

**Concrete**  
building for life.

# Concrete Zero: Canada's cement and concrete industry action plan to net-zero



# Overview

# CONCRETE ZERO

- *Why Net-Zero?*
- *Current Status*
- *Strategic Considerations*
- *Core Messaging*
  - *Values Based*
  - *Emissions Reductions Commitments*
- *Assumptions*
- *Data Highlights*
- *Launch Plan*



# Concrete is our Most Important Building Material

- All construction requires concrete
- Twice as much concrete is used than all other materials combined
- over **20 billion tonnes / 8 billion m<sup>3</sup> of concrete** produced globally each year
- using 4 billion tonnes of cement
- Second most consumed material in the world, **second only to water**
- Concrete is inherently a local material

Marine Gateway, Vancouver



Brentwood, Burnaby



# ... and a Significant Source of GHGs

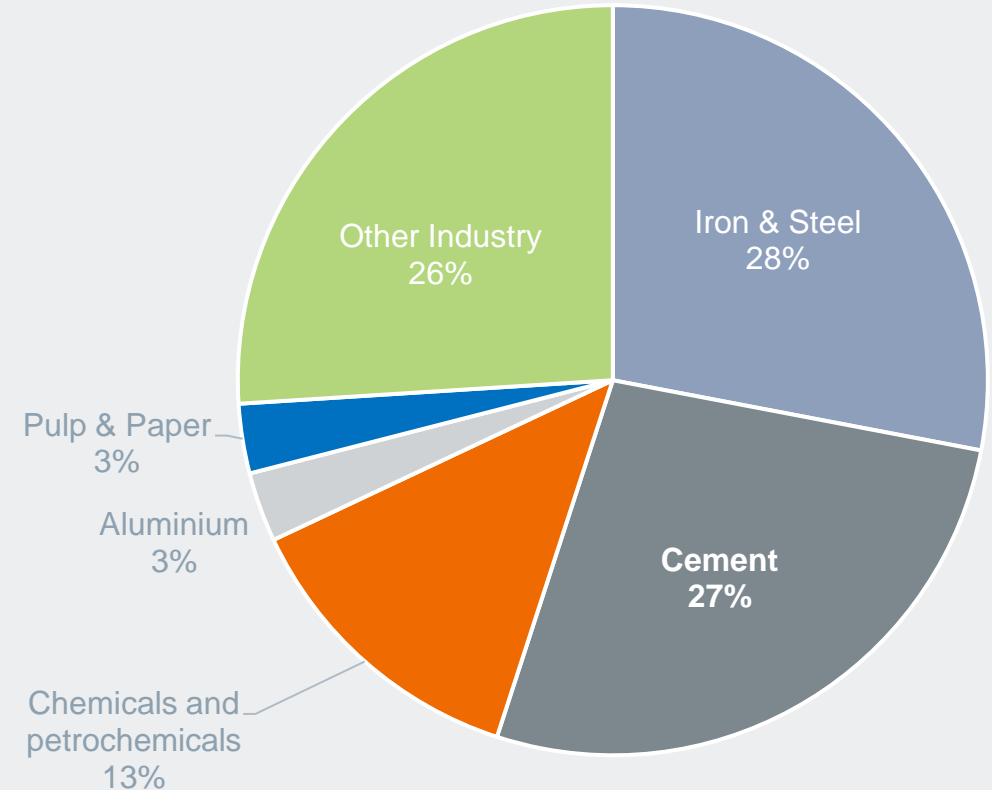
- Up to **8% of global emissions** come from the cement produced to make concrete <sup>1</sup>
- **1.4%** (~10 MT) of Canada's GHG emissions <sup>2</sup>
- **Deep cement and concrete decarbonization technologies and strategies are essential to decarbonizing the built environment.**

<sup>1</sup> Andrew, R.M., *Global CO<sub>2</sub> emissions from cement production, Earth System Science Data, 2017*

