



NRMCA CONCRETE INNOVATIONS SERIES

Who are we?

Lehigh Hanson
HEIDELBERGCEMENT Group

Is Transitioning To

Heidelberg Materials

In January 2023

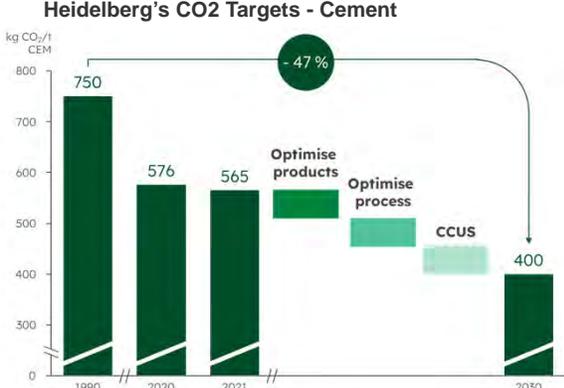
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Heidelberg Cement Group's 2030 Commitments

-  **Ensuring Compliance and Creating Transparency**
-  **Being a Good Neighbour**
-  **Enabling the Circular Economy**
-  **Reducing our Environmental Footprint**
-  **Achieving Excellence in Occupational Health and Safety**
-  **Driving Economic Strength and Innovation**

Heidelberg's CO2 Targets - Cement



Our CO2 targets are underpinned by a clear roadmap. Each country in our portfolio has a detailed bottom-up carbon roadmap, with all measures agreed with local management at plant level.

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SUSTAINABILITY EVOLUTION WITH ECOCEM SOLUTIONS

What is driving the urgency and action in sustainability evolution?



United Nations Climate Change

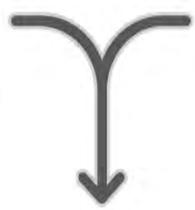
- Climate Change
- Intergovernmental Panel on Climate Change
- Paris Agreement
- Pan-Canadian Framework on Clean Growth and Climate Change
- Green Building Councils
- Corporate commitments to target reductions
- Shareholder concern for ESG factors is pressuring corporations to increase sustainability efforts

