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DETOCS - Data to Enable Transformation and Optimisation for Concrete Sustainability

Cement production is responsible for 8% of global CO₂ emissions, mainly from limestone processing to produce clinker. Clinker can be replaced by other raw materials, such as clay, ashes, slags or recycled concrete fines. These materials can be processed into Supplementary Cementitious Materials (SCM), which have a lower CO₂ footprint than Portland Cement. DETOCS proposes a new approach to rapidly increase the use of SCMs on existing production facilities: by exploiting the latest innovations in digital tools to predict and control the quality of cement and concrete blends with high amounts of SCMs compared to today's standards. Our network aims to lay the scientific foundations to create knowledge and new models to study the production of high quality SCMs and their impact on low-carbon cement and concrete mixes. The goal is to reduce clinker factor from ca. 70% today to 40% by 2030 and 25% by 2035, targeting a CO₂ emissions of 0.2 t.CO₂/t.cement (compared to today's global average of 0.65 t.CO₂/t.cement). At DETOCS, the partners combine top-notch scientific expertise, interdisciplinary know-how, engineering solutions and real-world process data into an industry-driven network. The structured approach combines complementary research for each individual project in the academic and industry sectors. The top-level research work is accompanied by a balanced mix of the newest scientific courses and transferable skills training delivered by each partner locally and in dedicated training schools, seminars, and workshops at the 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. DETOCS is impact-driven and strives for a portfolio of high-class joint publications, patents, and innovations along the value chain. The project will lay the foundations for first-of-its-kind engineering solutions to decarbonize cement and concrete products.

Coordinator: FLSMIDTH AS

Beneficiary: Università degli Studi di Padova

UNIPD Supervisor: Fabrizio Bezzo

Department: Department of Industrial Engineering

Total Contribution: € 259 437,60

Project Duration in months: 48

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