

**FOCUS**



You can find the full Annual Report at:  
[annualreport2019-20.aurubis.com](https://annualreport2019-20.aurubis.com)

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# FOCUS

**Dear reader,**

The past fiscal year has demonstrated once again that Aurubis has a solid position. It's no coincidence that we've made our way through the pandemic well thus far. This is the result of all of our employees' efforts – at all levels of the company. For this, we would like to express our sincerest thanks.

However, it is the course set in the past that provides our business model with a stable foundation. Our **FOCUS** is still directed towards implementing our strategic pillars of growth, efficiency, and responsibility. We are seeing more and more potential in recycling. We took an important step forward with the acquisition and integration of Metallo, which now makes us one of the most important players in Europe for producing the metals of today and tomorrow.

This year's magazine accompanying our Annual Report is made up of two parts: this part focuses on our strengths and what makes Aurubis what it is. We demonstrate what we took on and implemented during the past year. And why we're prepared for the future.

I hope you enjoy reading it.

  
**ROLAND HARINGS**  
Chief Executive Officer

## 02

The WE  
factor

## 03

Business  
model: robust  
yet flexible



## 10

Aurubis and  
Metallo – a  
growth story



## IMPRINT

### Publisher

Aurubis AG  
Hovestrasse 50,  
20539 Hamburg, Germany  
info@aurubis.com  
www.aurubis.com

**Photos** Aurubis AG, Metallo Group,  
Thies Rätzke, Thomas Panzau, Andreas  
Schmidt-Wiethoff, Jente Willems,  
gettyimages

### Concept and design

Kirchhoff Consult AG, Hamburg

**Print** Beisner Druck GmbH & Co.  
KG, Buchholz in der Nordheide



[www.blauer-engel.de/uz195](http://www.blauer-engel.de/uz195)  
• resource-conserving and environmentally  
friendly manufacturing process  
• low emission printing  
• primarily made from waste paper

BD3



This year's edition of  
the magazine has two  
parts that can be flipped.  
You can read it from the  
front and from the back.  
Both parts work on their  
own, but they're even  
better as a whole.

**Enjoy reading the  
magazine – and don't  
forget to flip it!**

# THE **WE** FACTOR

**Aurubis – that’s more than 7,000 employees, over 53 nationalities, and a great deal of expertise, occupational variety, and innovative spirit. Aurubis stands for diversity in practice, for tradition and modernity, and for an unwavering principle: we are only successful together.**

In times of crisis, a company’s strength becomes especially clear. This is why we can now proudly say: Aurubis is stable. Not just because of its robust business model, but also thanks to over 7,000 employees spread across all of its sites. With a great deal of discipline and commitment, they have made sure that Aurubis has made its way through the coronavirus pandemic relatively unharmed thus far. “Aurubis is a good example of how diversity can work when everyone has shared values such as a sense of responsibility, discipline, and solidarity,” says Chief Executive Officer Roland Harings.

## GROWING TOGETHER

This “We” feeling should continue to grow, for example through Mystery Lunches: digital lunches involving two employees who meet for lunch via Microsoft Teams, independently of site and level in the hierarchy. The goal is to promote employee networking and boost internal information and knowledge sharing. The Mystery Lunches are part of the Meet-Up concept, a format for strengthening Group-wide communication about relevant topics such as the Performance

**Aurubis is a good example of how diversity can work when everyone has shared values such as a sense of responsibility, discipline, and solidarity.**

## ROLAND HARINGS

Chief Executive Officer

Improvement Program (PIP), the Metallo integration, and collaboration in the company.

Working with each other means learning from each other. With the Aurubis Essentials, Aurubis has transferred this idea to learning formats: employees share their knowledge with colleagues, covering topics ranging from the story of copper to the business model to recycling, and in the process gain new contacts in different departments.

Protecting employees’ health isn’t the only top priority during the coronavirus pandemic. With its Vision Zero, Aurubis is pursuing the goal of zero work-related accidents in the company. One step on this path is the first uniform, Group-wide campaign on the 10 Golden Rules of

occupational safety – with training sessions and extensive informational material. The 10forZero also lend a hand: ten characters, each of whom represents one rule and one Aurubis metal, ensure safe conduct as they call on employees to watch out for each other.





# THE CRISIS REVEALS OUR **STRONG** **SOLIDARITY**

Like all other companies, we at Aurubis have worked under unprecedented conditions for more than half of the past fiscal year. The coronavirus pandemic created new challenges for everyone and influenced a number of decisions and actions. The long-term economic and social consequences of the pandemic remain to be seen. The Aurubis Executive Board explains how Aurubis is dealing with this situation and what is especially important to them in these exceptional times.