Compliance Pathways



Voluntary Pathways



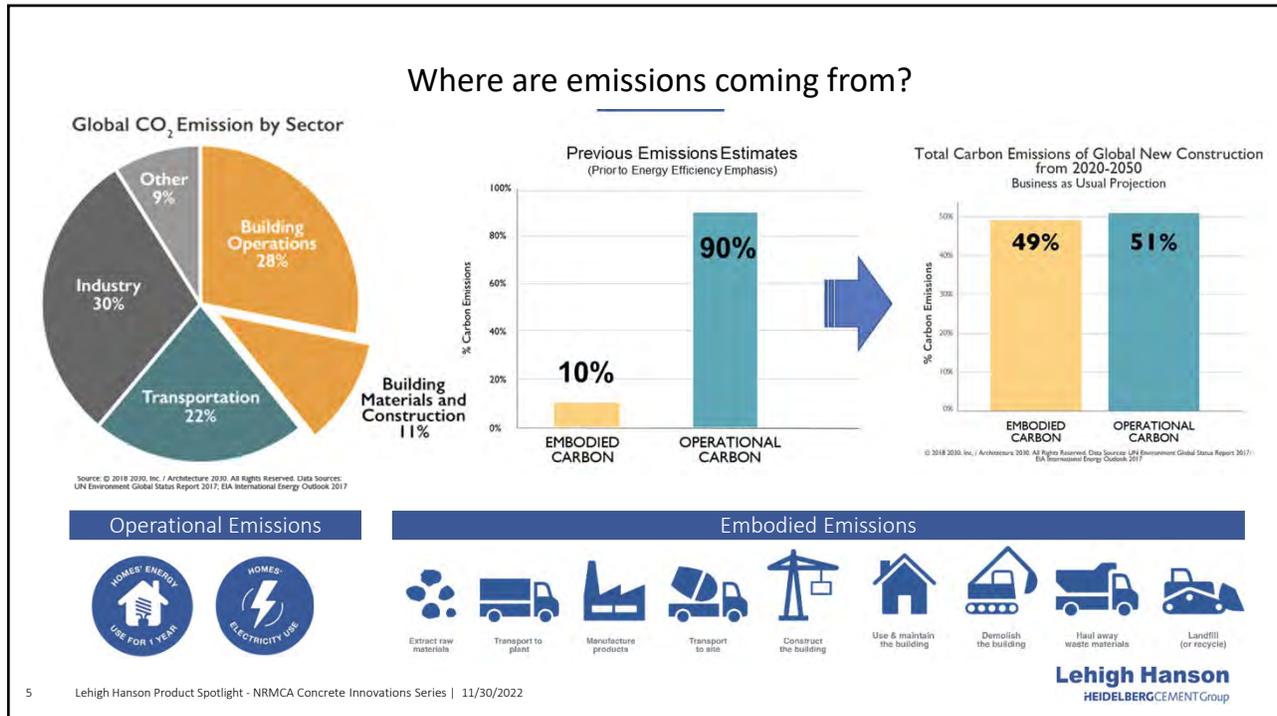


Enforcement Criteria



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