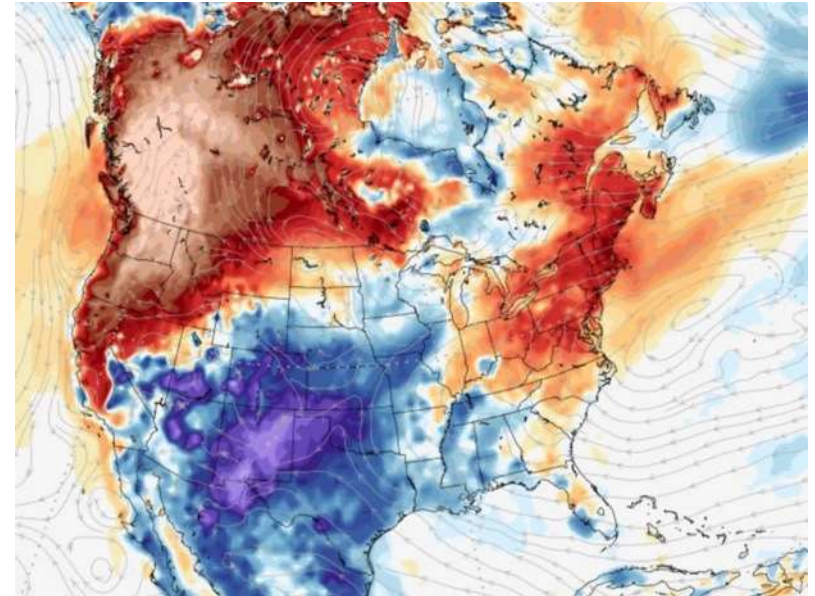
<sup>2</sup> *Environment and Climate Change Canada, 2020*

<sup>3</sup> 2014 data

Global direct industrial CO<sub>2</sub> emissions <sup>3</sup>

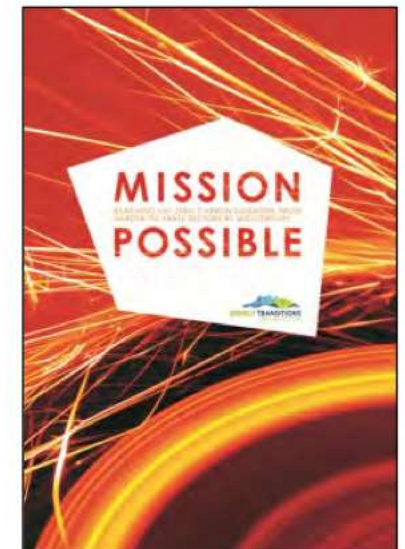
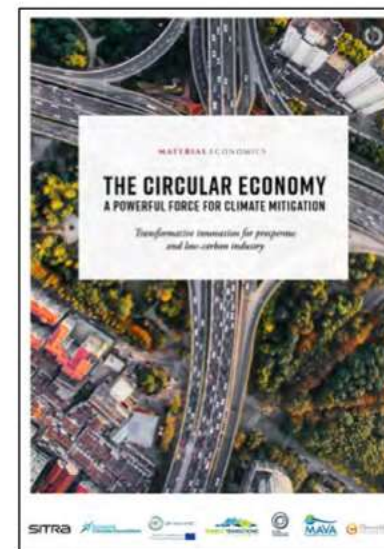
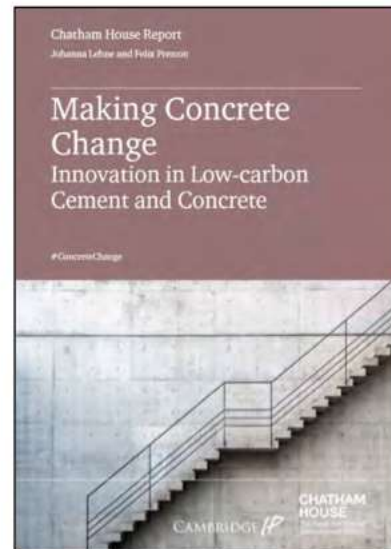
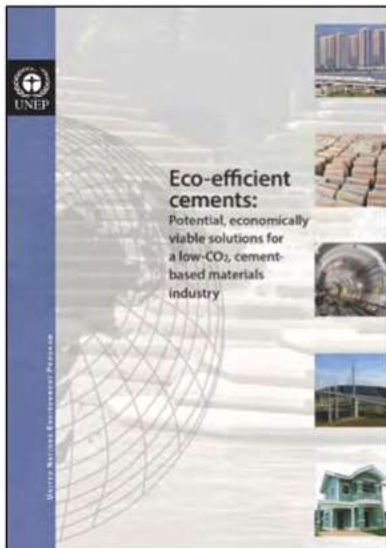


