

Cementing the European Green Deal

**REACHING CLIMATE NEUTRALITY ALONG THE CEMENT
AND CONCRETE VALUE CHAIN BY 2050**





Executive Summary

CEMBUREAU's carbon neutrality roadmap demonstrates that reaching net zero emissions along the cement and concrete value chain is achievable by 2050. To deliver this, the industry will need decisive political action in key areas:

Carbon Capture, Use and Storage (CCUS) will account for **42% of the CO₂ emissions reduction** in the sector. The EU should urgently look at developing a **pan-European CO₂ transportation and storage network**, provide continued **funding to demonstrators** and **support the business case** of the technology through State Aid.



The replacement of fossil fuels by non-recyclable and biomass waste, and the use of alternative raw materials, will deliver another **15% of the emissions reduction in the cement industry**. Policies should support this circular approach by **facilitating waste shipment** between EU countries, and **discouraging both landfill and exports** of waste outside of the EU.

Bringing low carbon-cements products to the market will deliver an additional **13% emissions reduction**. Upcoming policies should aim to reduce European building's CO₂ footprint, be based on a **life-cycle approach**, and **incentivise the market uptake** of low-carbon products.



A level playing field on carbon, regulatory certainty as well as an ambitious industrial transformation agenda, will be **pivotal to deliver the investments needed** to achieve carbon neutrality.



Concrete is the material basis of our modern society. It has been fundamental for how we have built Europe, and it will be as crucial for infrastructure, houses and other buildings in the future.

Concrete is made with cement. The European Green Deal explicitly recognises the cement sector as an essential industry for the EU economy. Cement and concrete are indeed vital construction materials for renewable energy infrastructure, low-carbon transportation systems, and sustainable buildings. They play a central role in achieving a carbon neutral and climate-resilient society.

Concrete is also a construction material with one of the lowest energy and carbon content¹. The manufacture of its key component, cement, is nevertheless CO₂-intensive.

As the European cement industry, we have the ambition to reduce that CO₂ intensity to reach carbon neutrality along the value chain by 2050. We are convinced that together with governments, NGOs, industries and other stakeholders, we can do this - and we can do it in Europe.

CEMBUREAU's Carbon Neutrality Roadmap looks at how the European cement industry can reduce its carbon emissions by 2050, and align with the objectives of the European Green Deal, or even surpass them. Our roadmap is ambitious, but it is based on the pooled technical expertise from across Europe, and it comes with realistic options and technologies.

¹ Please see Making Concrete change: Innovation in Low-carbon Cement and Concrete (pages 6-7), Chatham House, 2018

Carbon neutrality along the cement and concrete value chain is achievable by 2050, and deep CO₂ cuts can be made between now and 2030.

CO₂ emissions can be reduced by acting at each stage of the value chain – clinker, cement, concrete, construction and (re)carbonation – to achieve zero net emissions by 2050. This will require the deployment of existing and new technologies. These include for instance the use of non-recyclable and biomass waste to replace fossil fuels; more energy-efficient kilns; the development of innovative low-clinker cements; the deployment of breakthrough carbon capture and storage/use technologies (CCUS); and optimised concrete mixes and building techniques.

Our Carbon Neutrality Roadmap looks in detail at the role of these technologies in reducing emissions at each stage of the cement and concrete value chain.

In addition, our roadmap includes intermediary milestones. For 2030, CEMBUREAU aspires to be in line with the Paris Agreement's two degrees scenario, by reducing its CO₂ emissions by 30% for cement and 40% down the value chain.

To reach carbon neutrality, technology alone is not enough. We need the collaboration of all stakeholders across the construction value chain to integrate sustainability and CO₂ performance alongside existing criteria such as safety, durability and performance. As explained below, government support will also be necessary in a range of policy areas.

We will achieve these targets through a driven and continued focus on innovation.

