

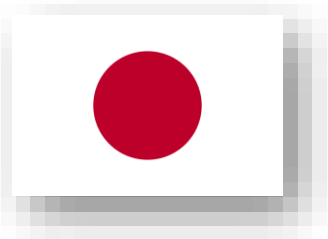
Reverse Metallurgy

Metal recycling in Wallonia

Opportunities for EU & Japan Industrial and Innovation Cooperation in the Circular Economy for Strategic Metals

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Belgium-Japan Association
Chamber of Commerce
日白協会兼商工会議所



- The Circular Economy : **EoL products** can be recycled to become **the raw material of another industry**
- This activity is **strategic for the Walloon economy** and is based on a **long and strong experience in metals and metallurgy**
- **Reshoring of metal value chains** is particularly important for Europe given its historical dependance on external sources
- The aim of the "**Reverse Metallurgy**" project is to create, in Wallonia, an internationally recognized platform for industrial, technological and scientific excellence in the field of metal recycling



- Reverse Metallurgy is to foster new economic activities in EoL metal processing by :
 - ***Developing and controlling complete industrial value chains in metal recycling***
 - Collection, sorting, transformation, manufacturing
 - ***Mastering key technologies and treatment processes***
 - Sensor based sorting, AI, hydrometallurgy, scrap conditioning, plasma, pyrometallurgy
 - ***Innovating and transferring at the industrial stage***
 - Rapid use of large-scale pilots for industrial validation

- Leverage central geographic position, industrial heritage and excellent logistics to :
 - **Assist partners and clients** to innovate and proceed with industrial transfer
 - **Commercialize and export** key treatment technologies and processes developed in Wallonia
 - **Activate waste reshoring** for full metal valorization in Wallonia

