Engineers and Geoscientists BC Presentation

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GEOSCIENTISTS
BRITISH COLUMBIA

Presentation Outline

- Energy Step Code – Updates
- Conformance to Part 10 – Relevant documentation
- Factors for Success – Lessons Learned

BC Energy Step Code – linkage to the Engineers and Geoscientists BC Position Paper

- Building Act:
  - Consistency, Competency and Innovation
  - Dec 2017 marked the end of local building requirements in bylaws
- 2016 Climate Leadership Plan:
  - Establishes a target that all new construction will be net-zero ready by 2032.
- Engineers and Geoscientists BC Position Paper - *Human-Induced Climate Change*:
  - Members have the potential to influence greenhouse gas emissions through their professional activities, and are expected to consider the impact of their work on the climate

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2018 BCBC

- Province has adopted the 2018 edition of the British Columbia Building Code, including Book II Plumbing Services. Effective December 10, 2018.
- Will apply to building permits applied for on or after that date.
- Step Code Metrics Stay the same. ASHRAE 90.1-2016 and NECB 2015 have been adopted. Water Efficiency section moved to Book II, Plumbing Services.
- New Reqt's include:
    - updates to airborne sound transmission ratings,
    - seismic design and climatic data, and
    - updates to stairs, ramps, handrails and guards, including an increase to the run dimensions for residential dwellings

Extensions and Minor Improvements to the BC Energy Step Code

- The fundamentals of the regulation remain unchanged.
- It will ensure builders can reach the Upper Steps — Steps 4 and 5 for homes and other simple buildings — in colder climates.
- It will correct an unintended impact of the standard in which certain large single-detached homes could potentially use more energy than those built to the minimum requirements of BCBC.
- It will make the BC Energy Step Code available to communities outside southwestern BC that may wish to use it.

Improvements – Contd. Part 9 Buildings

- TEDI Targets – Updated
- PTL as a Compliance Option – Removed
- MEUI Targets for Small Homes – Introduced
- Higher Steps in Colder Climates – Enabled
- Removed Barriers to Cooling – MEUI Targets Adjusted to Include Cooling

Improvements – Contd. Part 3
Buildings

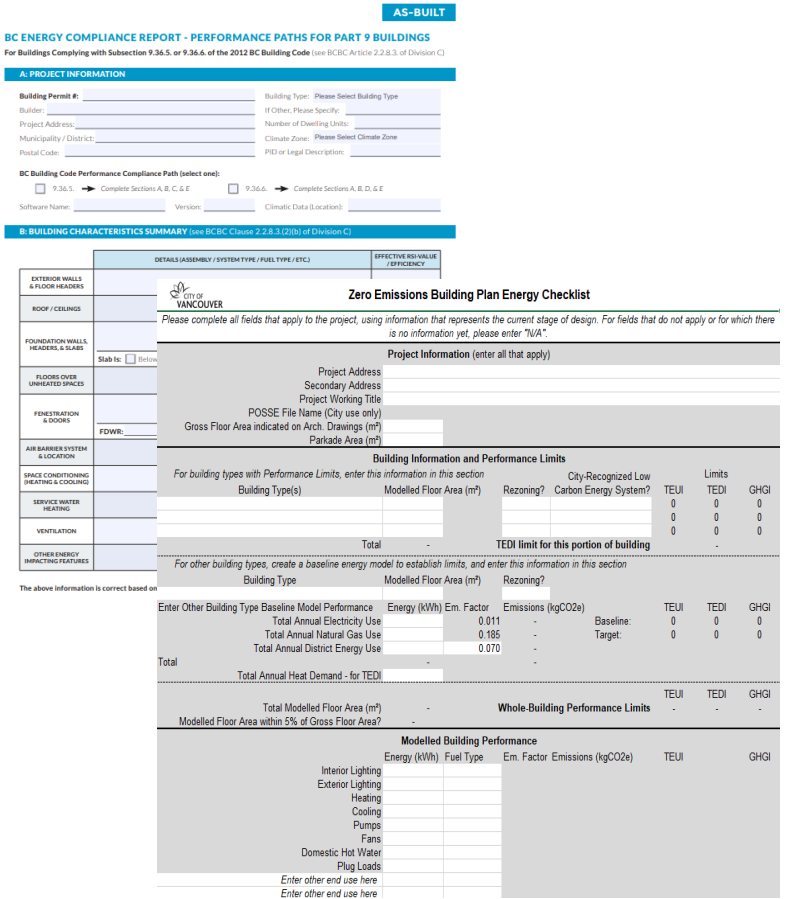
- Applicability of the Standard Throughout the Province – Offered
- Distinct Targets for Hotels and Motels – Established
- Distinct Targets for Offices – Established