SUSTAINABILITY OVERVIEW

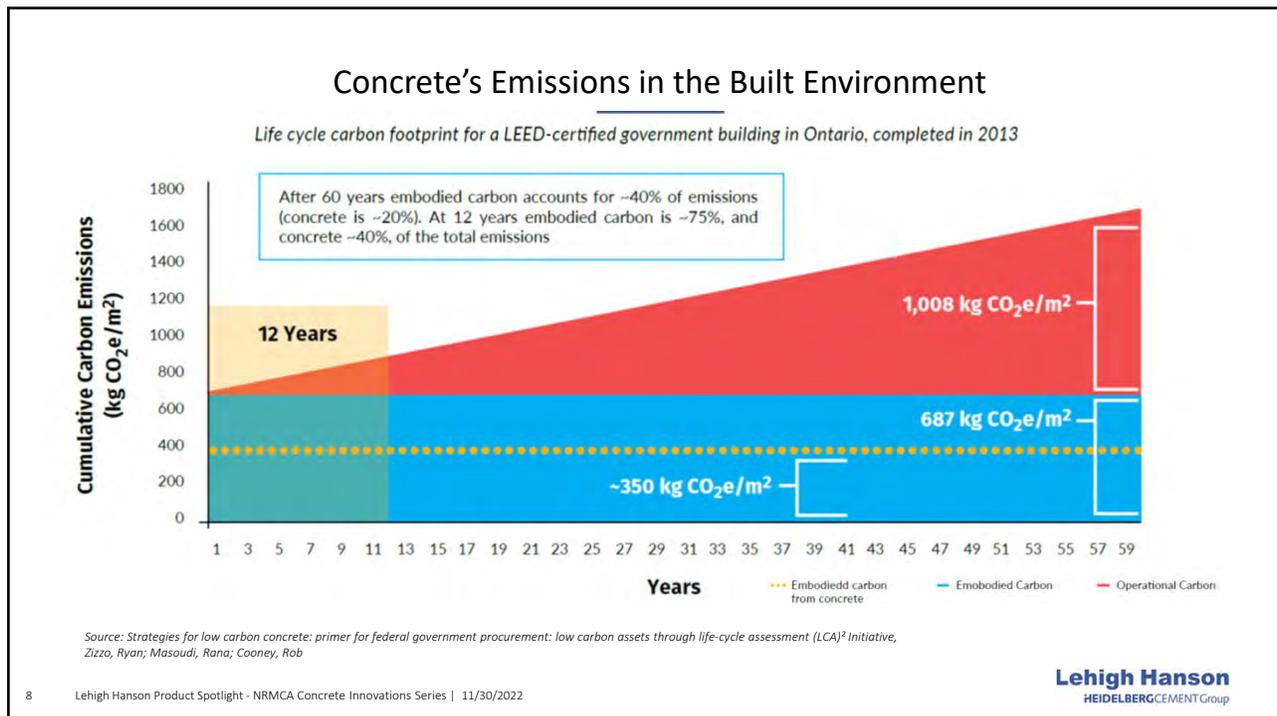
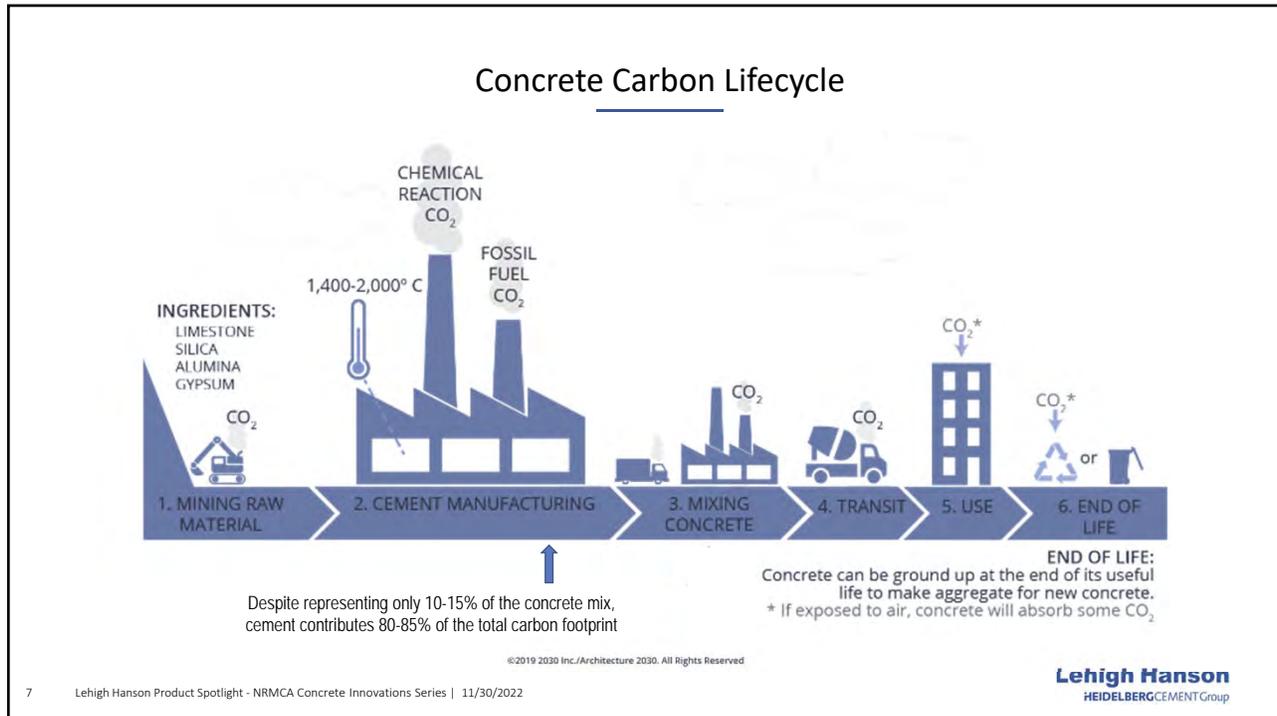
What about Concrete?

