

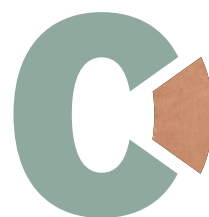


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# COPPER— THE PATHWAY TO NET ZERO

## Regional Focus: Europe

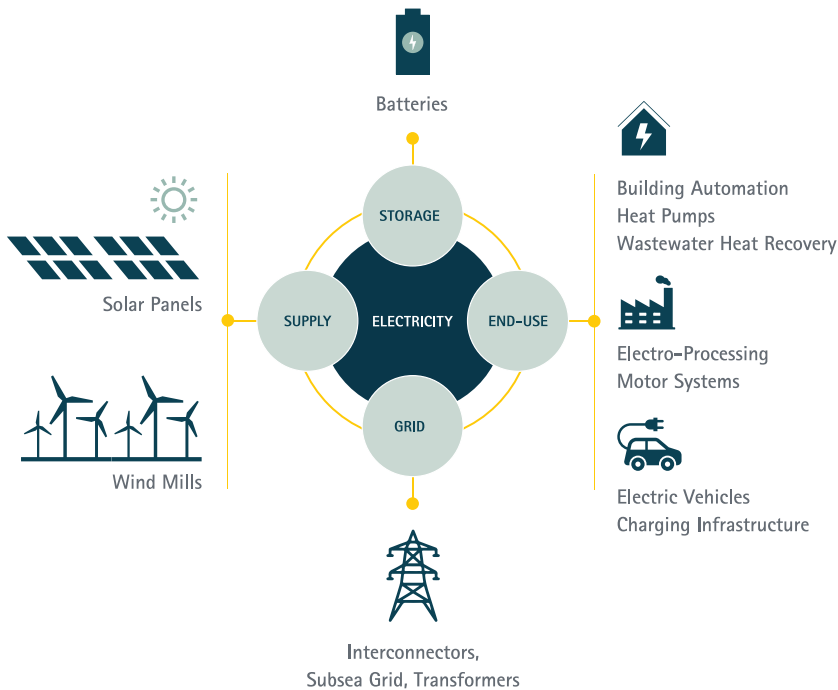


**Power  
of Zero**

**Policymaker Summary  
March 2023**

## Copper is essential for the clean energy transition

Thanks to its superior electrical conductivity, copper is used in a vast array of decarbonising technologies. When taken together, these technologies have the potential to account for the abatement of approximately two thirds of global greenhouse gas (GHG) emissions by 2050.



As a result of the energy transition, population growth and economic development, the annual global refined copper demand is expected to double by 2050 compared to 2020.

An increase of 35 percent is expected in Europe during the same period.