Chief Operations Officer Dr. Heiko Arnold sums it up as follows: "As uncertain as the coronavirus pandemic has made, and continues to make, a number of aspects, one thing is certain: the health and safety of all Aurubis employees have the highest priority for the Executive Board and its management team." Chief Executive Officer Roland Harings adds, "We are very aware of this significant responsibility toward our employees. The Executive Board, Works Council, and a number of company divisions jointly initiated the necessary measures to quickly minimize the infection risk at our sites. We are still doing this consistently: every day, we assess the situation in our Group-wide crisis team and inform employees promptly about the decisions we have made through all internal communication channels."

We immediately took far-reaching steps to protect our employees. For example, this included halting all business trips and public business at the sites. Employees were asked at a very early stage to avoid taking private trips to risk areas if possible. Every employee regularly receives mask sets, and there are concrete rules about the situations and areas in which a mask has to be worn.



**THE HEALTH  
AND SAFETY  
OF ALL  
EMPLOYEES  
ALWAYS HAVE  
THE HIGHEST  
PRIORITY.**

**DR. HEIKO ARNOLD,**  
Chief Operations Officer

We were also quick to take advantage of the options for digital work to a greater extent than previously planned. "Luckily, we rolled out new tools independently of the pandemic, so we were able to facilitate remote work from the start, especially for administrative employees, without any problems. And we continue to do so today," explains Chief Financial Officer Rainer Verhoeven.

At the same time, Aurubis is a company where work is carried out around the clock, 365 days a year. "Without a doubt, we have to maintain operations in our facilities and uphold the high level of quality in production. We have to make sure that we're always in a position to receive and process raw materials, to produce our metals, and to deliver them," says the Chief Executive Officer, summing up the situation. Despite temporary mine closures in South America due to the pandemic, Aurubis was well supplied with concentrates at all times. "We had to be flexible. But thanks to our long-term mine partners, we were able to maintain production at the smelter sites without any problems for the most part. Furthermore, the robust nature of our business model has proven itself during the pandemic, a fact that is reflected in our strong results." The purchase of recycling materials such as copper scrap and other metal-bearing materials also eased in mid-2020 following a brief shortage resulting from COVID-19-related lockdowns in many parts of the world.

Aurubis is and remains a production company first and foremost, with many employees who can only do their work on site – whether at the furnaces or in the many other production facilities. We offered working parents of young children the option to adjust their working time models, to make their working hours more flexible, and to reschedule or trade shifts. We released our employees from their duties, without any red tape, for the time they needed to coordinate childcare. State-of-the-art coronavirus quick tests are available in the medical departments of the Aurubis plants. The agile crisis team continually reviews the hygiene concepts and adjusts them as necessary. ➤

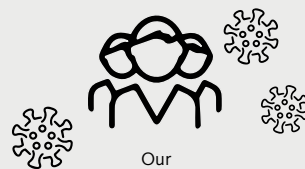
## FACTS & FIGURES



All  
**EMPLOYEES**  
receive mask sets  
as needed.

# 5,500

**RAPID TESTS**  
were distributed to the sites  
in November.



Our  
**CRISIS TEAM**  
assesses the situation  
every day.

# 24/7

**AROUND THE CLOCK,**  
365 days a year,  
employees are working at Aurubis.

Despite the pandemic, Aurubis in Germany was even able to welcome more new apprentices than in previous years. Nevertheless, the apprentice welcome event in Hamburg in September was a little different than usual: apprentices were divided into two groups and the ceremony took place in two rounds with the applicable hygiene and distancing rules. Apprentice training is continuing its usual course even during the pandemic, taking the mask and distancing requirements into consideration.

“Luckily, thanks to the quick measures that have been taken, the impacts of the virus on Aurubis have been limited,” Roland Harings summarizes. “We will of course do everything to ensure that it stays that way. For example, we continue to review our recommendations and instructions daily during this time.”

The pandemic isn’t over yet. The global infection rates will continue to rise rapidly during the winter months. “It’s now crucial again to continue putting our strong solidarity into practice,” says Chief Technology Officer Dr. Thomas Bünger emphatically. “Aurubis isn’t just a place where we do our work. Aurubis is all of our colleagues who work together to ensure that things continue even in these difficult times.”

Roland Harings is confident: “Together with my Executive Board colleagues, I trust that we Aurubians will overcome current and future challenges together in the coming year as well.”



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HAVE BEEN  
LIMITED.**

**ROLAND HARINGS,**  
Chief Executive Officer



# TRAINING FOR THE FUTURE



Despite the ongoing coronavirus pandemic, Aurubis AG increased the number of apprenticeships this year. The plants in Hamburg and Lünen are therefore among the biggest industrial training providers in these cities.

Aurubis has been investing in its own young employees for years – and this year was no different. A total of 98 young people started their apprenticeships at the company: 18 in Lünen and 80 in Hamburg. This is an increase of 13% compared to the previous year. With the occupational training we provide, we want to keep an eye on the unavoidable demographic developments, and give young people opportunities with an economically stable company.

