



BLOOM reaches key milestone in developing smart technologies for more sustainable mineral processing

Horizon Europe project advances innovative mineral analysis system to strengthen Europe's critical raw materials supply



Barcelona, Spain – September 2026 – The Horizon Europe-funded **BLOOM** project has successfully completed its first 18 months, achieving significant progress towards developing innovative technologies that will improve the extraction and processing of critical raw materials (CRMs). By combining advanced mineral analysis with Artificial Intelligence (AI), BLOOM aims to make mining operations more efficient, cost-effective and environmentally sustainable.

Critical raw materials such as tantalum, niobium, copper and cobalt are essential for clean energy technologies, electric vehicles, batteries, digital devices and other strategic industries. As Europe seeks to strengthen its domestic supply chains under the **EU Critical Raw Materials Act**, BLOOM is developing new tools that will enable mining companies to recover more valuable minerals while reducing energy use, costs and environmental impacts.

Advancing smarter mineral processing

During its first reporting period, the project has established the scientific, technological and engineering foundations required to develop its innovative **Mineral Liberation Analysis (MLA) system**, supported by machine learning and artificial intelligence (AI).

The project has completed extensive mineral characterisation and laboratory testing on representative copper-zinc and tantalum-niobium ores. These activities have provided valuable insights into how minerals behave during grinding and flotation processes, enabling researchers to design smarter and more efficient processing strategies.

In parallel, the consortium has developed the engineering design of the modular analysis system, including the mineralogical database, software architecture and communication interfaces required for future deployment in industrial processing plants.



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Bringing innovation closer to industry

A major achievement has been the development of a **containerised pilot plant**, which will allow BLOOM technologies to be tested under realistic operating conditions before their implementation in commercial mining sites.

The pilot facility will integrate **advanced sensing technologies, automation and intelligent process control**, enabling operators to monitor mineral processing in near real time and optimise production more effectively.

The project is also **working closely with mining companies and project developers from Europe, Canada and Ukraine** to ensure that the technologies respond to real industrial needs. Representative mineral samples and operational expertise are already supporting the development and future validation of the system.

Supporting Europe's strategic autonomy

By improving mineral recovery and making lower-grade deposits economically viable, BLOOM has the potential to unlock new sources of critical raw materials while reducing the environmental footprint of mining operations.

Beyond technological innovation, the project is laying the foundations for future life cycle assessments, environmental performance evaluations and techno-economic analyses that will support the commercial uptake of its solutions.

Through these developments, BLOOM contributes directly to Europe's ambitions to build more resilient, sustainable and competitive critical raw materials value chains.

"The progress achieved during the first 18 months demonstrates that BLOOM is successfully bringing together advanced mineral analysis, digital technologies and industrial expertise to address some of the most pressing challenges facing Europe's raw materials sector. Our next phase will focus on validating these innovations under real operating conditions and demonstrating their value for industry," said Josep Oliva, Project Coordinator at Universitat Politècnica de Catalunya (UPC).

About BLOOM

BLOOM (Liberation Analysis for Optimising Extraction and Processing of Critical Raw Materials) is a Horizon Europe Innovation Action funded by the European Union under Grant Agreement No. 101177962. Running from **December 2024 to November 2028**, the project brings together **14 partners from six countries** to develop an integrated online mineral analysis system based on Mineral Liberation Analysis and Artificial Intelligence. The technology will help optimise mineral processing, reduce costs and improve the sustainability and competitiveness of Europe's critical raw materials sector.

Project at a glance	Media information
Programme: Horizon Europe Duration: December 2024 – November 2028 EU contribution: €7.49 million Coordinator: Universitat Politècnica de Catalunya (Spain) Consortium: 14 partners from six countries	Email: info@bloomproject.eu Website: www.bloomproject.eu LinkedIn: linkedin.com/company/bloomproject



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