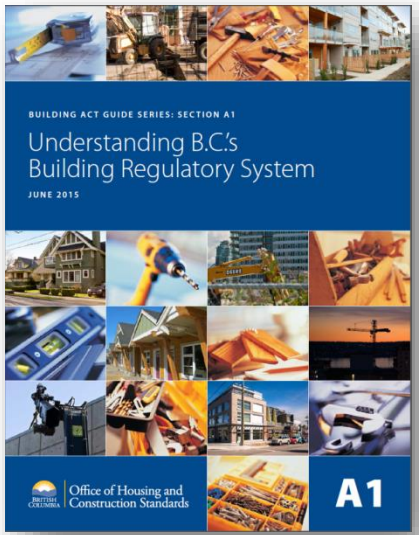
Energy Step Code

Zachary May | Senior Policy Analyst
Building and Safety Standards Branch | Government of B.C.

Clean Air Partnerships – January 24, 2017

BRITISH COLUMBIA | Office of Housing and Construction Standards

Building Regulation in BC



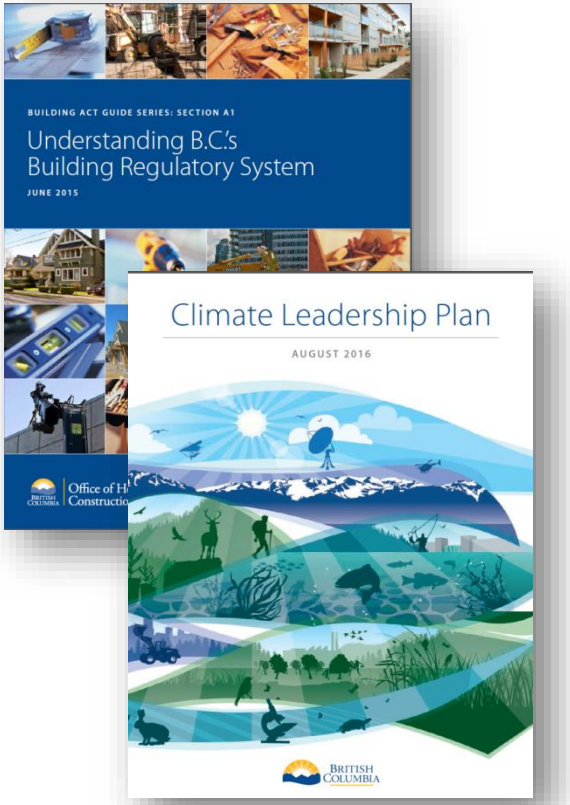
Province of BC

- Province establishes technical requirements
- No direct enforcement

Local Governments

- Local Governments enforce the Building Code
- May encourage or negotiate performance beyond the Building Code as part of development process
- City of Vancouver

Context for Energy Step Code



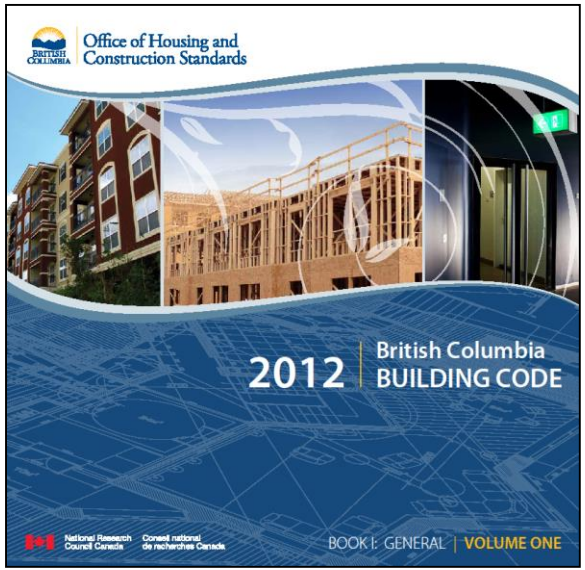
Building Act

- Consistency, Competency & Innovation
- December 2017 – end of 'local building requirements'
- New tools and opportunities

Climate Leadership Plan

- 'Net zero ready' by 2032
- 'Step Codes' for local governments to implement

Current BC Building Code



2012 BC Building Code

- ✓ Single minimum standard for Energy and Water Efficiency
- ✓ Focus on total energy use
- ✓ NBC 9.36.
- ✓ ASHRAE 90.1 (‘10) / NECB (‘11)

Two ways of complying:

1. Prescriptive (checklist) >90%
2. Performance (energy modelling)

Current BC Building Code

Typical Large Building (Part 3) construction Process

Planning and Rezoning

- Community consultation
- Conditions for approval of a project
- Possible ‘local building requirements’ in exchange for density

