2021)</li> </ul>
District of West Vancouver	<ul style="list-style-type: none"> <li>Building Bylaw <ul style="list-style-type: none"> <li>GHGI of 3 kg CO<sub>2</sub>e/m<sup>2</sup>/year (November 2020), (i.e., a 300m<sup>2</sup> building = 900kg = 0.9 tonnes GHG per year) and</li> <li>Seasonal average COP &gt;2 (November 2020) <ul style="list-style-type: none"> <li>Coefficient of performance (COP) for heating systems: <ul style="list-style-type: none"> <li>Natural gas furnaces &amp; boilers = &lt;1</li> <li>Electric baseboards = 1</li> <li>Natural gas heat pumps = &gt;2</li> <li>Electric heat pumps = 1-2.5+</li> </ul> </li> </ul> </li> </ul> </li> </ul>
City of Victoria	<ul style="list-style-type: none"> <li>Building and Plumbing Regulation Bylaw (effective Jan 2022) <ul style="list-style-type: none"> <li>GHGI of 3 kg CO<sub>2</sub>e/m<sup>2</sup>/year</li> </ul> </li> </ul>
City of Richmond	<ul style="list-style-type: none"> <li><b>TBD</b> - Likely GHGI of 3 kg CO<sub>2</sub>e/m<sup>2</sup>/year (in development – effective date Jan 2022)</li> </ul>
City of Surrey	<ul style="list-style-type: none"> <li><b>TBD</b> - Likely GHGI of 3 kg CO<sub>2</sub>e/m<sup>2</sup>/year (in development – effective date Jan 2022)</li> </ul>

# New Westminster's *Anticipated* Step Code Schedule & LCES Framework

Framework	2021	January 2022	January 2025	ByLaw Requirements
<b>A</b>	Step 5	Step 5	Step 5	<ul style="list-style-type: none"> <li><i>Similar to West Vancouver Requirements</i></li> </ul>
	OR	OR	OR	
	Step 3 + LCES	Step 3 + LCES	Step 4 + LCES	
<b>B</b>	Step 4	Step 5	Step 5	<ul style="list-style-type: none"> <li><i>Similar to City of Vancouver Requirements</i></li> </ul>
	OR	OR	OR	
	Step 3 + LCES	Step 3 + LCES	Step 4 + LCES	
<b>C</b>	Step 3	Step 4	Step 5	<ul style="list-style-type: none"> <li><i>Similar to New West tentative ESC schedule</i></li> </ul>
	OR	OR	OR	
	Step 2 + LCES	Step 3 + LCES	Step 4 + LCES	

\*New Westminster Staff considering GHGI requirement of 3 kg/CO2e/m2/yr (TBD – 2021)

# Mentimeter Questions

- Please enter the following URL in your browser: [www.menti.com](https://www.menti.com) & enter this code: XXXXXX

1. What is your preference for the three potential Energy Step Code frameworks for Part 9 Buildings shown?
2. What metrics should New Westminster use the following to define 'low carbon energy systems' for Part 9 residential buildings?
  - GHG Performance (e.g. 5 or 3 kg CO<sub>2</sub>e/m<sup>2</sup>/yr)
  - Energy Performance (e.g. COP > 2)
  - GHG Limit (e.g. 2 CO<sub>2</sub>e/ building/ yr)
  - No natural gas connection to building
  - Other

# Implications of “Low Carbon Energy System” definition for Residential Buildings

*LCES definitions are not mutually exclusive*

	All-electric	GHGI	COP
Impact on space heating & DHW	<ul style="list-style-type: none"> <li>No gas equipment for SH &amp; DHW</li> </ul>	<ul style="list-style-type: none"> <li>A GHGI limit of 1 will result in (nearly) all electric buildings</li> <li>A GHGI limit of 3 will typically prevent gas equipment from being primary source of SH &amp; DHW (back up systems possible)</li> <li>A GHGI of 6 will typically enable gas DHW</li> </ul>	<ul style="list-style-type: none"> <li>A COP of &gt;2 will prevent gas equipment and electric resistance from being primary source of SH &amp; DHW (back up systems possible)</li> <li>Greatest departure from current practices, as all SH &amp; DHW systems will need to be predominantly HP</li> </ul>
Impact on gas cooking & fireplaces	<ul style="list-style-type: none"> <li>Typically, no gas equipment</li> <li>Can make exceptions (e.g. for commercial kitchens) or define to not include cooking and/or fireplaces</li> </ul>	<ul style="list-style-type: none"> <li>Can allow gas cooking &amp; fireplaces (if 3 kg CO<sub>2</sub>e/m<sup>2</sup>/yr)</li> </ul>	<ul style="list-style-type: none"> <li>Allows gas cooking &amp; fireplaces</li> </ul>
Potential for conversion to gas equipment	<ul style="list-style-type: none"> <li>Likely best avoids later reversion to gas equipment</li> </ul>	<ul style="list-style-type: none"> <li>Some potential for conversion</li> </ul>	<ul style="list-style-type: none"> <li>Some potential for conversion</li> </ul>
Compliance processes	<ul style="list-style-type: none"> <li>Requires verification of no gas plumbing</li> </ul>	<ul style="list-style-type: none"> <li>Aligns well with “performance based” Step Code</li> <li>Requires processes to ensure installations adhere with modeled design (e.g. integrating into inspections processes; heating permit; etc)</li> </ul>	<ul style="list-style-type: none"> <li>Requires new approvals processes</li> </ul>

