The Pulse of Metal

Next-generation electrified hydrometallurgy enabling maximum recovery of critical and precious metals

Elmery

CHALLENGE

Securing the supply of critical raw materials is a rapidly growing challenge for governments and businesses alike

300-500% growth of demand

for precious and critical metals over the next decades.

Supply is concentrated in a handful of countries.

Creates vulnerabilities in the global supply chain and exposes industries to geopolitical risks.

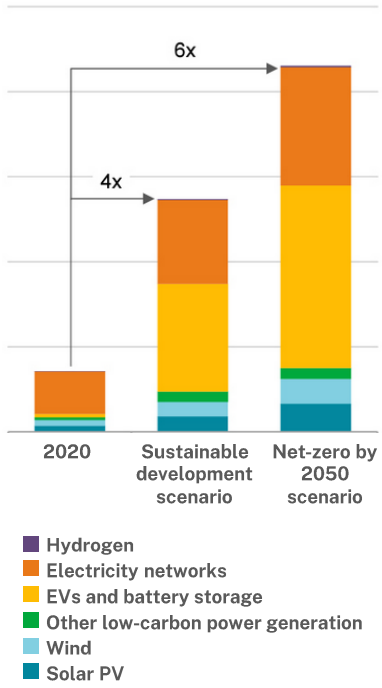
Expanding supply is difficult.

New mines take 10-20 years to develop, ore grades are declining, environmental and social regulations are tightening.

Securing supply is a strategic priority for the EU.

Critical Raw Materials Act entered force in 2024.

Demand for critical raw materials in clean energy technologies



Elmery

OPPORTUNITY

Billions of euros worth of critical and strategic metals are left behind during refining

Existing recovery technologies are too costly, chemical-heavy, slow, and too selective to recover every gram. Typical effective recovery rates vary from 95% (platinum, palladium) to 85% (rhodium, iridium), with 5-15% going to residues and bleed streams.

As €500 billion worth of critical and strategic metals are processed annually, **each 1% loss represents €5 billion in wasted value.**

	Electrowinning (EW)	Ion exchange (IX)	Solvent extraction (SX)	Precipitation-cementation	Elmery (EDRR)
Typical metals recovered	Cu, Ag, Au, Ni, Co, Zn	Pt, Pd, Au, REE, Sc	Cu, Co, Ni, REE	Cu, Zn, Ni, Co, Mn, Fe	Pt, Pd, Rh, Ru, Ir, Cu, Au, Ag, Te, Se, As, Bi
Recovery rate	95-99% requires heavy solution modification	95-99+% depending on metal	80-90% depending on metal	99% in simple feedstock	99+% for targeted metals and processes
OpEx	Expensive electrolyte processing	Expensive resins	Medium-high	Low	Only electricity 5 kWh / kg
Waste	Electrolyte purification/ replacement	Resins burned or aggressive acid wash	Creates a lot of organic waste	Gas scrubbers needed for H2 formation	Minimal waste, 0 chemical addition
Performance in complex feedstock	Sensitive to impurities	Good, limited to high value trace recovery	Drops with high concentration	Poor selectivity, multiple steps needed	Good to excellent

Elmery

SOLUTION

Elmery's breakthrough
We can recover the remaining 5-15% of critical metals.

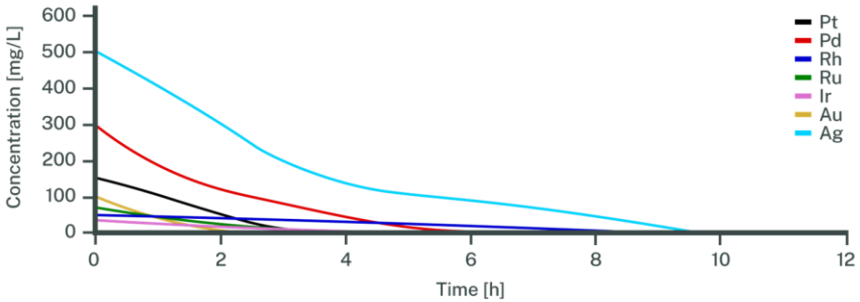
99%+ recovery and purity even in complex feeds.

