

Environmental Profile of Aurubis Copper Cathode

Copper's contribution to sustainable development

Copper is a key material enabling important technological developments, such as generating and transmitting renewable energy and enhancing the energy efficiency of motors and transformers. These developments are essential to reach the objectives of the European Green Deal, particularly for a clean energy transition.

Already small and still shrinking: The environmental footprint of Aurubis copper cathode

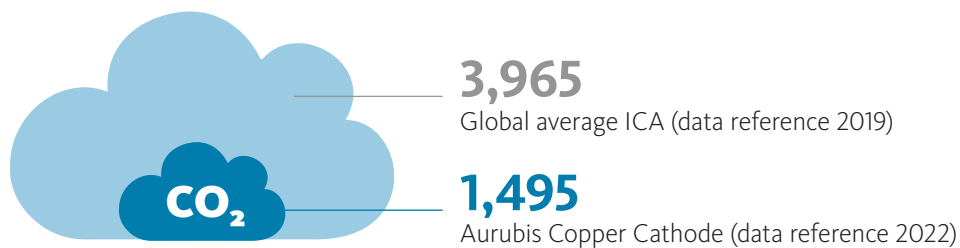
As a sustainably oriented multimetal company, Aurubis takes responsibility for the global challenges of climate change, environmental protection, and resource conservation. In 2021 we introduced our label 'Tomorrow Metals by Aurubis' that encompasses the many measures we are taking to enhance our sustainability performance. Aurubis is at the forefront of

industries committed to reducing the environmental impact of their operations: We have set the objective of achieving carbon-neutral production well before 2050. And we are well on our way: The carbon footprint of copper cathode from Aurubis has decreased by more than 35 % since 2013. The carbon footprint of our copper cathode is more than 60 % below the global average for all copper smelters and refiners.¹

From 2023 on, the environmental impacts of Aurubis' products are only calculated via the Environmental Footprint impact assessment method (3.0) to align with best scientific and industry reporting practices. The results based on the CML (Centre for Environmental Studies at Leiden University in the Netherlands) method will not be used anymore as announced last year.

Carbon footprint of Aurubis copper cathodes

in kg CO₂ equivalents per t of copper cathode



Note: The Environmental footprint method (3.0) is the most advanced impact assessment method adopted by the European Commission. The previous version of our LCA study used the now-outdated characterization method from the Centre for Environmental Studies (CML) at Leiden University in the Netherlands.

Life cycle assessment for Aurubis copper cathodes

However, looking at CO₂ emissions alone does not give a comprehensive picture of a product's environmental impact. Therefore, we at Aurubis evaluated the environmental profile of our core product, copper cathode, by carrying out a life cycle assessment (LCA). In this holistic approach, we considered all the activities involved in the production of copper cathode from cradle to gate, such as copper ore

extraction, smelting and refining, transportation, energy consumption, and auxiliary materials. The study was conducted in compliance with ISO standards 14040 and 14044 for life cycle assessment.² In the calculation, we included the production from both primary and secondary raw materials combined, i.e., the weighted average for copper cathode across the Aurubis Group.

¹ Sources: International Copper Association, Copper Environmental Profile, Global 2023 / Aurubis, supported by Sphera, Report: Life Cycle Assessment of copper cathode, Oct. 2023.