# IPCC Issues “Code Red” for Humanity



# We need to author our own narrative

- Outside think tanks and other stakeholders are already speaking and making decisions on behalf of the cement and concrete sectors



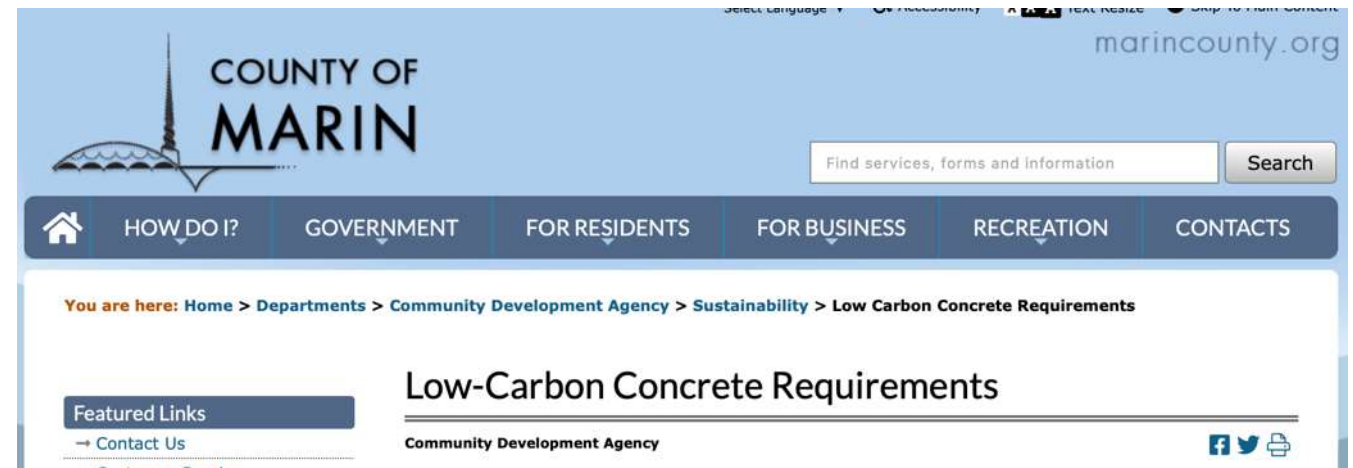
# Proliferation of procurement policies focused on cement and concrete

01  
APR '21

Biden Wants the United States to “Buy Clean” and Become a “Climate Star.” Here’s What That Could Look Like.

Fostering industry transition through green public procurement: A how to guide in the cement & steel sectors.

1 June 2021  
Written by Ali Hasanbeigi, Astrid Nilsson, Gökçe Mete, Germain Fontenit, Dinah Shi  
Building materials / Cement / Finance / Policy / Steel



# Concrete's Roadmap to **Net-Zero**





# Net-Zero requires collaboration across the entire construction value chain



Portland Cement Association released in October 2021 the industries' 2050 carbon neutrality roadmap