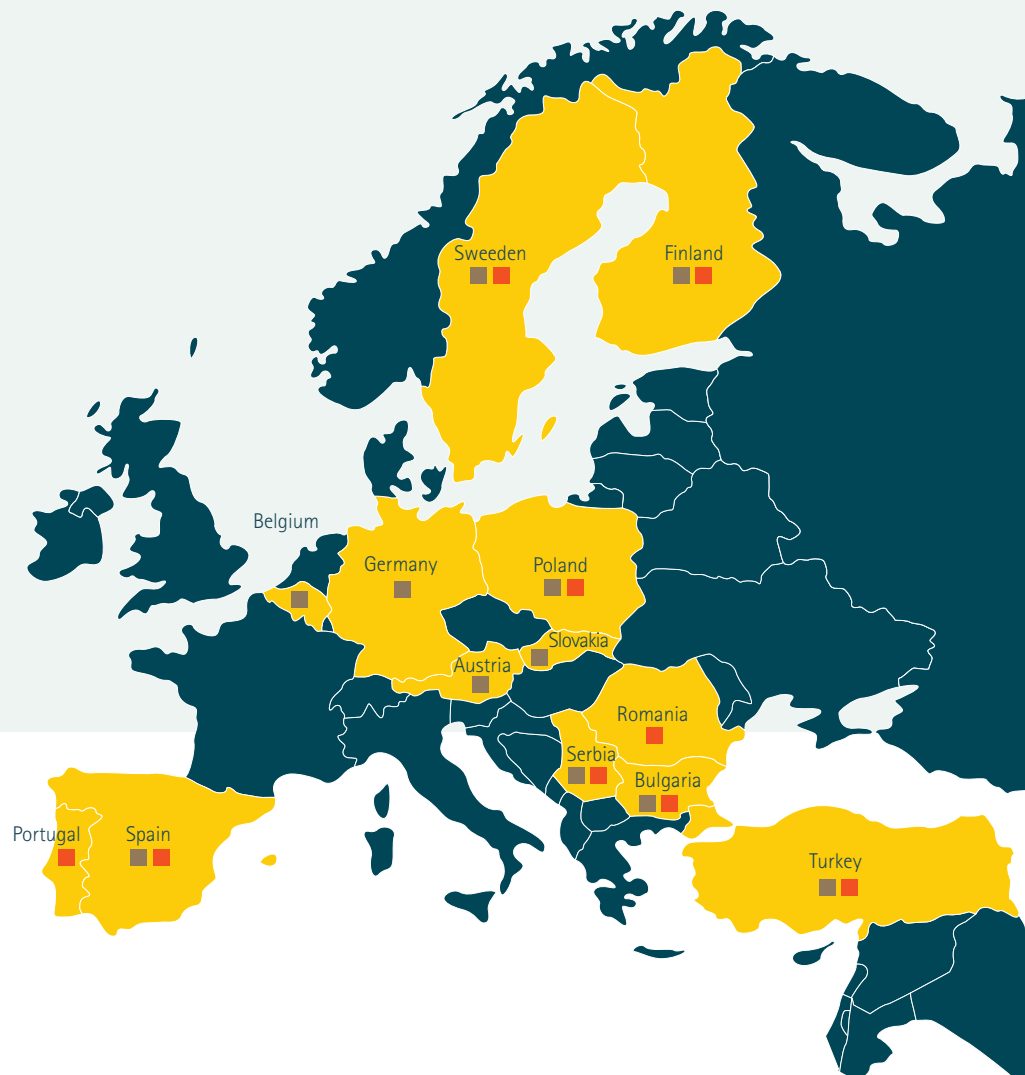
Copper is highly recyclable. 27 percent of copper demand in the EU can be fulfilled through the recycling of copper scrap from end-of-life products (Fraunhofer Copper stocks and flows, 2018)<sup>1</sup>. Another 28 percent of copper demand can be fulfilled through the recycling of fabrication scrap.

Figure 1 – Copper In The Energy Transition

## Copper production in Europe

The copper industry in Europe includes copper mines, smelters, refiners, recycling facilities and fabricators of semi-finished products from copper and copper alloys, such as tubes, wire rods and bars.

Copper is an important contributor to the European economy and the copper industry employs approximately 50 000 people in Europe. Many more individuals are employed indirectly.

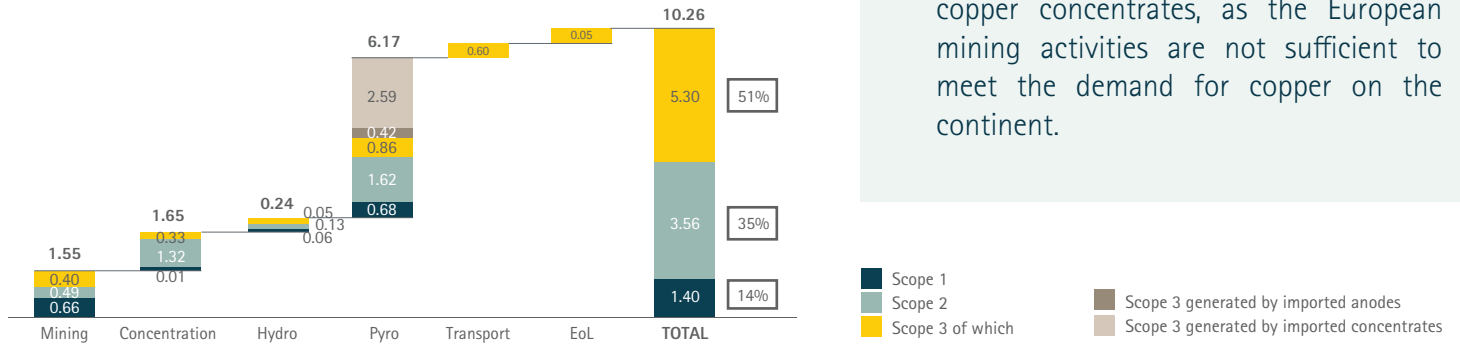


■ Mining – TOTAL 1.100  
■ Smelting – TOTAL 2.400  
 Quantities are in k tonnes (2018)

