

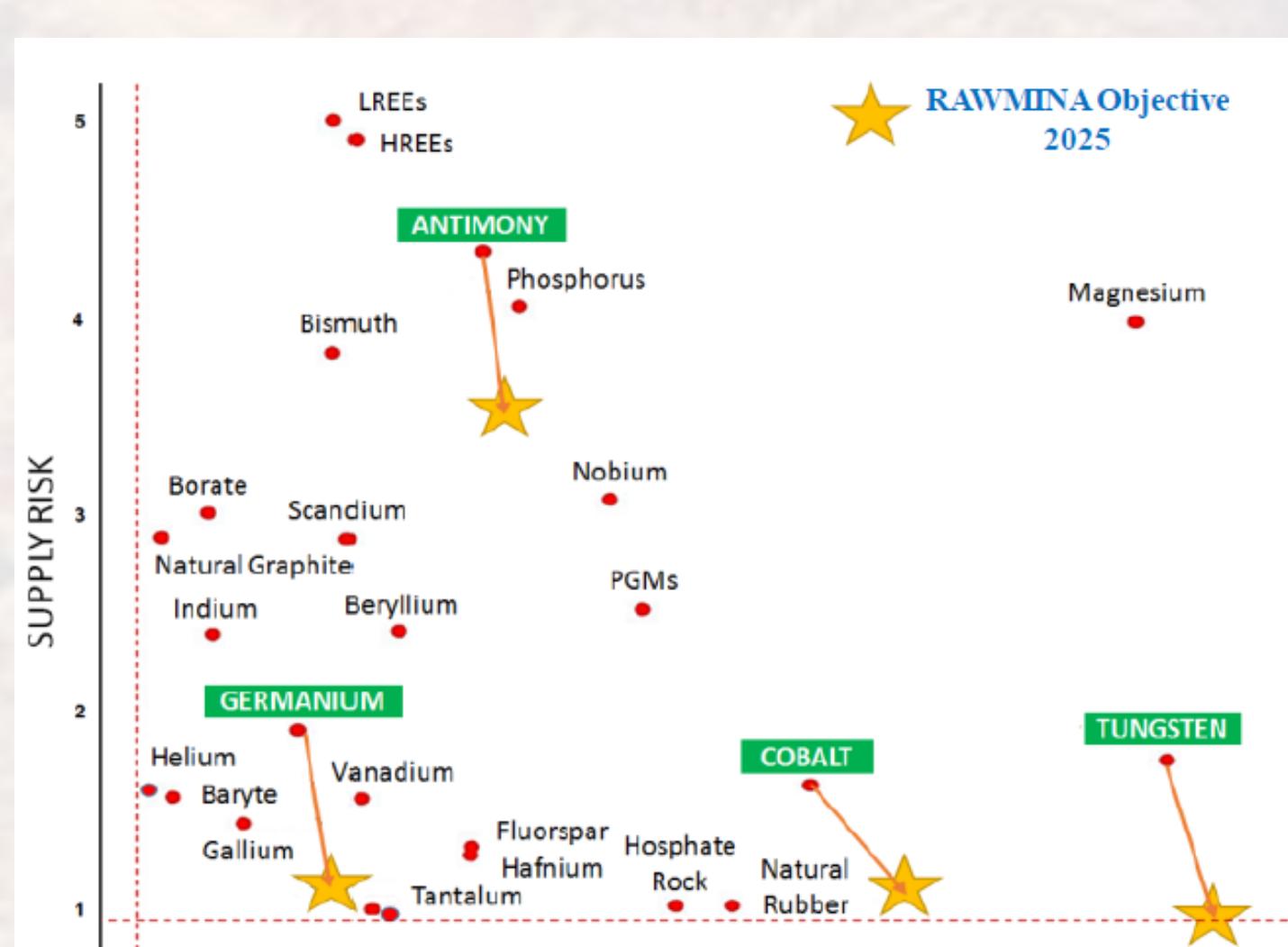
# Integrated Innovative Pilot System For Critical Raw Materials Recovery From Mine Wastes In A Circular Economy Context

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## BACKGROUND

Critical Raw materials (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.

