



June 20, 2018 – Anvil Centre

DEVELOPER WORKSHOP ON STEP CODE FOR PART 3 BUILDINGS AND EV CHARGING READINESS POLICY

Speakers / Facilitators



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Agenda

BC Energy Step Code in New Westminster

- Introduction to the BC Energy Step Code
- Application to Part 3 Buildings in New Westminster

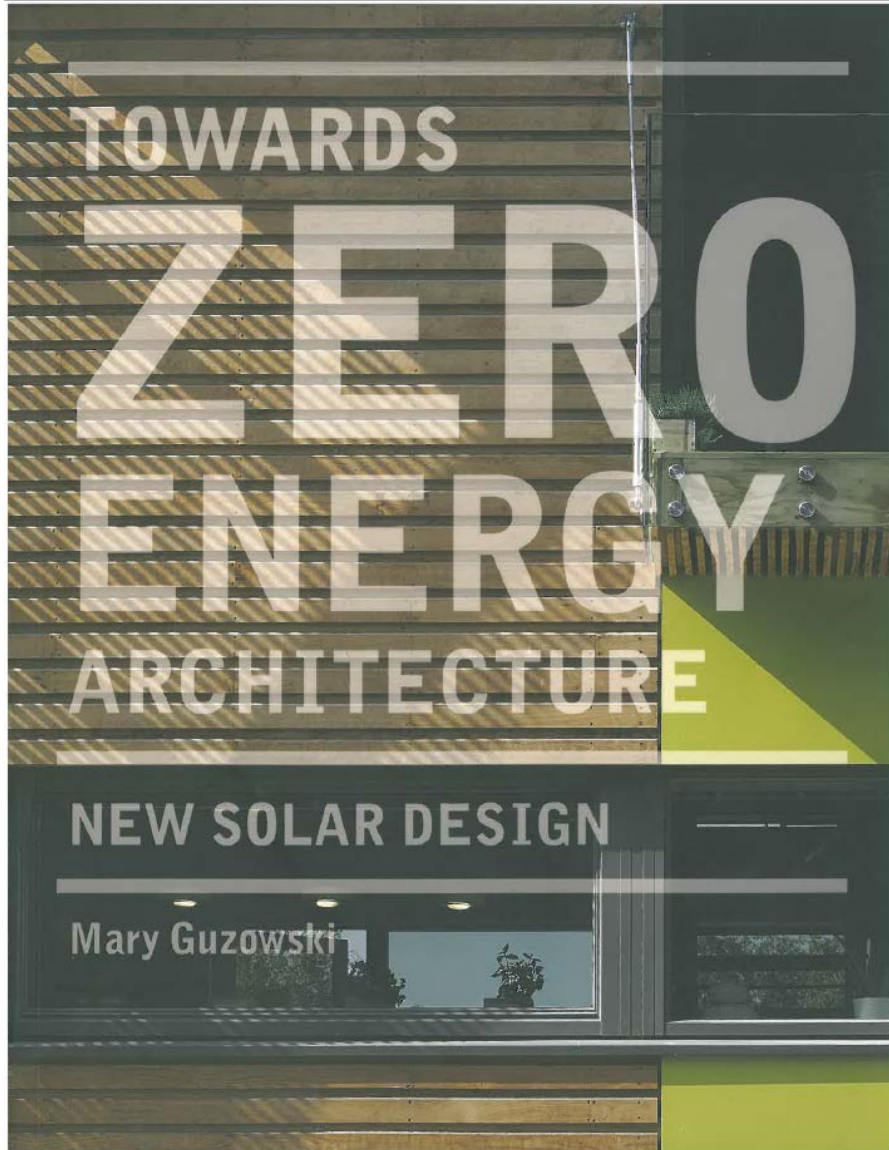
Energy Step Code & Part 3 Buildings

- Overview of Part 3 Buildings performance metrics and building archetypes
- Design strategies Step Code approach for buildings in the Sapperton district energy zone
- Proposed implementation framework
- Breakout discussions on Step Code framework and timing

EV Readiness Policy

- EV Readiness for non-visitor parking spaces in new residential buildings
- Next Steps: Zoning Bylaw amendment and development of rezoning guidelines commercial/institutional buildings
- Breakout discussions on EV Readiness Policy

