



SUBLime

Sustainable Building Lime
Applications via Circular Economy
and Biomimetic Approaches



OPEN PhD POSITION in European Training Network

We are looking for a dedicated and highly motivated Early Stage Researcher (ESR), who will join our team to craft the future of lime mortars/plasters in new construction and conservation of the built heritage.

SUBLime description (4 years ETN project starting February 2021)

Lime is one of the earliest industrial commodities known to man and it continues to be one of the essential building blocks of modern Society. The global lime market is anticipated to approach the value of 44 Billion Euros by the end of 2026 and resulting in various growth opportunities for key players. The SUBLime network aims to develop the most advanced technology in lime-based materials modelling and characterization for industrial use that will go beyond the limitations of existing solutions in new construction and conservation in the built heritage. It is dedicated to recruit and train fifteen PhD students in multiple scientific and engineering fields towards a better understanding and development of sustainable innovations in both added functionalities and sustainability aspects in lime mortars and plasters, strongly based on novel biomimetic and closed loop recycling approaches. The cross-disciplinary approach throughout the SUBLime value chain, leveraging the knowledge of the academic (6) and industrial members (11), such as lime producers, mortar/plaster/block producers, and end-users for the prioritization of industrial needs, will dramatically increase the transfer of scientific knowledge to the lime-consuming industries in the EU.

ESR15 – TU Darmstadt

Cradle-to-cradle sustainability of lime based construction systems

Objectives: To compare Environmental, Economic and Societal sustainability indicators between the current and the SUBLime innovative technologies for lime-based construction unit. Life cycle inventory data will be obtained from existing databases as well as from the lime producers and EULA. Based on cradle-to-gate inputs from ESR9, ESR15 will widen the LCA scope to consider in a more advanced approach the following life phases of the construction unit: a) construction phase: current versus digital fabrication technologies; b) use phase: models for CO₂ capturing, service life, operation, maintenance and retrofitting of lime-based constructions; c) end-of-life processes: where lime-based components are separated from bricks and used in closed loop recycling. The LCA will consider the predicted long-term performance of elements at construction scale under real exposure conditions, by collaboration with ESR12, 13 and 14 on service life and CO₂ capture predictions.

Expected Results: Quantified cradle-to-cradle sustainability of construction building units integrating novel lime-based mortars and plasters ingredients. Current and innovative SUBLime technology is compared. A more advanced rational approach to include durability and service life of lime-based masonry systems in the LCA assessment.

Keywords: Life cycle assessment (LCA), lime mortar construction systems, digital fabrication, service life, CO₂ capture.

Applicant Profile: Master level in Civil Engineering or related field, ideally with background in LCA research. Excellent communication skills (both written and oral) in English.

PhD main locations: The recruited ESR is given the opportunity to conduct 3 years of PhD studies at [Institute of Construction and Building Materials](#) at the [TU Darmstadt](#) and to visit other network partners for secondments ([University of Minho](#) and [Silesian University of Technology](#)), and to attend the training events of the network.

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More details about SUBLime project, requirements for the candidates and recruitment procedure: www.sublime-etn.eu/jobs/