Part 10 Compliance Paths

- For the purposes of compliance with Part 10 of the Code, the BC Building Code requires that the energy performance of Part 3 buildings to comply with these energy codes or standards:
  - the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1,
  - the National Energy Code of Canada for Buildings (NECB) or
  - the BC Energy Step Code.

Relevant Documentation

- Checklists and where applicable, forms
  - for ASHRAE 90.1 (City of Vancouver's checklists, and the ASHRAE forms),
  - or NECB checklists developed NRCan (City of Vancouver's checklists),
  - or the BC Energy Step Code and the City of Vancouver's Energy Modelling Guidelines and the associated Zero Emissions Building Plan (ZEBP) Energy checklist,
- drawings and specifications, and energy statements on drawings provided by the registered professionals of record, and
- where appropriate, through documentation of whole building energy modelling and whole building air-leakage rate testing



AS-BUILT

BC ENERGY COMPLIANCE REPORT - PERFORMANCE PATHS FOR PART 9 BUILDINGS

For Buildings Complying with Subsection 9.36.5. or 9.36.6. of the 2012 BC Building Code (see BCBC Article 2.2.8.3. of Division C)

A: PROJECT INFORMATION

Building Permit #: Building Type: Please Select Building Type
Builder: If Other, Please Specify:
Project Address: Number of Dwelling Units:
Municipality / District: Climate Zone: Please Select Climate Zone
Postal Code: PID or Legal Description:

BC Building Code Performance Compliance Path (select one):

☐ 9.36.5. → Complete Sections A, B, C, & E ☐ 9.36.6. → Complete Sections A, B, D, & E

Software Name: Version: Climatic Data (Location):

B: BUILDING CHARACTERISTICS SUMMARY (see BCBC Clause 2.2.8.3.(2)(b) of Division C)

	DETAILS (ASSEMBLY / SYSTEM TYPE / FUEL TYPE / ETC.)	EFFECTIVE RSI VALUE / EFFICIENCY
EXTERIOR WALLS & FLOOR HEADERS		
ROOF / CEILINGS		
FOUNDATION WALLS, HEADERS, & SLABS	Slab Is: ☐ Below	
FLOORS OVER UNHEATED SPACES		
FENESTRATION & DOORS	FDWR:	
AIR BARRIER SYSTEM & LOCATION		
SPACE CONDITIONING (HEATING & COOLING)		
SERVICE WATER HEATING		
VENTILATION		
OTHER ENERGY IMPACTING FEATURES		

The above information is correct based on

CITY OF VANCOUVER

Zero Emissions Building Plan Energy Checklist

Please complete all fields that apply to the project, using information that represents the current stage of design. For fields that do not apply or for which there is no information yet, please enter "N/A".

Project Information (enter all that apply)

Project Address
Secondary Address
Project Working Title
POSSE File Name (City use only)
Gross Floor Area indicated on Arch. Drawings (m²)
Parkade Area (m²)

Building Information and Performance Limits

For building types with Performance Limits, enter this information in this section

Building Type(s)	Modelled Floor Area (m²)	Rezoning?	City-Recognized Low Carbon Energy System?	Limits TEUI	TEDI	GHGI
				0	0	0
				0	0	0
				0	0	0
Total	-		TEDI limit for this portion of building		-	

For other building types, create a baseline energy model to establish limits, and enter this information in this section

Building Type	Modelled Floor Area (m²)	Rezoning?

