



## Concrete is meeting the low carbon challenge

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BY MICHAEL MCSWEENEY

Governments are preparing to spend hundreds of billions of dollars over the next decade on infrastructure, an investment characterized by elected officials as short-term stimulus to meet ambitious longer-term social, economic and environmental needs.

It's hard to imagine getting this right without considering concrete. Activities related to our industry contribute \$73-billion a year to the economy, maintaining 151,000 jobs across the country. Concrete is the most used building material on the planet—by a long shot—double all other materials combined. Whether it's buildings, roads, public transit, sewers, airports or power plants, most public infrastructure projects wouldn't be possible without it.

While concrete is known for its strength, durability, resiliency and versatility, our sector is also emerging as a massive clean-tech opportunity where Canada is well positioned to lead—and profit from—the transition to a low-carbon and climate-resilient built environment.

Governments, which procure more than half of all building materials consumed in Canada, are beginning to recognize the importance of aligning public infrastructure procurement with the need to reduce GHGs and adapt to climate change. British Columbia's climate plan, for example, prioritizes the use of Contempra, a cement product that costs and performs exactly as regular cement does, but reduces GHGs by 10 per cent. At a national scale, Contempra is a no-cost, one-megatonne GHG reduction opportunity. In Ontario, where the phase-out of coal-fired electricity still holds the title as the most significant GHG reduction action in North America, government attention has turned to helping our sector transition from coal to lower carbon alternatives—an opportunity that could reduce the GHG intensity of our sector by an additional 20 per cent. And in communities across Canada, concrete's unique properties (e.g. thermal mass, lower rolling resistance, etc.) are playing key roles in net-zero buildings, climate-resilient in-

frastructure and lower carbon roads and highways.

On their own, these are significant steps forward. But in Canada's journey toward a clean economy future, concrete's role as a first application for an emerging class of technologies known as CO<sub>2</sub> utilization (CO<sub>2</sub>U) is a game changer. These technologies use post-industrial carbon dioxide as an ingredient to make valuable products. A recent report by The Global CO<sub>2</sub> Initiative found that CO<sub>2</sub>U could provide \$1.1-trillion in new market value, and reduce global greenhouse gas emissions by 15 per cent, by the year 2030.

Canada has an enormous opportunity to lead the world by building on its strong foundation in CO<sub>2</sub>U technologies. For example:

Halifax-based CarbonCure Technologies has developed a technology that takes waste carbon dioxide from industrial processes and injects it into concrete to make it stronger and greener. CarbonCure's Technology is commercially available, and is being used by nearly 60 concrete plants with significant domestic and export growth potential.

Solidia Technologies® is a carbonation-based process that reduces the carbon footprint of concrete by up to 70 per cent and water consumption by 60-80 per cent while enhancing concrete's other performance attributes.

Pond Technologies takes CO<sub>2</sub> from the cement manufacturing process to grow algae that can be converted to biofuels and other low-carbon products such as animal feeds, soil amendments and pharmaceuticals/nutraceuticals.

Other CO<sub>2</sub>U opportunities include sequestering CO<sub>2</sub> in mineral waste products from

other industrial sectors to create a "carbonated" aggregate that can reduce environmental impacts in two ways—replacing virgin aggregate in concrete while storing significant CO<sub>2</sub> in the process.

The question for government is how to secure and capitalize on Canada's leadership in this unique clean economy space, so that the country fully benefits from being at the forefront of this innovation play. Carbon pricing is an essential but insufficient part of such a strategy. As a major purchaser, directly and indirectly through transfers to provinces and municipalities, the federal government must also shape procurement decisions to favour low-carbon products. Doing so will have three key benefits:

First, it will reduce GHGs across the economy.

Second, it will incent export and domestic markets (rather than lag them) for these products as well as the technologies that support them—a strategy that Ontario is already pursuing.

And finally, by ensuring that all infrastructure projects that receive public dollars are required to account for the full economic and carbon lifecycle impacts, it will allow governments to align their environmental priorities with the objective of ensuring value for money.

In other words, these measures will help ensure better value for public infrastructure spending, lower GHG emissions and create a wave of innovation and job creation as we transition to our clean economy future.

*Michael McSweeney is president and CEO of the Cement Association of Canada.*

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