1. Fraunhofer Copper stocks and flows, 2018, see <https://copperalliance.org/policy-focus/society-economy/circular-economy/stocks-flows/>

## GHG Emissions from EU copper production today

Scope 1, 2 and 3 CO<sub>2</sub>e emissions of EU copper production in 2018 (Mt)



The high share of Scope 3 emissions is explained by the reliance of copper production in Europe on the import of copper concentrates, as the European mining activities are not sufficient to meet the demand for copper on the continent.

Figure 2 – Scope 1, Scope 2 And Scope 3 CO<sub>2</sub>e Emissions Of EU Copper Production In 2018 (Source: Quantis, ICA Analysis)

34 percent of CO<sub>2</sub>e emissions were generated by EU mining sites, 25 percent by the production of imported concentrates, 35 percent by the smelting and refining stages of production (pyrometallurgy) and the remaining 6 percent occurred in upstream and downstream transport and in the end-of-life treatment of sold products.

Copper producers in the EU have already made important efforts to reduce their GHG emissions. This resulted in a reduction of approximately one third in the carbon intensity of refined copper over the period 1990-2018<sup>2</sup>.

## Copper-The Pathway to Net Zero

The International Copper Association (ICA) and its members have performed an in-depth, robust analysis, based on a comprehensive set of data, facts and sound hypotheses, to determine how fast GHG emissions of copper production can be abated with market-ready and developing technologies, at what cost and under what conditions. In this section, we outline the main findings of this analysis.

### Four key levers to reduce Scope 1 & 2 emissions



#### DECARBONISED ELECTRICITY

#### Examples

Decarbonised electricity supply or on-site generation



#### ALTERNATIVE FUELS

Hydrotreated vegetable oil  
e-fuels  
Hydrogen



#### EQUIPMENT ELECTRIFICATION

Battery-driven haulage trucks  
Electric drills  
In-pit crushing and conveying



#### EFFICIENCY GAINS

Higher efficiency grinding media for mills  
Higher efficiency in smelting, leaching, ...

These technologies should allow reducing the Scope 1 and 2 emissions from copper production in the EU along the trajectory depicted below:

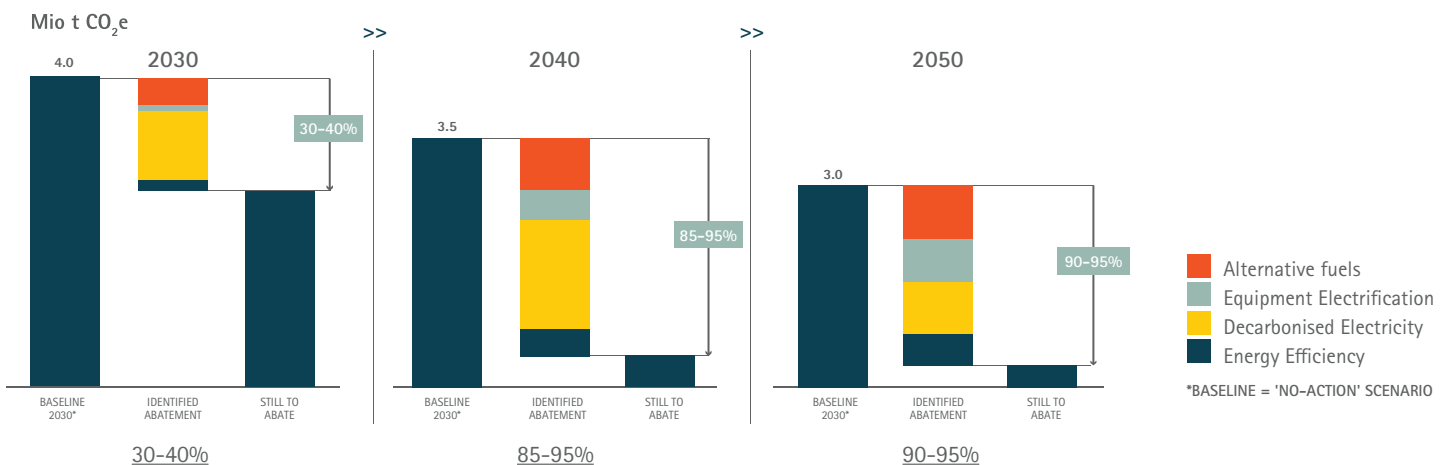


Figure 3 – Potential For Scope 1 And 2 Emissions Abatement (Source: MineLens asset decarbonisation tool; Team Analysis)

## Reducing Scope 3 emissions

Addressing the reduction of Scope 3 emissions is more challenging, as the interdependence between actors in the value chain requires a partnership approach to maximize potential abatements, which are not under the sole control of copper producers. The availability of up-to-date, quality data on emissions presents an additional challenge.

Based on a preliminary assessment, the following main levers were identified to abate Scope 3 emissions:

1. decarbonised electrification
2. near shoring
3. alternative production technologies or fuels
4. efficiency gains
5. increased circularity

Combining these levers could allow the EU copper producers to reduce Scope 3 emissions along the trajectory below:

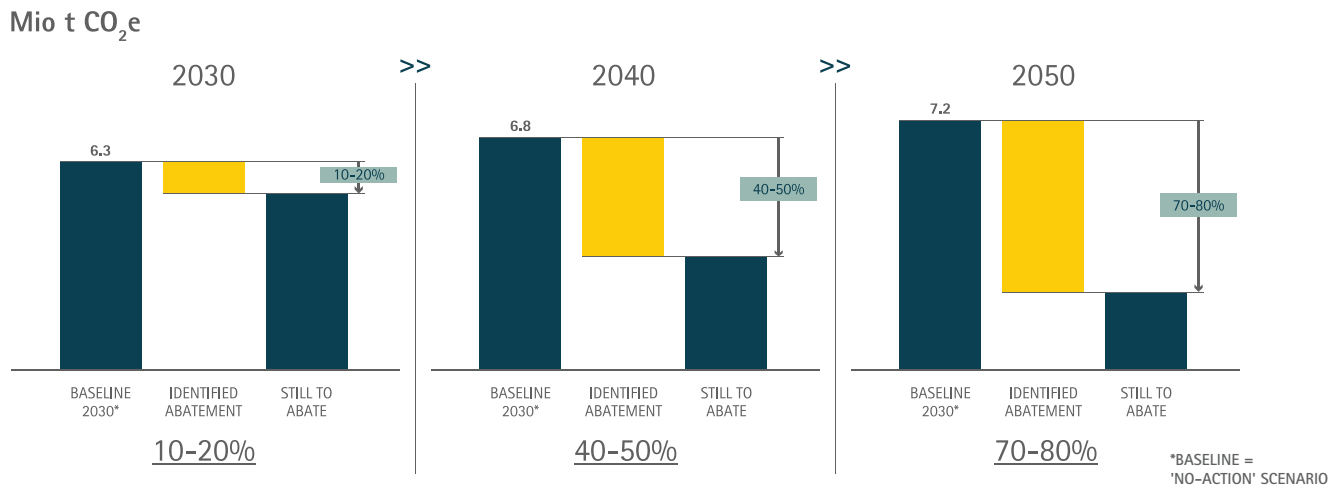


Figure 4 – Scope 3 Emissions Abatement Potential (Source: MineLens asset decarbonisation tool; Team Analysis)

### Our commitment to decarbonise copper production

Based on the analysis, the members of the International Copper Association (ICA) in Europe and globally commit to

- ▶ a goal of bringing Scope 1 and 2 greenhouse gas emissions to net zero by 2050;
- ▶ actively engaging with their value chain partners to bring Scope 3 emissions as close as possible to net zero by 2050.

This is a collective ambition. The intermediate trajectories of individual ICA members companies are likely to vary given differences in the scope of activities and operating conditions of companies. This ambition is based on current knowledge and, therefore, may evolve.