At both sites, Aurubis offers state-of-the-art training in new, modern training centers. And with a retention rate of 85% on average, the apprentices' job prospects are very good as well. Furthermore, cooperative training is carried out with other local companies in both Hamburg and Lünen. A good start to a promising future.

## +13 %

**APPRENTICES**

compared to the previous year



**“Aurubis offers me opportunities for continuing education, and supports me in my professional development. During our training, we become a team – and we stay a team.”**

**Atakan Kahveci**  
Apprentice Chemical Technician,  
year 2 (Hamburg)



**“Treating each other with respect has high priority, regardless of cultural background, religion, age, or position. You identify with Aurubis quickly.”**

**Jan Klauswald**  
Apprentice Industrial Mechanic,  
year 1 (Lünen)

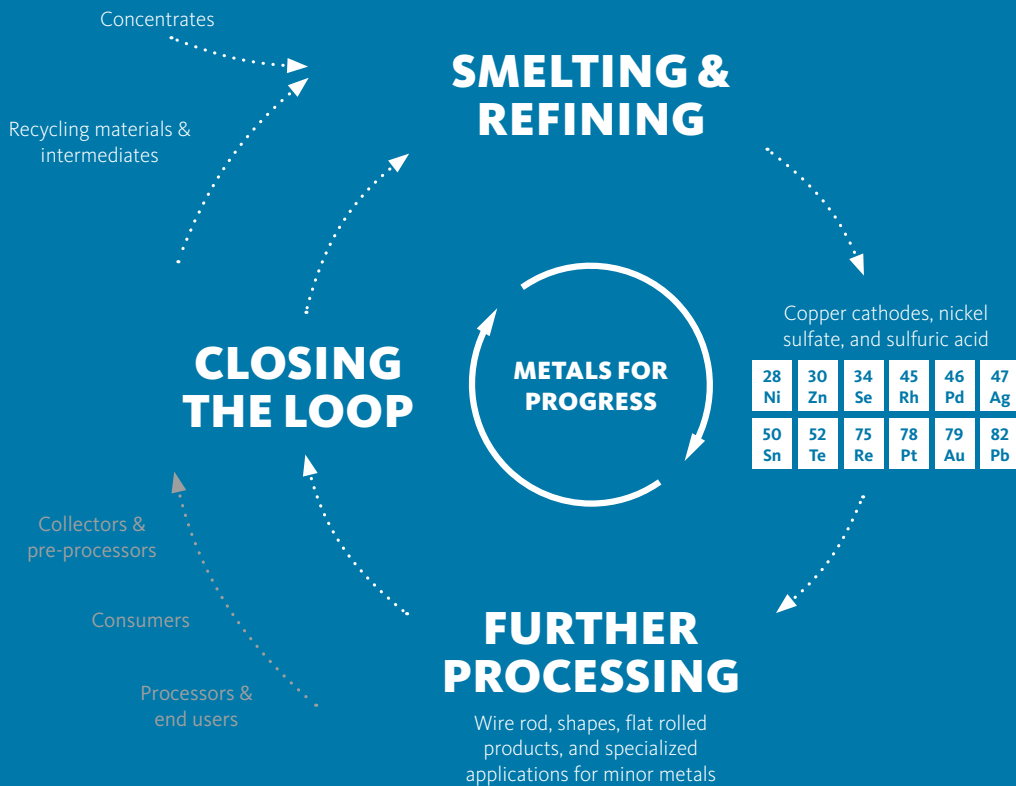


**“My requests and ideas are heard. I never have the feeling that I’ve been left on my own. It’s great training in a company with a strong reputation.”**

**Tijana Trbara**  
Apprentice Industrial Management  
Assistant,  
year 3 (Hamburg)

# BUSINESS MODEL

**ROBUST YET FLEXIBLE**



**In these challenging times, Aurubis is rock-solid – thanks in part to our business model and the course that has been set over the past several years. But what makes this business model what it is?**

Being smart and connected doesn't work without metals. Whether renewable energies, electric vehicles, digitalization, or urbanization, the demand for metals will continue to rise. For more than 150 years, Aurubis has produced copper and other metals that are crucial for modernization and for the ongoing development of our lives over the next decades. This is how we create the foundation for technologies of the future.

Thanks to our metallurgical know-how, state-of-the-art facilities, and groundbreaking environmental standards within our industry, Aurubis is a leading global copper recycler and provider of non-ferrous metals. Our main area of expertise is the processing and optimal utilization of complex concentrates and recycling raw materials to produce metals of the highest purity.

In addition to our main metal, copper, these include precious metals like gold, silver, and platinum group metals, but also metals such as lead, nickel, tin, zinc, and selenium. Additional by-products including sulfuric acid, iron silicate, and synthetic minerals round off the product portfolio.

Our customers include the semifinished product industry, the electrical engineering, electronics, and chemical industries, as well as suppliers for the environmental technology, construction, and automotive sectors.

Sustainability plays an important role in all of our activities. "Aurubis responsibly transforms raw materials into value" – following this maxim, sustainable conduct and business activities are integral aspects of our corporate strategy.