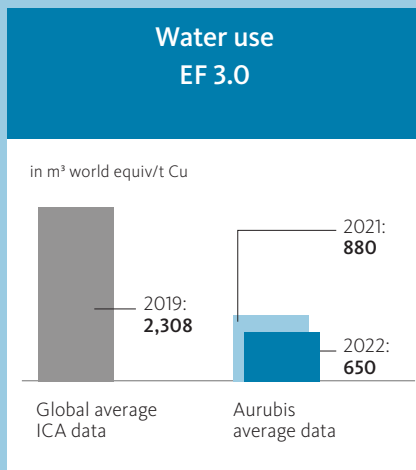
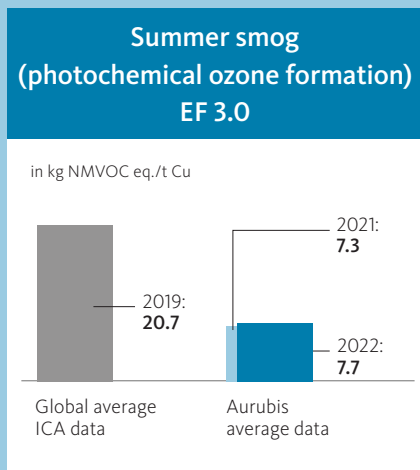
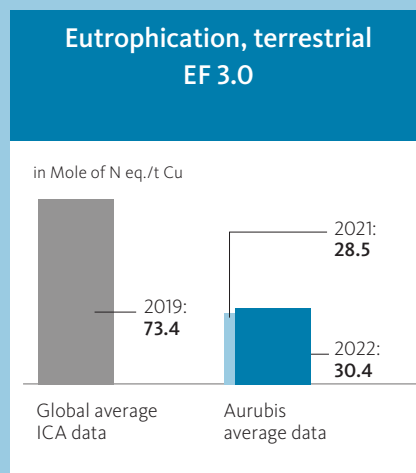
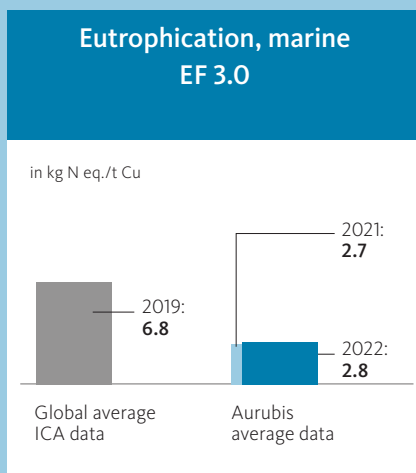
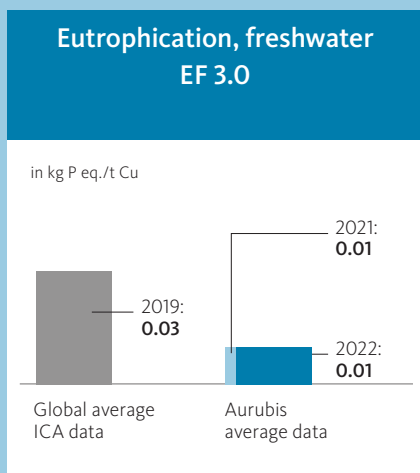
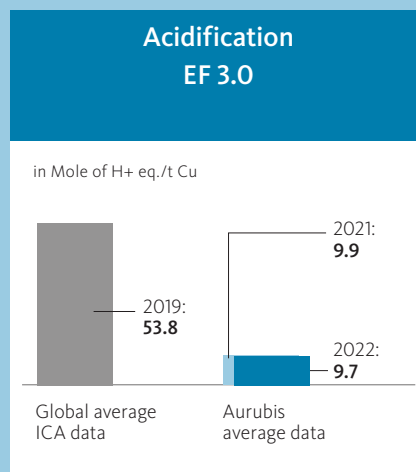
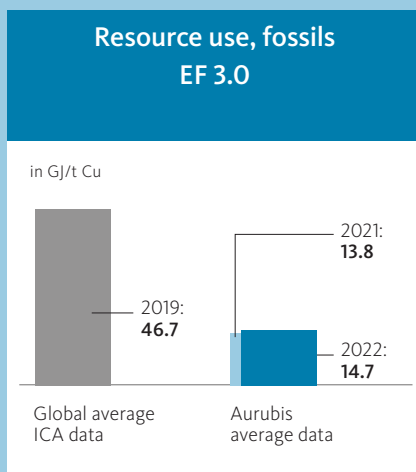
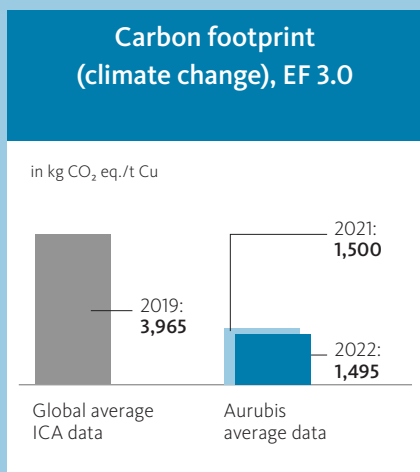
² ISO 14040:2021 Environmental management — Life cycle assessment — Principles and framework.
ISO 14044:2021 Environmental management — Life cycle assessment — Requirements and guidelines.