National and Provincial Building Code Direction



Pan Canadian Framework on Clean Growth and Climate Change

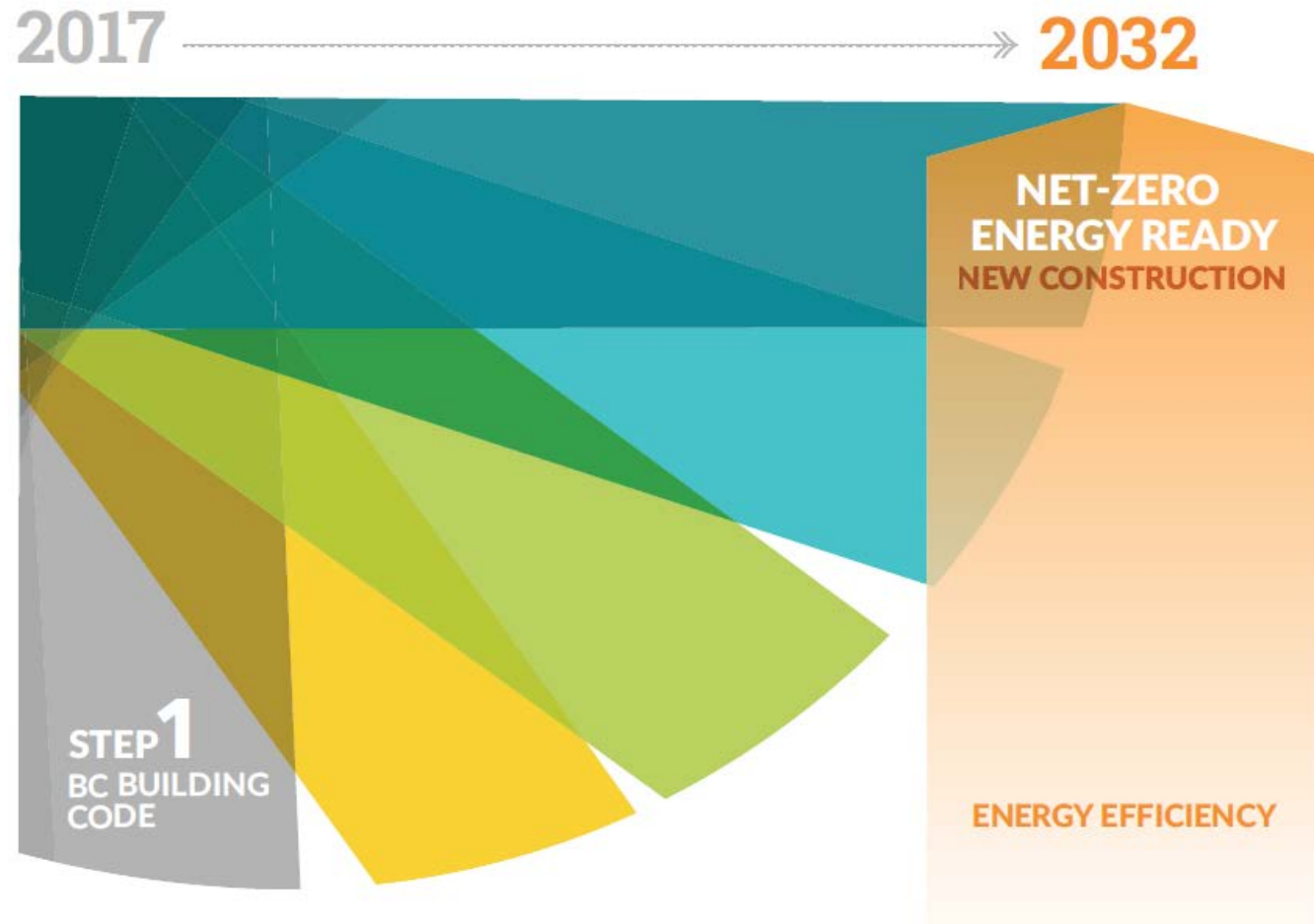
Federal direction for the National Building Code is to adopt increasingly stringent, model building codes starting in 2020, with the goal that all provinces and territories adopt 'net zero energy ready' building requirements by 2030.

BC Climate Leadership Plan

Intent is for phased updates to the BC Building Code so that all new buildings are 'net zero ready' by 2032, using the Step Code as the framework for setting beyond Code requirements.

Only three Building Code cycles away!

The BC Energy Step Code

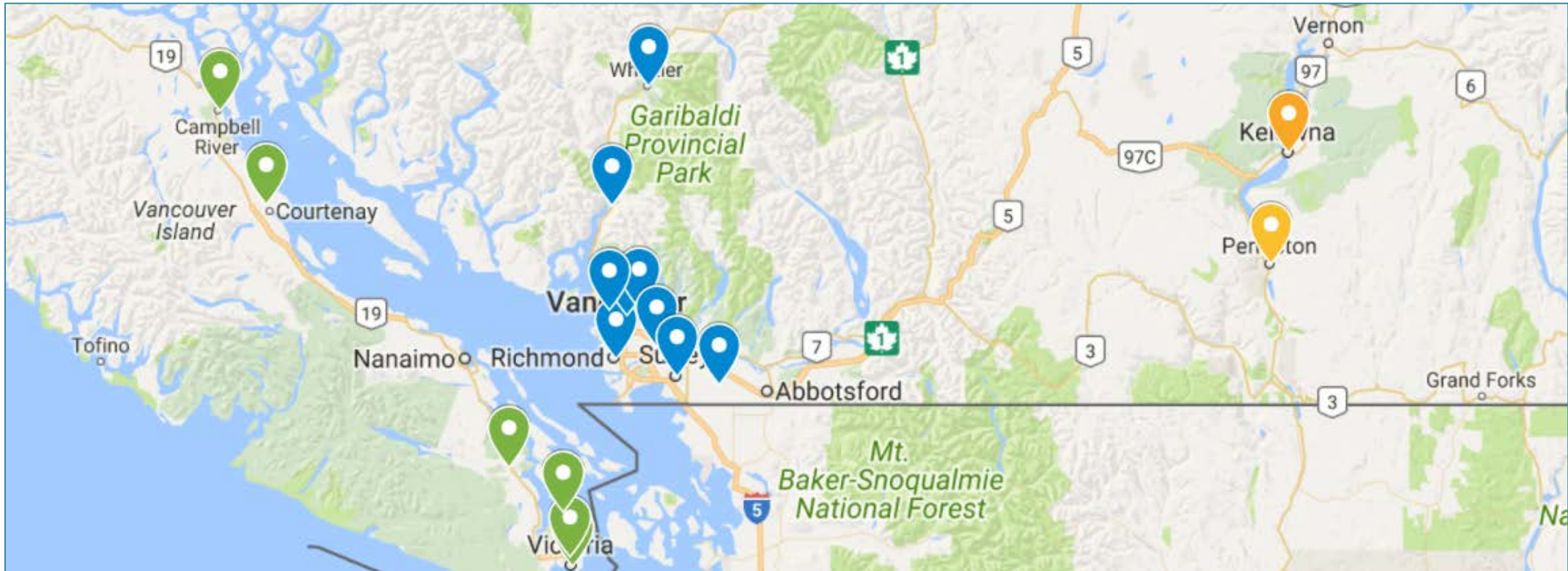


The BC Energy Step Code serves as a policy pathway and technical roadmap to reach net-zero energy ready levels of efficiency by 2032.

Step Code Implementation in BC

MUNICIPAL CONTEXT

- 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.