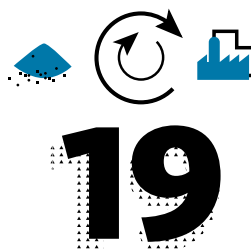
Aurubis accomplished a great deal in fiscal year 2019/20. We have been able to handle the impacts of the coronavirus pandemic on both the production side and the earnings side thus far, and we fulfilled the forecast for the past fiscal year that we published in December 2019. In particular, the good operating performance of our plant facilities and higher precious metal prices supported earnings.

But Aurubis, too, felt the impacts of the pandemic-related lockdown in Europe and recorded substantially weaker demand for copper products. This is where our broad position and the flexibility of our business model served us well. Instead of manufacturing copper products such



as wire rod from copper cathodes, we sold more copper cathodes to China, for example, and were therefore able to cushion the impacts of reduced product demand.

Despite the challenging environment in fiscal year 2019/20, Aurubis is very stable from a financial perspective and is successfully implementing its strategy. In May 2020, we announced the acquisition of the Metallo Group and successfully placed a Schuldschein loan with an ESG (environmental, social, and corporate governance) component [Focus, page 14](#) – which is being used to finance the Metallo transaction, among other things. In July, we acquired the Berlin software developer azeti – a key building block of our new digital strategy. In early March 2020, Aurubis paid out the dividend for fiscal year 2018/19, and based on our strong balance sheet position and good liquidity situation, we started a share buyback program in March 2020.



**DIFFERENT METALS ARE  
RECOVERED AT AURUBIS**



A close-up, high-angle shot of a massive pile of scrap metal. The pile is composed of countless small and medium-sized pieces of metal, including bolts, nuts, washers, gears, and various unidentifiable fragments. The colors range from dark, oxidized steel to lighter, possibly aluminum or galvanized steel. The lighting is bright, creating strong highlights and deep shadows that emphasize the textures and shapes of the metal pieces. Overlaid on the center of the image is the text "MULTI METAL" in a large, bold, white, sans-serif font. The text is split into two lines: "MULTI" on the top line and "METAL" on the bottom line. The background is a dense, chaotic arrangement of metal parts, with a prominent yellow gear visible on the left side.

# MULTI METAL





**Metallo can process a number of complex recycling materials with low metal contents.**

## Aurubis and Metallo – a growth story

The Belgian-Spanish recycling group Metallo has belonged to the Aurubis Group since late May 2020. Following an extensive review, the European competition authorities issued their unconditional approval of the Metallo acquisition on May 4, 2020. The purchase price was € 375 million and was financed through a Schuldschein loan with an ESG (environmental, social, and corporate governance) component. The interest rate conditions are dependent on the development of our EcoVadis sustainability rating. This underlines Aurubis' commitment to sustainability in the company.

### ACHIEVING MORE TOGETHER

Together, we will surpass the threshold of 1 million t of recycling material input. And this new level is only the beginning. The global recycling volume will continue to rise, and we see good growth opportunities for our business model here.

Metallo specializes in processing recycling materials with low metal contents, with a focus on tin, lead, nickel, zinc, and copper – an exciting market with potential: due to global trends, both the quantity and the complexity of recycling materials will increase significantly, along with the competitive pressure for primary and secondary raw materials that are easy to process. Aurubis is already one of the leading recycling companies for complex recycling materials. With the Metallo acquisition, Aurubis is expanding its technological processing expertise and the related capacities in order to remain competitive in the long term and to grow sustainably.



**This acquisition represents an important step in the implementation of our multimetal strategy. Our stated objective is to become one of the most efficient and sustainable smelter networks in the world.**

**ROLAND HARINGS,**  
Chief Executive Officer

Metallo Belgium, based in Beerse, was founded in 1919. Metallo Spain was founded in Berango (in the province of Biscay) in 1991.



Metallo's processing know-how and technical processes perfectly complement Aurubis' core expertise. The merger thus makes a considerable contribution to our multimetal strategy. Together, we will continue to expand our capabilities and capacities for recycling important industrial and precious metals, strengthening the European circular economy in a meaningful way.

Our goal is to always generate the greatest possible value from all input materials. One special feature is Metallo's zero waste approach, with the goal of converting all input materials into marketable products – in complete alignment with our Sustainability Strategy.

#### COMBINING STRENGTHS – FOR OPTIMAL PRODUCTION

The Metallo production sites are currently being integrated in the Aurubis Group network. One stated objective of the integration is to optimize the production network of our five large smelters and thus to offer our customers and suppliers additional solutions. We will substantially boost efficiency in the Group at the same time.



