

## Concrete contribution to carbon removal: recognising carbonation, natural and enhanced, as permanent carbon storage

Concrete Europe welcomes the Commission proposal for a regulation establishing the EU-wide voluntary framework that would certify high-quality carbon removals (CRCF). It will provide the necessary rules to assess which carbon removals will be eligible for certification.

Concrete is a versatile product which allows promoters, architects, engineers and builders to build for public and private owners sustainable, durable and resilient buildings and infrastructures.

Concrete also has the ability to take up CO<sub>2</sub> through mineralisation of the cement it contains. That process, called **carbonation**, happens naturally throughout the lifetime of buildings or infrastructures, and the IPCC qualified it as a carbon sink in 2021<sup>1</sup>. This chemical reaction can also be *enhanced* at two different stages of the concrete life-cycle:





- 1) when concrete is being made via injecting CO<sub>2</sub> during the manufacturing process (e.g. curing) and
- 2) at the end-of-life phase of concrete, when absorption of CO<sub>2</sub> into the crushed concrete can be enhanced for the production of aggregates.

Concrete Europe believes that concrete carbonation activities qualify as carbon removal activities when the source is not industrial, due to the fact that aggregates and concrete producers can permanently store carbon in their products through mineralisation<sup>2</sup>.

The **enhanced carbonation** of concrete is a new field of research at EU and national level and start-ups are already developing carbon removal activities in the EU and outside of Europe. We provide a non-exhaustive list of those projects and companies in Annex (see below).

### CARBON REMOVALS CLASSIFICATION



	Origin of the CO <sub>2</sub>	Permanence of CO <sub>2</sub> storage	Carbon Removal (yes / no)
Storage of CO <sub>2</sub> in concrete (Enhanced Carbonation of concrete/carbon curing)		Permanent	<span style="color: red;">●</span> no
		Permanent	<span style="color: green;">●</span> yes
Natural Concrete carbonation		Permanent	<span style="color: red;">●</span> no
Natural Concrete carbonation (if arising from carbon neutral cement)		Permanent	<span style="color: green;">●</span> yes
Temporary Carbon storage	All origins	Short-term	<span style="color: red;">●</span> no

<sup>1</sup> [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Full\\_Report.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf) (page 1171)

<sup>2</sup> Referring to CEMBUREAU [position paper](#), Concrete Europe believes that natural carbonation does not qualify as carbon removal activity under the Commission proposal, except when concrete is manufactured with carbon neutral cement. Natural carbonation should however be accounted for in MS and EU greenhouse gas calculations (see our previous [position paper](#))

These new activities have a great potential of CO<sub>2</sub> removal, as some of these companies put forward the number of 500 Mt of CO<sub>2</sub> per year<sup>3</sup>. But in order to reach their full potential, they need to be supported by a clear legal framework, a sufficient supply of biogenic and direct air carbon at reasonable price and the recognition of permanent storage as the only viable solution for their access to captured CO<sub>2</sub>.

Concrete Europe also wants to underline that, according to our reading of the Commission proposal, temporary carbon storage does not qualify as a carbon removal activity since the carbon is emitted at the end of life.

That is why Concrete Europe calls on Member States, Members of the European Parliament in the co-decision process, the Commission and stakeholders of the Expert Group on carbon removals to:

- Recognise only the permanent removal of carbon dioxide as "carbon removal" in the framework of the above-mentioned regulation.
- Recognise enhanced carbonation of concrete/aggregates as a permanent form of storage of non-industrial carbon dioxide.
- Recognise natural carbonation as a permanent form of carbon removal when concrete is manufactured with carbon neutral cement.

We are ready to continue contributing to the development of carbon removals certification in months to come through our participation to the Commission expert group on Carbon removals.

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<sup>3</sup> <https://www.neustark.com/remove>

# ANNEX

- **EU funded projects:**
  - <https://www.carbon4minerals.eu/>
- **Research / Innovation projects working on enhanced carbonation of aggregates or concrete:**
  - Fastcarb (France): <https://fastcarb.fr/en/home/> & <https://www.mdpi.com/2076-3417/13/2/849>
  - Finnish Association of Construction Product Industries: [https://www.hiilineutraalisuomi.fi/en-US/Canemure/Subprojects/Finnish Association of Construction Product Industries RTT/Finnish Association of Construction Prod\(50132\)](https://www.hiilineutraalisuomi.fi/en-US/Canemure/Subprojects/Finnish%20Association%20of%20Construction%20Product%20Industries%20RTT/Finnish%20Association%20of%20Construction%20Prod(50132))
- **Member States / local authorities**
  - The Bavarian State Government is in the process of defining a strategy to become carbon neutral in the years to come. Carbon capture is seen as a 'must' by Bavarian companies with some of them working on ways to make use of the captured CO<sub>2</sub> possibly in CO<sub>2</sub> enriched concrete" (EP think tank BRIEFING Pre-legislative synthesis Certification of carbon removals).
- **Companies working on enhanced carbonation of aggregates or concrete:**
  - <https://www.carboncure.com/carbon-removal/> - 500 million metric tons of carbon emissions annually.
  - <https://www.marshalls.co.uk/media/latest-news/marshalls-to-be-first-concrete-product-manufacture#:~:text=Marshalls%20has%20committed%20to%20adopting,production%20of%20our%20concrete%20products>
  - <https://www.neustark.com/remove> - Towards 2050, our approach to CDR has a global potential of over 500 Mt of CO<sub>2</sub> per year.
  - <https://www.solidiatech.com/solutions.html>
  - <https://www.carbon8.co.uk/solution>