Step Code Implementation in BC

Local Government Notification to Province of BC on Step Code Engagement	
City of Richmond	City of Victoria
City of North Vancouver	District of Saanich
District of North Vancouver	District of North Saanich
District of West Vancouver	Comox Valley Regional District
City of New Westminster	City of Duncan
City of Surrey	City of Campbell River
Township of Langley	City of Kelowna
District of Squamish	City of Penticton
City of Burnaby	City of Kimberley
Resort Municipality of Whistler	City of Vernon

Step Code Implementation in New Westminster

April 9, 2018: Council Policy

- Council endorsed the proposed Step Code implementation framework for Part 9 buildings
- Council instructed staff to develop a Step Code framework for Part 3 buildings & engage development community
- Council instructed staff to develop supportive administrative and regulatory processes for Step Code implementation

Action 1.1.a in the forthcoming Environmental Strategy and Action Plan

- Adopt Step 1 and incrementally adopt higher Steps over a five year period



Step Code Framework for Part 9 Buildings

Part 9 Residential	Late 2018	2019 / 2020	2022
Single Detached Home	Step 1	Step 3	Step 4
Laneway / Carriage Home	Step 1	Step 2	Step 3
Duplex, Triplex or Quadriplex	Step 1	Step 3	Step 4
Townhomes / Stacked Townhomes	Step 1	Step 3	Step 4

Endorsed by City Council – April 9, 2018

Step Code Implementation in New Westminster



SMALL BUILDINGS

**Regulated by Part 9
of BC Building Code**

Buildings under 600 m²
(6,458 ft²) in floor area



LARGE BUILDINGS

**Regulated by Part 3
of BC Building Code**

Buildings over 600 m²
(6,458 ft²) in floor area



Endorsed by City Council – April 9, 2018

Recommendations to Council – Sept 2018

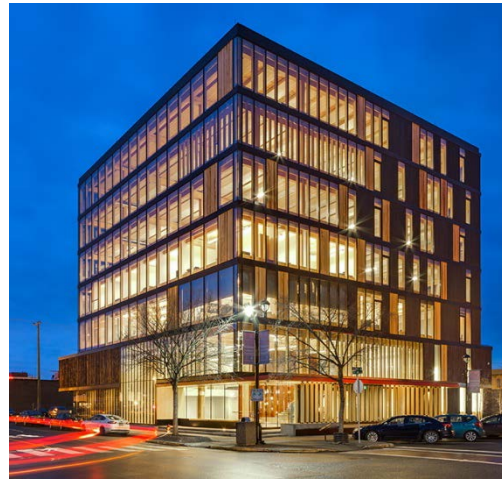


The Step Code for PART 3 Buildings

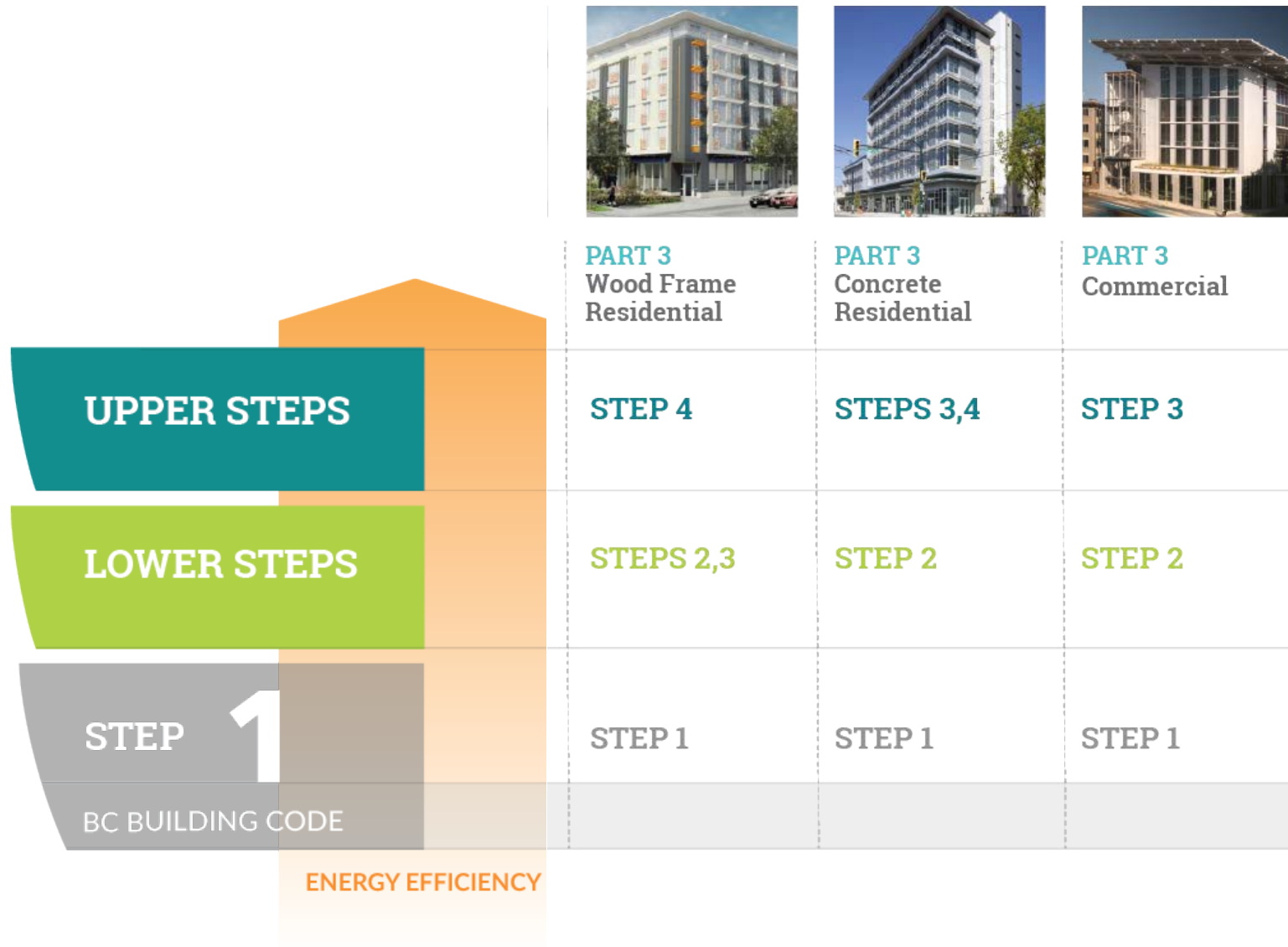


Part 3 Archetypes

- Mid-Rise MURB
- High-Rise MURB
- Mid-Rise Mixed Use
- Commercial Office
- Commercial
- Hotel/motel (forthcoming)



Part 3 | Performance Path for New Construction



Part 3 | Performance Path for New Construction

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



Part 3 Building Metrics



Thermal Energy Demand Intensity (TEDI)



Total Energy Use Intensity (TEUI)