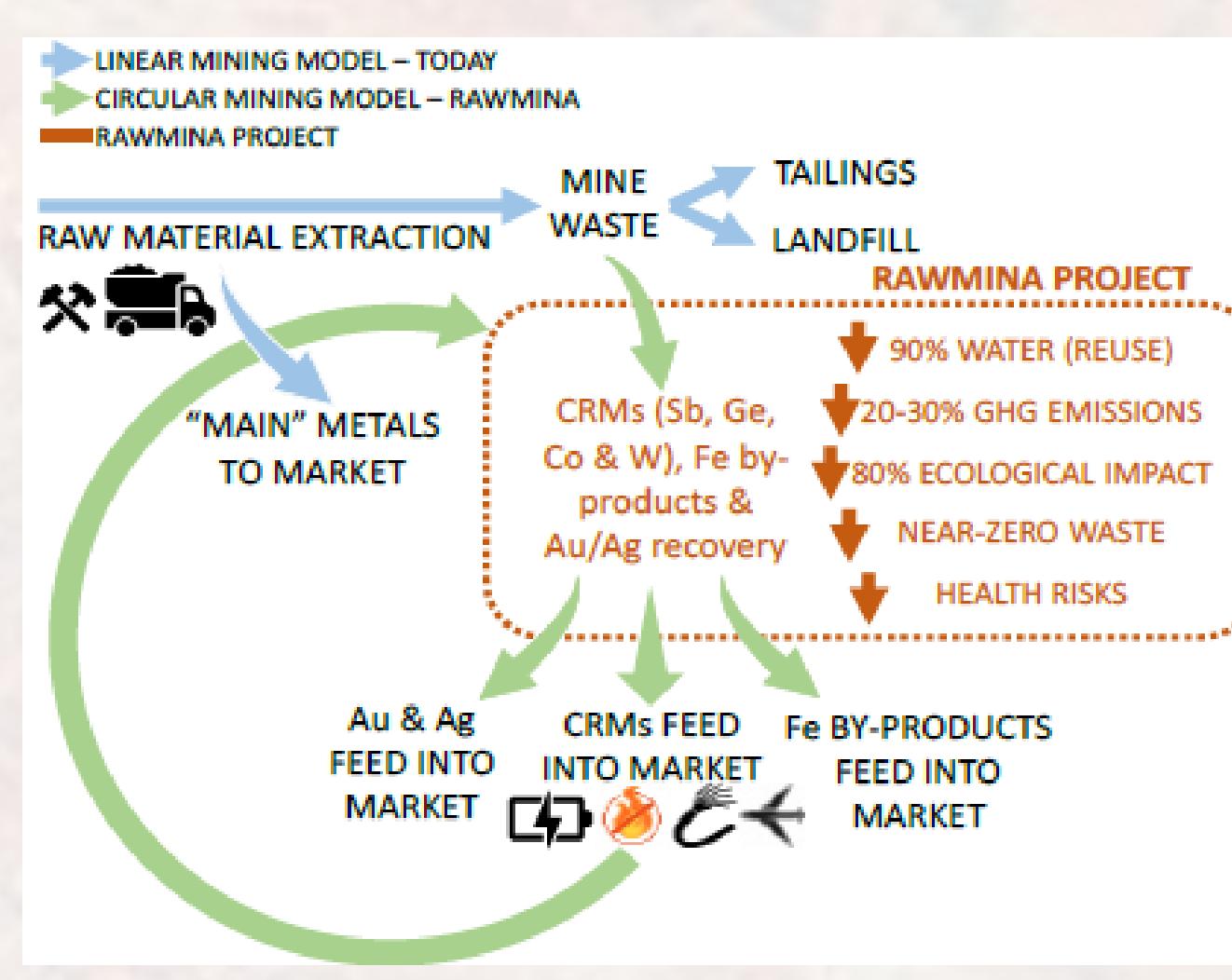
There is no system or process currently implemented within EU to valorise the mine waste since there is no process demonstrated at figures above 90% recovery rate and 40% selectivity.