Universally applicable. 38 metals demonstrated, full pH range

Cost-efficient & sustainable. Electricity only, no chemical reagents.

Easy retrofit. Compatible with existing refinery equipment.

ML/AI optimization. Ready for real-world complexity. Every case makes the system smarter.



Case example: platinum, palladium, rhodium, ruthenium, iridium, gold, and silver recovered at 99.9% efficiency within hours.

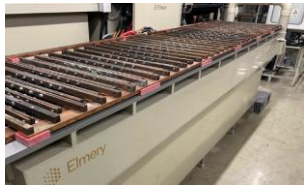
Elmery

INNOVATION

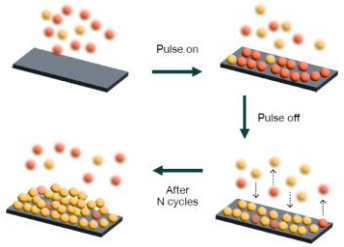
Electrodeposition Redox Replacement (EDRR)

using patented pulsating electrolysis

Metal-containing liquid solution



Elmery's module integrated in the process



Target metals accumulate on electrodes

The formed pure metal layer is recovered

Pulsating electrolysis uses electricity to collect metals selectively out of liquid waste streams, gathering them onto electrodes for effortless recovery.

Proprietary pulse recipes are tailored for each customer stream, which can then be further optimized with ML/AI.

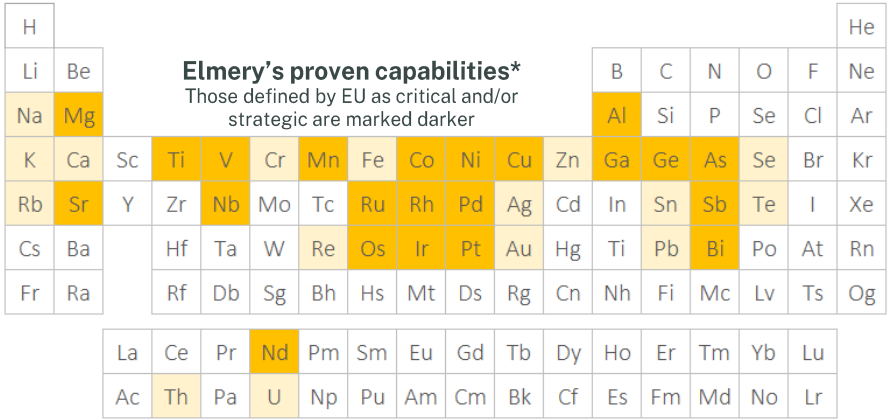
Based on cutting-edge scientific research initiated in 2014 at Aalto University

Patents:
1. A method of recovering copper from a dilute metal-containing solution (granted in the US, Chile, South Africa, Indonesia)
2. A method for recovering Pt and Ag from sulphuric acid base metal solutions (granted in EU, US, South Africa. Chile, Indonesia, South Africa).

PROVEN CAPABILITIES

99%+ recovery rate demonstrated for 38 metals

focusing on recovery of Platinum Group Metals (PGMs), gold, silver, copper, cobalt, and removal of most unwanted elements such as tellurium, selenium, arsenic, bismuth and iron

