

Environmental Profile of Aurubis Copper Cathodes

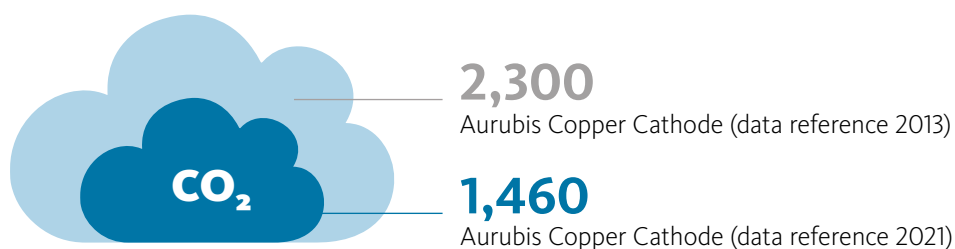
Already small and still shrinking: The environmental footprint of Aurubis copper cathodes

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

As a sustainably oriented multimetal company, Aurubis takes responsibility for the global challenges of climate change, environmental protection, and resource conservation. We therefore have set the objective of achieving carbon-neutral production well before 2050. And we are well on our way: within eight years, the carbon footprint of cathode copper from Aurubis has decreased by more than 35 %. The carbon footprint of our cathode copper is a full 60 % below the global average for all copper smelters and refiners.¹

Carbon footprint of Aurubis copper cathodes

in kg CO₂ equivalents per t of copper cathode



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 cathodes, by carrying out a life cycle assessment (LCA). In this holistic approach, we considered all the activities involved in the production of copper cathodes from cradle to gate, such as copper ore extraction, smelting and refining,

transportation, energy consumption, and auxiliary materials. The study was conducted in conformance with the 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 operations in Hamburg, Pirdop, Lünen, Beerse, Berango, and Olen, and calculated the weighted average for copper cathode across the Aurubis Group.

¹ Sources: International Copper Association, Copper Environmental Profile, Sept. 2017 / Aurubis, supported by Sphera. Reference years 2013 and 2021, respectively.

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

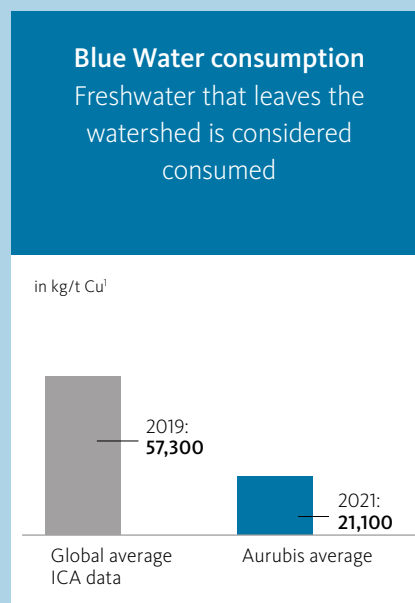
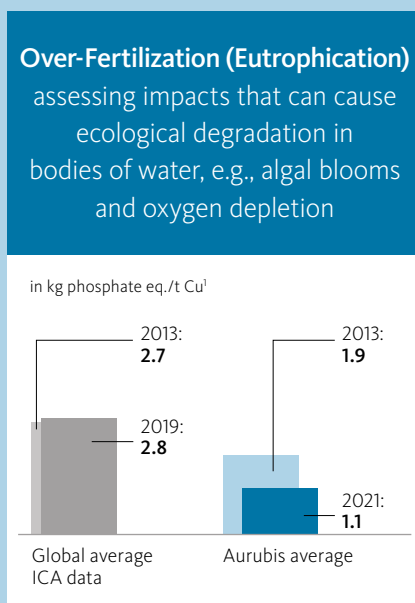
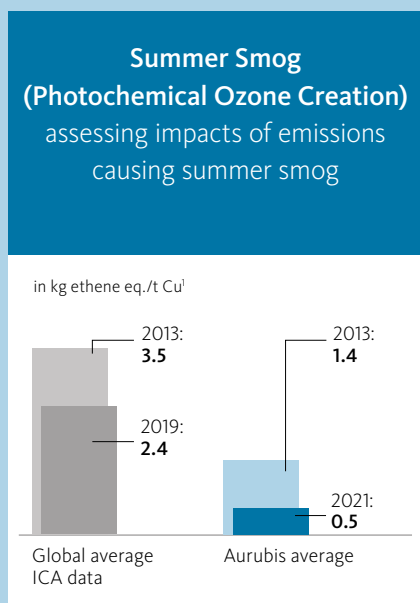
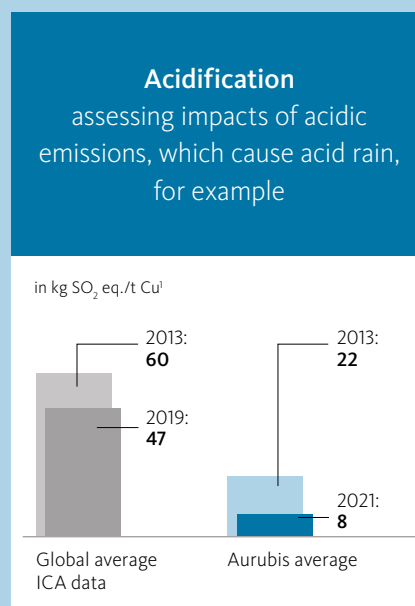
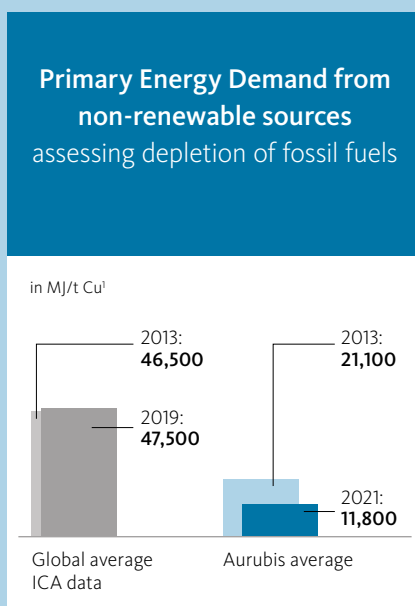
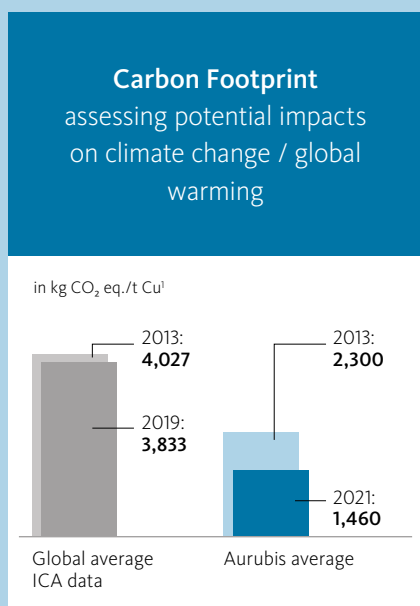
The results: Our footprint is getting (even) smaller