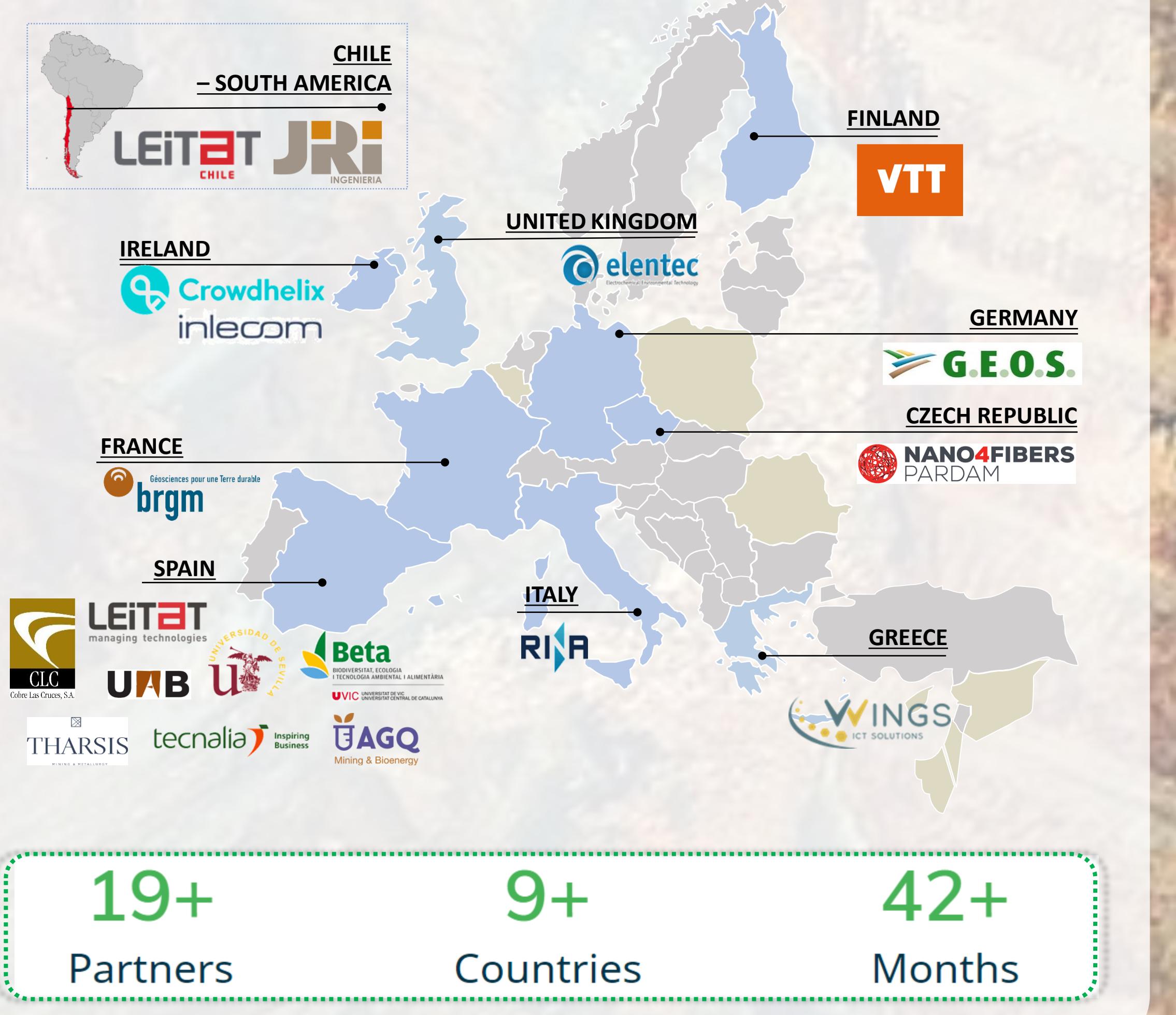
## RAWMINA'S OBJECTIVES

RAWMINA's main objective is to develop and to demonstrate the RAWMINA pilot system: an industrially scalable and flexible innovative pilot in continuous operation for mine waste valorisation, achieving:

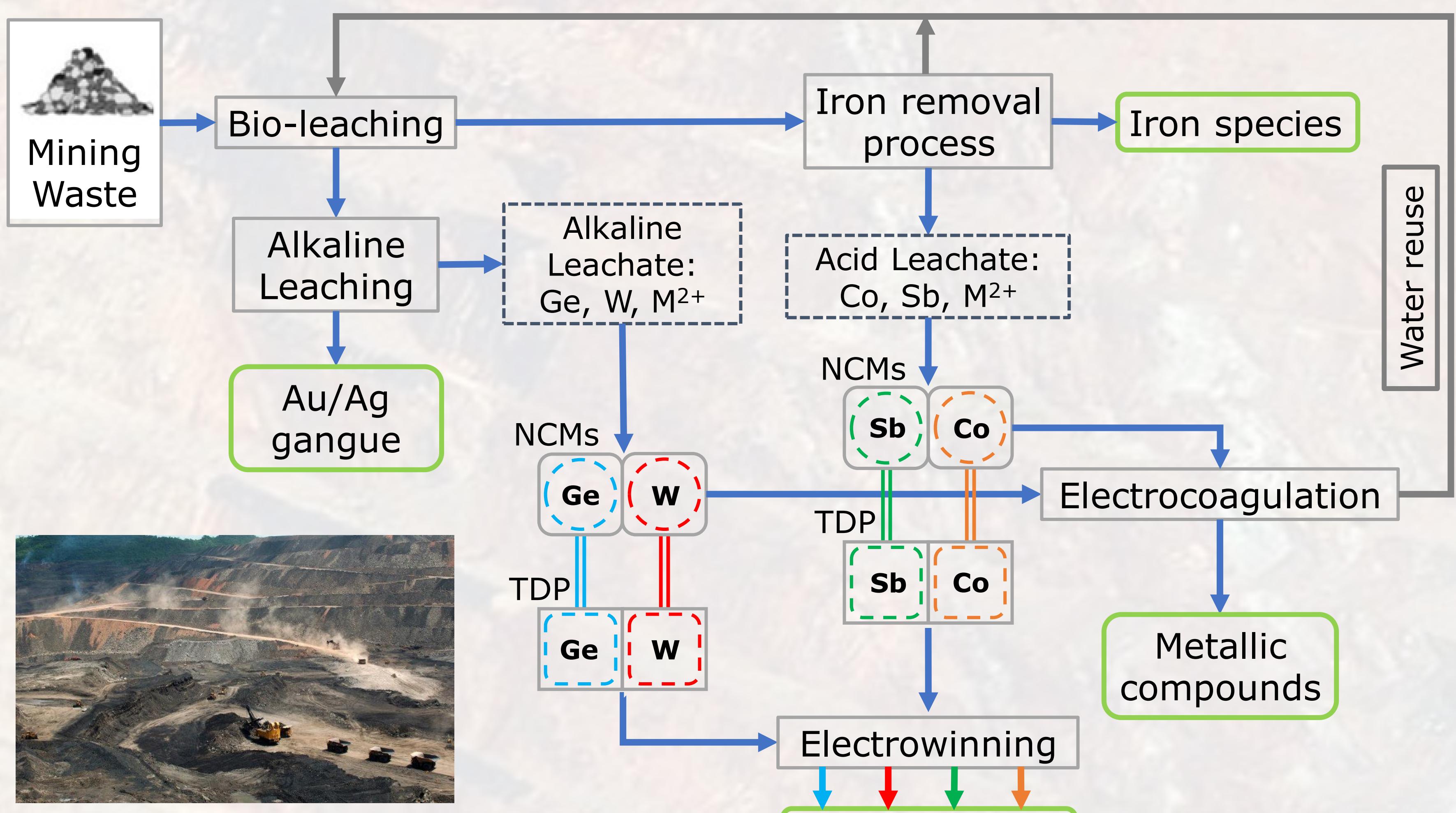
- 95% recovery rate and 95% selectivity for CRMs (Co, Sb, Ge, W).
- 80-90% recovery rate and 95% selectivity for Au, Ag and Fe-based high-value products.
- Up to 100-150 kg MW/day on an industrial demonstration (TRL7).
- Water-based, circular and close to zero waste solution.
- More than 44 M€ in Net Present Value in 5 years.