*Source: Brendan McEwen, AES Engineering*

# ENERGY PERFORMANCE BOND

## BP Application/ Issuance

### Energy Performance Bond Collected

Deposit of 1% of the total construction value (up to a maximum of \$25,000)

Pre-Construction Compliance Form with Building Permit application

Building Permit Issued

## Construction/ Inspections

Pre-drywall air tightness test & submit Mid- Construction Form

Conduct a final air tightness test

Submit As-Built Compliance Form with Final certificate

Final

Energy Performance Bond reimbursed at project completion with damage deposit

Forfeited Bonds

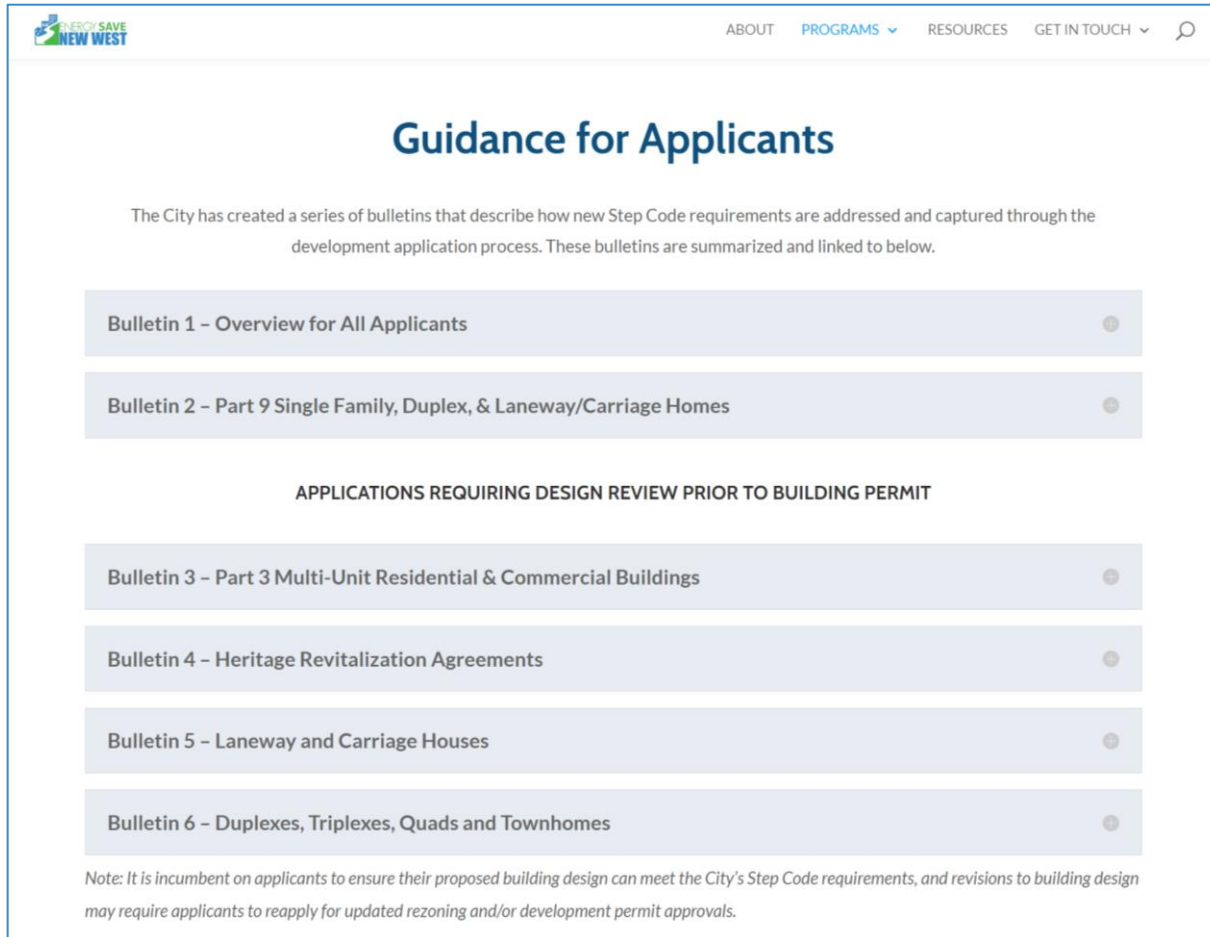


# Mentimeter Questions

- Please enter the following URL in your browser: [www.menti.com](https://www.menti.com) & enter this code: XXXXXX
- What support or resources will your government need to adopt a GHG performance requirement for low carbon energy systems?
- What other training programs are needed by local builders? / topics for future Builder's Breakfast Events?