The results of an update of our earlier life cycle assessment show that the environmental footprint of Aurubis copper cathode has considerably decreased further in all the impact categories investigated.

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

The key environmental aspects were assessed along a set of so-called impact categories. These impact categories were selected because they represent a broad range of environmental impacts and are each determined by a well-established scientific approach.

The results below are based on the CML impact assessment methodology (CML 2001, update August 2016).



¹ The diagrams show the industry's global average results for the reference years 2013 and 2019 (left bars), and the average results for Aurubis copper cathode for 2013 and 2021 (right bars).

Verification

The environmental profile of Aurubis copper cathode has been verified by TÜV Nord Cert in accordance with DIN EN ISO 14040:2021 and DIN EN ISO 14044:2021.

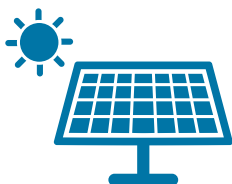
How we got there: Improvements by constantly implementing environmental and climate measures

The improvements achieved were only possible with major investments into 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 goes along with a lower footprint in the LCA results. The recycled content of the copper cathode production for the financial year 2020/21 was 47 %.



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 strengthening this advantage with the goal of becoming the most efficient and sustainable integrated 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 by 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

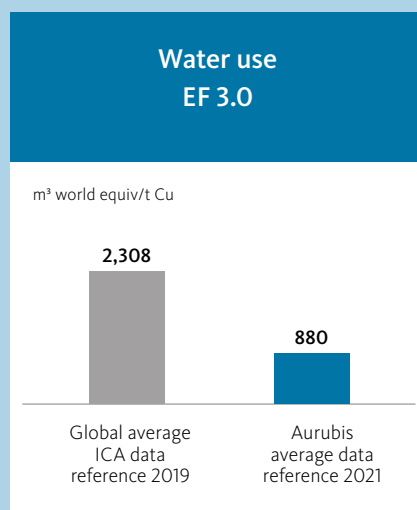
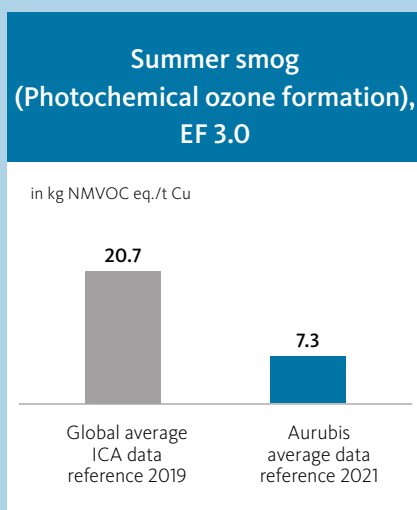
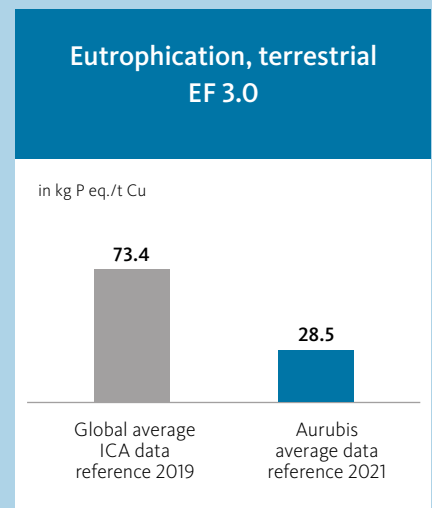
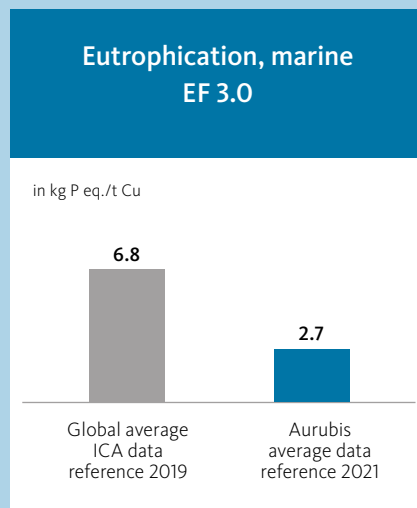
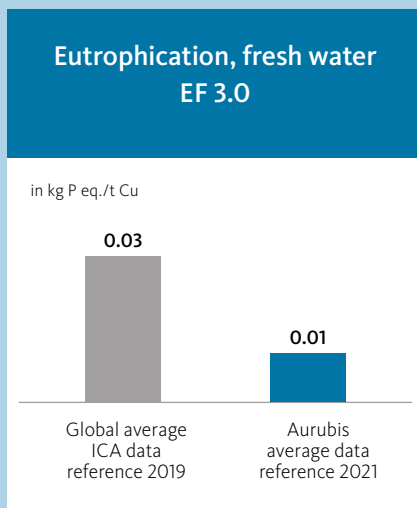
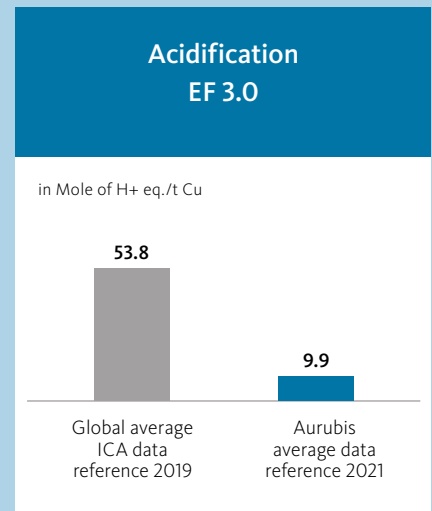
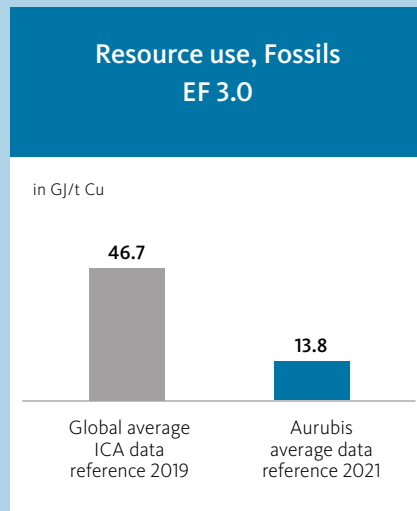
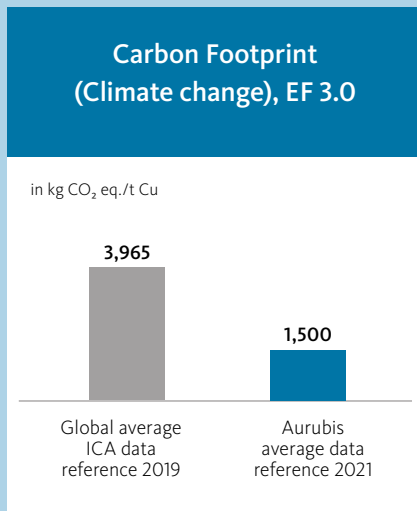
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ANNEX



The environmental profile of Aurubis copper cathode (reference year 2021) was recalculated based on **the Environmental Footprint Impact assessment method (EF 3.0)**.

The Environmental Footprint Impact assessment method is considered the most appropriate therefore the results obtained with this method will be used in the future.