**The integration of Metallo in the Aurubis Group was the right decision for the future development of Metallo and Aurubis. Within the company network, we will be able to leverage significant synergies.**

**DIRK VANDENBERGHE,**  
Metallo Group CEO

What this means concretely: we will increase the precious metal inputs in Metallo's raw material mix and recover these metals from the anodes we receive from Metallo at our plant in Olen, Belgium. Furthermore, we will recover more tin as well – thanks to the additional processing capacities for tin-lead alloys at our site in Beerse, Belgium. And our site in Lünen will certainly benefit from Metallo's copper-nickel expertise as well.

Like Aurubis, Metallo is a company with a long history, celebrating its 100th anniversary last year. We are also bound by aspects such as innovation, technical expertise, sustainability, and tradition, too.



More information and a video about Metallo and its products are available at:  
[www.metallo.com](http://www.metallo.com)

# A forerunner in the sector

## Successful placement of the first ESG-linked Schuldschein loan

In June 2020, Aurubis became the first company in the basic materials industry in Europe to place a Schuldschein loan with an ESG (environmental, social, and corporate governance) component. With the ESG-linked Schuldschein loan, investors have the opportunity to invest capital in accordance with clear sustainability aspects.

The order book volume of € 200 million was significantly oversubscribed due

to high investor demand, so we were able to place a volume of € 400 million with terms of three, five, and seven years with both fixed and variable interest rates. Aurubis is using these funds for general

company financing and for the acquisition of the Metallo Group.

Aurubis' sustainability achievements, which are reflected in the rating given by the recognized, independent sustainability agency EcoVadis,

flow directly into the calculation of the interest costs for the loan. When Aurubis' sustainability rating improves, the company receives more favorable interest rate conditions;

if the rating declines, the interest rate increases. Our responsibility for supply chains, people, and the environment is therefore directly linked to our financing costs.

**€ 400 m**

**IS THE VOLUME OF THE ESG-LINKED  
SCHULDSCHHEIN LOAN**

# New paths with azeti

## A central element of the new digital strategy

With the July 2020 acquisition of software developer azeti – a Berlin start-up – Aurubis has secured an Internet of Things (IoT) platform to integrate and analyze production data in the long term. The software is able to bring together large volumes of data from highly diverse sources simply and quickly, allowing previously undiscovered optimization potential to be identified and utilized. The azeti platform will make production processes in metal production and recycling more flexible and efficient, though the acquired expertise and resources open up new digital possibilities in other areas as well.

azeti will continue supporting customers from other industries. This ensures that the platform is continuously adjusted to new market needs, and at the same time, we'll learn how other industries are implementing the topic of digitalization.



More information in a short film and at: [www.azeti.net](http://www.azeti.net)

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# Partnership with TSR

## Joint venture for the circular economy

Aurubis AG and the recycling company TSR Recycling GmbH & Co. KG signed an agreement to establish a recycling joint venture. Aurubis will hold 40% of the company, called Cablo GmbH, which will combine the cable dismantling activities of the Aurubis subsidiary Cablo and TSR (Lünen). Under the operational management of TSR, the new company's objective is to recover copper granules and to strengthen the trade in additional metals and recovered plastics.

"The separate recycling strengths of both partners will complement each other perfectly in the joint venture: TSR contributes a broad network of branches that collect the materials, as well as its existing logistics and its pre-processing expertise; Aurubis brings along extensive metallurgical processing knowledge for a wide variety of recycling raw materials to recover different metals," explains Aurubis Chief Executive Officer Roland Harings.



This joint venture is a further development of the recycling business within the scope of our "closing-the-loop" approach and creates a broader basis for securing input materials in the long term. This will further optimize the Aurubis Group's sustainable pre-processing and utilization of recycling materials.

Our joint venture makes a crucial contribution to the objectives of the European Commission's Green Deal, especially the shift from a linear to a circular economy – and it serves as a role model for other material flows as well.

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# More breathing room

## Share buyback for future acquisitions and financing

Building on its strong balance sheet and good liquidity position, Aurubis passed a resolution in March 2020 to buy back its own shares: up to 10% of the existing share capital with a maximum volume of € 200 million. On March 1, 2018, the shareholders at the Annual General Meeting authorized the management to take this step. The objective of the share buyback program is to use the treasury stock for purposes authorized by the shareholders at the Annual General Meeting on March 18, 2018, particularly possible acquisitions or future financing needs. The buyback program started on March 1, 2020 and will conclude on September 17, 2021 at the latest. During the first and second tranche until early November 2020, Aurubis bought back about 2.89% of its share capital for a total price of approximately € 60 million. This does not affect our dividend policy.



# INNOVATIVE SOLUTIONS ...

**Not only our input materials are becoming increasingly complex, but so are logistics and processing methods.**

**Every day, we work on decoding this complexity and better understanding the composition of our input materials in order to develop ideas and technologies we can use to draw the very best from these materials and our production processes.**

## **Tracking ships with artificial intelligence**

"Track shipment" has become a common feature in online shopping, so why not for shipments of copper concentrates? This was the thought behind the IT project ETA. ETA stands for "estimated time of arrival." Until now, this has been difficult to precisely predict for ships with copper concentrates on board, and it has required a great deal of effort. The goal of ETA was to improve this by collecting data from ship routes in a machine learning model, with routes starting in 2015 being gathered with the help of historical GPS data. Predictions can now be made, to the day, about when ships with copper concentrates will arrive at our primary smelter sites. This is a huge improvement for raw material, plant capacity, and production planning.



