Lead’s infinite role in Europe’s metal recycling industry

Control room of a plasma fumer installation

Recycled lead flowing out of vacuum furnaces

Metals are infinitely recyclable, making Europe’s interconnected metals sector a key player in the region’s circular economy – the home-grown metals recycling industry is in fact one of the most advanced and efficient in the world. As the EU works towards a cleaner and more competitive Europe through the Circular Economy Act, the ability to recycle metals efficiently is becoming increasingly important.

Lead has a pivotal role in Europe’s circular economy. Lead batteries are the most recycled consumer product, and at least 75% of lead used in the EU itself comes from recycled end-of-life products. But lead’s role does not stop there - it also plays an essential part in the recovery and recycling of other critical metals and materials from electronics waste, catalytic converters and other increasingly-complex products.

Lead acts as a carrier metal. When molten, it can dissolve other metals - including many materials needed for today’s green and digital transitions - helping to separate and recover valuable elements from waste streams and primary input materials. Its carrier metal properties make lead an efficient and effective enabler for the recycling of a broad range of non-ferrous metals, from critical raw materials such as bismuth, antimony, gallium, and platinum, through to the precious metals gold and silver, as well as tin and other materials vital to Europe’s industrial success and energy transition.

Using lead as a carrier metal streamlines metallurgical processes, reducing the energy and chemical inputs needed for metal recovery, which in turn improves economic and environmental sustainability. It achieves this by maintaining the value of products, materials and resources for as long as possible, returning them to the product cycle at the end of their use, and minimising the generation of waste.

Lead metallurgy is therefore a “critical infrastructure” and a key enabler of the circular economy. Without it, the circular economy for many critical and valuable metals would be significantly diminished.

Strict risk management processes are observed when working with lead. Alongside the industry's voluntary commitments and proactive measures, there is a long-standing framework of legislation developed specifically to address the occupational risk of working with lead - including recently updated EU binding limit values - which covers the production, use, and end-of-life recovery from waste.