Enter Other Building Type Baseline Model Performance	Energy (kWh)	Em. Factor	Emissions (kgCO2e)		TEUI	TEDI	GHGI
Total Annual Electricity Use		0.011	-	Baseline:	0	0	0
Total Annual Natural Gas Use		0.185	-	Target:	0	0	0
Total Annual District Energy Use		0.070	-				
Total	-		-				
Total Annual Heat Demand - for TEDI							

			TEUI	TEDI	GHGI
Total Modelled Floor Area (m²)	-	Whole-Building Performance Limits	-	-	-
Modelled Floor Area within 5% of Gross Floor Area?	-				

Modelled Building Performance

	Energy (kWh)	Fuel Type	Em. Factor	Emissions (kgCO2e)	TEUI	GHGI
Interior Lighting						
Exterior Lighting						
Heating						
Cooling						
Pumps						
Fans						
Domestic Hot Water						
Plug Loads						
Enter other end use here						
Enter other end use here						

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Example: Documentation Requirements

- An energy modelling report for the project
- Project energy modelling output files and supporting documentation
- A project airtightness testing plan
- A project costing report
- A measurement and verification plan
- Project drawings and renderings

Reqts' from: Better Buildings BC: The Net-Zero Energy-Ready Challenge

Success Factors

- Join the Energy Modelling Community
- Understand Soft Costs
- Incorporate Integrated Project Delivery
- Build for Resiliency
- Collaborate, Research, Learn and Train!

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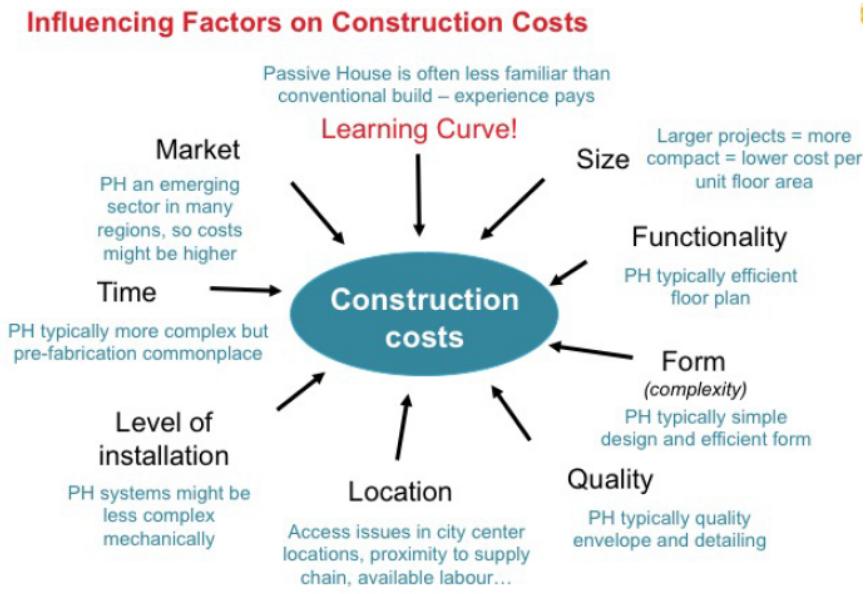
Join the Energy Modelling Community

- Know the industry and training groups:
  - IBPSA-BC - Industry
  - CHBA-BC (Part 9) – Industry and training
  - BCIT (e.g. Energy Modelling for Professionals Course) - training
  - Canadian Passive House Institute – Industry and training
- Attend Networking Events: ZEBx, IBPSA, or BC Housing Building Smart Series