The arrival times of deliveries by ship can now be planned early on.





**Manual pre-dismantling offers advantages for raw material recovery.**

## Recycling better

Aurubis is one of 22 partners participating in the European research project "FORCE – Cities Cooperating for Circular Economy." Together with Stadtreinigung Hamburg (the city of Hamburg's municipal waste management service), the company investigated the recycling advantages of manually pre-dismantling small electrical and electronic devices compared to non-dismantled devices – including with regard to the environmental impacts. The preliminary results confirm that manual pre-dismantling holds certain advantages related to the recovery of non-ferrous metals, iron, and especially plastics. There is a great deal of public interest in the project. For Aurubis, it's a great opportunity to serve as a partner in environmental cooperation.

## Research for impending trends

When recycling lithium-ion batteries, Aurubis wants to recover as much of their metal contents as possible – more than 90 %. For this purpose, the Group's Research & Development department is working on a technology and a hydrometallurgical process to recycle the non-ferrous metal contents such as copper, nickel, and cobalt, as well as to open up access to manganese and lithium. Aurubis would like to use this process on an industrial scale in the future and return the recovered valuable metals to battery manufacturers.



**This robot analyzes stamping samples fully automatically.**

## Taking samples completely automatically

Automation is steadily moving ahead at the Aurubis plants. Receiving the sample, turning the milling machine, setting aside the sample, recording the result – fully automatically. For three years, the Analytical Laboratory at the Hamburg plant has been using a robot to analyze stamping samples. The optical emission spectrometer helps automatically determine the chemical composition of copper samples. The digital helper conducts more than 450,000 analyses per year to quality control copper products such as shapes and rod.

# ... FOR COMPLEX DEMANDS!

**FORWARD**



You can find the full Annual Report at:  
[annualreport2019-20.aurubis.com](https://annualreport2019-20.aurubis.com)

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# FORWARD

Dear reader,

It has never been more appropriate to say that we are currently living in tumultuous times. In 2020, the pandemic challenged the world and its economy, bringing it to the very edge of the realm of possibility. Political conflicts like the one between the US and China remain unclear. With its Green Deal, the European Union has brought forth the world's most ambitious objectives for sustainable economic activity.

But even in these challenging times, we haven't lost sight of one thing: the future. Aurubis is facing the demands of today while also purposefully focusing its view on tomorrow. Because we see promising prospects and attractive opportunities in the markets in which we are active. In this context, we are treading new paths and moving **FORWARD** – for a successful future.

This year's magazine accompanying our Annual Report is made up of two parts: in this part, we're looking forward. How do we use the strengths of today to shape the successes of tomorrow? How do we leverage the potential inherent in our organization and in our markets? On the following pages, we highlight some of these prospects for Aurubis. We show you what we're occupied with now so that we remain successful in the future as well.

Enjoy reading about it.

## 02

Metals are  
indispensable

## 11

Responsibility



## 03

Strategy

## 16

Developing digitalization:  
countless opportunities

## IMPRINT

### Publisher

Aurubis AG  
Hovestrasse 50,  
20539 Hamburg, Germany  
info@aurubis.com  
www.aurubis.com

**Photos** Aurubis AG, Thies Rätzke,  
Daniele La Porta, Prof. Dr. Werner  
Eichhorst, iStockphoto LP, gettyimages

### Concept and design

Kirchhoff Consult AG, Hamburg

**Illustration** Kirchhoff Consult AG,  
Carolin Eitel

**Print** Beisner Druck GmbH & Co.  
KG, Buchholz in der Nordheide



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Both parts work on their  
own, but they're even  
better as a whole.

**Enjoy reading the  
magazine – and don't  
forget to flip it!**

# THE GREATER THE CLIMATE AMBITIONS, THE MORE METALS WILL BE NEEDED

Metals and minerals will be key for a clean energy transition. But what does that mean concretely? In 2020, the World Bank Group published a report entitled *Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition*, which intends to provide answers to that question.



The report is available  
as a free download at:  
<http://pubdocs.worldbank.org>

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An interview with  
**DANIELE LA PORTA**,  
Senior Mining Specialist  
at the World Bank

*Ms. La Porta, what will be the role of metals in the clean energy transition?*

**DANIELE LA PORTA** The clean energy transition will require the significant input of a range of minerals and metals. Renewable energy technologies are key to reaching a net zero emission future, and they are more mineral-intensive than their fossil fuel counterparts. As a rule of thumb, we have found in our report that the greater our climate ambitions, the more minerals and metals will be needed.

