



Exploit for Innovative Materials

Exploit4InnoMat Project



[Exploit4innomat.eu](https://exploit4innomat.eu)



In the contemporary era, the construction industry bears the responsibility for 40% of energy consumption and 36% of CO₂ emissions in the European Union (EU). Hence, the European Commission (EC) has established a goal to achieve almost Zero Energy Buildings (nZEB). Consequently, the significance of building materials and their embodied energy or related CO₂-emissions is growing in importance, with the aim of guiding Europe towards a dependable path for renovation and support.

The Exploit4InnoMat project aims to offer a sustainable solution throughout Europe to create, expand, and confirm novel material ideas. Its objective is to establish a network for open innovation test beds (OITBs) focused on building envelopes, with the ultimate goal of supporting the European Commission's target for nearly Zero Energy Buildings (nZEB).

Exploit4InnoMat Team & Their Objectives

The Exploit4InnoMat Team comprises 27 partners hailing from 11 diverse European Union countries, along with Turkey, Switzerland, and the United Kingdom. These 27 organizations, recognized as global leaders in their respective domains, represent a broad spectrum of professional sectors, including academia, local authorities, research and policy organizations (RPOs), and small to medium-sized enterprises (SMEs). Within this consortium, there is a wealth of expertise spanning various skill sets, encompassing novel materials design, bio-based materials, environmental science and policy, climate modeling, citizen and social science, data management, and construction engineering.

Exploit4InnoMat project includes 6 Groups of services offered to SMEs, Industry or Universities. The first Group contains the 8 Pilot Lines (PLs), located in 7 EU countries (Norway, Sweden, Germany, Spain, Greece, Italy and Belgium) which are responsible for the processing of advance and/or nano-enabled multifunctional materials, including sorting and processing of construction and demolition wastes (CDW) to be used as secondary raw materials.

This approach is expected to yield sustainable materials and products that not only reduce operational energy demands (e.g., through enhanced insulation properties, reduced thermal bridging, and energy harvesting or storage) but also have lower embodied energy (due to the incorporation of CDW and other secondary raw materials). Moreover, these materials are anticipated to promote a healthier and more comfortable indoor environment, offering benefits such as improved thermal comfort and cleaner air.

Delving into specifics, the incorporated PLs include nanodispersion, 3D printing, and robotic spraying. Thus, various fields of expertise will be investigated, including Open Innovation Testbeds for nano-enhanced cement, non-cement premixes, ceramics, advanced coatings, and glazing solutions featuring aerogels, fibers, PCMs, and other nanomaterials to deliver multifunctional properties. Furthermore, a network of four full-scale living laboratories for the evaluation of nearly Zero Energy Building (nZEB) technologies will serve as a practical tool for developing technology solutions that are close to market readiness.

The remaining five groups will provide substantial technical (e.g., materials characterization and modelling) and non-technical services (e.g., innovation management), assisting and supporting the fulfil of Exploit4InnoMat project's targets. Additionally, there will be a semi-automated tool that combines BIM analysis, fast track modeling, and simulation to create a digital platform for integrating building components (structural, solar thermal, and BIPV) and achieving a unified and visually pleasing urban environment.



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Funded by the European Union's Horizon Europe 2023, Research and Innovation programme under Grant Agreement No. 101092339