Building Design Professionals

FREE BEAM ESTIMATOR TRAINING
- Boost your skills with this embodied carbon accounting tool
- Courtesy of the City of Nelson's Low Carbon Homes Pilot
- Contact Alex Leffelaar (aleffelaar@nelson.ca)

10 Affordable Ways to Reduce Embodied Carbon in Your Designs

Building design professionals like architects, engineers, and designers play an important role in embodied carbon reductions. As problem solvers and innovators, you can lead clients to creative solutions. Find ways to improve your designs by considering embodied carbon early on, and by bringing together various building professionals involved in a project into an **Integrated Design Process (IDP)**. This encourages collaboration between these professionals and can substantially reduce embodied emissions, building costs, and construction delays. The impact you can have might be greater than you think! As a structural engineer, you could:

Cut one economy flight to New York
Save 1,600 kgCO_2e

Cut meat, dairy, and beer from your diet
Save 2,000 kgCO_2e/year

Stop driving your car
Save 3,000 kgCO_2e/year

Reduce 20% of embodied carbon on your projects
Save 200,000 kg CO_2e/year

CO2 embodied carbon | building costs | homeowner income | energy costs | housing availability | maintenance

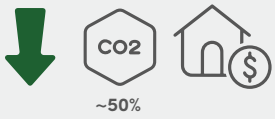
Build Less for More

1 Build Smaller Buildings

- Challenge building designers/homeowners to be creative in achieving more efficient uses of smaller floor areas

2 Retrofit or Reuse Existing Buildings

- New builds can be an attractive option, but old buildings are timeless.
- Consider finding an existing building that could be retrofitted/refurbished to suit your client's needs



3 Increase Occupant Capacity

- Add a second unit to single-family homes or choose multi-unit buildings
- New BC zoning = more housing

Build Smarter

4 Design for Durability

- Design buildings that last longer, have potential for various future uses, consider end-of-life material recycling & reuse possibilities

5 Optimize Windows

- Optimize size and location of windows (which account for ~11% of a home's embodied emissions and ~30% of heating/cooling demand)

FORTIS BC™

City of NELSON

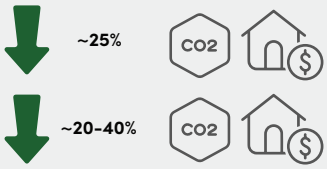
6 Improve Efficiency & MEP System Sizes

- Improve the airtight envelope of a home, increase insulation, optimize windows, and select appropriate building orientation and form (low surface area to volume ratio)

Building Material Consideration

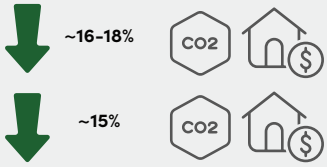
7 Reduce Concrete Use

- Reduce wall thickness from 8” to 6”
- Reduce slab thickness from 5” to 3-4”
- Reconsider in-floor heating
- Eliminate basements, use pier/screw pile foundations



8 Improve Concrete Mix

- Ask for a lower carbon concrete mix
- Reduce compressive strength of concrete mix to those specified by building code/or engineering



9 Consider Alternative Insulation Materials

Material		R-Value x in²	Resistance (fire | moisture | pests)	Cost	Emissions based on 100 m² (-1000 0 1000 2000 3000 kg/CO₂)
Batts	Mineral Wool	4	🔥 💧 🐛	< $6	608
	Fibreglass	3.6	🔥	< $2	154
Spray / Blow-In	Spray Foam	4.6	🔥 💧 🐛	< $6	open cell 380 – closed cell 3013
	Fibreglass	2.6	🔥	< $4	229
	Cellulose	3.6	🔥 💧 🐛	< $4	dense packed -564 – -445 loose fill
Rigid Board	XPS	5	💧	< $3	715
	EPS	4	💧	< $2	288
	Mineral Wool	3.6	🔥 💧 🐛	< $6	473

Manage Waste & Material Reuse

10 Measure Embodied Carbon & Compare Material Options

- Use a Life Cycle Assessment (LCA) like the **BEAM Estimator Tool**
- Free, easy to use, designed for Canada
- Compare material options for flooring, siding, and other building systems
- Check out **Nelson's Materials Guide**, and the **CLF's Materials Guide** to compare the impacts of different materials like flooring, siding, and insulation.