Global Cement and Concrete  
Association



# CONCRETE FUTURE

The GCCA 2050 Cement and  
Concrete Industry Roadmap  
for Net Zero Concrete

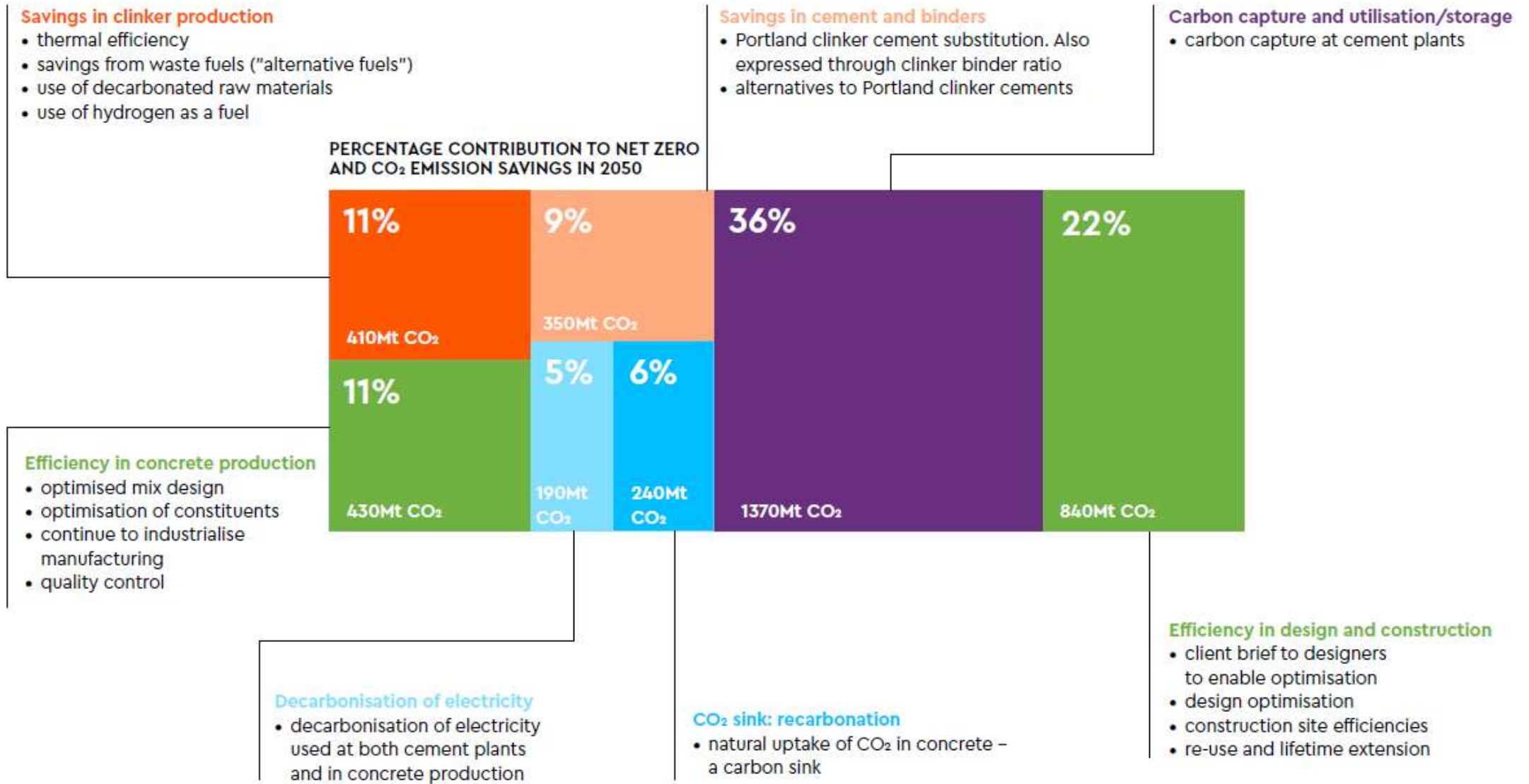
ROADMAP FULL DOCUMENT

# The “5C Approach”

- **C**linker
- **C**ement
- **C**oncrete
- **C**onstruction
- **C**arbon Uptake / Carbonation