Air leakage rate, in $\text{L}/(\text{s.m}^2)$ @75 Pa Pressure Differential

Proposed Step Code Targets for Part 3 Buildings

	Energy Modelling & Airtightness Testing	Thermal Energy Demand Intensity Target	Total Energy Use Intensity Target	Estimated Annual Energy Savings (over BCBC Baseline)
Multifamily Residential (MURB)				
Step 1 Enhanced Compliance	Required	Conform to Part 8 of the NECB		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%
Commercial (Group D & E)				
Step 1 Enhanced Compliance	Required	Conform to Part 8 of the NECB		N/A
Step 2	Required	30	150	N/A
Step 3	Required	20	120	N/A

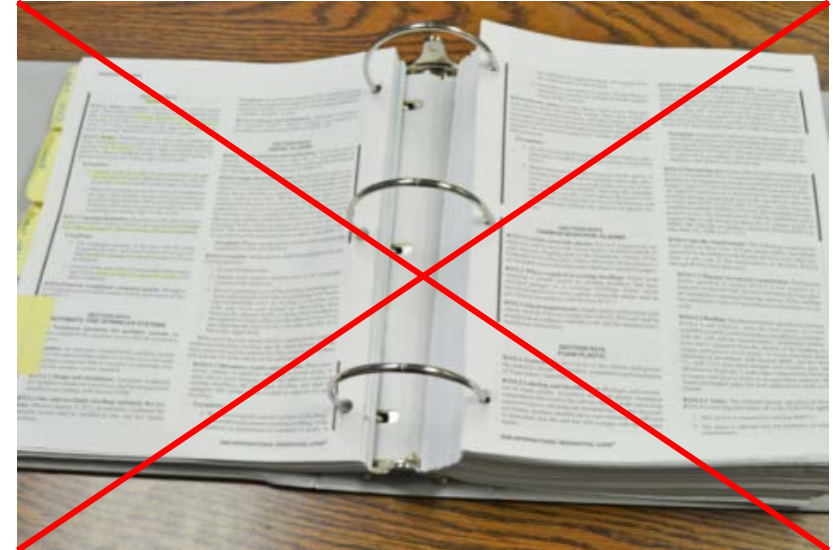
Performance Path Compliance



Energy modeling



Air-Tightness Testing



No Prescriptive
Requirements



Designing for the Step Code



Building to the Step Code

- Do you have any projects in the works that will achieve the Step Code?
- What are the challenges and benefits of building to the Step Code?