This target to decarbonise production hinges on a set of key enabling conditions explained below.

## Enabling conditions for reaching the decarbonisation goals of ICA Members in Europe

### 1. Access to a sufficient amount of fossil-free, competitively priced electricity

Access to clean and competitively priced electricity in sufficient quantity is a pre-condition for decarbonising copper production in the EU. Unprecedented electricity prices in the last 18 months have increased the operational costs of copper miners, smelters and refiners in Europe and are causing a competitive disadvantage vis-à-vis producers in other regions where electricity prices remain lower. Electricity is already the most important energy source for copper smelting and refining in Europe and its relative importance will increase given the prevalent role of fossil-free electricity in decarbonising copper production in Europe. In the current situation, the unpredictability of prices is impacting on the ability of copper producing companies to make investments.

**Changes are needed to the EU's electricity market design to address the high cost of electricity for consumers and to ensure investment predictability:**

- Implement a technology neutral price shock absorber mechanism that would apply in moments of extraordinarily high prices to ensure that the price of electricity is no longer directly tied to the price of natural gas.
- Facilitate the use of renewable Power Purchase Agreements (PPAs) by copper producers by introducing solutions to reduce shaping risk which currently makes these contracts expensive.



- Accelerate the deployment of additional fossil-free generation capacity.

- Allow member states to put support schemes in place to help energy-intensive industries in the EU remain competitive until sufficient new decarbonised electricity generation capacity is deployed.

## 2. Availability of decarbonisation technologies from manufacturers at sufficient scale

Decarbonisation technologies, such as zero-emission haulage trucks, on-site storage systems for fossil-free energy and windmills, must be available from manufacturers at sufficient scale.

## 3. Increased end-of-life collection rates of copper-containing products

Refined copper production from secondary sources requires less energy than that needed from primary sources and the associated GHG emissions are 70-85 percent lower, depending on the quality of the input material. Increasing the input rate of scrap in the production process lowers its carbon emission intensity while helping meet the growing demand for copper.

To allow wider use of secondary raw materials recovered from waste, improvements to the EU legislative framework are needed to facilitate the collection of discarded products and materials, to improve sorting and treatment of waste streams and secure access to the secondary raw materials by the industry processing.

- The **regulation on Waste Shipment** should allow the export of waste outside the EU territory only when environmental and safety standards at the destination are equivalent to or higher than the EU ones. The classification of waste streams shipped within the EU territory should be harmonised and simplified.

- The **directive on End-of-Life Vehicles** should allow improved treatment of the discarded vehicles before their shredding, to avoid dispersing copper within the ferrous scrap.

- The **directive on Waste from Electrical and Electronic Equipment (WEEE)** should be reviewed to improve collection, separation and sorting processes, and to incentivise consumers to bring back their WEEE.

- The proposed **EU regulation on Ecodesign for Sustainable Products** should ensure the recyclability of products at the design stage.

## 4. Access to financing

Between 2020 and 2050, the copper industry in the EU will need to invest approximately 12.5 billion EUR to meet increasing demand and an additional 5.3 billion EUR –at least– to reach decarbonisation targets, an average of 600 million EUR per year. Copper producers should have access to public and private funding to support innovation and the deployment of decarbonisation technologies to help meet the ambitious plans of ICA members in Europe to decarbonise their copper production.

- It is important that ambitious yet realistic criteria that are fit for the copper production process are included in the Climate Delegated Act under the **EU Taxonomy framework** to determine the manufacturing of copper as an activity that substantially contributes to climate change mitigation.

## 5. A global level playing field on carbon pricing

Today, the EU's climate policies are much stronger than those of most other countries and regions. Copper producers are price-takers and cannot pass on the cost increases brought about by the **EU Emission Trading System (ETS)** to consumers without losing market share to producers who do not face the same costs. This means that as long as third countries do not have climate policies resulting in equal climate costs for industry in the same timeframe as the EU, it is of crucial importance that the EU legal framework provides robust protection to avoid the relocation of production sites to countries outside the EU that have less stringent environmental regulations.

The ETS must ensure there is a level playing field on the carbon costs paid by EU copper producers and non-EU copper producers. Strong protection against carbon leakage is needed to deliver on the environmental goals of the ETS and to maintain the competitiveness of the European metals industry.

