POSITION PAPER

Decarbonisation and Whole-Life Carbon Policies: Proposals from the Concrete and Cement Sector

The following proposals of the concrete and cement sector are crucial for securing investments in carbon neutrality by (1) establishing a level playing field between construction materials and (2) ensuring a policy framework that rewards innovative solutions, both of which are essential for achieving carbon neutrality in the construction sector by 2050.

ESTABLISH A POLICY FRAMEWORK THAT SETS TARGETS ENABLING ALL CONSTRUCTION SOLUTIONS TO CONTRIBUTE TOWARDS A DECARBONISED BUILT ENVIRONMENT

- **Ensure material and technology neutrality:** European policy should aim for a decarbonised built environment without favouring specific technologies, materials or solutions. Evaluations should be based on robust methodologies (as outlined below).
- **Encourage the development of new technologies:** European policy should foster innovation and accelerate the transition to net-zero emissions, with the overarching objective of attaining a carbon-neutral continent. This can be achieved by:
    - Setting clear and consistent performance goals.
    - Establishing a scientifically based framework (see next point).
    - Implementing appropriate funding schemes.

USE THE CORRECT SCIENTIFIC METHODOLOGIES FOR ASSESSING THE WHOLE LIFE CARBON OF CONSTRUCTION WORKS

Apply a full life cycle analysis (cradle-to-grave / cradle)

- Optimal solutions for decarbonisation, sustainability, and circularity should be determined on a case-by-case basis[1], taking into account local conditions such as energy mixes, availability of raw and recycled/re-used materials, deconstruction, and recycling technologies etc.
- Full life cycle analysis should be conducted at the level of a building or infrastructure in accordance with international/European recognised standards. The impact of different but equivalent functional units should be assessed on this basis.

[1] *Kurkinen, E. et al. Energy and climate-efficient construction systems: Environmental assessment of various frame options for buildings in Brf. Viva, 2018 page 41, SP Rapport, ISSN 0284-5172; 2015:70 E*

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Consider both embodied and operational impacts

- Both embodied and operational carbon throughout the whole-life cycle of a construction work, including end-of-life and potential benefits, should be considered together to reduce the whole-life carbon:
  - A component with higher embodied carbon that delivers higher operational carbon savings shall be promoted (e.g., insulated vs. non-insulated building);
  - Equally, for the same operational performance, the lowest embodied carbon component shall be promoted.

Update methodologies and data regularly

- Methodologies and underlying data should be reliable, representative, and comprehensive:
  - Use the latest European standards on the Assessment of Environmental Performance of Buildings (EN 15978, EN 15804+A2) and their corresponding product category rules for evaluation;
  - Clearly identify the Life Cycle Inventories (LCI) datasets used and promote using up-to-date data, as specific as possible;
  - When comparing solutions and functional units at the building level, always consider the same technical performances (insulation, available floor space, fire performance, building service life, etc...), their level of accuracy (average, best practices, current practices) and their decarbonisation pathway;
  - The data should be comprehensive, up-to-date, in accordance with EN 15804+A2 and inclusive of significant emissions or removals, and should also be geographically and technologically representative.

Include durability, service life and maintenance CO_2 costs

- Encourage and support construction techniques that enhance the durability, resilience, and facilitate adaptability of construction works to changing needs.
- Recognise the benefits of long service life in amortising environmental and economic construction costs, such as in Whole-Life Carbon (WLC) calculation.
- Consider the impact of substitution and maintenance of functional units during the reference service life.
- Distinguish between short-term (replaced during the service life) and long-term elements of a construction work.
- Reward products with a service life longer than that of the construction work taking into account their potential for "re-use" (both entire structures and single elements).

RECOGNISE AND REWARD PERMANENT CARBON STORAGE

Consider permanent carbon storage in the assessment

- The assessment of carbon balance should consider carbon that is permanently stored (i.e., remains in the product at its end of life) in construction materials. Carbonation should be recognised as a significant carbon sink, and thus should be included in the EU greenhouse gas calculations.
- Materials that have been enhanced by capturing and permanently storing CO2 should be rewarded with carbon removal certificates. For more information, refer to the Concrete Europe position paper on Concrete Contribution to Carbon Removal.

- Temporary storage with a lifetime of less than 100 years should not be considered. This is because it not only shifts the burden to future generations, but also lacks scientific consensus regarding its actual impact.

DECARBONISATION AS A COMPONENT OF SUSTAINABILITY AND ENVIRONMENTAL GOALS

Note that the Global Warming (GWP) Potential is one of the indicators to consider

- The full suite of United Nations Sustainable Development Goals, particularly those relevant to the built environment, should always be considered, especially when formulating sector-specific policies.
- In evaluating the WLC at the level of construction works, it is important to balance these outcomes with other potential negative impacts (such as biodiversity loss, land use change, use of substances of very high concern (SVHCs) etc.), especially as CO_2 impacts will decrease in coming years. Remember to consider the other positive impacts of locally sourced cement-based and concrete products that make substantial use of waste and by-products.

Consider additional objectives and their interaction with decarbonisation

- Adaptation to climate change.
- Resilience.
- Circular economy.

IN THE CONTEXT OF DEEP RENOVATIONS, EVALUATE AND SUPPORT REBUILDING OPTIONS WHEN APPROPRIATE

Assess the rebuilding option

- When a construction work requires extensive renovation, it might be more beneficial to refurbish it or to dismantle and rebuild it, depending on the specific circumstances.
- A full life-cycle assessment (cradle-to-grave/cradle) should be performed for both options, including WLC profile.
- In addition to the LCA assessment, the following factors may be considered:
  - New constructions, for the same land use, are generally more efficient (they offer more floor area, lower carbon solutions, and are designed for future disassembly).
  - Materials from dismantling can be reused within the same construction work or for other purposes, exemplifying the concept of buildings as material banks.

Support the best option regardless of its nature

- Policies should not a priori promote one option over the other, either legally or financially. The solution that offers the best LCA/WLC profile should be supported.
- Financial support, whether in direct forms or through fiscal incentives, should prioritise the most effective solutions.