# CITY UPDATES



**Guidance for Applicants**

The City has created a series of bulletins that describe how new Step Code requirements are addressed and captured through the development application process. These bulletins are summarized and linked to below.

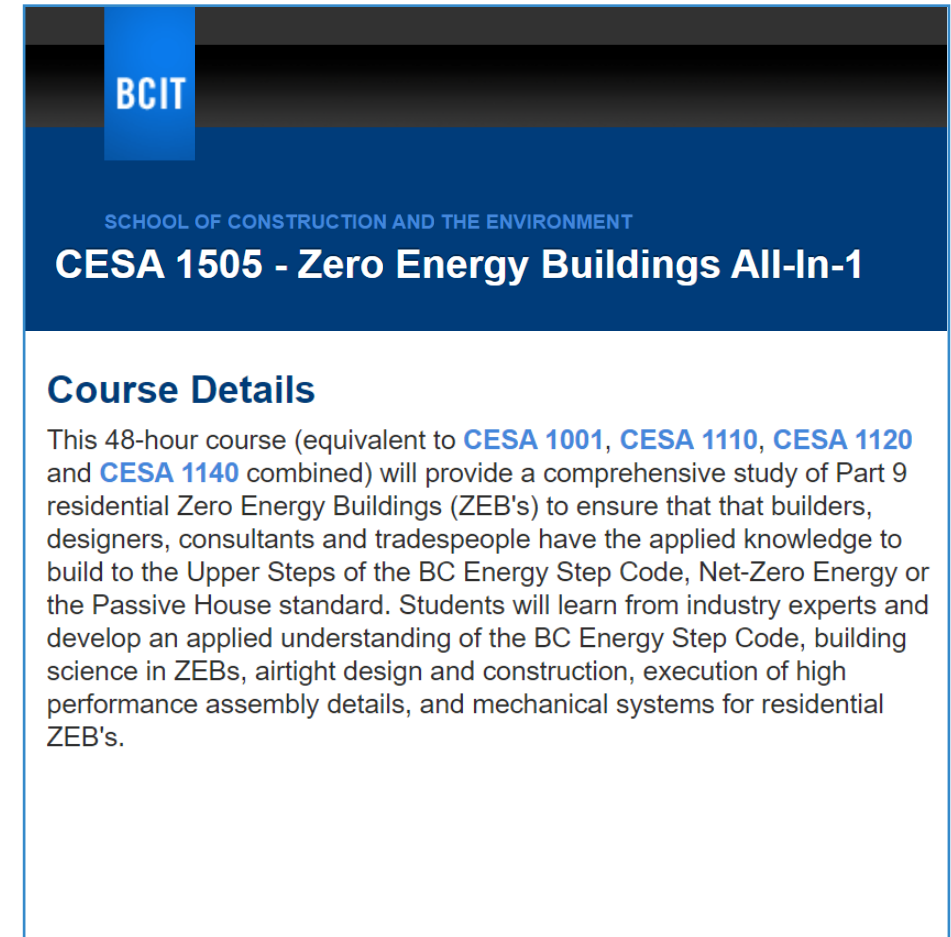
- Bulletin 1 – Overview for All Applicants
- Bulletin 2 – Part 9 Single Family, Duplex, & Laneway/Carriage Homes

**APPLICATIONS REQUIRING DESIGN REVIEW PRIOR TO BUILDING PERMIT**

- Bulletin 3 – Part 3 Multi-Unit Residential & Commercial Buildings
- Bulletin 4 – Heritage Revitalization Agreements
- Bulletin 5 – Laneway and Carriage Houses
- Bulletin 6 – Duplexes, Triplexes, Quads and Townhomes

*Note: It is incumbent on applicants to ensure their proposed building design can meet the City's Step Code requirements, and revisions to building design may require applicants to reapply for updated rezoning and/or development permit approvals.*

**UPDATED ENERGY STEP CODE TECHNICAL BULLETINS  
ISSUED IN JANUARY 2021**



**BCIT**

SCHOOL OF CONSTRUCTION AND THE ENVIRONMENT

**CESA 1505 - Zero Energy Buildings All-In-1**

**Course Details**

This 48-hour course (equivalent to **CESA 1001**, **CESA 1110**, **CESA 1120** and **CESA 1140** combined) will provide a comprehensive study of Part 9 residential Zero Energy Buildings (ZEB's) to ensure that that builders, designers, consultants and tradespeople have the applied knowledge to build to the Upper Steps of the BC Energy Step Code, Net-Zero Energy or the Passive House standard. Students will learn from industry experts and develop an applied understanding of the BC Energy Step Code, building science in ZEBs, airtight design and construction, execution of high performance assembly details, and mechanical systems for residential ZEB's.

**BCIT – Next cohort is March 2<sup>nd</sup> to 23<sup>rd</sup>, 2021**

# THANK YOU

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