*In your report, you considered 17 different metals and minerals and their estimated demand until 2050. Which of them will be the “winners”?*

**DANIELE LA PORTA** It is difficult to assess who the real “winners” will be because it will depend heavily on what the future clean energy pathway will look like. For example, on the one hand, the demand for graphite, lithium, and cobalt – so-called “battery minerals” – could increase by








**DANIELE LA PORTA**

**DANIELE LA PORTA** is a Senior Mining Specialist with the Energy and Extractives Global Practice of the World Bank, where she works on mineral sector governance and sustainable development in mineral-rich developing countries. She also leads the Bank's Climate-Smart Mining Initiative, which aims to support resource-rich developing countries in benefiting from the increasing demand for strategic minerals for the clean energy transition, while effectively decarbonizing and reducing the material footprint of their mining sector. Daniele is Brazilian with degrees in geology and environmental management.



**“Without minerals, a low-carbon future will not be possible. And without a climate-smart metals sector, the clean-energy value chain will not be truly ‘clean’.”**

DANIELE LA PORTA

nearly 500% by 2050. But there are uncertainties surrounding the demand – not only which technology will predominate, but which sub-technology.

*Can you describe the role of the metals produced by Aurubis, i.e., copper, lead, nickel, silver, and zinc, for future demand coming from energy technologies?*

**DANIELE LA PORTA** We considered minerals like copper, nickel, and lead as cross-cutting minerals. These minerals are important to the clean energy transition because they are used across a wide variety of technologies and are not dependent on one specific technology. Silver and zinc feature in only a small range of energy technologies and the anticipated increases in demand are a small percentage of current production levels.

*Let's be more concrete: How will the demand for copper increase, for instance?*

**DANIELE LA PORTA** Based on the most ambitious scenario, which limits the rise of the global temperature to well below 2°C, copper demand from clean energy technologies alone may amount to up to 40–50 million t until 2050. Even in a mid-range scenario, demand will be about 30 million t. These projections don't even include the associated infrastructure like transmission lines or the physical parts like chassis of newly built electric vehicles.

*To meet future demand, how important will recycling be?  
What are the challenges?*

**DANIELE LA PORTA** While our report underscores the important role that the recycling and reuse of minerals will play in meeting demand, it also highlights that even if we scale up end-of-life recycling rates for certain minerals, like copper and aluminum, by 100%, recycling and reuse would still not be enough to meet the demand from energy technologies. The challenge with meeting most of the demand from recycling is partly due to a lack of existing material to recycle and reuse, along with costs and technological barriers.

MAPPING MINERALS WITH RELEVANT  
LOW-CARBON TECHNOLOGIES

	Wind	Solar photo-voltaic	Concentrated solar power	Hydro	Geothermal	Energy storage	Coal	Gas	Carbon capture and storage
<b>COPPER Cu</b>									
<b>LEAD Pb</b>									
<b>NICKEL Ni</b>									
<b>SILVER Ag</b>									
<b>ZINC Zn</b>									

## Cu

### COPPER

**Features:** easily shaped and tough. An excellent conductor of heat and electricity.

**Uses:** in nearly all green technologies, particularly wind energy, photovoltaics, and electric vehicles.

## Pb

### LEAD

**Features:** strong formability before it breaks, resistant to certain acids.

**Uses:** in wind energy, photovoltaics, and geothermal energy, to name a few examples.

## Ni

### NICKEL

**Features:** medium-hard, malleable, can be polished easily. Very resistant to air, water, hydrochloric acid, and leaches at room temperature.

**Uses:** for nearly all CO<sub>2</sub>-free energy sources.

## Ag

### SILVER

**Features:** soft, easily formable, with very high electrical conductivity.

**Uses:** especially in solar energy.

## Zn

### ZINC

**Features:** easily formable between 100 and 200°C, otherwise fairly brittle. Forms a weather-resistant protective layer of zinc oxide and zinc carbonate in air, so it is often used as corrosion protection.

**Uses:** in wind and solar energy, as well as hydropower.



Energy storage technologies, for example battery technologies, are becoming more important.

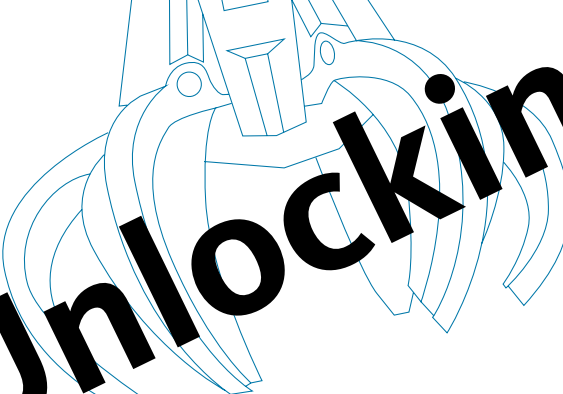
*How should smelters like Aurubis behave when striving to meet future demand for minerals while contributing to the clean energy transition?*

**DANIELE LA PORTA** In addition to providing the minerals that are needed for a low-carbon future, large smelters may rely on non-renewable energy sources to meet their large energy needs. Smelters around the world should make energy efficiency a key part of their decarbonization strategy, in addition to committing to sourcing energy from renewable sources. From a recycling perspective, smelters have a comparative advantage in scaling up recycling and should therefore pave the way in innovative practices to overcome some of the technical and economic barriers to recycling.

