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CO2Valorize - Valorization of CO2 for low carbon cement

Cement production is responsible for 8% of global CO2 emissions, which mainly come from the processing of limestone. CO2Valorize proposes a new approach to drastically reduce these emissions by partly replacing some of the limestone content with supplementary cementitious materials (SCM). Such materials are additionally carbonated using captured CO2, so this part-replacement process utilises captured CO2. Promising, calcium silicates rich SCM can come from waste materials such as mine tailings and recycled concrete, all of which are available in large quantities. The carbonation process of such materials is complex and barely understood to date. Our networks aim to lay the scientific foundations to create fundamental knowledge on the mechanisms, reaction kinetics, the physico-chemical subprocess, and the performance of the modified cement in order to provide a proof-of-concept and show that a CO2 reduction by 50 % per tonne of cement produced is feasible. The project is driven by leading companies that represent important parts of the value chain and ensure a fast uptake of the results with the potential to commercialise new equipment, processes and software during and after the project. The structured approach combines complementary research for each individual project in the academic and industry sector. This is accompanied by a balanced mix of high-level scientific courses and transferable skills delivered by each partner locally and in dedicated training schools and workshops at network level. This way, each doctoral candidate builds up deep scientific expertise and interdisciplinary knowledge to deliver game-changing cleantech innovations during and after the project. CO2Valorize is impact-driven and strives for portfolios of high-class joint publications in leading journals and patents. The transfer of the results into first-of-its-kind engineering solutions contribute to the next generation of cement processes that can mitigate climate change.

Coordinator: FLSMIDTH AS

Beneficiary: Università degli Studi di Padova

UNIPD Supervisor: Fabrizio Bezzo

Department: Department of Industrial Engineering

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Project Duration in months: 48

Find out more: <https://cordis.europa.eu/projects/en>