- 2013 : Initial Reverse Metallurgy concept and structuring of proposal

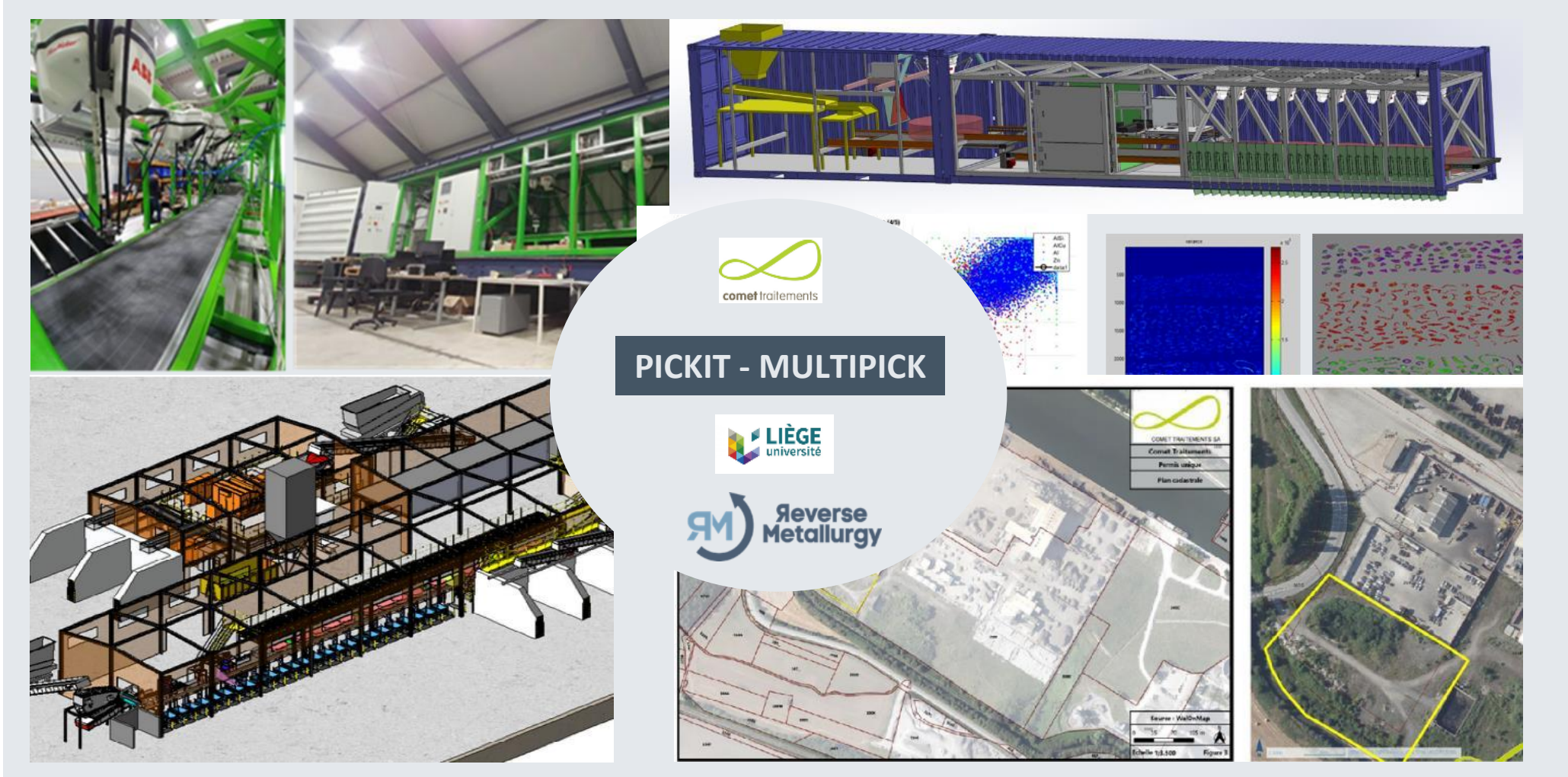
REVERSE METALLURGY PHASE 1

- 2014 : **42M EUR financing** by Walloon government to develop **Reverse Metallurgy** under a five-year plan (2014-2019)
- 2019 : Delivery of new technologies / pilots in four key areas