The results

The results of an update of our life cycle assessment show that the environmental footprint of Aurubis copper cathode is more than 50 % lower than the ICA average in all the relevant impact categories.

Aurubis thus makes a real contribution to the global challenge of environmental and climate protection.

The key environmental aspects were assessed with the Environmental Footprint impact assessment method (3.0) along 16 impact categories. The main impact categories reported in this factsheet were selected because they represent a broad range of environmental impacts. Results for all 16 indicators are available upon request. However, it is important to note that 'abiotic depletion potential' and 'toxicity' impacts are not sufficiently robust and accurate to be used for metals.



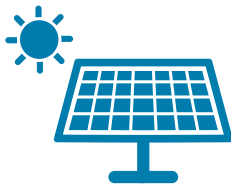
How we got there

The improvements achieved since 2013 were only possible with major investments in environmental measures that reach ambitious environmental standards. Aurubis also develops innovative and energy-efficient technologies in environmental protection that often set new benchmarks worldwide.



Emission reduction

To reduce emissions to air, we have installed an innovative gas cleaning system in our primary smelter in Pirdop (Bulgaria), to name one example. This installation uses a modern process, a technology called Sulfacid, that is unique for Bulgaria and for the entire copper smelting industry.



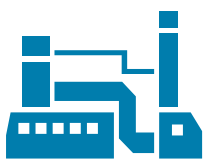
Energy-efficient technologies

We also invested in energy-efficient and low-carbon technologies at all sites across the Aurubis Group, implemented measures to save energy, facilitated the switch to renewable energies, and enabled decarbonization. For example, we implemented projects such as our industrial heat project at the Hamburg plant, which uses the excess heat from production processes for district heating. With this project, HafenCity East is the first urban neighborhood near our Hamburg plant to be almost fully supplied with CO₂-free industrial heat.



Extending recycling capacities

The extension of Aurubis' recycling capacities and the acquisition of the recycling specialist Metallo also contributed to the improvements of our overall footprint on the environment. With the recycling plants in Beerse (Belgium) and Berango (Spain), Aurubis extended the recycling of secondary materials significantly, which is reflected in a lower footprint in the LCA results. The recycled content of the copper cathode production for fiscal year 2021/22 was 44 %.



Enhanced multimetal recovery

The efforts of Aurubis to convert the raw materials as completely as possible into marketable products also help to reduce our overall footprint. Aurubis is in the process of further strengthening its position as the most efficient and sustainable smelter network worldwide. This network encompasses the metallurgical infrastructure that enables enhanced multimetal recovery.

With all measures we implemented, we reduced the direct emissions of pollutants such as sulfur dioxide and dust as well as the greenhouse gas emissions. At the same time, our recycling and the efficiency of metal recovery increased, which is now visible in the improved results in our life cycle assessment.



We are committed: Carbon-neutral by 2050

The EU has an ambitious goal for 2050: a carbon-neutral society and economy. And Aurubis has followed suit: We have set the objective of achieving carbon-neutral production well before 2050. In late 2019, **we committed to the Business Ambition for 1.5 °C**, an initiative of the UN Global Compact, committing the Group to setting science-based targets to reduce the greenhouse gas CO₂. Our target has been validated in the meantime:

- » **reduce direct and indirect emissions by 50 %**, and
- » **reduce upstream/downstream emissions by 24 %** until 2030 compared to 2018.

The targets cover the company's greenhouse gas emissions as defined by the GHG Protocol Corporate Standard.

By taking part in this initiative, we are contributing to achieving the 1.5 °C target of the Paris Climate Agreement.

And we take our responsibility seriously: To make our achievements in environmental protection and our carbon footprint transparent, we publish our own reporting, and we participate in sustainability ratings and rankings, such as the Carbon Disclosure Project (a non-profit organization that advocates for climate reporting).

Aurubis AG

Corporate Environmental Protection

Dr. Jörn Mühlenfeld

Environmental Manager
Corporate Environmental Protection
j.muehlenfeld@aurubis.com

Daniela Cholakova

Environmental Manager
Corporate Environmental Protection
d.cholakova@aurubis.com