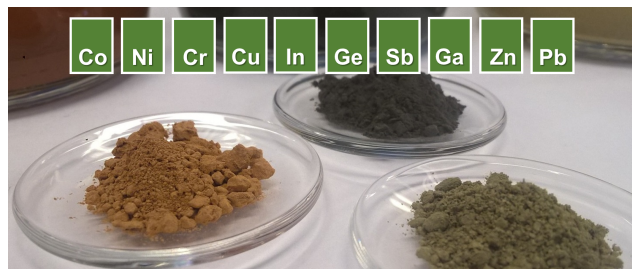


## Novelty

- The systems approach (toolbox) to couple the individual unit operations to obtain the most cost-effective and environmentally-friendly flow sheet for a given low-grade resource.
- The development of several new metallurgical unit operations. METGROW+ demonstrates and validates the New Metallurgical Systems Toolbox for a multitude of low-grade resources in the EU.

## Impact of METGROW+

The use and replication of the METGROW+ toolbox boosts the European mineral extractive and processing industry since it triggers the cost-effective exploitation of Europe's domestic low-grade primary and secondary resources. The metals include both economically important and critical metals.



## Consortium



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## Metal Recovery from Low Grade Ores and Wastes



*METGROW+ solves bottlenecks in the European raw materials supply by developing innovative metallurgical technologies for unlocking the use of potential domestic raw materials.*



**METGROW+ is a project funded by the European Commission**

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## METGROW+ New Metallurgical System

METGROW+ project develops technologies for extracting valuable metals from metallurgical waste and low-grade ores, from which recovery is not yet economically viable.

The research involves the development and combination of **pyro-, hydro-, solvo-, electro-, iono- and biohydrometallurgical** unit operations for pre-treatment, metal extraction and metal recovery, as well as **final residue matrix valorisation**.

The primary objective of METGROW+ is to create, demonstrate and validate an industrially viable, flexible **New Metallurgical Systems Toolbox**. The toolbox allows producing innovative, systems based, metallurgical solutions to recover metals and to valorise the residual matrix, while minimising energy consumption and the overall environmental footprint.

## Four low-grade resource families were selected:

- Nickel-cobalt laterite deposits (Ni, Co)
- Iron-rich sludges from the zinc industry (Zn, In, Ga, Ge)
- Chromium-rich sludges (Ni, Cr)
- Fayalitic slags from non-ferrous metallurgy (Cu, Sb, Fe)

Materials were chosen as they:

- Are relatively generic for Europe
- Cover a wide range of economically important and critical metals
- Cover a wide range of mineral compositions