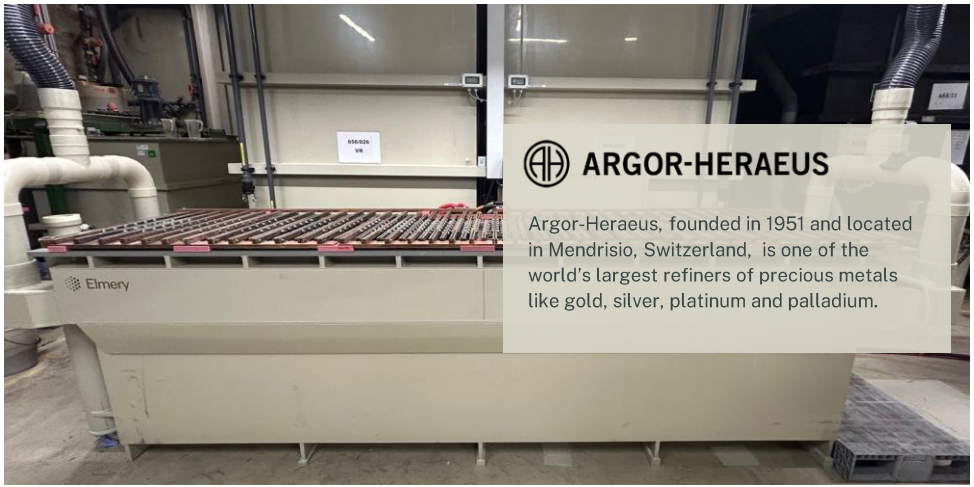


*Demonstrated in most common solution medias, including NH_4Cl, HCl, H_2SO_4, HNO_3, NaOH, KOH, H_3PO_4, H_2O, and H_2O_2.

Elmery

VALIDATION

Exceeding platinum recovery targets at Argor-Heraeus



Service installation at Argor-Heraeus has been successfully recovering platinum from hydrochloric acid media since 2024

Demonstrated low chemical and energy consumption at Argor-Heraeus

Platinum recovery: €100 000+ value creation

Energy use: only 5 kWh per kg of recovered metal

Total equipment cost: €58 000 cell and power supply

"With Elmery's technology, we can easily and constantly recover platinum significantly exceeding target levels."

– Simone Frigerio
Technical Director
Argor-Heraeus

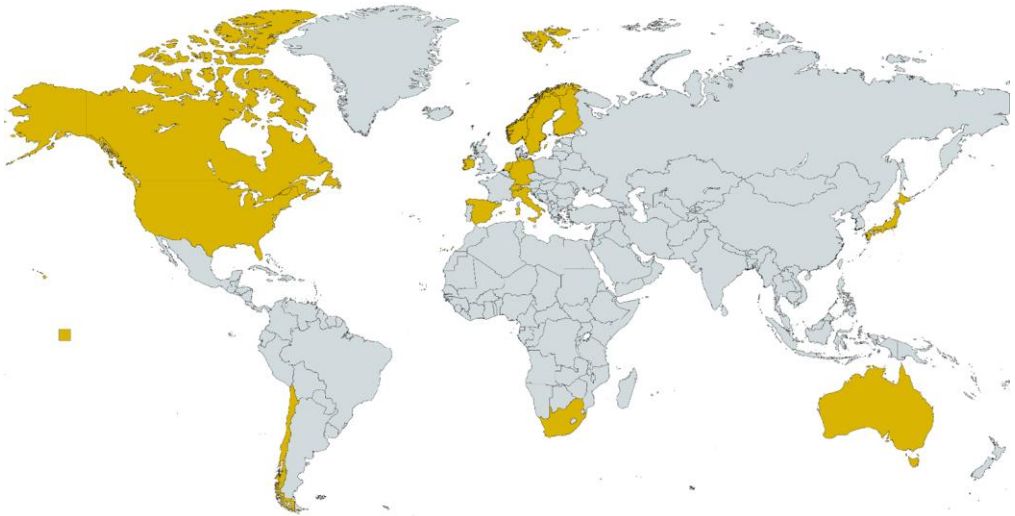
TRACTION

Pilots and prospects in 15 countries

Engaged with leading global refiners & recyclers

€183k revenue (2024) → €330k (2025)

Long-term potential: 200+ systems, ~€100M ARR
(unlocking requires further R&D and industry validation)