Design and Construction

BC Building Code
+
‘local building requirements’ and/or negotiated commitments

Occupancy and Operations

Voluntary programs for actual efficiency of buildings

Current BC Building Code

Typical Large Building (Part 3) construction Process

Planning and Rezoning | **Design and Construction** | **Occupancy and Operations**

Local Building Requirements

BC Building Code

→ Voluntary Efficiency Programs

Current BC Building Code

Current state:

- Range of programs and approaches to improve efficiency in each community
- Inconsistency
- Not compatible with the Building Act

Common issues:

- ‘Points’ vs. Performance
- The occupant paradox

Energy Efficiency Working Group

Professional Engineers and Geoscientists of BC

Victoria Residential Builders Association

Homeowner Protection Office
Branch of BC Housing

AIBC
Architectural Institute of British Columbia

GVHBA
Greater Vancouver Home Builders' Association

British Columbia

UDI

Canadian Home Builders' Association British Columbia
The Voice of the Residential Construction Industry in BC

BC Hydro
Power smart

FortisBC

LGMA
Local Government Management Association of British Columbia

Union of British Columbia Municipalities

NGOs

Utilities

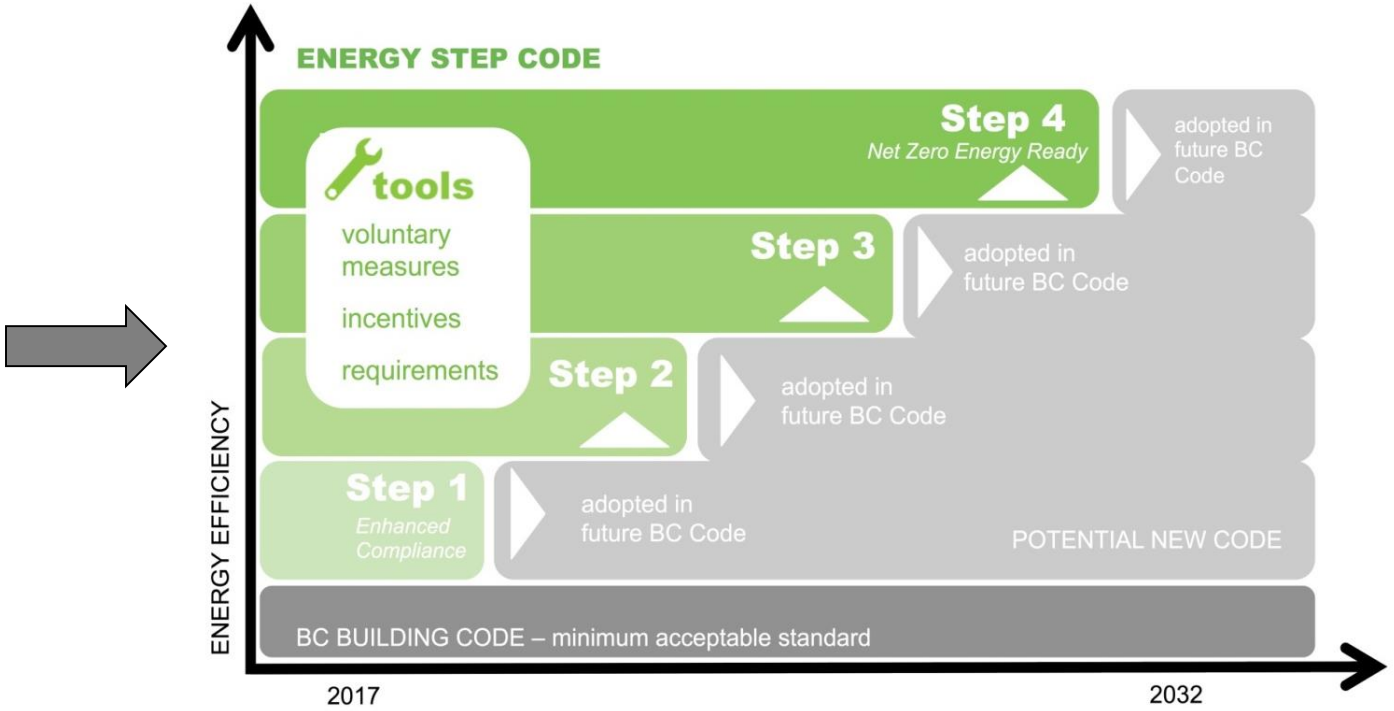
Local Governments

Province

Developers & Builders

Professionals & Trades

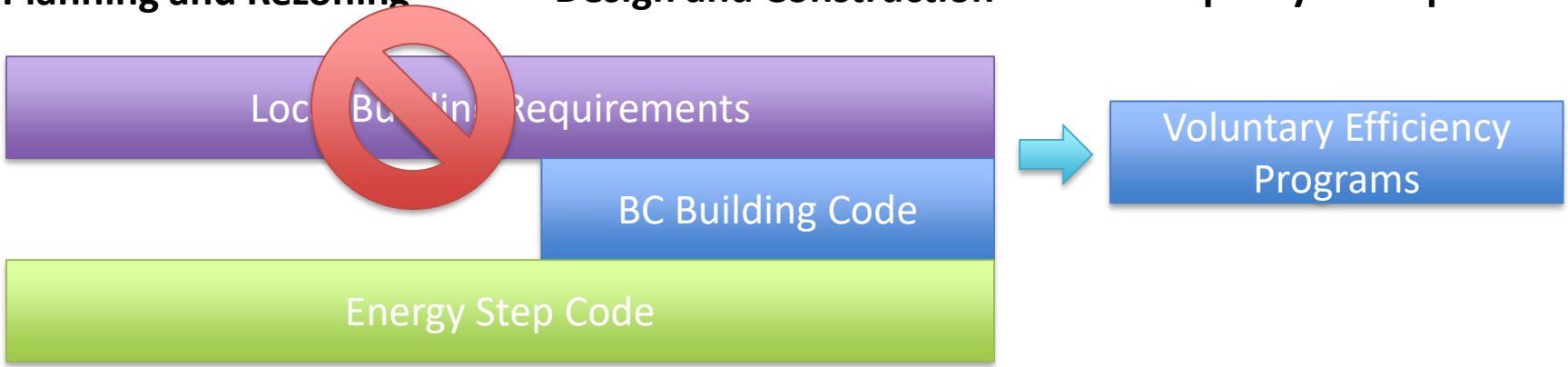
Energy Step Code – Overview



Current BC Building Code

NEW Large Building (Part 3) construction Process

Planning and Rezoning | **Design and Construction** | **Occupancy and Operations**



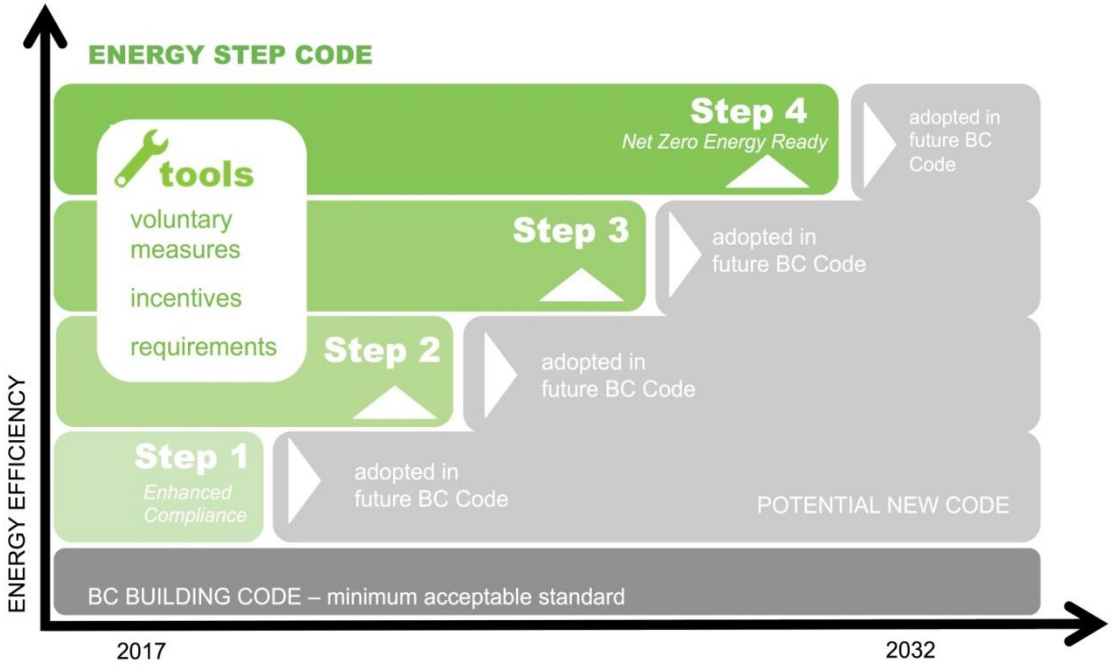
Energy Step Code – Overview

Tools for the long term:

- Energy modelling
- Air tightness testing

Features:

- Outcome/performance based
  - No prescriptive requirements!
- Envelope first
  - Reducing overall loads and simple equipment
- Compliance/Quality Assurance
- Flexibility for LGs / Industry



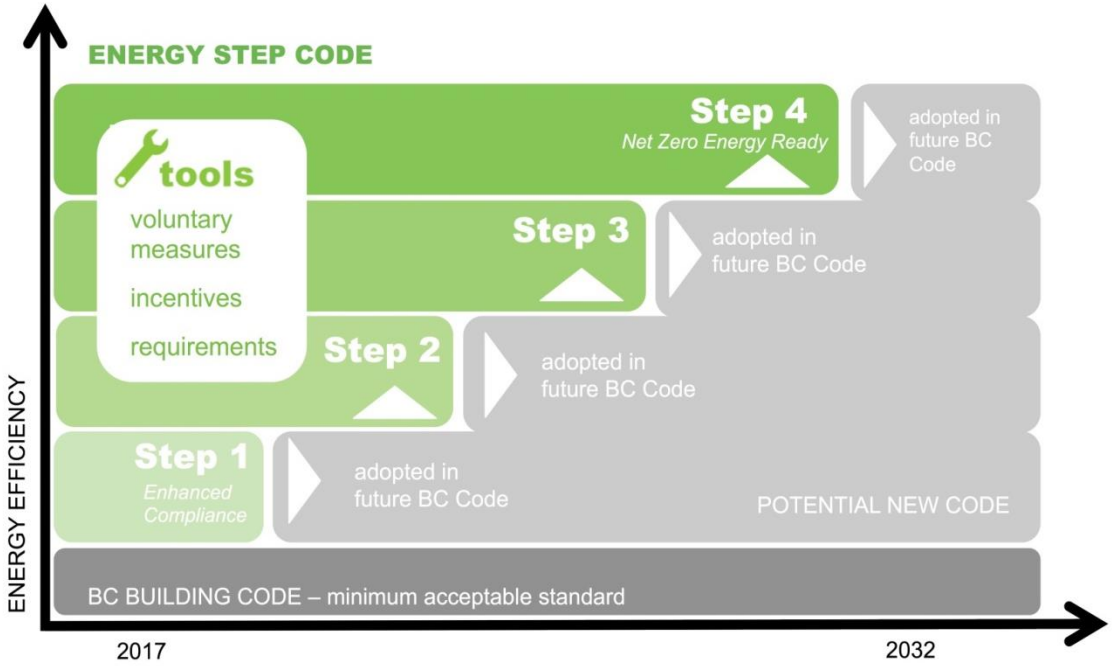
Energy Step Code – Overview

Tools for the long term:

- Energy modelling
- Air tightness testing

Features:

- Outcome/performance based
  - No prescriptive requirements!
- Envelope first
  - Reducing overall loads and simple equipment
- Compliance/Quality Assurance
- Flexibility for LGs / Industry