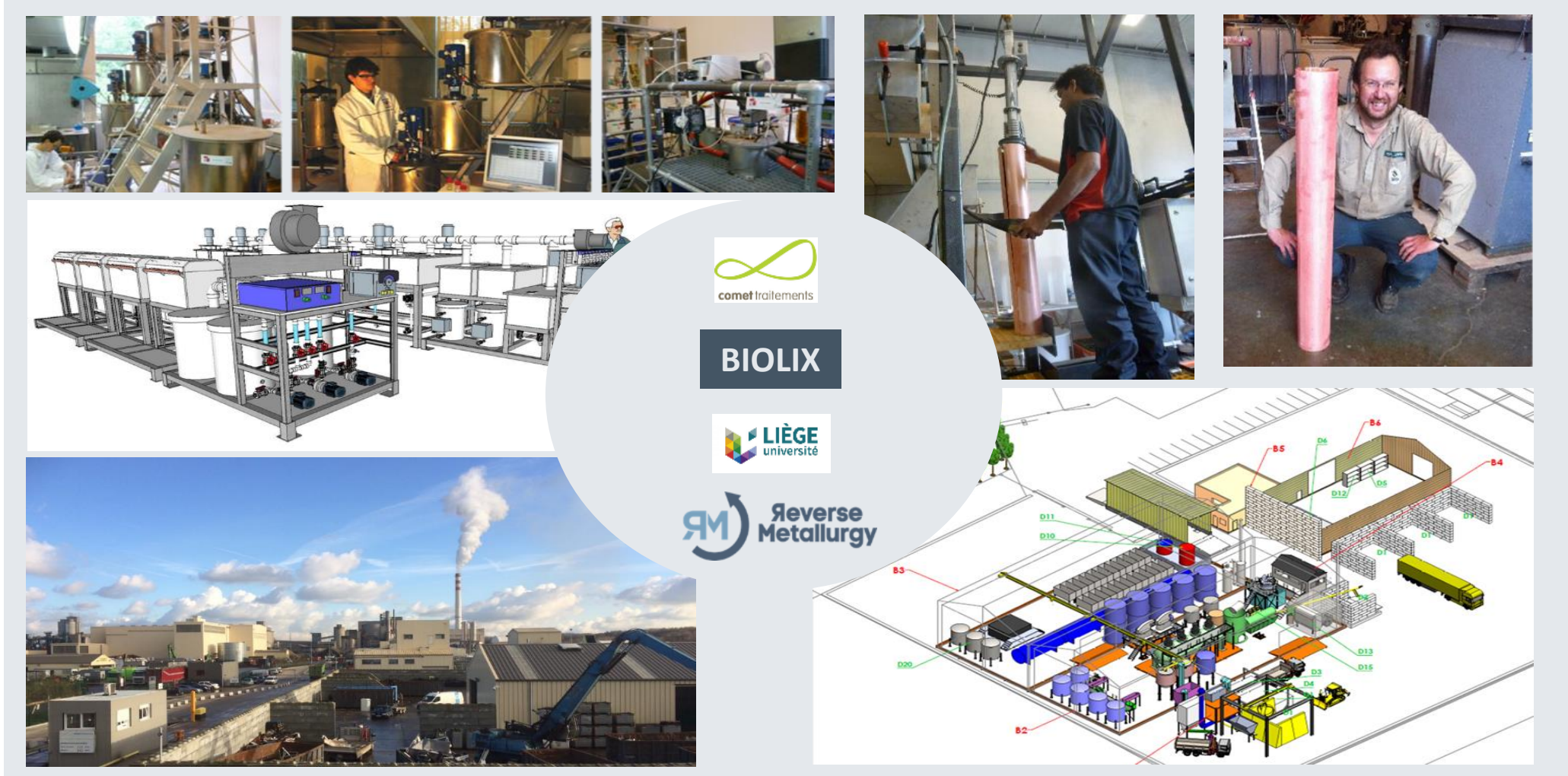
REVERSE METALLURGY PHASE 2

- 2020-2021 : Concept and structuring of proposal for **Reverse Metallurgy+**
- 2022 : **113M EUR financing** by EU and Walloon government (National Recovery and Resilience Plan) to develop Low Carbon and Circular Economy projects and notably **Reverse Metallurgy+**





Investment of 9.4 M€ - Processing capacity of 20,000 t/year of non-ferrous Zorba (metal value > 30M€/year) - Creation of 15 new jobs



Investment of 14.8 M€, production of 1500 t/year of copper cathodes (annual metal value of > 6 M€) - Creation of 20 new jobs



Investment of €6 million, unique prototype to validate the feasibility of recovering metals from high added value complex waste streams