## RAWMINA'S CONSORTIUM

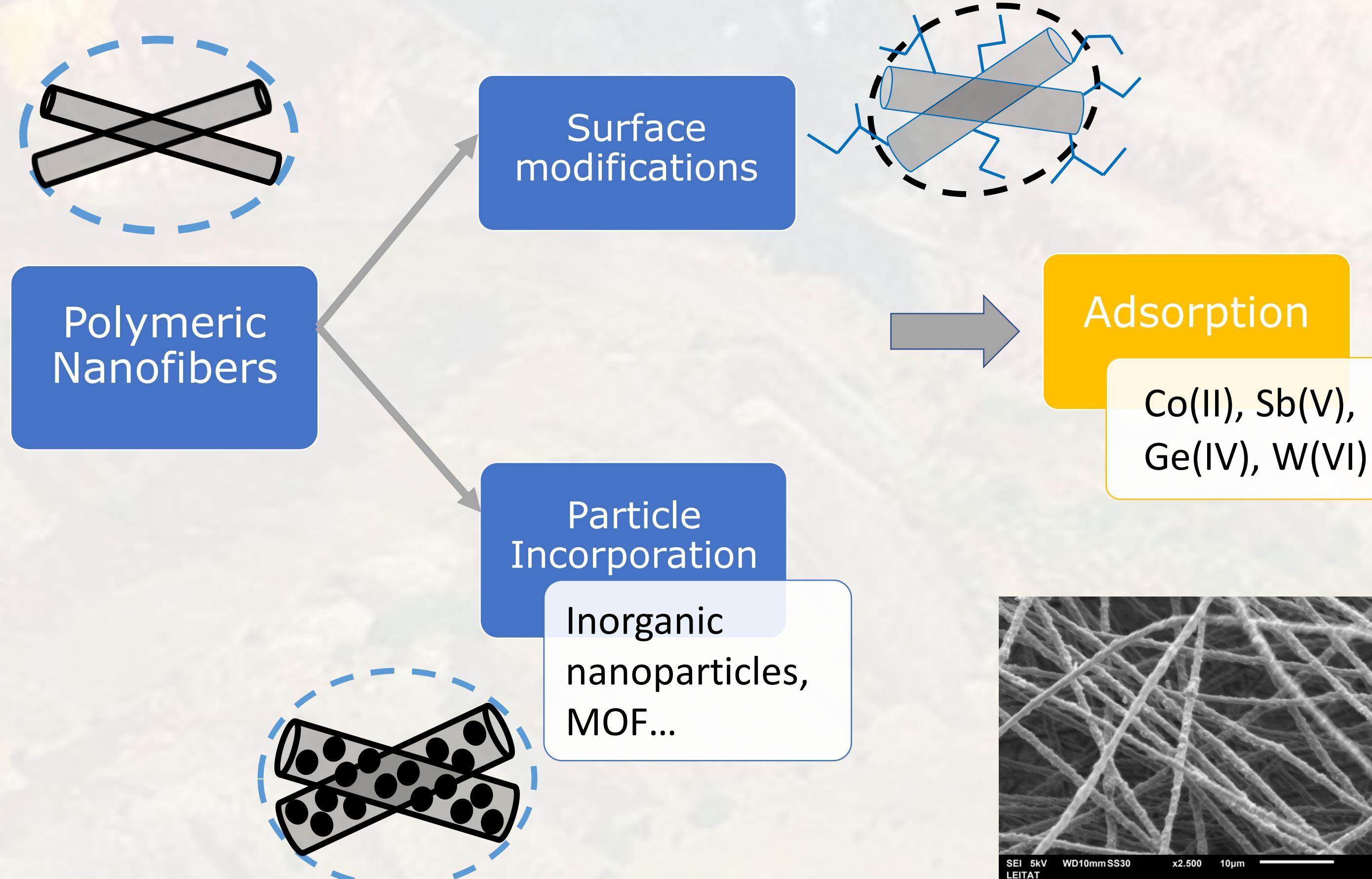


## RAWMINA'S CONCEPT



## NCMs FABRICATION PROCEDURE

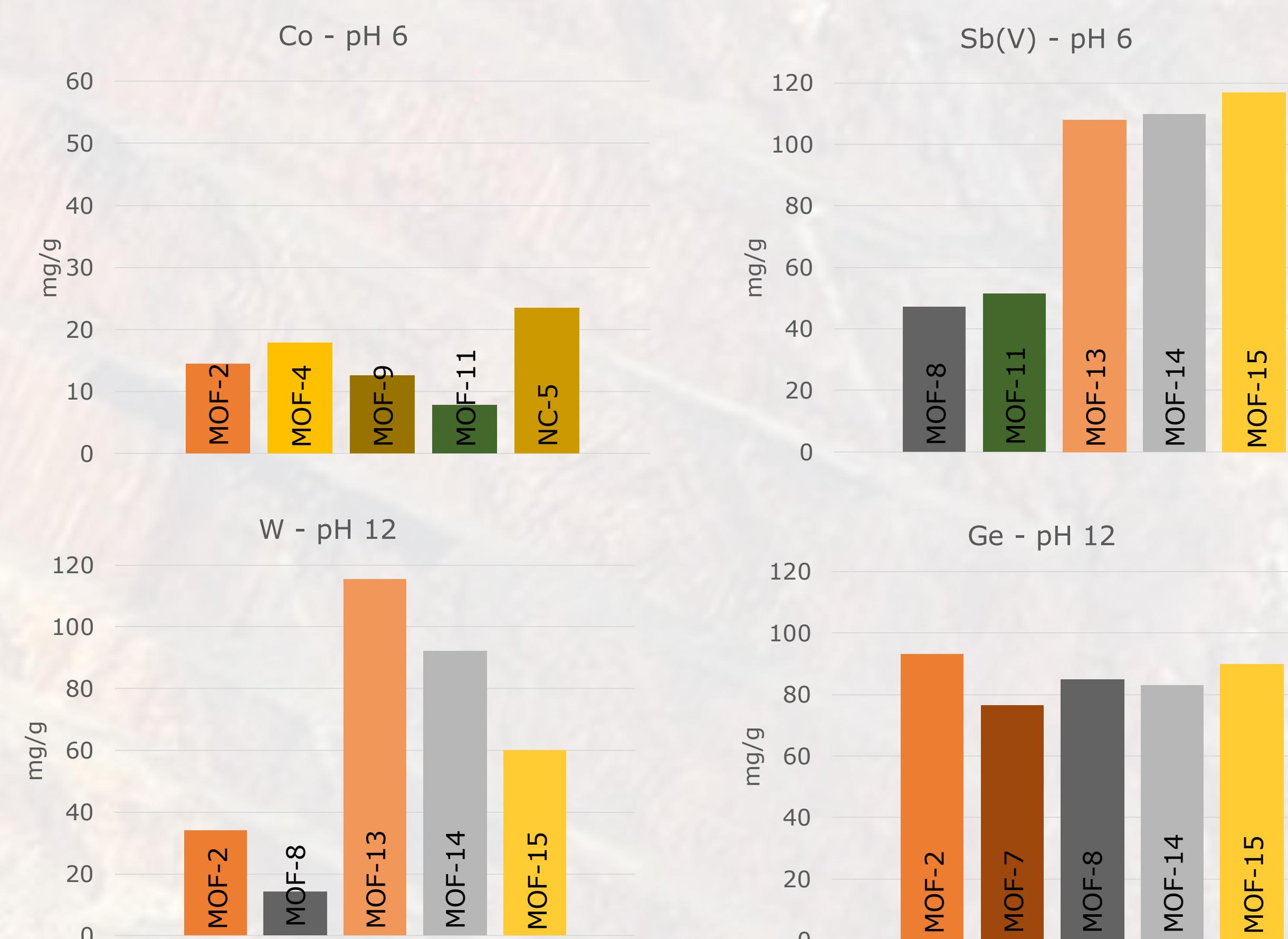
The novel nanofiber composite materials (NCMs) with selectivity towards Co, Sb, Ge, W will include polymeric nanofibers produced by electrospinning and centrifugal spinning process.



### Nanofibers properties:

- ✓ High surface area and porosity.
- ✓ Flexible non-woven web-like materials.
- ✓ Eliminates the need of any phase separation.
- ✓ Reusable on continuous flow system.

## FIRST ADSORPTION RESULTS



## NEXT STEPS

- Selection of the best particles or surface modification for Co, Sb, W and Ge recovery.
- Development and characterization of NCMs.
- Scale-up of the NCMs production.
- Design of the prototype system for pre-scaling up the adsorption and desorption process.

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