

# Whole-Building Life Cycle Assessment

Building a new Part 3 building?

You'll need an LCA to apply for a Development Permit



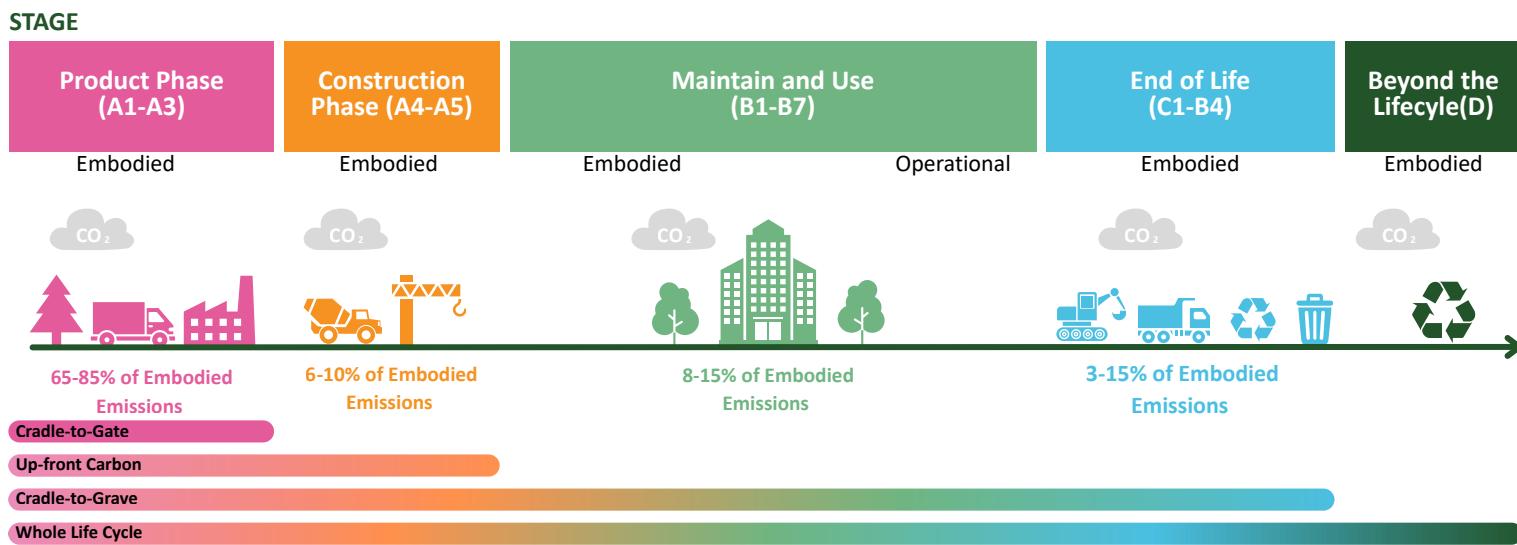
## What is a Life Cycle Assessment (LCA)?

An LCA evaluates the environmental impacts of a building **from cradle-to-grave** including:

- Extraction of raw materials
- Manufacturing of products
- Transportation
- Construction processes
- Maintenance and renovation or replacement of materials
- End-of-life processes (demolition, disposal, or recycling).

It provides a scientific method to evaluate a building's environmental impact from raw material extraction through to demolition. All of the materials and processes are gathered into an inventory using software and multiplied with the appropriate impacts for each material or process. By mapping these impacts, builders can see where the largest emissions come from and identify opportunities for more sustainable design.

## A Building's Life Cycle



## Do I need a Life Cycle Assessment?

A Life Cycle Assessment (LCA) is required for **all new Part 3 buildings**, except non-market affordable housing\*, citywide as part of the Development Permit process. Refer to the Development Permit Area #1 design guidelines in the Official Community Plan.

If your project contains three storeys or less and has a single use, it is likely a Part 9 building and this requirement does not apply. Part 3 buildings are typically larger and more complex. If you're unsure, check with [Development Services](#).

\*Exempt projects should reach out to Nelson's Low-Carbon Homes Pilot for support, as carbon and cost-saving building design strategies often overlap.

\*\*This handout has been prepared for general guidance purposes only. It is neither a bylaw nor a legal document. Consult the Local Government Act in addition to the City of Nelson's applicable bylaws for definite requirements and procedures.

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## Why is This Being Required?

The construction of buildings has a large environmental footprint. In fact, **embodied carbon**—the greenhouse gases released during the various phases of a building's lifecycle—accounts for **about 10% of global energy-related emissions** (Canada Green Building Council).

By requiring an LCA for new large developments, Nelson aims to:

- **Build local capacity** in advance of anticipated building code updates requiring whole-building life cycle assessments (wbLCAs)
- **Raise awareness** of embodied carbon in building projects
- **Support informed choices** about design and materials
- **Contribute to climate action** and long-term sustainability
- **Align with national standards** and best practices in green building

There is currently no required level of performance. It is simply a reporting requirement. The collected LCAs will be used to establish local benchmarks and identify key opportunities to reduce embodied carbon. This is a way to acclimate the industry to the practice of reporting data, setting the stage for a more meaningful embodied carbon requirement in the near future, whether adopted by the Province or the City.

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## How Does the Process Work?

### 1 Preliminary LCA

- Prior to submitting your Development Permit application, prepare a preliminary **whole-building Life Cycle Assessment**. This ensures that design and material choices are considered early in the project.
- LCAs can be prepared by a professional or completed by builders using free or paid recognized software tools. It must be prepared according to the [National guidelines for whole-building life cycle assessment](#). Most commonly used software tools for building embodied carbon assessment claim to comply with these guidelines including: *tallyLCA*, *tallyCAT*, *Embody Carbon in Construction calculator (EC3)*, *One Click LCA*, and *Athena Impact Estimator for Buildings*.
- Once your preliminary whole-building LCA has been prepared, report the results using the designated City of Nelson reporting form and submit it with your Development Permit application.

### 2 Final LCA

- This version must reflect any design or material changes made during construction.
- Update your LCA using your software of choice once the building has been finished.
- Submit an updated, final assessment to the City, using the same form, before receiving **partial or full occupancy approval** (whichever comes first).

## Need Help?

We understand that embodied carbon estimates and LCAs are still new for many people in the industry. You might consider working with an LCA professional. The Athena Sustainable Materials Institute maintains a directory of those who have completed the whole-building LCA professional development program at the BC Institute of Technology: <https://www.athenasmi.org/resources/find-a-wblca-professional/>.

To better understand the National Guidelines for whole building Life Cycle Assessments, consult this [Practitioner's Guide](#). The City of Vancouver has prepared software guidance videos that may be useful to you: <https://tinyurl.com/COV-ECDR>. Learn more about low-carbon construction in Nelson at [Low Carbon Buildings](#). Read about carbon and cost saving building strategies here: [Strategies for Building Design Professionals](#).

At the City of Nelson, you can direct your questions to the Climate & Energy Team's Low Carbon Homes Pilot at [aleffelaar@nelson.ca](mailto:aleffelaar@nelson.ca)

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