Understand Soft Costs



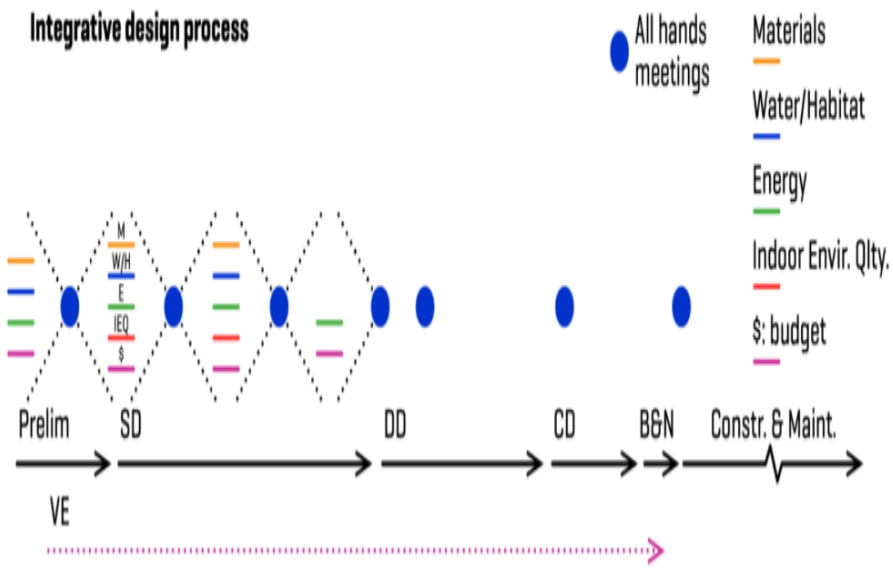
As industry gains experience with energy efficient construction practices—and energy-efficient products become more readily available—cost premiums will decrease.

Please see the 2018 Metrics Study Update and the Case Studies at www.energystepcode.ca

Graphic from: Passive House 120 A course

Integrated Project Delivery

- Aligned with lean construction principles
- Multi-party agreements through single contract
- Positive for innovation, but not suitable for small projects
- Bottom Line: Coordination from the Conceptual/Schematic design Phase is essential.



Graphic from the BCIT's Energy Modeliing for Professionals Course

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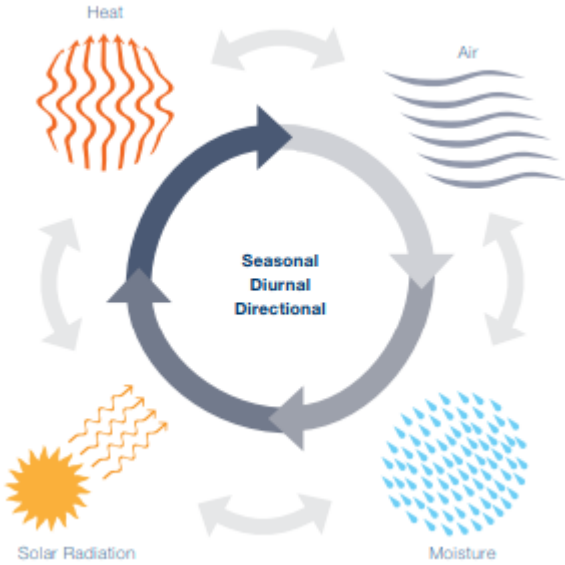
Build for Resiliency

- Thermal Bridging – minimizes heat loss and prevent overheating
- WWR, fenestration positioning, operable windows, overhangs: minimizes heat loss, allows winter sun
- Shading, massing, orientation, form factor, cool/green roofs
- Modelling objectives: # overheating hours, optimizing SHGC
- Solutions with multiple benefits e.g.: heat pumps that offer heating + cooling



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Training/Events

- ✓ CPD Events:
  - Thermal Bridging Calculations
  - EnergyPlus Training
  - AIBC PD Events
  - BC Housing Seminar Series
- ✓ BCIT: Graduate Diploma Programs (on-going)
- ✓ Passive House Course (on-going)
- ✓ Visit https://energystepcode.ca/all-resources/
- ✓ Sign up to Energy Step Code Stakeholder Update Newsletter:
- ✓ https://energystepcode.us15.list-manage.com/subscribe?u=6394fa7be6bf69bb22890b08e&id=c8a8992b95

THANK YOU

If you have questions regarding the *Engineers and Geoscientists BC's* Practice Guidelines, Bulletins, or the Energy Step Code please contact:

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