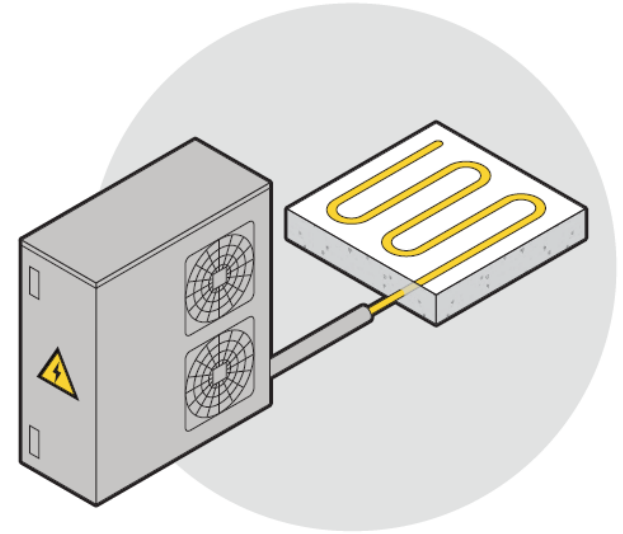
The Benefits of Energy Efficient Design



Improve Health and Comfort



Reduce Costs

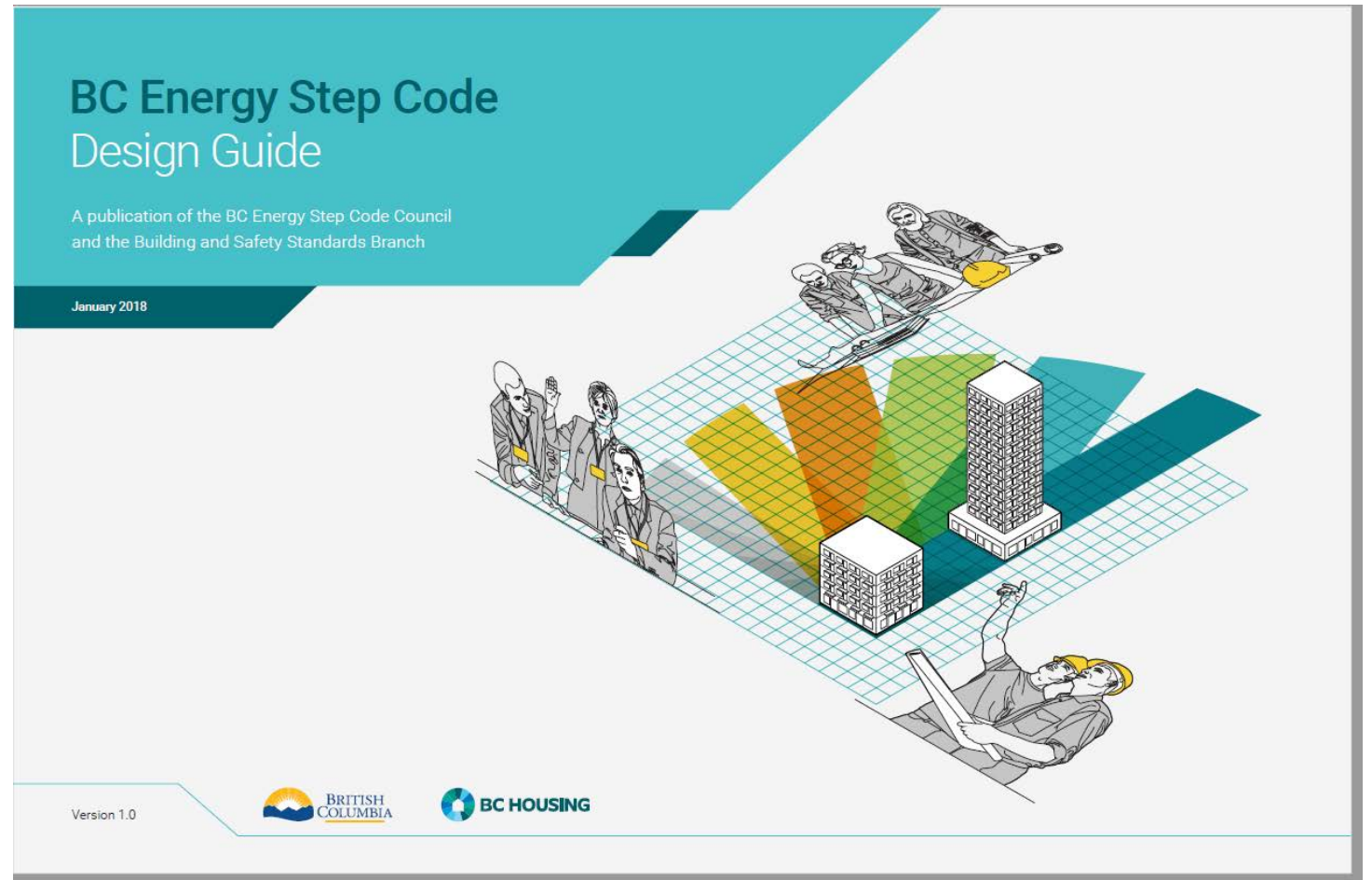


Achieve Better Performance with Today's Technologies

Design Strategies

A quick reference for developers, architects, and local governments.

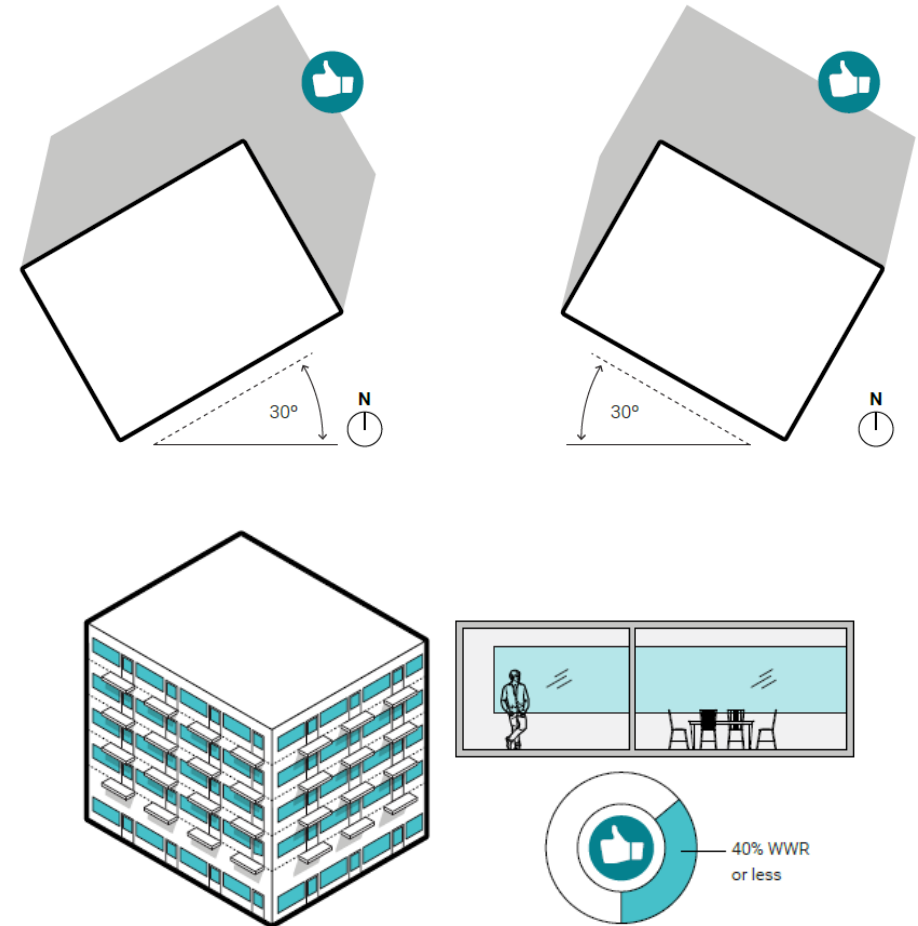
Outlines key design strategies needed to meet the requirements of the BC Energy Step Code for High-Rise and Mid-Rise MURBs, as well as commercial buildings.



Design Strategies

Building Orientation, WWR & External Shading

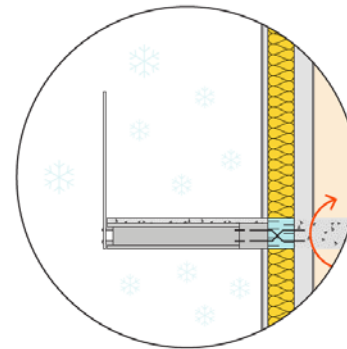
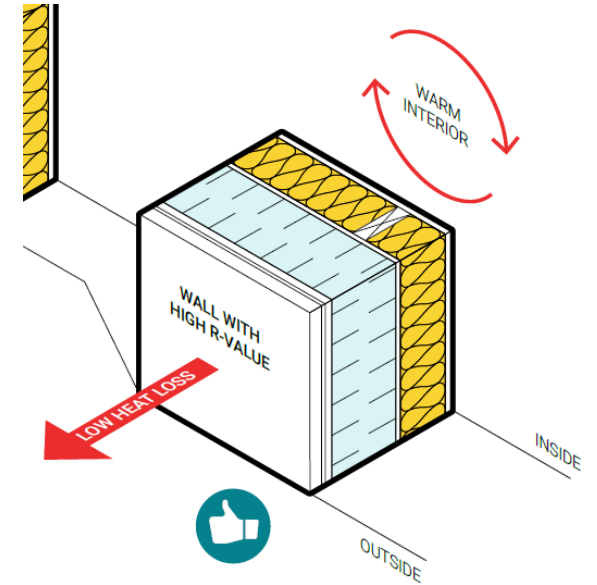
- ✓ Minimize heat loss through simplified massing & orientation
- ✓ Target a 40% WWR
- ✓ Use external shading devices to minimize unwanted solar gains