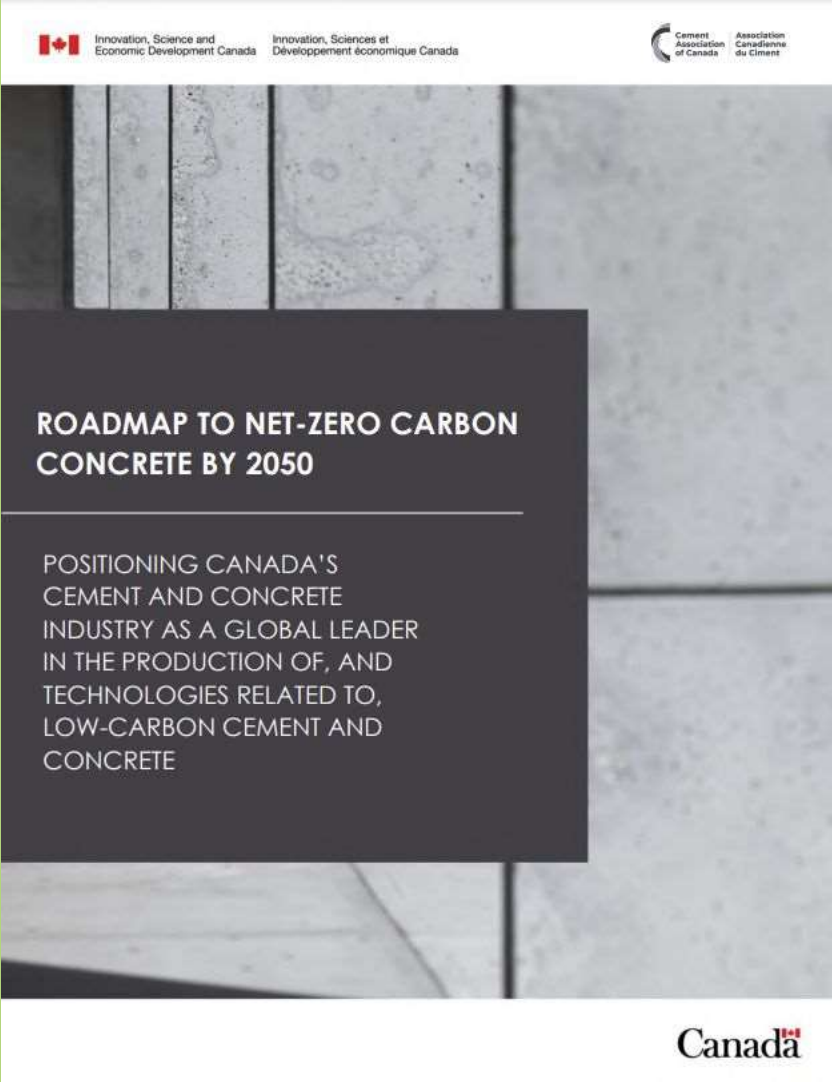


# Concrete's Pathway to Carbon Neutrality



# First in kind industrial decarbonization agreement

*We have a plan to reduce our emissions by up to 40% by 2030 and deliver net-zero concrete by 2050.*





## De-Risking Investment

Capital and other fiscal supports to attract global investment in first-commercialization