Copper is not included in the list of sectors to which the **Carbon Border Adjustment Mechanism (CBAM)** will apply in the first instance. However, we note the intention of the EU institutions to expand CBAM to other ETS sectors in the future. Several important concerns remain as to the ability of CBAM to establish a level playing field between EU and non-EU producers in practice, in particular in relation to the treatment of EU exports, the inclusion of indirect emissions, potential circumvention and the on-the-ground application of CBAM. We are therefore concerned that a CBAM applied on the copper sector would not effectively replace the existing carbon leakage protection measures under the EU ETS.

– It is important to keep the current **State Aid framework** until 2030 to allow member states to compensate electro-intensive industries for the increased electricity prices they pay as a result of higher carbon costs that utilities pass on in the electricity price, and to ensure adequate free allocation under ETS in Phase 4.

– The extension of **CBAM** to new sectors must be carefully assessed on a case-by-case basis, in dialogue with the industry.

## 6. A coherent regulatory framework that incentivises investments

The copper industry in the EU has to remain competitive to be able to invest in advancing decarbonisation and circularity. This requires a coherent and fit-for-purpose regulatory framework that provides legal clarity and predictability, together with a more ambitious industrial policy to support strategic raw material value chains that are essential for achieving the EU's objective to become a carbon neutral continent by 2050.

It is essential to ensure coherence between the policy objectives on decarbonisation, industrial policy, environmental protection, chemicals management, circular economy and resource efficiency to allow an optimised and responsible contribution of copper and its by-products, such as iron silicate, to the transition toward climate neutrality.

– **EU chemicals regulation** should be aligned with the wider sustainability and circular economy objectives to avoid making key strategic raw materials subject to disproportionate regulatory processes that are not fitted to their risk profile. The risk of unjustified restrictions or even bans and unpredictable compliance costs are proving a real disincentive for investors to choose the EU over competing markets.

– The **Critical Raw Materials Act** should recognize copper as a strategic raw material and take concrete steps to facilitate and accelerate permitting and financing for new mining, processing and recycling operations and expansions.

– The **Net Zero Industry Act** should follow a value chain approach focusing not only on the production of net zero technologies, but also on the strategic raw materials needed to produce them, making Europe a more attractive place to invest both upstream and downstream.



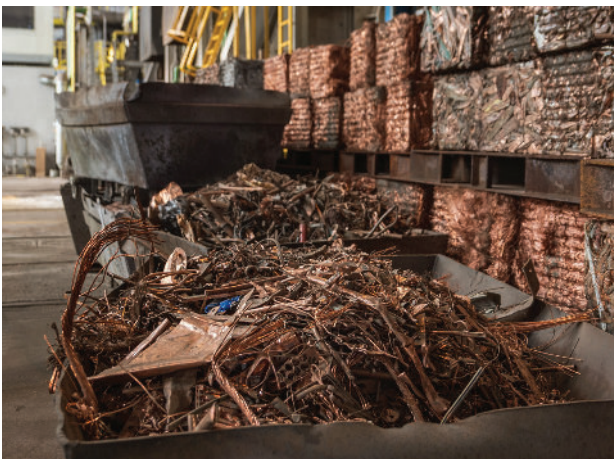


## The Way Forward

ICA members commit to:

- **Measuring progress** through a robust, aligned methodology for calculating the carbon footprint of copper production and a regular, transparent monitoring mechanism (to be established by end of 2024).
- **Advancing decarbonisation in a responsible way**, supporting and enhancing communities and the environment around copper assets in Europe, for example through commitment to The Copper Mark®.
- **Updating the *Pathway to Net Zero* and the *Regional Focus: Europe*** at least every 5 years, or more frequently if needed, to track and analyse relevant changes across the global industry.
- **Engaging in partnerships to address the challenge of decarbonisation.** We invite policymakers, academic institutions and civil society organizations to pursue innovative partnerships to reduce GHG emissions.

ICA members in Europe, together with the European Copper Institute, look forward to actively engaging with suppliers, customers, communities and policy makers to ensure the contribution of copper and the copper industry to achieving the objectives of the European Green Deal, in a responsible and sustainable way.





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