

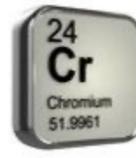
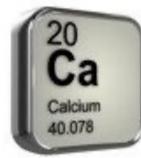


EU Magnesium

A continuous Magnesium production in and for Europe from Cr-production waste

6/2022 – 5/2025, total budget: 3.67 M€

EU Magnesium's products



Magnesium (Mg) is a critical metal for the EU, US, UK and Australia. Currently, EU has no domestic Magnesium production and fully depends on Chinese imports. China has a near-monopoly on Mg for the world market with a share of 90%. Last year there was a power shortage in China, causing a Mg production stop, resulting in a Mg supply shortage with record prices up to \$10,240/mt in September 2021.

The recently funded EIT Raw Materials "EU Magnesium" project (Nr: 21105) will be the first domestic magnesium (Mg) production in Europe. Magnesium is a critical raw material for manufacturing light weight aluminum magnesium (AlMg) alloys, in particular for the automotive and aerospace industries.

Mures Magnesium, the lead partner, will construct a primary Mg metal production facility in northcentral Romania using COPR (chromic ore processing residue) as raw material feedstock. Mures Magnesium purchased the 84ha former state-owned site including the COPR waste. By utilizing an innovative reprocessing method, the COPR feedstock provides a innovative multi-stream producing Mg metal, Chrome Oxide Green (Cr₂O₃), Calcium Chloride (CaCl₂) and NaOH as by-product from a single feedstock stream.

Mures Magnesium Srl will bring cca. 20,000 tpa of Mg to the EU market from 2026, representing 13.5% of the EU Mg demand. Furthermore, 82,000 tpy of CaCl₂ and, in the first 9 years, 8,200 tpy of Cr₂O₃ will be produced.



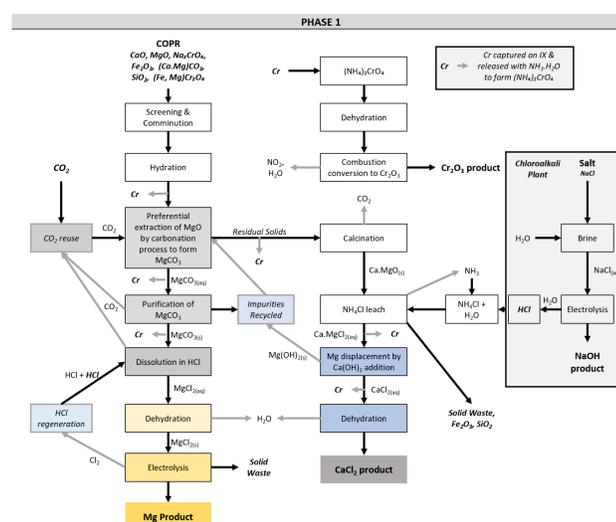
The Mures Magnesium plant expects to increase output of Mg to 25,000 mt/y or the equivalent of 15% of EU demand in phase 2 using micronized dolomite from dolomite excavation wastes as feedstock.



Innovative and 'Green Deal' processing

COPR Reprocessing

- No mining** – as the Mures Magnesium feedstock is from a calcined Mg rich waste material, this provides a **low CO₂ footprint & low environmental impact**.
- In line with **EU Circular Economy and sustainable use of minerals**. Mures Magnesium aims to be the premier secondary Mg resource company in Europe.
- Remediation** – Mures Magnesium will produce a CRM from a mineral waste by reprocessing using its developed technology, **removing and converting the toxic chrome content** into safe and saleable mineral resource (Cr₂O₃).
- Sustainable energy** – the future reprocessing facility will use solar energy. A **77 ha Solar Park (~ 45 MW cogeneration plant)** will be installed.
- Long term employment for 270 FTE** will be provided through the new facility. This will reduce the high unemployment rate of this county.



Sequential Hydrometallurgical Process

- Mobilisation and collection of Cr
- Mobilisation of Mg
- Purification of Mg
- Formation of MgCl₂ interim product
- Mg Product**
- Mobilisation of Calcium
- CaCl₂ product**
- Cr₂O₃ product** from IX collected Cr
- By-product of NaOH** from chloroalkali plant
- Waste
 - Trials to date indicate
 - Mg 64% recovery, equivalent to 178kt Mg**
 - Cr 77% recovery, equivalent to 74.5kt Cr₂O₃**
 - Ca 64% recovery, equivalent to 383kt CaCl₂**
 - Plus by-product NaOH

Consortium
Mures Magnesium, Romania (www.muresmagnesium.eu) is a metallurgical company owning an 84-hectare former chemical production site in Mures County, central Romania. The site has been cleared and has an 18.7-hectare Waste Storage Facility (WSF) of 1.94 million tonnes of waste minerals (Chromic Operations Processing Residue or "COPR"). Mures Magnesium has developed a processing route where it will extract minerals from the COPR to produce Magnesium metal (Mg), Chrome Oxide Green (Cr₂O₃) and Calcium Chloride (CaCl₂). Mures Magnesium has developed the project over the past 8 years entirely through private funding. Mures Magnesium will bring the project to a bankable feasibility study level via the EU Magnesium project. The company has a CPR and an indicated MRE already done by SRK (UK) Ltd.
Van der Laan International Consultancy (V.I.C.) (www.vicinternational.eu) is a Dutch consultancy firm serving the Global metal and mining industry. VIC is specialised in Competitor analysis, Business appraisal and strategy, market surveys and analyses for critical metals and minerals. VIC was founded in April 2021 by Henk van der Laan a senior metallurgist and business consultant with over 42 years of experience in the metal industry.
National Institute of Chemistry – Slovenia (NIC) (<https://www.ki.si/en/>) The National Institute of Chemistry is an excellent Research Institute, established in 1946 in Slovenia. The Institute has 3 primary fields of activity: Research, Education and Collaboration with industry partners. The Department of Catalysis and Chemical Reaction Engineering, partner in the EU Magnesium project, is primarily invested in chemical (process) engineering, reactor and unit operation design and construction, as well as multi-scale process modelling.
MEAB, Germany (www.meab-mx.com): For more than 50 years, MEAB has been active in the hydrometallurgical field. Focus is the development of processes for recovering metals from solid or liquid waste. MEAB brings in hydrometallurgical experience such as Mg leach, Cr(VI) removal, Mg purification and pure Mg precipitation. MEAB was already involved in the initial development of the pilot plant work and mass balance.
SEC IKE, Greece (www.senc.gr) a senior consultancy firm, is responsible for the Material Flow Analyses and Life Cycle Assessment of the system, having expertise on Life Cycle Cost Analysis, Social Life Cycle Assessment, eco-design, environmental communications and regulatory compliance to private companies and business associations. SEC IKE has in depth experience in EU funded projects.
Géosciences Conseils-CATURA Geoprojects, France (www.catura.eu) is a consultancy company created in 2017 by Dr. Beate Orberger. B. Orberger has more than 30 years of experience in the raw material sector from exploration to metallurgical processing. International industrial and scientific project management. Catura contributes to developing go-to-market strategies for spin-offs of the EIT projects. Furthermore, Catura is responsible for communication and dissemination activities. Apart from EU Magnesium, Catura is partner in the KIC-EIT projects "ScaVanger, Scaleup, VALORE, Dyscovery". Previously Catura was partner in the EIT Raw Material projects ANCORELOG and PAIRED-X, and consultant for ERAMET IDEAS in the H2020 SOLSA project.