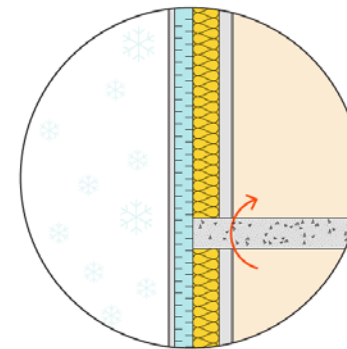
Design Strategies

Building Envelope & Thermal Bridges

- ✓ Select envelope systems with high effective R-values and low U-values
- ✓ Break thermal bridges with insulating materials
- ✓ Install a continuous air barrier to minimize heat losses through building envelope



Thermally broken balcony



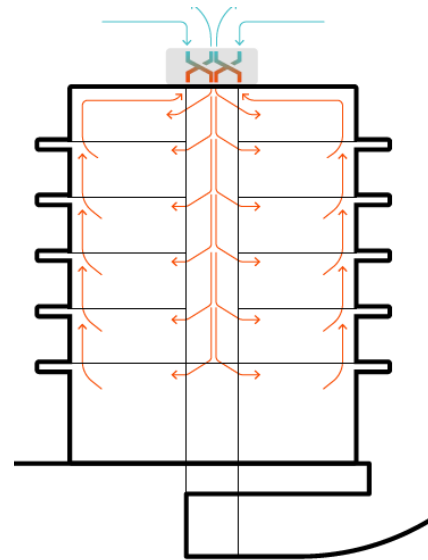
Continuous insulation

Design Strategies

Heat Recovery Ventilation

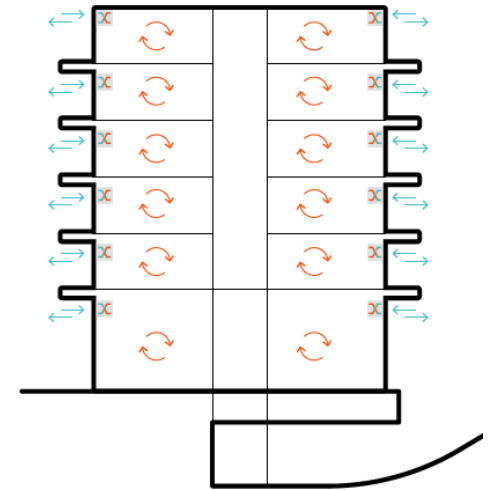
- ✓ Use heat recovery at the whole building or individual unit scale to reduce heat losses

Compartmentalized Ventilation



Centralized systems that use heat recovery achieve higher levels of energy efficiency

Heat Recovery



Decentralized ventilation systems

GHGI Targets



Greenhouse Gas Intensity (GHGI)

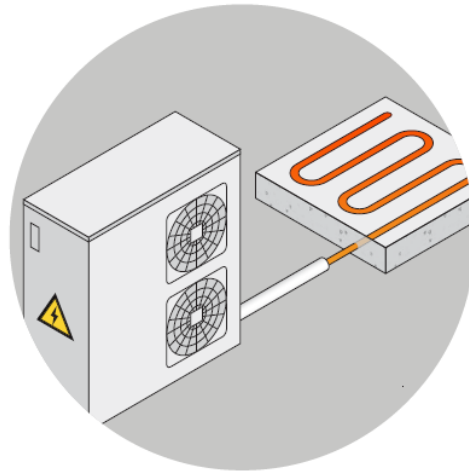
Why measure **GHGI**?

- ✓ Visible progress toward municipal and provincial carbon reduction targets
- ✓ Helps reduce number of buildings requiring costly retrofits to meet future targets

Design Strategies

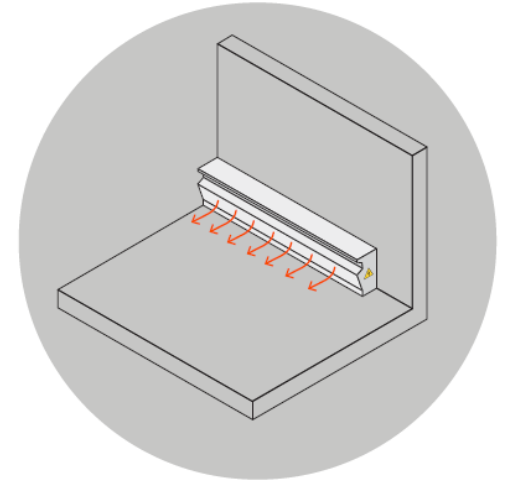
Low Carbon Energy

- ✓ Electricity-based systems at the building scale
- ✓ Low-carbon district energy systems



Hydronic* Delivery Using Electricity

- Lower Carbon
- Highest performance solution



Electric Baseboards

- Lower Carbon
- Cheapest

The BC Energy Step Code

Questions?



Implementing the Step Code in New Westminster



Implementing the Step Code – City of Victoria

Endorsed by City Council, April 27 2018

Part 3 Archetypes	November 2018		January 2020		To be determined	
	Outside DES	Within DES	Outside DES	Within DES	Outside DES	Within DES
Mid-Rise MURB	Step 1	N/A	Step 3	N/A	?	N/A
High-Rise MURB	Step 1	N/A	Step 2	N/A	?	N/A
Commercial	Step 1	N/A	Step 2	N/A	?	N/A

Implementing the Step Code – City of Vancouver

City of Vancouver's Zero Emissions Building Plan

Part 3 Archetypes	2016 Bylaw Updates				2016 Rezoning Update				2020 Rezoning Update				2025 Bylaw Requirement			
	Outside DES		Within DES		Outside DES		Within DES		Outside DES		Within DES		Outside DES		Within DES	
	TEDI	GHGI	TEDI	GHGI	TEDI	GHGI	TEDI	GHGI	TEDI	GHGI	TEDI	GHGI	TEDI	GHGI	TEDI	GHGI
Mid-Rise MURB	35	5.5	-	-	25	5	35	5	15	4.5	35	4.5	15	0	TBD	0
High-Rise MURB	55	20	-	-	32	6	40	6	18	5	40	5	TBD	5	TBD	0
Commercial Office	40	9.5	-	-	27	3.0	27	3.0	21	1	27	1	21	0	TBD	0