## Education, training & collaboration

Supporting policy and supply chain alignment on low-carbon solutions



## Procurement, Codes, Standards & Specifications

Moving to more agile performance-based solutions



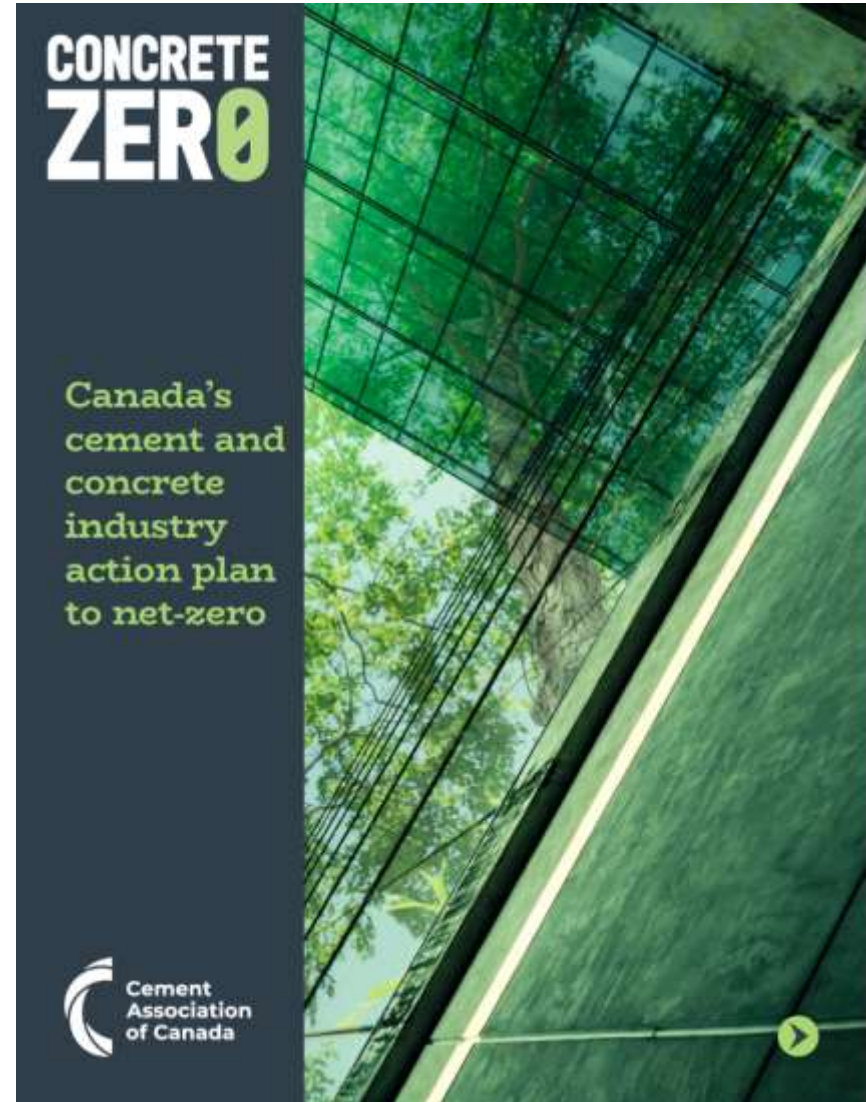
## Transparency and Data

Updated, standardized and publicly available LCI data



# Industry Action Plan: Current Status

- First full draft of text complete
- Initiating review of text and data with Industry Task Group and CAC Committees
  - Some updates to data will be needed given recent publication of updated regional concrete EPDs
- Engagement of professional writer to “punch-up” the text
- Visuals and collateral design well underway
- “Peer review” with key external stakeholders
  - ISED, Climate Institute, ENGO’s, etc.
- Proposed launch first week of May, at Federal Lobby Days event



# Strategic Positioning

## Standing out among corporate “net-zero” commitments

- More transparent, more realistic, more interactive/collaborative, more credibility ... ***our own net-zero brand***
- Highlight existing validation through ISED partnership
- Acknowledgement of the challenge/uncertainty ... aspirational

## Aligned with the GCCA and PCA, but tailored to Canada’s unique political and regulatory context

- ISED Roadmap, Fiscal Supports (NZA, ITC, CCfD etc.), Procurement, Fed/Prov dynamics

## Full value chain buy-in and operationalization

- Strong focus on member, ally and key stakeholder participation and actions
- Strategic targeted engagements with the most influential audiences

## Visually sophisticated and engaging

- Credible visuals and comprehensive cross-platform outreach





# Key messages

- A net-zero world will, literally and figuratively, rest on concrete
- Our Action Plan lays the foundation for what are doing and will do, going forward
  - *We are a committed leader in solutions to climate change*
  - *We are committed to achieving net-zero in a transparent, accountable way*
  - *We are committed to filling data gaps and minimizing assumptions*
- Our Action Plan does not rely on reductions from technologies that have yet to be developed or proven
- Our Action Plan is about finding “true net-zero”— we aren’t relying on offsets to get us to zero
- We won’t use today’s economic and policy realities as an excuse for inaction – we are working to identify and support a realignment of regulatory and market signals.
- Achieving net-zero won’t be easy. There are no silver bullets.
- Together we can deliver concrete zero.



