UABDIVULGA
BARCELONA RECERCA I INNOVACIÓ

09/07/2021

Critical Raw Materials Recovery From Mines Wastes

RAWMINA H2020 project has been launched, an Integrated Innovative Pilot System For Critical Raw Materials Recovery From Mines Wastes In A Circular Economy Context. It is driven by 19 partners, with the participation of researchers from the Department of Chemistry of the UAB.

istock_intst

A 42-month EU funded project driven by 19 partners from 9 EU countries, 1 non-EU country and 2 international partners, aiming to develop and demonstrate an innovative pilot system for the clean and sustainable production of non-energy, non-agricultural raw materials from Mine Waste (MW) resources has been launched.

Funded by the EU, RAWMINA project officially started in May 2021. The project addresses major challenges for the international mining industry, and will deliver significant impact across the European Economy, Environment and Social Wellbeing.

Funded by the Horizon 2020 program, under the Grant Agreement nº958252, RAWMINA benefits from an overall budget of about 10.8M€ with an allocated European funding of about 9M€ (see Fig. 1) to be expend in 42 months. European competitiveness is strongly supported with a 26.4% and 30.3% of total budget for innovative SMEs and large industries, respectively. The consortium covers 9 countries (European: Czech Republic, Finland, France, Germany, Greece, Ireland, Italy, Spain; International; Chile, UK) and includes 5 RTOs, 3 universities, 4 large enterprises and 7 SMEs. Coordinated by LEITAT, and involving a prominent industrial partner from Chile, where the world's largest copper ore deposits exist, the consortium will also

leverage the knowledge and support of the Advisory Board members, including expertise from the mining sector in South Africa, Portugal and Turkey.

The European Challenge: "Securing access to a stable supply of Raw Materials"

Critical Raw materials (CRMs) are crucial to Europe's economy. They form a strong industrial base, producing a broad range of goods and applications used in everyday life and modern technologies. CRMs are needed for significant economic and strategical sectors, as for example manufacturing batteries, construction tools, sensors and electronic devices, medical devices, metals, automotive, defence or renewable energy sectors. However, unreliable supply and difficult substitution to CRMs is a growing concern within the EU and across the globe. Currently, the EU relies on the rest of the world for many CRMs such as Antimony (Sb, 100% imported), Cobalt (Co, 32% imported), Germanium (Ge, 64% imported) and Tungsten (W, 44% imported). European reserves and current recycling rates are low (2% for Ge as an example), and recycling rates are substantially insufficient to meet demand.

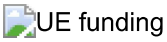
RAWMINA aims to develop and to demonstrate the RAWMINA pilot system: an industrially scalable and flexible innovative pilot in continuous operation for MW valorisation, achieving 95% recovery rate and 95% selectivity for CRMs (Co, Sb, Ge, W), and 80-90% recovery rate and 95% selectivity for Gold (Au), Silver (Ag) and Iron (Fe) based high-value products, whilst reutilising 90% of water. The RAWMINA pilot system will treat up to 100-150 kg MW/day on an industrial demonstration (TRL7, 12 months operation) and includes an efficient, circular and robust process control by an end-to-end Intelligent Management System. To achieve these aims, RAWMINA activities include MW conditioning and characterization, optimization and upscaling of innovative technologies, such as continuous bioleaching, iron removal with magnetic separation & by-products recovery, selective recovery of Co, Sb, Ge and W through a combination of Nanofibrous Composite Materials, Thermo-Desorption Process and Electro Winning followed by other metals recovery by Electro Coagulation, process simulation, integration, and pilot design, System engineering & Demonstration. The sustainability and social impact of these technologies will be checked and finally the exploitability of the project will be analysed with a Circular Business Plan. The project will create a unique community, named "CRM Recovery Helix" to maximise clustering and dissemination to all the relevant stakeholders (researchers, industries, investors, municipalities, policy makers, NGOs, Society).

An interdisciplinary, vibrant, industry led consortium, formed by 19 partners, with recognized expertise, experience, skills, resources, infrastructure and position in the fields of mining industry, circular economy, renewable energy, material sciences, and business development, is prepared to achieve these goals. Finally, RAWMINA will contribute to reduce production costs and environmental impacts, contributing to the objectives of the European Innovation Partnership on CRMs.

Manuel Valiente
manuel.valiente@uab.cat
Project RAWMINA coordinator at UAB
Department of Chemistry
Universitat Autònoma de Barcelona
Gustavo Pérez
gustavo.perez@uab.cat
RAWMINA project manager and contact person at UAB

Department of Chemistry
Universitat Autònoma de Barcelona

References



View low-bandwidth version