



The Road to 2050

Bridging the Gap Between Challenges
& Solutions in the Built Environment.

Built Environment

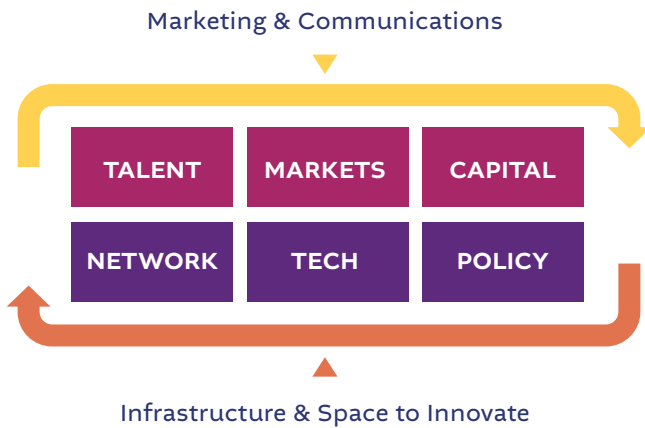


Bridging the Gap Between Challenges & Solutions in the Built Environment

The Province of British Columbia has set GHG emissions reduction targets of 40%, 60% and 80% for 2030, 2040, and 2050. In order to achieve these goals, there must be a supportive, industry-driven innovation ecosystem that encourages the rapid uptake of new innovations as well as the application of best available clean technology and low carbon materials.

Roadmaps are a tool that are used to explore progress towards a goal by outlining targets and timelines across multiple activity areas. It gives industry stakeholders a common vision, identifies steps along the way to the goal, and potential barriers or gaps that need to be addressed to achieve the shared vision.

Barriers that prevent innovation can exist in multiple areas across the industry: talent, markets, capital, networks, technology, and policy. A roadmap is an important tool to help identify these gaps from a whole industry perspective - is there supportive policy in place? What are the technology competencies in the industry? Is there enough talent and capital to execute?



CORE Cluster and Foresight are producing a series of roadmap landscapes in the six sectors of CORE’s focus. The intent is to provide a snapshot of the roadmaps that exist in each, and how they are being used. This will help identify gaps in the required elements, as well as places where roadmaps either don’t exist or are insufficient to achieve the government’s targets.

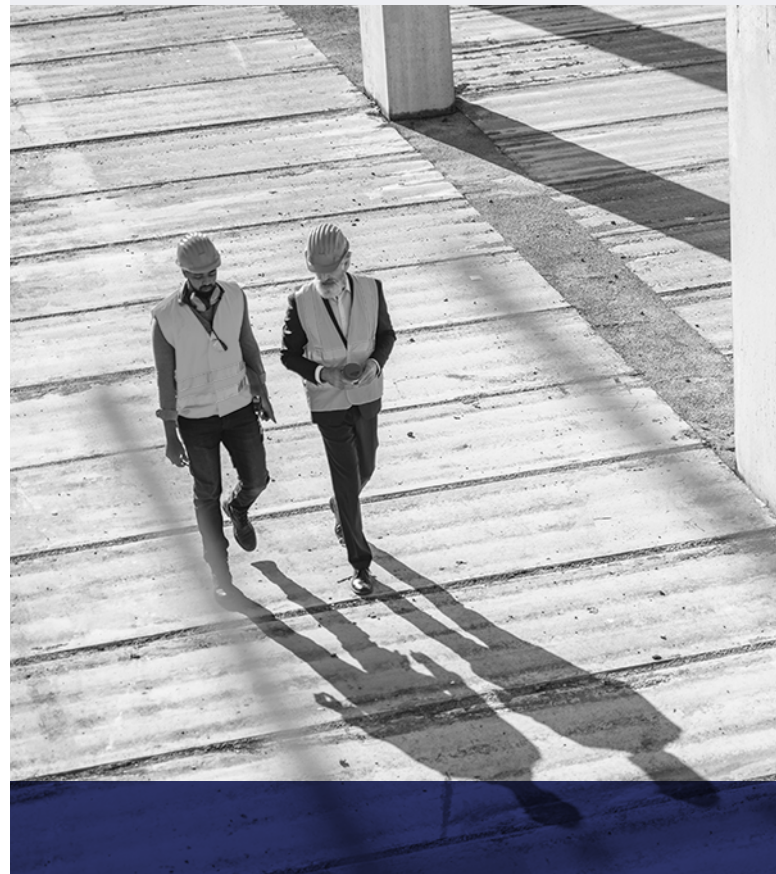
This introductory document is meant to provide a snapshot of roadmaps, guidance, standards and building codes in use in the built environment sector in BC, to provide a strategic overview of the path to the targets for 2030-2050, and to identify areas where the industry would benefit from further support in order to achieve the targets.

What’s At Stake

Housing and the built environment are not only critical to the health, safety and livability of the province but also play a significant role in meeting Canada’s Climate Change goals.

The built environment includes the public and private infrastructure in the province: housing, culture, recreation and sports facilities: office buildings, industrial facilities, roads and bridges.