- EMISSION-FREE, QUIET LIVING ENVIRONMENT**
Concrete walls and floors don't harbor toxic mold growth or emit harmful chemicals. They also dampen sound, which contributes to a quiet living environment - particularly important for residential buildings.
- LOW MAINTENANCE**
Concrete is dimensionally stable in all environments, maintaining a finish resistant to damage from direct exposure to fire, rain, hail, UV rays, airborne pollutants and weathering conditions associated with our harshest environments.
- COST EFFECTIVENESS**
Concrete structures offer a level of serviceability over other materials that reduces the cost of ownership over the lifecycle, including the cost of bringing structures back into use after a major disruption.
- RESILIENCE**
Concrete is resilient in the harshest of environmental conditions. It is sufficiently strong to resist impacts, strong winds, blasts and natural catastrophes like earthquakes, tornadoes and floods.

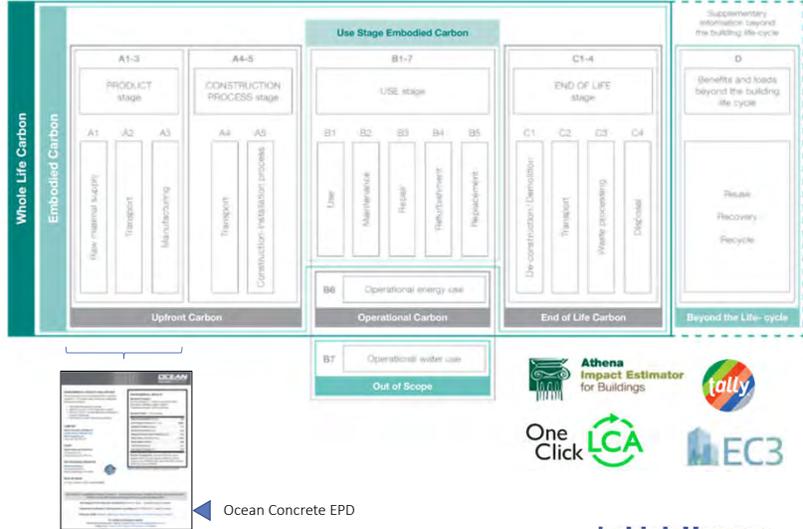
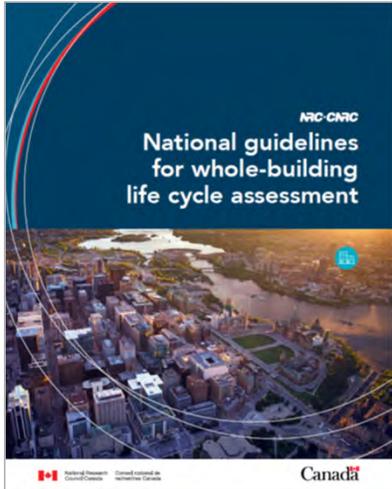
Cement Association of Canada. <https://www.cement.ca/>

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Measurement through whole building Lifecycle Assessments (wbLCA)



How can specifiers help? Strategies for Low Carbon Concrete



1. Consider performance-based design requirements
2. Material efficiency
3. Use Portland-limestone cement – also called “general-use limestone” (referred to as GUL and/or PLC).
4. Maximize the use of supplementary cementing materials (SCMs), alternative cementitious materials or blended cements.
5. Maximize recycled content in reinforcing steel (rebar).
6. Adjust testing age
7. Aggregate optimization and gradation.
8. Use of water reducing admixtures.

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Converting GWP Targets to Carbon Budgets

Application	Strength (MPa)	Exposure Class	Maximum GWP (kg CO ₂ e/m ³)	Bonus Maximum GWP (kg CO ₂ e/m ³)	Volume (m ³)	Total GWP (kg CO ₂ e)
Footings	25	N	256	200	500	128,000
Floors and Slabs	30	N	305	255	1,000	305,000
Columns	35	N	355	280	600	213,000
Exterior Concrete	32	C2	362	305	300	108,600
					TOTAL	754,600

DON'T enforce limits at the individual mix level.

Consider incentivizing producers that can deliver exceptional embodied carbon reduction as part of the tender process with a second maximum GWP target set

DO enforce limits at the project total level.

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Performance-Based Procurement

Jurisdictions that have implemented (or are planning to implement) a performance-based specification or procurement policy for low carbon concrete that are supported by the use of EPDs include:

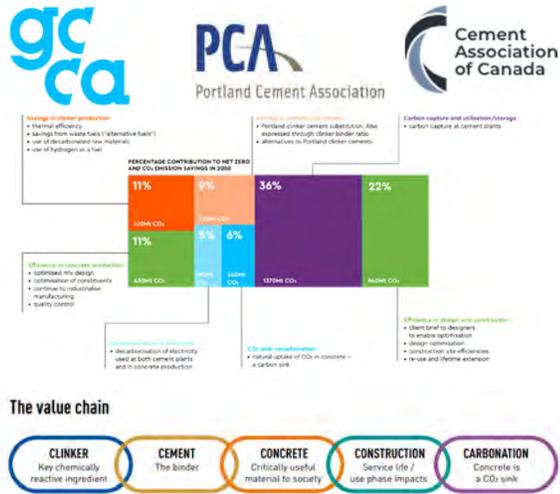
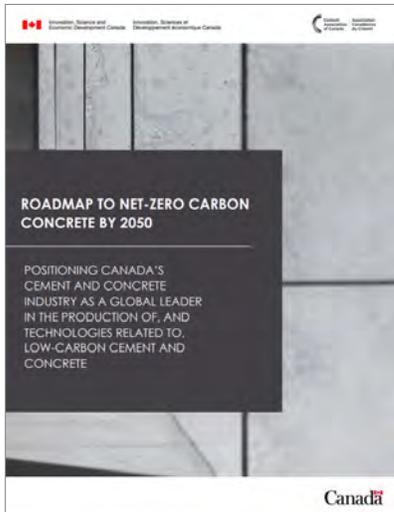
- [The City of Vancouver, British Columbia](#)
- [The City of Portland, Oregon](#)
- [Marin County, California](#)
- [Treasury Board of Canada's Low Carbon Concrete Procurement Policy \(Forthcoming\)](#)
- [US General Services Administration's Facilities Standards for the Public Buildings Service](#)



