

LOW CARBON CONCRETE

The production and deployment of concrete in global construction projects is estimated to cause about 8% of all CO₂ emissions¹. Early-stage efforts to create the methodology for low-carbon-concrete have made progress toward commercial viability. The Canadian government has recently produced a new Building Code for use in the concrete industry. The relevant next step toward implementation of all or part of that Building Code is adoption by individual provincial and municipal governments.

The technology invented by Blue Planet corporation, as described in Peter Fiekowsky's book² and elsewhere, absorbs CO₂ (from the effluent of an adjacent electric power plant that runs on natural gas.) When scrap concrete (demolished structures, sidewalks and roadways) is processed and incorporated, the final product can be rated as carbon negative. While this is a specialized situation, it is sufficiently interesting from a commercial viewpoint that LaFarge, a large Canadian corporation operating in the building industry, has an agreement with Fiekowsky's company and is exploring further applications. The Blue Planet process will likely be adopted³ wherever practicable, but there are significant limitations, particularly as to logistics and infrastructure compatibility:

- Scrap concrete must be 'locally' available
- The concrete plant must be built adjacent to a large source of CO₂ emissions, such as certain power plants. In addition, the site must be commercially viable overall; for example - proximity to construction sites is important
- Assuming a future where carbon capture is government mandated for all industrial CO₂ emission sources, then it seems possible for the Blue Planet technology to qualify as a carbon capture installation, at specific sites, able to operate continuously.

Academic teams are investigating methods of reducing the carbon emissions from concrete. Professor Chris Cheeseman, Imperial College, London, and his associates are currently researching reduction of emissions from Portland cement, the central ingredient of concrete. In addition, they have developed a process that utilizes magnesium silicate. This method, known commercially as Seratech, has the potential of creating a carbon-negative cement. This process can be integrated easily into existing commercial infrastructure, thus lowering barriers to implementation.

Recognizing that emissions from construction activity are major contributors to CO₂ emissions, the City of Toronto has promulgated the Toronto Green Building Standard. A developer/ construction company is required to buy carbon offsets for all the fossil carbon that is

¹ See: <https://ourworldindata.org/emissions-by-sector>

² Climate Restoration; Peter Fiekowsky with Carole Douglass; July 2022, Rivertowns Books, Irvington N.Y., U.S.A.

³ Lafarge, Corp. active in construction across Canada, currently has a commercial agreement with Blue Planet which would enable it to utilize this technology where appropriate.

embodied in a new building, so that it is ‘net-zero’ for fossil carbon inputs. As technologies evolve, it may eventually be more financially attractive to build with low carbon concrete rather than to purchase offsets.

A full description of the podcast discussions hosted by Project Save the World is available on request.

RECOMMENDATIONS

At all building sites, use of low carbon concrete should be the first choice, and should be required, assuming that such requirements reflect that the material is logistically reasonably convenient, or even provide the impetus for establishing local availability.

The relevant Building Code(s) should be the subject of early discussions between the federal government and both provincial and municipal governments. Lowering of barriers to implementation should be addressed on an urgent basis.

Because some techniques and technology for low-carbon concrete are already available for commercial use, early adoption could improve Canada’s performance in reaching its goals under the Paris Agreement.

Canadian officials should promote the use of low-carbon concrete in relevant international fora. The Canadian government can stipulate that, in its own procurement policy, it will give preference to purchasing concrete that yields the lowest carbon emissions of any available, subject also to it meeting all required technical specifications at competitive cost.