The European cement industry is a global leader on innovation. Innovation in the cement and concrete industry started in Europe, which is home to the industry's major R&D centres. Europe also hosts the vast majority of projects using breakthrough technologies such as carbon capture in conjunction to cement production. It is also in Europe that the technologies of tomorrow are developed – from the use of big data and 3D printing in industrial operations to the development of new binders that solidify by absorbing carbon.

Achieving carbon neutrality will not be easy or without significant cost, as major investments will be needed to deploy these low-carbon technologies in the over 200 cement plants across Europe. Operational costs will also be impacted, for instance through the increased use of carbon-free electricity to reduce emissions and implement technologies such as CCUS. It will only be possible with a proper business case, and with the appropriate carbon leakage measures in place.



We have identified specific policy measures that will be essential to meet our carbon neutrality ambitions.

The European Green Deal has already identified some of the key policy areas – circular economy, sustainable built environment, investment in low-carbon technologies, reducing the risk of carbon leakage – which will be needed to deliver carbon neutrality. Building on these, our Carbon Neutrality Roadmap looks at the policy measures that can help to ensure deep CO₂ cuts at each step of the cement and concrete value chain:

- **Investments in low-carbon technologies requires regulatory certainty from now until 2030.** Higher EU climate change targets need to be achieved with proper respect for the current legal framework against which companies are currently making their investment decisions.
- **Reaching net zero emissions will require a level playing field on carbon vis-à-vis non-EU importers.** Such a level playing field is indispensable to stimulate low-carbon investments and support carbon emission reductions worldwide. This can be achieved through the design of a WTO-compatible carbon border mechanism that must co-exist with ETS carbon leakage measures until at least 2030.
- **Investments in low-carbon technologies will require innovative forms of funding and updated State Aid rules.** The cement industry has long-term investment cycles. Continued EU funding and innovative sources of financing, such as carbon contracts for difference, will be key for the roll-out of low-carbon technologies.
- **We will require more access to non-recyclable and biomass waste to phase out the use of fossil fuels.** Policies should facilitate waste shipment between EU countries, discourage landfill and minimise exports of waste outside of the EU. In addition, sufficient access to biomass and non-recyclable waste should be guaranteed for co-processing in cement kilns, as the most ecological solution for the majority of materials.
- **Energy-intensive industries, including cement, will need sufficient infrastructure to transport, re-use and store the CO₂ it captures.** The EU should urgently look at developing a pan-European CO₂ transportation network that responds to the industry's needs. Continued support for CCUS technologies, as well as measures to support the business case of this technology (such as State Aid), are urgently needed.
- **The development of low-carbon cements and concrete must be incentivised.** Green public procurement and the upcoming EU sustainable product policy offers key opportunities in this respect. The EU should work with standardisation bodies to ensure the timely adoption of product standards to allow low-carbon cement and concrete to be put on the market, and look at facilitating access to raw materials allowing for lower CO₂ cements.
- **We need policies that make renewable energy affordable for industry.** The electrification of industry should be encouraged through tax exemptions for electricity use in industrial processes (Energy Taxation Directive) or appropriate compensation mechanisms (State Aid Guidelines).
- **Policies based on material neutrality and the life-cycle performance of products should be encouraged across all EU legislation.** The CO₂ footprint of products should be based on a cradle-to-grave lifecycle approach that goes beyond placing a product on the market and also takes into account the performance of the product during its use and after its useful life.