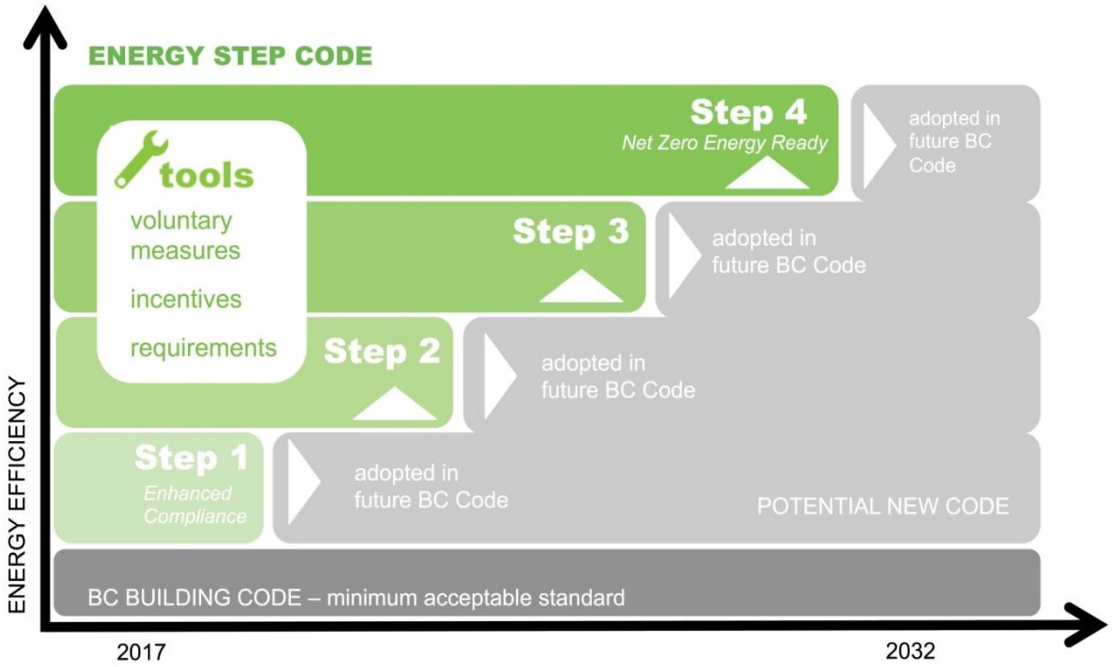


Energy Step Code – Overview

Step Code applies to:

Part 9 (<4-story, <600m^2)
- Residential buildings
- All climate zones

Part 3 (large buildings)
- Residential + Commercial (office/mercantile)
- Climate zone 4 only



Energy Step Code – Overview

	Energy Modelling + Airtightness Testing	TEDI (kWh/m²/yr)	Total EUI (kWh/m²/yr)	Estimated Annual Energy Savings
		ltifamily Resid	l (MURB)	
Step 1: Enhanced Compliance	Required	N/A	N/A	Up to 20%
Step 2:	Required	45	130	Up to 40%
Step 3:	Required	30	120	Up to 50%
Step 4:	Required	15	100	Up to 60%

Energy Step Code – Overview

	Energy Modelling + Airtightness Testing	TEDI ($kWh/m^2/yr$)	Total EUI ($kWh/m^2/yr$)	Estimated Annual Energy Savings
Multifamily Residential (MURB)				
Step 1: Enhanced Compliance	Required	N/A	N/A	Up to 20%
Step 2:	Required	45	130	Up to 40%
Step 3:	Required	30	120	Up to 50%
Step 4:	Required	15	100	Up to 60%

Energy Step Code – What gets measured

Total Energy:

Total EUI

Envelope:

TEDI

Total EUI:

- kWh/m^2/yr intensity metric
- Plug and process loads
- Excludes some unusual loads

Thermal Energy Demand Intensity (TEDI):

- kWh/m^2/yr intensity metric
- All energy loss and gains through envelope
- Ignores equipment efficiency

Energy Step Code – Overview

What's in the Step Code:

- Building efficiency only
  - Fuel/material neutral
  - Envelope + mechanicals
- Performance outcomes, no prescriptive or certification requirements
- New buildings only

Opportunity for other programs:

- GHG emissions
- Materials and site considerations
- Post-occupancy benchmarking data and requirements

Proposed Implementation

Step Code Regulation (February 2017)

Step Code – Purely Technical Regulation

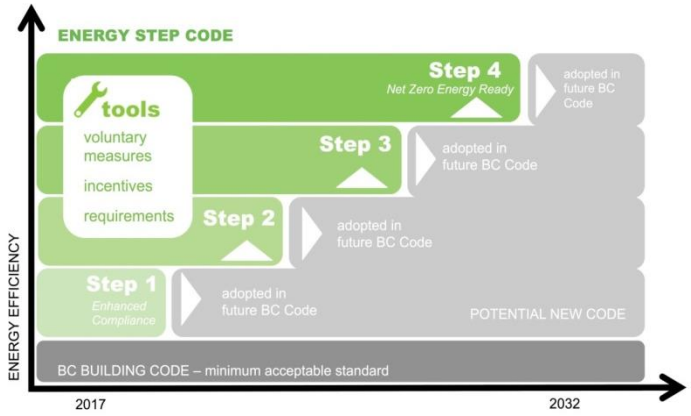
Immediately available for voluntary incentive programs or builders to use as BCBC compliance

Opt-in Regulation (February 2017)

Authority for LGs to reference Step Code in Bylaws (Dec 2017)

All local governments will be able to 'require', in bylaw, that builders build to a particular performance step.

Consensus



Province

- Consistent building requirements
- Roadmap to 2032 targets

Builders and Developers

- Consistent, long-term expectations
- Predictable capacity building

Local Governments

- Flexibility for local planning and development practices
- New authority and cooperation with stakeholders

When a regulation flaps it's wings in BC…

Nationally

- National 'Step Code'
- Updates to national programs through NRCan
- Possible database of Step Code buildings
- Updates to voluntary programs (LEED, BOMA BEST)

Locally

- Focus on simplified equipment and simple design
- Consistent requirement from community to community
- Increased innovation in building envelopes and HVAC systems

Questions?

Zachary May – Senior Policy Analyst
Zachary.May@gov.bc.ca

BRITISH COLUMBIA | Office of Housing and Construction Standards