# Assumptions & Limitations

## Assumptions

- Demand for concrete will increase by 1% per year, on average, from today to 2050
- Clinker efficiencies will see the production of clinker decrease
- Canada's electricity grid will be fully decarbonized by 2050
- Emissions free commercial vehicles and heavy equipment will be commercially available and economic before 2050
- Advanced zero carbon fuels (e.g. benefacted biomass, H2) etc. will begin to be economically available at scale starting after 2030
- Codes, Standards and Specifications will evolve in parallel with the introduction of lower-carbon cements and concretes
- Using UN IPCC Definition of "net-zero" – same as GCCA

## Limitations

- The only reliable real-world data is clinker / cement production and emissions, everything else is extrapolated / modelled
- Scope 2 emissions (electricity) are reported, but not integrated into our emissions profile for clinker, cement, and concrete. This creates discrepancies with emissions reported in EPDs
- We have no data on where concrete is used in the market, reducing the precision with which we can model mix optimization and material efficiency reductions
- We do not have sufficient data to separate import / export related impacts



# Key Messages – Emissions Reduction Commitments

## Clinker

- Elimination of virgin fossil fuels, both in the kiln and in our commercial fleets
- Increased use of decarbonated raw materials
- Thermal Efficiency
- CCUS

## Cement

- Clinker Substitution (PLCs, Blended Cements)
  - Reducing our clinker ratio from 890kg/tonne in 2020 to 630kg/tonne by 2050

## Concrete

- Mix Optimization: Blended cements, SCMs and additives
- Manufacturing and transportation reductions

## Construction

- Material efficiency

## Carbon Uptake

- IPCC approved IVL Method, with commitments to further research to support regional/domestic validation



# Data Highlights

	2020	2030	2040	2050
Clinker Production (Million MT)	11.4	10.2	9.2	8.2
Cement Production (Million MT)	12.7	13.4	13.2	12.9
Concrete Production (Million MT)	42.8	43.6	46.3	49.8
Clinker: Cement Ratio	89.3%	76.0%	69.9%	63.5%
Fuel Substitution	11%	42%	60%	100%
Clinker Emissions Intensity (Kg CO2/MT)	833	737	693	604
Cement Emissions Intensity (Kg CO2 /MT)	744	595	528	435
Cement Content in Concrete (Kg/M3)	297.4	291.5	266.1	235.8
Emissions Intensity of Concrete (Kg CO2/M3)	269.3	212	166	119
Carbon Uptake (Million MT)	1.4	1.2	1.0	0.8
CCUS		1.5	2.0	4.4
<b>Gross CO2 Remaining for CCUS (Million MT)</b>	<b>10.0</b>	<b>6.1</b>	<b>4.1</b>	<b>0</b>



# Non-cement reductions from Concrete

	2020	2030	2040	2050
<b>CONCRETE PRODUCTION &amp; EMISSIONS</b>				
Gross Concrete Emissions (MT CO <sub>2</sub> )	11.5	8.8	7.1	5.2
Gross Cement Emissions (MT CO <sub>2</sub> )	9.5	7.1	5.9	4.4
Emissions from SCMs (MT CO <sub>2</sub> )	0.3	0.3	0.4	0.5
<b>NON-CEMENT EMISSIONS</b>				
Manufacturing Emissions %	5%	4%	2%	0%
Manufacturing Emissions (MT CO <sub>2</sub> )	0.6	0.5	0.2	0
Transportation Emissions %	6%	4%	2%	0%
Transportation Emissions (MT CO <sub>2</sub> )	0.7	0.5	0.2	0
<b>CONCRETE EMISSIONS REDUCTIONS AGAINST 2020</b>				
Non-cement CO <sub>2</sub> Reductions from Concrete Phase (MT CO <sub>2</sub> )		0.4	1.0	1.5



# Launch Plan

Launch in conjunction with 3-day Federal Lobby event, May 1-3, 2023

- Seeking sponsorship and coordination with Minister Champagne
- Potential to include validators (ENGOS etc.) as part of launch
- Opportunity for national media
- Targeted education sessions on specific elements of the Action Plan
  - Ally “training” session on core messaging
  - Government session on performance-based low-carbon procurement
  - Clean-tech forum
- “National Tour” of Action Plan through targeted sponsorships, webinars, speaking opportunities, articles etc.





# Concrete building for life.