Elmery

MARKET

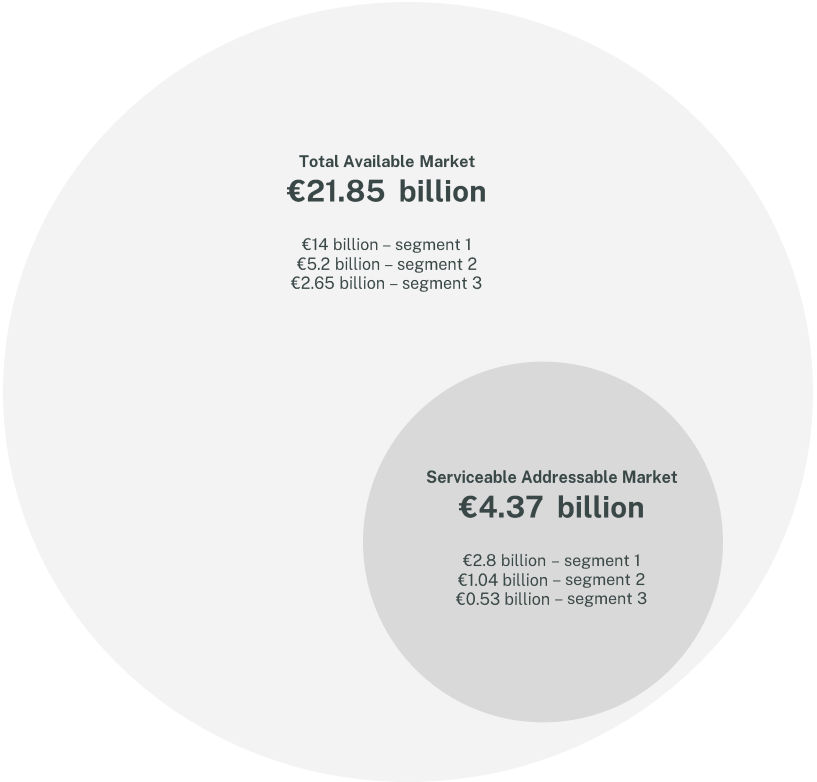
€4.4 billion annual opportunity in three segments with strong market pull

Option to target additional processes and metals multiplies the potential

Segment 1: Recovery of Pt, Pd, Rh, Au, Ag from copper processing (copper anode slime).

Segment 2: Recovery of Pt, Pd, Rh, Au, Ag, Ir from secondary raw materials (e-waste).