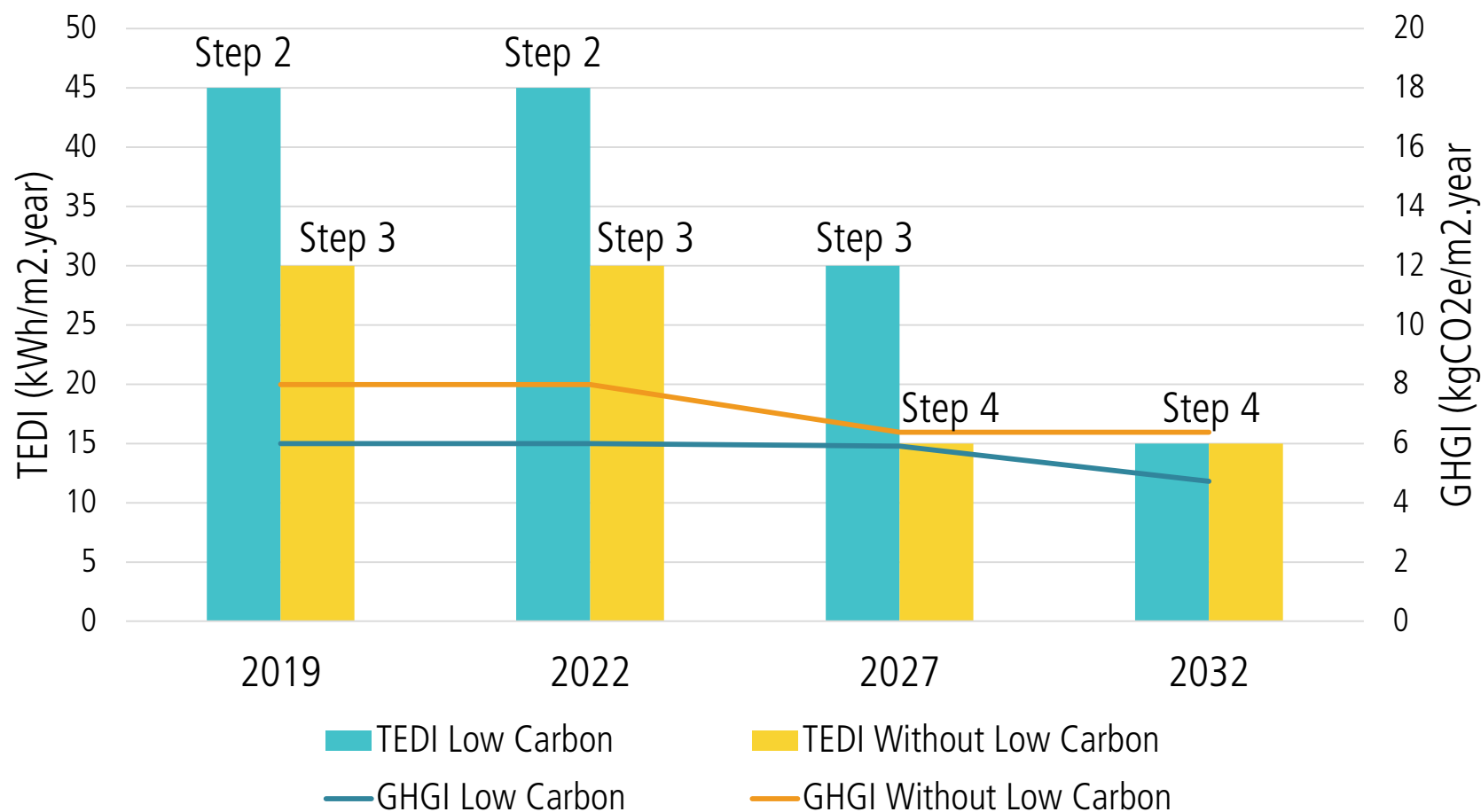
Implementing the Step Code – City of Richmond

City of Richmond's Part 3 Requirements

Part 3 Archetypes	June 2018		2022		2025	
	Outside DES	Within DES	Outside DES	Within DES	Outside DES	Within DES
Mid-Rise MURB	Step 3	Step 3	Step 4	Step 4	Step 4	Step 4
High-Rise MURB	Step 3	Step 2	Step 3	Step 3	Step 4	Step 4
Commercial	Step 2	Step 2	Step 3	Step 3	Step 3	Step 3

Proposed Implementation Framework

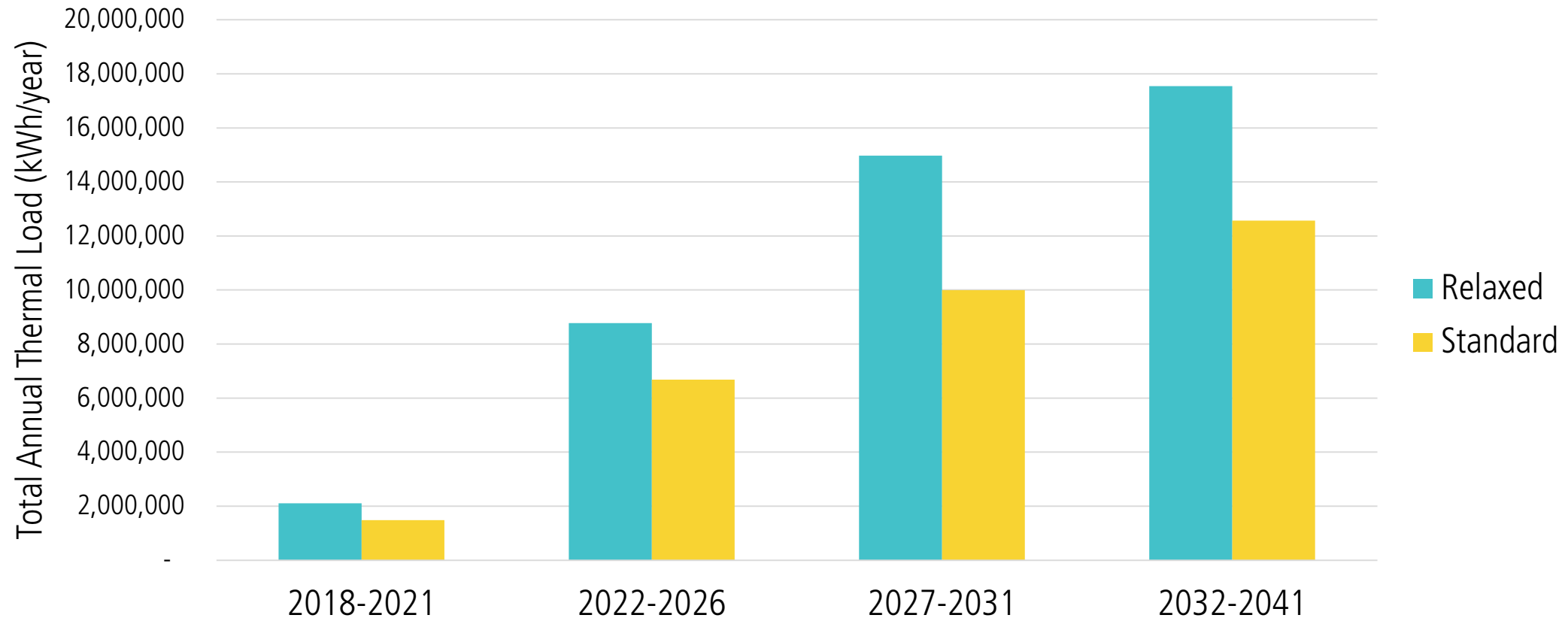
Potential Implementation Scenarios - High Rise MURB



