Low and Zero Carbon Codes in Canada

Portland

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Who We Are

IMAGINE | PERFORM | ACCELERATE | SUSTAIN

LEED Platinum Certified: 50+
LEED Gold Certified: 59
Zero Net Energy Projects in Design: 100+
Living Building Challenge Projects: 09
What We Do

MECHANICAL  ELECTRICAL  WATER  ENERGY

INTEGRALDRIVE  SUSTAINABILITY  REFRIGERATION  COMMISSIONING

LIGHTING DESIGN  FIRE PROTECTION  TECHNOLOGY  INTEGRATION
What We Do
Market Transformation Tools

Data & Reporting

Regulations

Incentives

Education & Training

Demonstration & Recognition
Carbon Codes: Key Metrics

**TOTAL ENERGY USE INTENSITY**
to address peak demand and overall energy demand

**THERMAL ENERGY DEMAND INTENSITY**
to improve thermal comfort, resilience & building longevity

**GREENHOUSE GAS INTENSITY**
to incentivize low-carbon buildings and help meet jurisdiction’s GHG targets
Targets-Based Plans across Canada

- **British Columbia**
  - ↓ 100 kWh/m²/yr
  - ↓ 15 kWh/m²/yr
  - --

- **City of Vancouver**
  - ↓ 100 kWh/m²/yr
  - ↓ 15 kWh/m²/yr
  - ↓ 0 CO₂e/m²/yr

- **Toronto**
  - ↓ 100 kWh/m²/yr
  - ↓ 15 kWh/m²/yr
  - ↓ 5 CO₂e/m²/yr
The BC Energy Step Code serves as a policy pathway and technical roadmap to reach net-zero energy-ready levels of efficiency by 2032.
The BC Energy Step Code – Part 3

PATHWAY TO 2032: PART 3 (WOOD-FRAME RESIDENTIAL)

2017

1. BC BUILDING CODE
   - ENHANCED COMPLIANCE

2032

1. NET ZERO READY
   - NEW CONSTRUCTION
   - 50% BETTER

2. 20-40% BETTER

INCENTIVES AND/OR REQUIREMENTS

IMAGINE | PERFORM | ACCELERATE | SUSTAIN
The BC Energy Step Code - Part 9

2017 ➔ 2032

5
4
3
2
1

STEP 1
BC BUILDING CODE

STEP 2
ENHANCED COMPLIANCE

STEP 3
IMPROVED
ERS REFERENCE HOUSE
ENERGY EFFICIENCY

STEP 4
40% BETTER

STEP 5
NET ZERO READY
NEW CONSTRUCTION

Requirements for Lower Steps

Incentives for Upper Steps
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<thead>
<tr>
<th>Rank</th>
<th>Program</th>
<th>Energy Efficiency</th>
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<tr>
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<td>netzero readyhome</td>
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**Program Equivalencies**
Step Code Adoption

To date, 20 municipalities have submitted a notification form to the Province of BC indicating that they are consulting with local building industry on the Step Code.
## Adoption Timeline: Part 3 Residential – Mid Rise / Wood Frame

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Compliance

- Energy modelling outputs
- Air tightness test results
- Compliance forms (P9)
- Letters of Assurance (P3)

- Building capacity across the industry – including local governments
Passive Design Exclusions
Height Relaxations

E.g. City of New Westminster – discretion to relax height requirements for Step Code Level 5 and Passive House projects by up to 4 feet.
## LCES Relaxations: Part 3 Residential – Concrete HR

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## Costs of Compliance – Part 3

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<tr>
<th>Climate Zone</th>
<th>Commercial Office</th>
<th>Big Box Retail</th>
<th>High-Rise MURB</th>
<th>Low-Rise MURB</th>
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<td>7A</td>
<td>1.8%</td>
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<td>4.1%</td>
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</table>
Better Buildings BC

Supporting, promoting and celebrating the design and construction of net-zero energy-ready buildings
Program Objectives

✓ Familiarize the BC building industry with the technologies, tools, and strategies to meet the highest Step/Passive House
✓ Reward ambitious designs ahead of the curve
✓ Promote and showcase successful building designs
Eligibility
<table>
<thead>
<tr>
<th>Building Type</th>
<th>Incentive Amount</th>
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<tbody>
<tr>
<td>Low-Rise multi-family</td>
<td>• $60/m² to a maximum of $100,000</td>
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<tr>
<td>High-Rise multi-family</td>
<td>• $80/m² to a maximum of $350,000</td>
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<tr>
<td>Office</td>
<td>• $10/m² to a maximum of $250,000</td>
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<tr>
<td>Retail</td>
<td>• $40/m² to a maximum of $175,000</td>
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<tr>
<td>Institutional</td>
<td>• $25/m² to a maximum of $350,000</td>
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</table>
The BC Energy Step Code Design Guide

BC Energy Step Code
Design Guide

A publication of the BC Energy Step Code Council
and the Building and Safety Standards Branch

January 2013

Version 1.0

ARCHITECTS AND DEVELOPERS

IMAGINE | PERFORM | ACCELERATE | SUSTAIN
The BC Energy Step Code Design Guide
Resources for the Building Industry
Targets-Based Plans across Canada

- **British Columbia**
  - 100 kWh/m²/yr
  - 15 kWh/m²/yr
  - --

- **City of Vancouver**
  - 100 kWh/m²/yr
  - 15 kWh/m²/yr
  - 0 CO₂e/m²/yr

- **Toronto**
  - 100 kWh/m²/yr
  - 15 kWh/m²/yr
  - 5 CO₂e/m²/yr
The City of Toronto is one of the fastest growing cities in North America, and faces the challenge of providing for a growing population while reducing its carbon emissions. The Zero Emissions Building Framework provides an integrated approach to addressing some of the City of Toronto's key priorities.

**CITY PRIORITIES**

01. Improve building energy efficiency to reduce energy costs and stresses on the electrical grid.

02. Enhance resilience to the impacts of climate change, including heat waves, power outages, and flooding.

03. Decrease GHG emissions by 80% below 1990 levels, increasing local renewable and district energy generation.

**NEW TARGETS**

- Total Energy Use Intensity targets lower overall energy use and utility costs.
- Thermal Energy Demand Intensity targets ensure buildings have better envelopes that save energy and improve resilience.
- GHG Intensity targets encourage low-carbon fuel choices and reduce building emissions.

**BUILDING BETTER BUILDINGS**

- Benchmarking and reporting requirements ensure energy performance can be tracked and improved over time.
- Renewable energy targets increase low-carbon energy generation and safeguard against power outages.
- Resilience checklist improves the safety and security of buildings during extreme events.
- Air-tightness testing ensures building envelopes keep indoor temperatures comfortable.
- Building commissioning ensures that buildings are constructed and operated properly.

**PATHWAY TO ZERO EMISSIONS**

- Lower GHG emissions and lower energy costs.
- Guidance for energy modelers, designers, and owners.
- Better, safer buildings for occupants.
- Stringent but achievable targets.

The new framework will help Toronto reduce its emissions by 30.6 megatons by 2050.
City of Vancouver

Up to 5% MORE FLOOR SPACE for zero-emissions buildings

IMAGINE | PERFORM | ACCELERATE | SUSTAIN

ZEBX
ZERO EMISSIONS BUILDING EXCHANGE
Lisa Westerhoff
Associate
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