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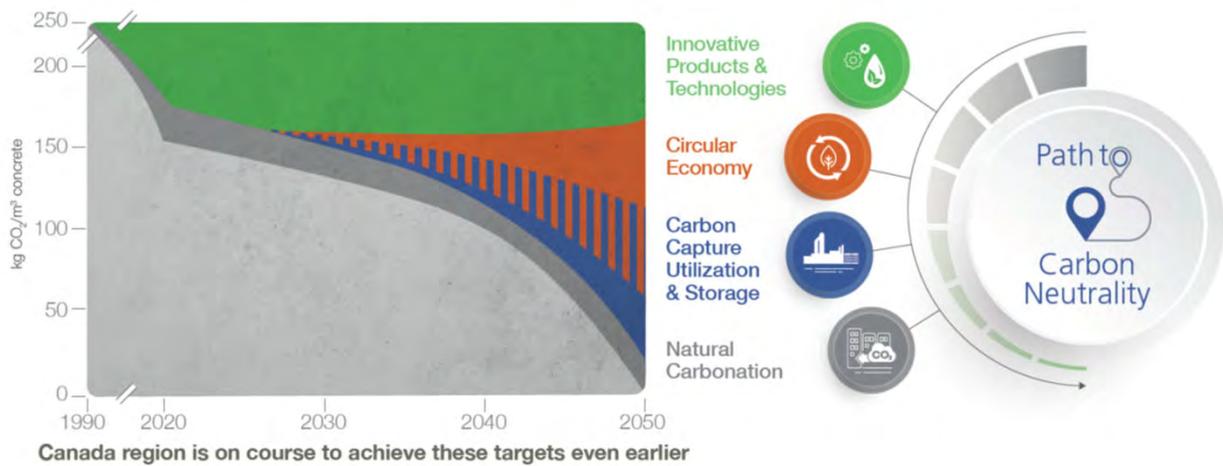
Roadmap(s) to Carbon Neutral Concrete



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Lehigh Hanson: A Multi-Dimensional Approach to Carbon Neutral Concrete



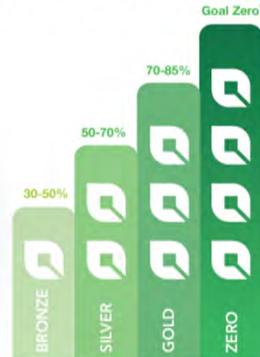
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EVOBUILD™ LOW CARBON CONCRETE

EvoBuild™ Low Carbon Concrete

Dial up the green. Dial down the CO₂.






Environmental Product Declaration

CRMCA Member Industry-Wide EPD for Canadian READY-MIXED CONCRETE



Table 7. Summary Results (A1-A3): 28-30 MPa ready mixed concrete product, per cu

Indicator/CC Method	GWP		AP		POCP		PEI		NET
	kg CO ₂ e	kg CO ₂ e	kg	kg	kg	kg	kg	kg	
Minimum	235.92	3,492.05	1.11	0.22	20.12	2362.22	219.27	219.27	219.27
Maximum	276.48	3,708.00	1.09	0.22	20.09	2379.90	219.27	219.27	219.27

EvoBuild Bronze (30-50%), Silver (50-70%), Gold (70-85%) savings levels are measured against CRMCA Industry Average EPD (2017) in Canada, and the "Typical" concrete values from the 2021 Carbon Leadership Forum Material Baselines in the United States.



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Lehigh Edmonton Cement CCUS: Carbon Footprint Projection

Cement Emission Intensity (kg CO₂-eq/tonne of cement)

833
667
500
333
167
0
-167

Cement*

Scope 3 (upstream) | Scope 1 & 2

Concrete Emission Intensity (kg CO₂-eq/m³ of concrete)

250
200
150
100
50
0
-50

Concrete* | **Construction** | **Use**

Scope 3 (downstream)

PROJECT IMPACT: Emission Reduction of 280 kg CO₂e/tonne of cement

CARBON NEUTRAL CEMENT

CARBON NEUTRAL CONCRETE

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Questions?

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