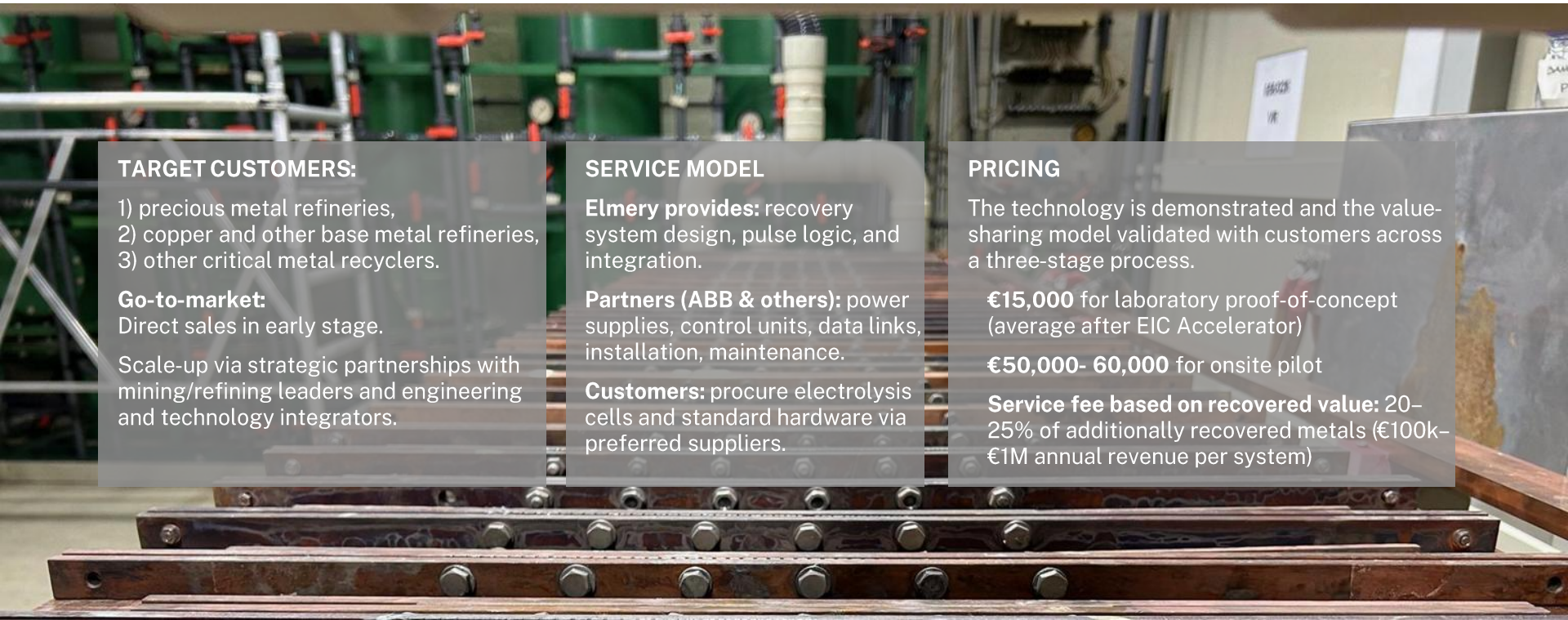
Segment 3: Removal of unwanted Te, Se, Ar, Bi, Fe during copper processing.



Elmery

BUSINESS MODEL

Value-sharing revenue model
Proven with first customers



TARGET CUSTOMERS:

1) precious metal refineries,
2) copper and other base metal refineries,
3) other critical metal recyclers.

Go-to-market:
Direct sales in early stage.

Scale-up via strategic partnerships with mining/refining leaders and engineering and technology integrators.

SERVICE MODEL

Elmery provides: recovery system design, pulse logic, and integration.

Partners (ABB & others): power supplies, control units, data links, installation, maintenance.

Customers: procure electrolysis cells and standard hardware via preferred suppliers.

PRICING

The technology is demonstrated and the value-sharing model validated with customers across a three-stage process.

€15,000 for laboratory proof-of-concept (average after EIC Accelerator)

€50,000- 60,000 for onsite pilot

Service fee based on recovered value: 20–25% of additionally recovered metals (€100k–€1M annual revenue per system)

EIC ACCELERATOR

From startup to global service provider – scaling faster with EIC support

Fuel growth, impact and accelerate customer adoption

Achievements
(2022-2025)

First service in operation: proven technology and value sharing based business model (TRL7 for platinum)

Strong product–market fit: 15 paying customers, 3 collaborators across 6 continents, 10+ prospects

Recovery of 38 metals demonstrated in customer solutions

€2.5M EIC grant
+ €1.1M self-financing (2026-2028)

Accelerate deployment from 3 months to 2 weeks: shorten lab testing, de-risk pilots, enable faster customer rollouts

Demonstrate full refinery scale: in three target processes.

Expand capacity: Strengthen the team with industry experience and extend partner network

Attract the necessary private capital: EIC support provides crucial risk-sharing.

€5M EIC investment
+ €5M from VCs (2028-2030)

Launch “metal recovery as a service” at global scale, backed by ML/AI optimization.

Execute sales & marketing strategy while continuing R&D to move towards €97M revenue in 2032.