Evolution du prix des matières premières 2003-2020

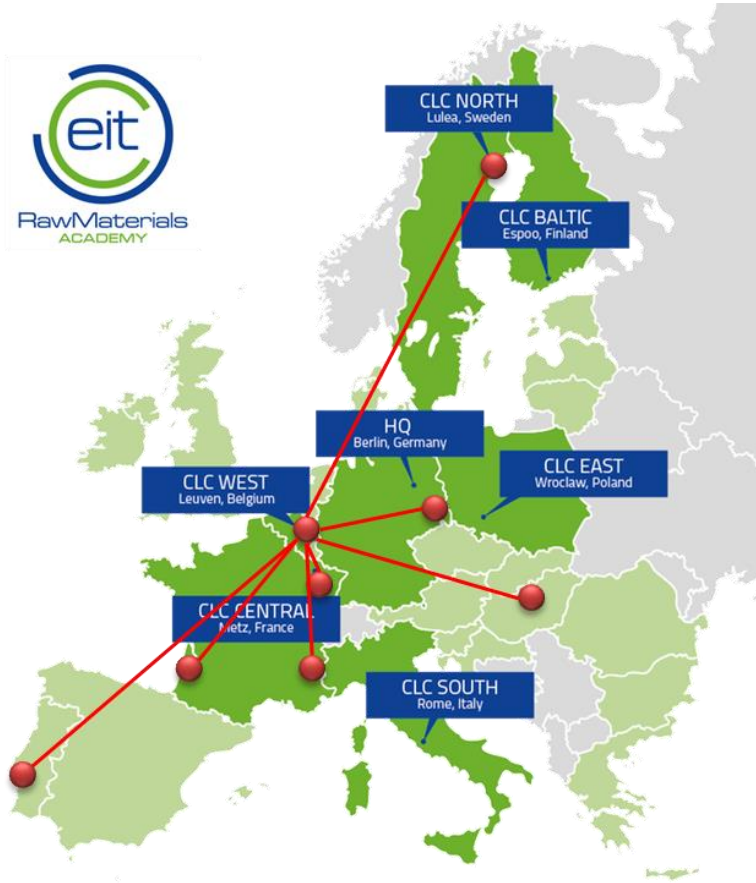
Price €/kg

CRM GROUP

RECOPEAUX

MARICHAL KETIN

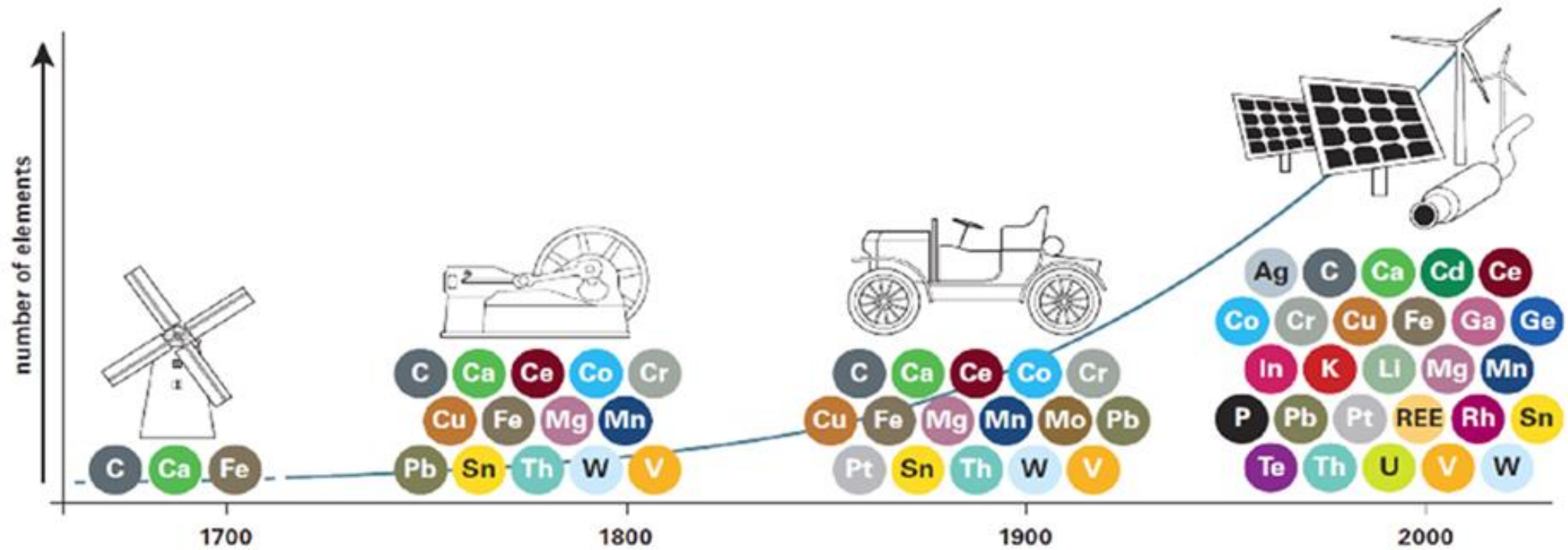
Investment of 600 k€, win-win short circuits for critical elements (Nb, W...) in workshops and foundries in Wallonia



ULiège is partner / key player in **3** of the 6 EIT labeled **European Master Programs** :

- **EMerald** Master in Resources Engineering
- **AMIR** Master in Advanced Materials & Innovative Recycling
- **AMIS** Master in Advanced Materials for Innovation & Sustainability

Moving along ...



- Metals and societal challenges
- Metals = Walloon genetic code

Digital

Energy

Future Materials

Technologies and Process

Capacity for rapid upscale to industrial stage

Reverse Metallurgy+ (PHASE 2 - 2022-2026)

Recovery and Resilience Facility

| Thematic axes | Name | Industrial sector | Description | Coordinating Company |
|-------------------------|-------------------|--|--|--|
| Digital | ECWALI | Steel and Aluminum alloys | Circular Economy of Aluminum alloys and Stainless Steel in Wallonia | Comet Traitements - Pierre-François Bareel |
| Energy | CISTEMEEC | Batteries and Energy products | Industrial Value Chains, Energy Transition, Electric Mobility and Circular Economy | Comet Traitements - Pierre-François Bareel |
| | PYROTECNIC | Critical Metals | Industrial pyrometallurgy and intelligent material preparation techniques for the Circular Economy | Hydrométal - Jean-Baptiste Wauters |
| Future Materials | REMADE | Additive Manufacturing Technologies | Recycled materials for advanced manufacturing technologies | Westinghouse - Xavier Pitoiset |

Reverse Metallurgy

In lockstep with ESG principles

- Focusing on the Circular Economy of metals for material and energy efficiency
- In line with regional strategy : Circular Wallonia
- In line with European strategy : Green deal
- In line with EU taxonomy and Do No Significant Harm regulation
- In line with ESG criteria :
 - Environmental : climate mitigation, reduction of gas emissions and prevention of environmental risks
 - Social : employment safety and health protection, supply chain monitoring and consideration of interests of communities and social minorities
 - Governance : transparent reporting, anti-corruption measures, sustainability management

Reverse Metallurgy is :

- **Your partner of choice** with the experience and metallurgical heritage to readily think at the industrial scale for metal recycling projects
- **A one stop shop** from aiming to control complete metal value chains (Al, Cu, REE,) and mastering key technologies at the industrial scale (pyro, hydro, sorting ...)
- **A world-class scientific platform** of excellence capable of providing innovative and disruptive solutions for major industrial groups

Reverse Metallurgy SCRL

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Web site : <https://reverse-metallurgy.net/en/>