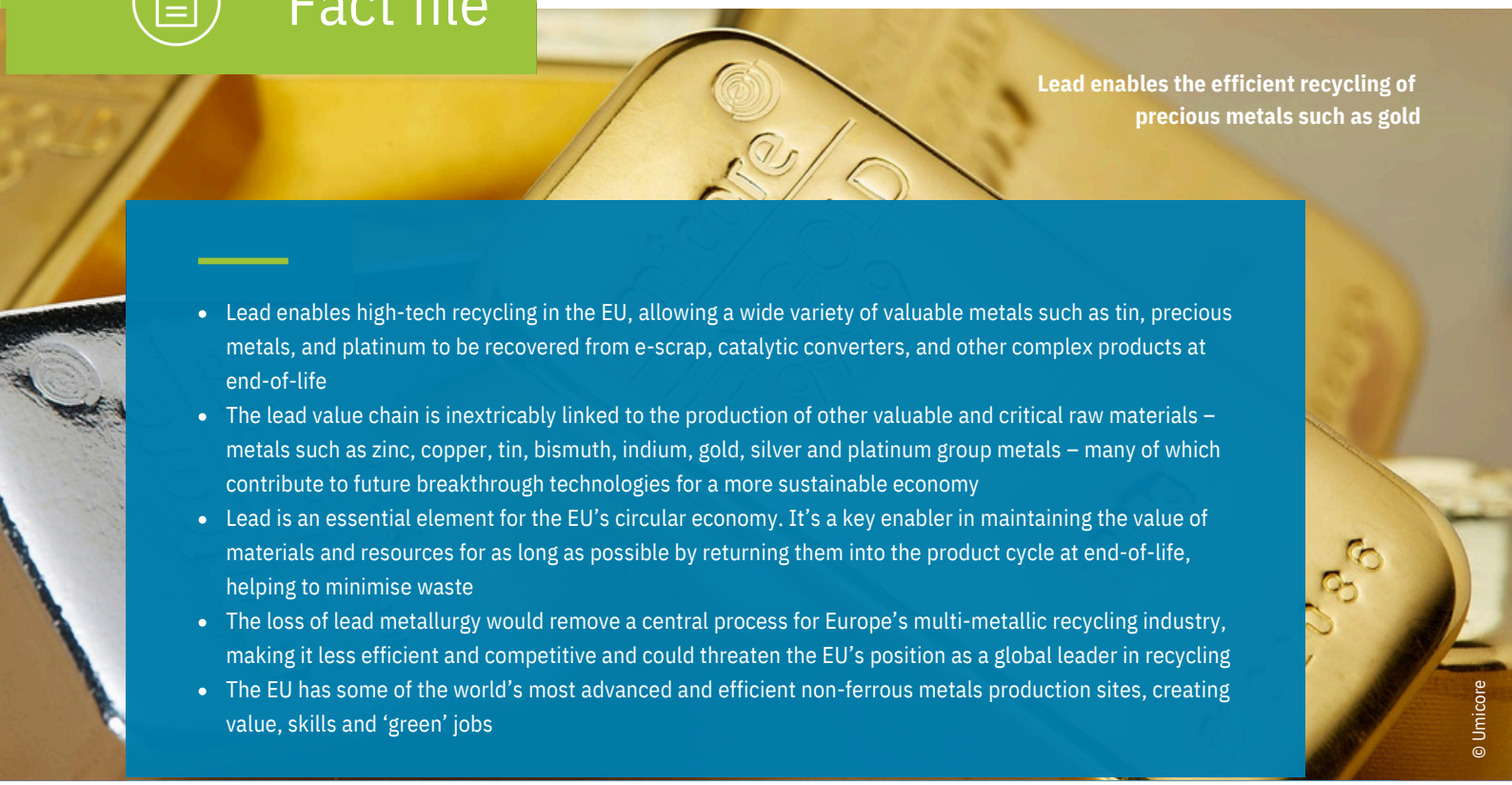
Demand for non-ferrous metals is increasing exponentially, in line with growth of technologies such as batteries, electric vehicles, and solar panels. The World Bank has projected that, by 2050, 300% more metals will be needed by the world's wind turbines, 200% more for solar panels, and 1,000% more for batteries.

With the EU aiming to establish a single market for more secondary raw materials, reduce reliance on third-country imports, increase the supply of high-quality recycled materials, and stimulate EU demand for these materials, lead metallurgy must continue to play an essential role in the EU's metal production capability, supporting the European economy, strategic autonomy, and industrial success.

A quarter of the world's recycled metals are already generated in Europe. Lead metallurgy can help guarantee the security of these high-demand raw materials while continuing Europe's global leadership role in the circular economy.

Lead plays an essential part in recovering other critical metals from electronics waste

Fact file



Lead enables the efficient recycling of precious metals such as gold

- Lead enables high-tech recycling in the EU, allowing a wide variety of valuable metals such as tin, precious metals, and platinum to be recovered from e-scrap, catalytic converters, and other complex products at end-of-life
- The lead value chain is inextricably linked to the production of other valuable and critical raw materials – metals such as zinc, copper, tin, bismuth, indium, gold, silver and platinum group metals – many of which contribute to future breakthrough technologies for a more sustainable economy
- Lead is an essential element for the EU's circular economy. It's a key enabler in maintaining the value of materials and resources for as long as possible by returning them into the product cycle at end-of-life, helping to minimise waste
- The loss of lead metallurgy would remove a central process for Europe's multi-metallic recycling industry, making it less efficient and competitive and could threaten the EU's position as a global leader in recycling
- The EU has some of the world's most advanced and efficient non-ferrous metals production sites, creating value, skills and 'green' jobs

Developed in conjunction with European Metals, Aurubis, Umicore and the European Precious Metals Federation, this case study highlights just one of the many essential applications of lead that provide societal benefits and boost the EU's economy

For Europe's future, lead matters.

Lead Matters