Low Carbon DES results in similar GHG intensity even with higher thermal load.

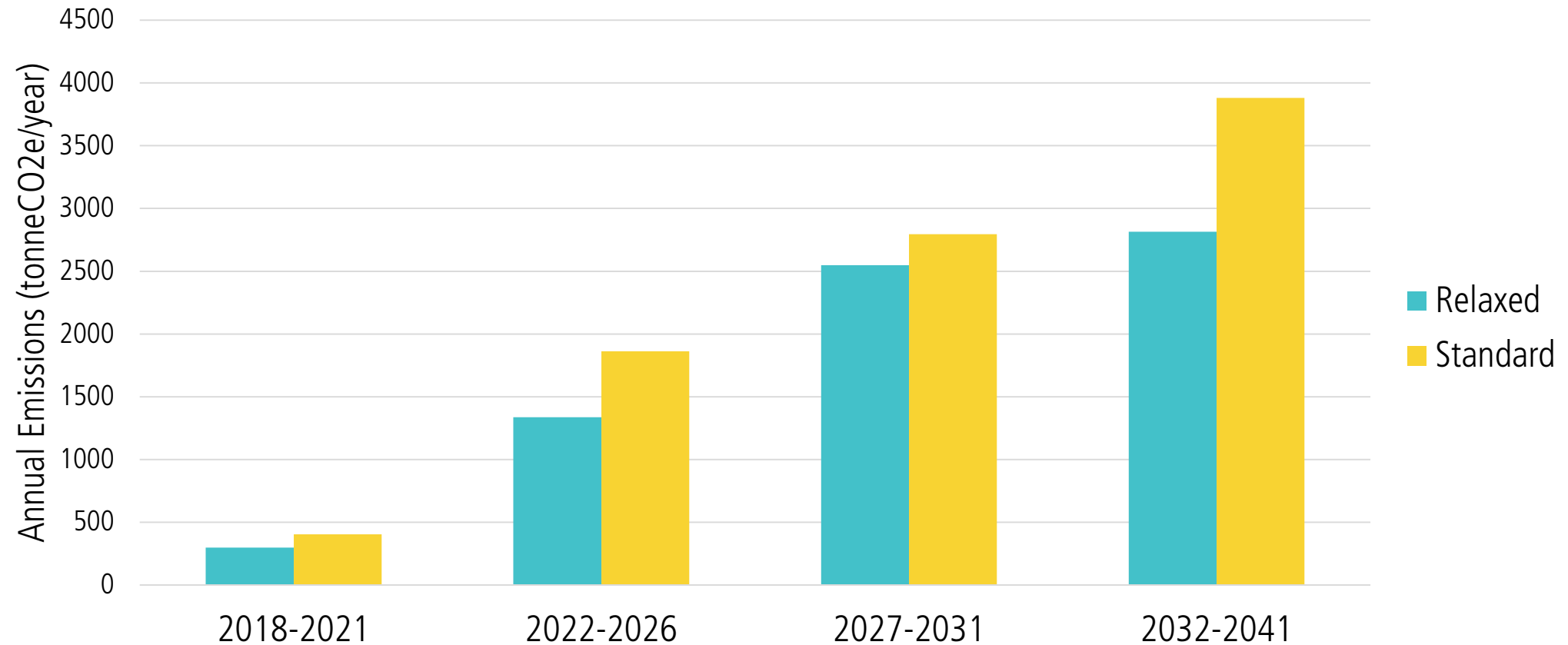
Proposed Implementation Framework

Sapperton District Energy System – Projected Total Annual Thermal Load (Relaxed vs Standard Implementation Framework)



Proposed Implementation Framework

Sapperton District Energy System – Projected Total Carbon Emissions (Relaxed vs Standard Implementation Framework)



City of New Westminster – Implementation Framework

City of New Westminster: Proposed Step Code Approach for Part 3 Buildings

Part 3 Archetypes	2019		2020		2025		2030	
	Outside DES	Within DES	Outside DES	Within DES	Outside DES	Within DES	Outside DES	Within DES
Mid-Rise MURB	3	2	3	2	4	3	4	4
High-Rise MURB	3	2	3	2	4	3	4	4
Commercial Office	2	2	2	2	3	2	3	3
Commercial Retail	2	2	2	2	3	2	3	3
Mid-Rise Mixed-Use	2	2	2	2	3	2	3	3

Breakout Session

1. What are your reactions to New Westminster's draft schedule of Step Code adoption?
2. What resources would help support compliance?
3. What are your preferred approaches to lowering GHGs?
 - a) Relaxing the Step Code level for buildings in a low-carbon district energy zone
 - b) Relaxing the Step Code level for buildings with a standalone low carbon system
 - c) Adding a GHGI target
 - d) Other



Reporting Back

What are the top three ideas that came out of your discussion?



Step Code Implementation – Next Steps

- City staff and consulting team will consolidate workshop results and comments received. Workshop summary will be shared with participants, invitees and UDI Pacific.
- Further energy modeling work on Sapperton DES will be completed this summer using proposed Part 3 Step Code scenarios.
- Follow-up workshop on proposed framework scheduled in September, with recommendations to follow in Council Report.