- Building and construction is responsible for 39% of global carbon emissions. ¹
- Construction is a \$16.5 billion dollar industry that provides 8.7% of the province’s GDP. ²
- Building and construction employs more than 200,000 in BC. ³
- In Metro Vancouver alone, the demand for high performance building products and technologies is estimated to be a \$3.3 billion CAD market between 2019-2032. ⁴



How Are We Getting There? The Roadmap Matrix

Interviews with a cross-section of industry players revealed that there are a number of different roadmaps, guidance, standards and building codes for the built environment sector in use in BC. While some are used by all players and across sectors, others are used in specific sectors or sometimes by only a few companies in the province. Some larger organisations have developed their own internal roadmaps to meet targets.

The impact of the BC Energy Step Code is significant. While it is currently an optional compliance path in the BC Building Code, by 2022 it will be mandatory for new construction. It is not yet universal, but has been adapted in projects with significant construction activity.

A summary of compliance, green building standards and others that are being used by the different sectors of the industry to develop their roadmaps is shown in the table that follows.

	BC STEP CODE	LEED	CAGBC ZERO CARBON STANDARD	PASSIVE HOUSE	OTHER*
Single Family Residential	✓		✓	✓	
Multi Family Residential	✓		✓	✓	
Commercial	✓	✓	✓		✓
Industrial	✓				✓
Institutional		✓		✓	✓

*GRESB, FITWEL, WEL and others.



Brock Commons at UBC.
 Photo courtesy of naturallywood.com
 Photographer: Brudder

The barriers are not technical. The challenge is how to make these changes at scale

Observations

- Industry is supportive of the BC Energy Step Code because it provides clarity and allows for long-term planning. This was consistent across the industry.
- With the exception of the mandated BC Energy Step Code, the roadmap used was dependent on the industry sub-sector. For example, commercial and industrial sectors value LEED because it can be used as a marketing tool, while well-known standards like Passive House are not commonly used outside of residential.
- CleanBC targets are driving the industry towards electrification in homes and buildings. In order to get there, we need a wider breadth of technologies, in particular in the building shell and heating technologies. This leads to two gaps:
 - » A talent/training gap: There are not enough skilled tradespeople or architects/designers with the depth of experience needed to support wide deployment of new technologies. While the industry is aware of the talent gap and the need for training and labour market development, further work to fully define the scale of these training needs and the areas that should be prioritized would be beneficial.
 - » A market gap: The full suite of products and services available that are needed to reach carbon neutral standards are not readily available in BC because much of the equipment is imported, and therefore subject to product testing/certification barriers, and more expensive (e.g. heat pumps).
- The talent gap and the difficulties with importing equipment is compounded by a lack of diverse funding models which could enable retrofitting through financial incentives.
- As energy efficiencies improve, embodied carbon will have an increasingly important role in GHG reduction - this will benefit the mass timber industry in BC, as it will lead to a demand for low-carbon wood building materials.





Recommendations:

In the Built Environment sector, the roadmaps, guidance, standards and building codes outlined above are helping the industry to progress toward achieving the CleanBC targets set by the Provincial Government. However, in order to remove the current barriers to adoption the following steps are recommended:

- A detailed study of future skills and labour market requirements for the building/ construction industry should be conducted along with a review of training programs currently in place in the province. This could be used to identify skills gaps and opportunities to fill them within BC's academic and skills training ecosystem.
- The codes, standards and guidelines are aiding construction companies and developers in developing their roadmaps. The BC Energy Step Code only applies to new buildings - having a similar code for retrofits would be beneficial given the life span of existing buildings.
- Engage industry to work with knowledge centres and academia to train construction trades and engineers on new technology solutions that deliver co-benefits.
- Develop finance models and incentives for retrofits that take into account co-benefits, long term return of investments and maximise affordability. This will drive greater consumer demand for high-performance building retrofits.
- There is an opportunity for BC to become a leader in low carbon building materials, particularly mass timber.
- Given the range of roadmaps in use, there is an opportunity to coordinate the network working on carbon neutral buildings across the province and further energize this sector toward a collaborative model and single vision.



About the Project

The CORE Cleantech Cluster is driving economic development goals of job growth, company growth, investment attraction and trade opportunities in British Columbia by activating, coordinating and developing collaboration opportunities and energizing an innovation ecosystem centred around cleantech and sustainability.

A more detailed analysis of the Built Environment sector and its role in the cleantech innovation ecosystem is available in the report [Accelerating British Columbia's Clean Economy: A Cleantech Cluster Strategy for the Province of British Columbia](#).

Foresight

About Foresight Cleantech Accelerator Centre

This roadmap landscape report is funded through [Foresight Cleantech Accelerator Centre](#). Foresight is Western Canada's Cleantech Innovation Centre which supports the identification and validation of cleantech opportunities and the successful commercialization of solutions.

¹ <https://www.iea.org/reports/global-status-report-for-buildings-and-construction-2019>

² <https://www.bccassn.com/media/bcca-report-construction-innovation-2016.pdf>

³ https://www.bccassn.com/media/BCCA_IndustryStatistics_Source2019.pdf

⁴ <https://www.vancouvereconomic.com/research/green-buildings-market-research/>