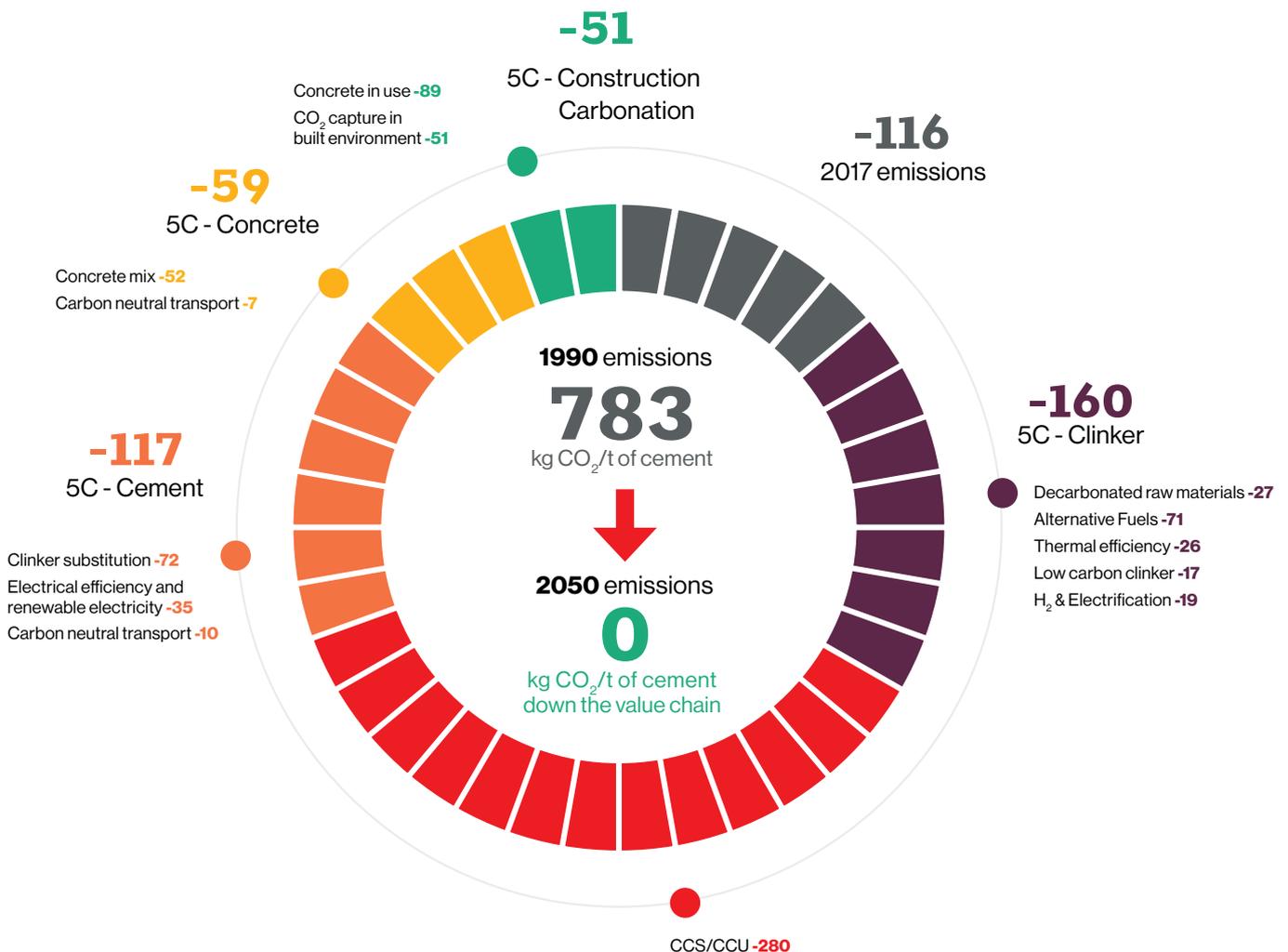
→ **Delivering carbon neutrality in the building sector will require appropriate skills and new building techniques.** The upcoming Sustainable Built Environment strategy should promote cooperation between architects, local authorities and engineers. It should foster skills and training to deliver energy-efficient designs and lower-carbon concrete mixes.

→ **Concrete absorbs CO₂ during its lifetime – the EU should fully use this untapped potential.** The re-carbonation of built concrete products over their life cycle should be recognised in CO₂ emissions accounting, carbon footprint methodologies, and CO₂ certification removal schemes.

→ **A more circular approach to buildings is key to reducing emissions.** Policies should maximise the different properties of construction materials including their durability, recyclability, thermal mass or re-carbonation potential.

CEMBUREAU 2050 roadmap

CO₂ reductions along the cement value chain (5Cs: clinker, cement, concrete, construction, re-carbonation)





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