

Request for Industrial Partners to join the Industrial Advisory Board

Advanced mineral CARBOnatiOn techniques in Sustainable and Thermal-efficient construction products

Acronym: CARBOOST

Project ID	
Type	Strategic Basic Research for clusters (cSBO), bio-economy, intercluster project with the spearhead cluster Flux 50
Period	4 years
Total project budget	+/- 2.000.000 EUR
Starting date	2024
Industrial partners (Advisory Board)	Current partners not disclosed at the moment
Applicants (Knowledge partners)	VITO, KU Leuven, UGent, SCK CEN
Catalisti contact	Bert Boekaerts (bboekaerts@catalisti.be) Aron Deneyer (adeneyer@catalisti.be)

Project description

Introduction

In line with the Fit-for-55 plan Flanders has the ambition to strongly reduce its CO₂ emissions. A portfolio of methods and solutions will be needed to make this happen. This project focuses on mineral carbonation, a technology that combines the beneficial use and long-term sequestration of CO₂ into stable building materials (CCUS). This approach offers a dual advantage: not only can the CO₂ footprint of buildings be substantially reduced, but also the CO₂ emitted by the Flemish industry can be put to beneficial use. In addition it enables the use of secondary resources and stimulates circularity.

Mineral carbonation building materials have a significant potential for decreasing GHG emissions, by uptake of CO₂ during the production process and, more importantly, by reducing the need for carbon-intensive cement. So far, research has mainly been focused on CCU potential during production, while very limited attention has been given to the use phase. For intelligent renovation and construction, high performance materials are needed that not only have a low CO₂ content but also have excellent properties. In this project, we will address novel mineral carbonation products with focus on the long term CCU balance, taking into account durability aspects and thermal insulation performance. Clearly the research will enable the development of a new generation construction materials that go beyond the state of the art. Flemish companies and research institutes are frontrunners in mineral carbonation based CCUS technologies. This project is needed to maintain that position and ensure that Flanders can benefit from the economic and environmental benefits of the technology.

Goals

The overall goal of this project is to build-up knowledge and develop models and tools that enable the introduction of the next generation carbonation-based construction materials engineered for durability and insulation performance. This will be done by:

- Exploration of novel production processes for the next-generation carbonation-based materials to allow for performance-based design (WP1)

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- In-depth knowledge generation on the relation between microstructure, porosity, density, mass and energy transfer-, and buffering capacity (WP 2) that will support the modelling and knowledge build-up
- Development of detailed models that link material characteristics and performance (ML-supported reactive transport and thermodynamic modelling) and that can be used to design materials with the desired properties (WP3)
- In-depth assessment of in-service product properties such as durability (service life) and thermal insulation (WP4)
- Assessment of the performance of the developed products in building structures and structural components (optimisation of energy savings and environmental impact over the life cycle) (WP 5).

A positive environmental impact will be achieved since mineral carbonation building materials are CO₂-negative at production resulting from a net uptake of CO₂ (-130 kg CO₂/m³ material) and the replacement of cement (- 240 kg CO₂/m³ material). Additional environmental benefits are expected from a longer lifetime (reducing raw material and energy needs for building replacements) and energy savings from insulation performance. Implemented to its full potential the technology would be able to reduce the CO₂ emissions in Flanders by more than 0.9 million tonnes of CO₂ each year. In addition, the technology has the potential to use and upcycle each year 1.6 million tonnes of local (Flemish) secondary resources (e.g. construction and demolition waste or metallurgical slags) to produce mineral carbonation building materials.

If successful, CARBOOST will develop knowledge and seed innovation for implementation in at least 4 novel production sites in Flanders. The investment cost for a mineral carbonation production plant is estimated at 20-30 M€ per plant with each plant securing employment for around 40 people. This results in an added value for Flanders of 80-120 M€ in investments and 160 full-time jobs being created.

Request

To foster interaction with the industry, the project partners are looking for companies that wish to be involved in this cluster strategic basic research (cSBO) project as part of an advisory committee.

More specifically, the project partners are searching for industrial actors covering different segments in the value chain with business in the field of

- emitting and capturing CO₂
- valorization of Ca-rich secondary resources (steel slags and other secondary resources)
- construction, building management, retrofitting and insulation.

The primary role of companies during the pre-project phase is to tailor the project proposal to the actual needs of the companies and thereby maximise the likelihood of future utilisation of the results. During the project execution, a two-way dialogue between the researchers and the user field involved remains essential to achieve the targeted knowledge transfer from scientific research to concrete applications.

The primary role of companies during the implementation phase is:

- to assist the research from an economic point of view;
- to assist in designing and preparing the translation of the results into concrete economic applications.

During the cSBO project execution, companies may contribute as member of the advisory committee. In addition, they may prefer to undertake parallel R&D activities that are related to the subject of the SBO project at their own expense. In the latter option, the parallel R&D activities are not part of the SBO project. Companies may explore the possibility to obtain funding from the Agency for Innovation and Entrepreneurship.

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The Advisory Board is open to all interested companies, including companies established outside the Flemish region.

Important notice: Companies that wish to be involved in this cSBO project, will need to be (at least) member of one of the involved spearhead clusters. For more information on membership and membership fees, please contact Aron Deneyer (adeneyer@catalisti.be). In compliance to SBO regulations, the following requirements apply during the project implementation:

- All commercial members of the advisory committee are required to make a monetary contribution of minimum € 250/year in the case of an SME or minimum € 1,000/year in the case of a large enterprise or another organisation.
- A commitment to a substantive contribution and a time investment to participate in bilateral consultations with the project executors and/or meetings of the advisory committee.

How to reply to this request

Please send an **email** to Bert Boekaerts (bboekaerts@catalisti.be) and Aron Deneyer (adeneyer@catalisti.be), and **briefly describe your interest and potential contribution** to the project. After submission of your offer, you will be contacted for more information on the project contents, and a Letter of Intent and Questionnaire will be provided to join the Advisory Board of the project.

Important notice: Partners that wish to participate in Catalisti-supported projects are required to be member of Catalisti. For more information on membership and membership fees, please visit our [website](#) or contact Aron Deneyer (adeneyer@catalisti.be).

Contact

Please contact Bert Boekaerts (bboekaerts@catalisti.be) or Aron Deneyer (adeneyer@catalisti.be) if you have questions concerning this RfP.

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