Elmery

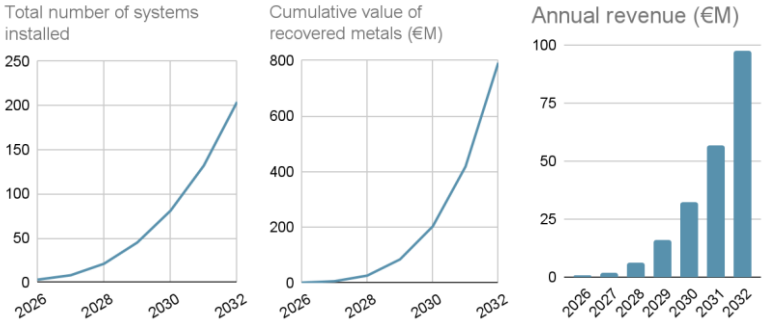
GO-TO-MARKET

From existing pipeline to global scale through partners

Initial traction: 30 qualified prospects already engaged (long-term potential: 200+ systems → ~€100M ARR)

Model advantage: Low-capital, service-driven, scalable through EPC/system integrator partners

Scaling: strengthen team, leverage existing pipeline, scale through multi-site rollouts, and expand with partners



2026-2028	2028-2029	2030-2031	2032 targets
• **Technology development** to enable scalable service delivery • **ML/AI foundations** laid to accelerate deployment and scale metal recovery • **Strengthen team**: from 19 to 40 people, industry-experienced delivery and S&M • **Industry validation and references** with go-to-market action plans in Europe, US/Canada, Chile, South Africa, Japan, Australia • **€10M equity investment** (2027).	• **Launch wide-scale** in 2028|Q2 • **Convert existing pipeline** to paying service customers, strong installed base • **Deploy 10-member S&M team** & regional partners (2028Q1) • **Optimize technology** and leverage ML/AI • **Leverage the global network** of system integrators and EPC companies.	• **Focus on full adoption** by early adopters through multi-site rollouts. • Growth driven with strong **global partner network** • **Extend applications** to new metals, solution chemistries and mines	• **204** operational systems • **€97M** annual revenue • **€800M** worth of metals recovered • **50** customers • **5** sales partners • **+60** direct jobs

Elmery

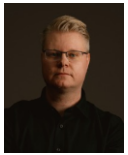
TEAM

25 professionals | 200+ years of combined experience
in metal refining, technology scale-up and business growth

Mika Paalanne

CEO, Founder

20+ years in business development and tech transitions (Nokia, Microsoft, Nissan, Outokumpu)



Petteri Halli, PhD

CTO, Founder

10+ years in development of electrochemical methods for extracting precious and critical metals from industrial streams

Mari Lundström, PhD

Chief Advisor, Founder

Globally recognized hydrometallurgy expert with 20+ years in industry and academia,, specialising in sustainable metal recovery and recycling

PARTNERS

+16 TEAM MEMBERS

Sales director, service director, CIO, data science and ML expert, senior full stack developer, electrochemical engineer, 4 customer project managers, 6 laboratory & technical specialists

+6 BOARD MEMBERS AND ADVISORS

Kimmo Oila, 25 years scaling technology scaleups and startups

Simo Säynevirta, 30 years industrial electrification digitalisation and data (process and manufacturing industry)

Tor-Oskar Karlberg, impact investment professional

Steven van Zupthen, expert and startup CEO with electrochemical scale-up experience

Niklas Törnqvist, 15 years building high-tech companies

Jo **Rogiers,** Ex-SVP in Aurubis and Umicore, CTO in copper recycling tech company

NEXT GROWTH HIRES (with EIC support)

COO, sales & service managers, hardware integration manager, customer success engineers, additional electrochemistry experts, and industry advisors, CFO, CCO.

Elmery

IMPACT

Recover €3 billion worth of critical raw materials by 2035

Full alignment with the EIC Accelerator Challenge 2.4:
“Boosting the European Critical Raw Materials value chain.”

- Improves EU’s domestic recovery and processing capacity.
- Reduces dependency on third-country suppliers and enhances strategic autonomy and supply resilience.
- Delivers lower CO_2 emissions, reduced toxicity, and enhanced circularity.

Join us on our journey to make critical metals less critical!

Smarter metal recovery is a pulse away!

Elmery