

Data and AI to support CRMs recovery from urban waste



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The iBot4CRMs project has received funding from the European Union's Horizon Europe research and innovation program under grant agreement no. 101189783


iBot4CRMs

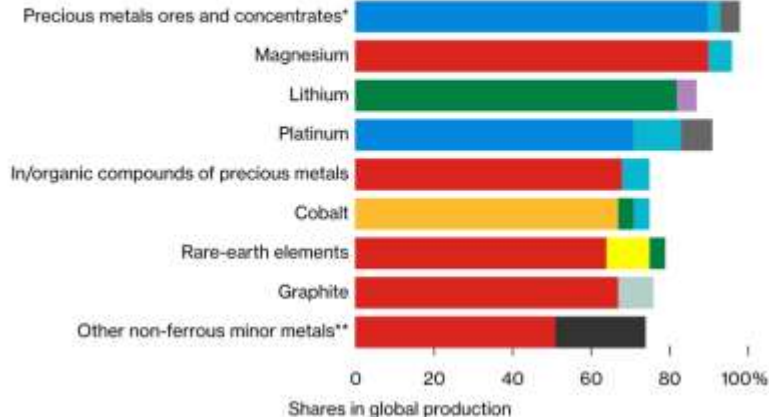
Why critical raw materials are important?

Critical raw materials are strategic ingredients (metals and minerals) in key technologies, which are essential for the green shift, digitalisation, industrial and military products. They are critical, because our economy is dependent of them and there is a risk with their supply (one country control most of the supply).

A Few Countries Dominate Production of Critical Raw Materials

Top producers of the most production-concentrated critical raw materials

China South Africa Democratic Republic of the Congo Myanmar Australia
Russia Zimbabwe South Korea Brazil Chile



Source: Organization for Economic
Cooperation and Development



A list of over 34 critical raw materials.

Source: European Commission



63%

of the world's cobalt, used in batteries, is extracted in the Democratic Republic of Congo



97%

of EU's magnesium supply is sourced from China



100%

of the rare earths used for permanent magnets are refined in China



98%

of EU's supply of borate is provided by Türkiye

4. CRM Act: a high priority for Europe for its sovereignty and resilience → New markets!!!

Established in March 2023. It also aims to support projects in third countries with a preliminary budget of €300 billion Global Gateway Strategy.

As part of the formerly established "Green Alliance", Norway and the EU signed a bilateral strategic industry partnership agreement March 21. The partners aim to develop and ensure integrated value chains for sustainable production and supply of land-based critical raw materials and batteries.

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-The European Union's efforts to ensure sustainable and robust value chains for raw materials within the European market is incredibly important also for Norway – and for us at the Geological Survey of Norway (NGU) in particular. Norway is rich on critical raw materials and has a substantial potential for increased mineral production. Thus, this new industrial partnership is a great leap forward both for Norway and the EU, says Head of Department at NGU, Henrik Sciellerup.



SETTING 2030 BENCHMARKS FOR STRATEGIC RAW MATERIALS



EU EXTRACTION

At least **10%** of the EU's annual consumption for extraction



EU PROCESSING

At least **40%** of the EU's annual consumption for processing



EU RECYCLING

At least **15%** of the EU's annual consumption for recycling



EXTERNAL SOURCES

Not more than **65%** of the EU's annual consumption of **each strategic raw material** at any relevant stage of processing from a single third country

Current status of urban mining



Manual processes are not sustainable and will not solve the actual crisis.

Manual sorting from residual waste

Manual disassembly



Manual dismantling



Recovery of materials from landfill is not fully explored



9,5
€ mill.



18
partners



8
EU countries



4
Pilots



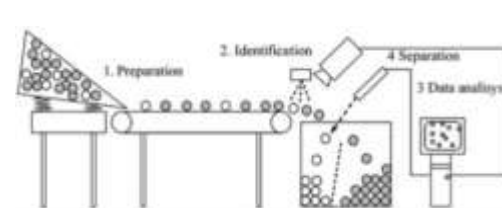
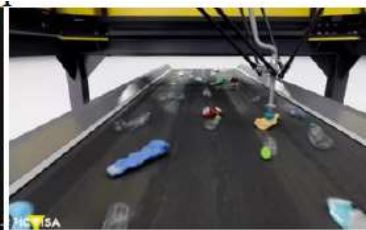
4
Years
2024 - 2028



Co-funded by
the European Union

Coordinated by
NORCE

AI-powered self-learning robots for high-performance waste valorization and CRMs recovery





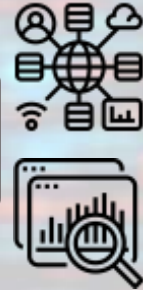
AI/ML
models

The role of data and AI

Multimodal
sensors



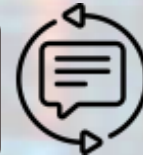
Big data
analytics



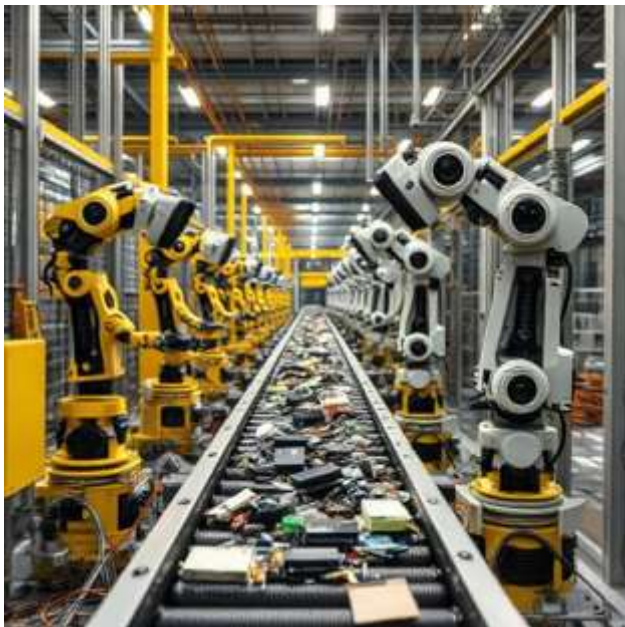
Integration
with digital
twins



Real-time
feedback
loops



Decision-making in iBot4CRMs



Data collection and processing

Materials identification



Value and risk assessment

Trade-off estimation



Autonomous sorting decisions

Picking path-planning



Learning from experience

Reinforcement learning



Traceability and
explainability

Process optimisation

Thank you!



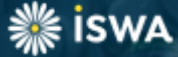
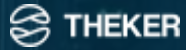
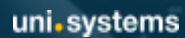
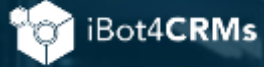
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