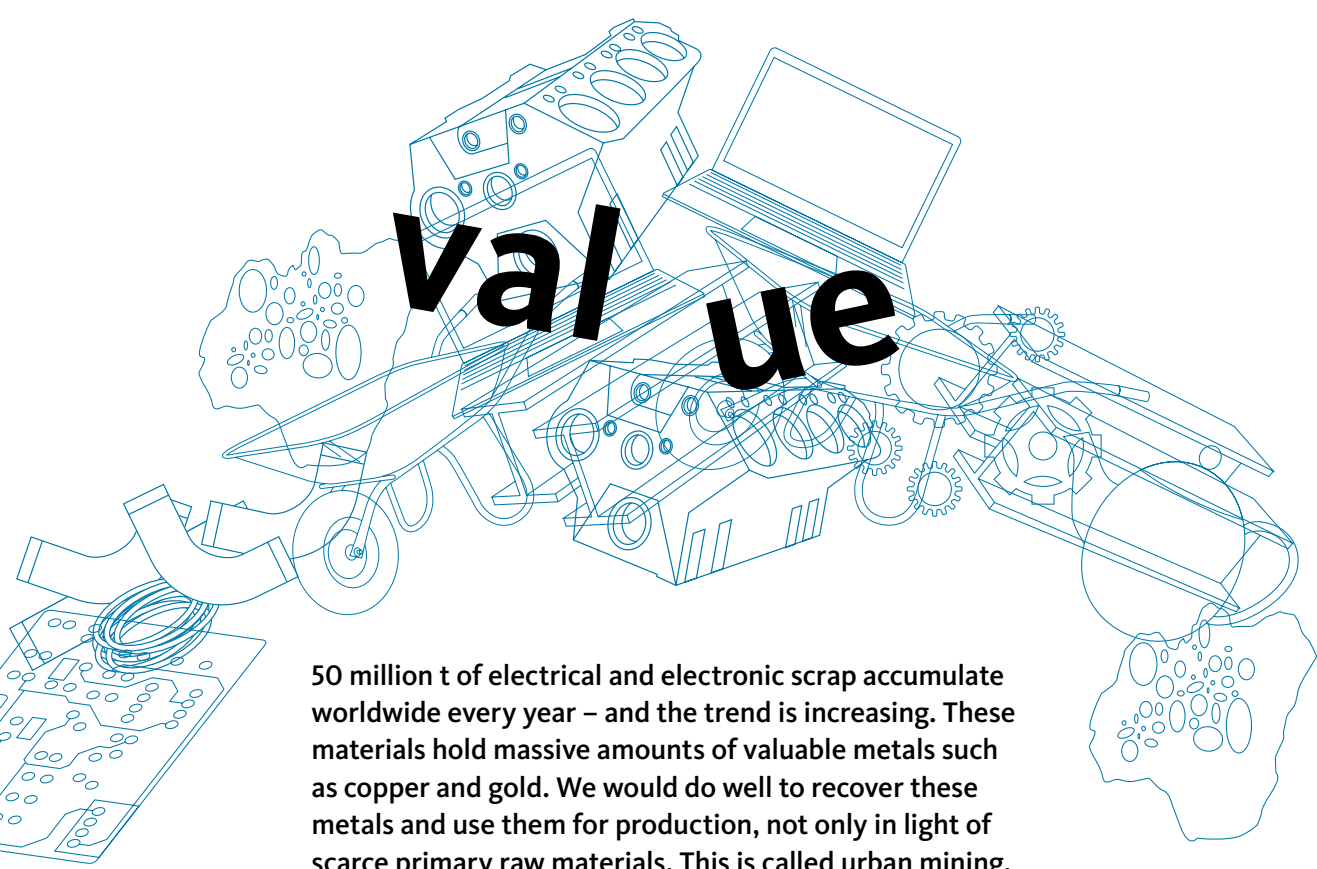
**“Smelters around the world should make energy efficiency a key part of their decarbonization strategy.”**

*What challenges still need to be tackled by 2050?*

**DANIELE LA PORTA** A challenging task revolves around the sheer scale of the rising demand for strategic minerals and metals in such a short time frame. We will need to use a huge amount of energy, land, and water to meet the demand for low-carbon minerals. Another challenging task concerns the lack of capacity and knowledge about how to minimize the carbon and environmental footprint of the mining industry in developing countries. Mineral recycling will play an important role in meeting future demand and will need policy support to overcome the economic, technical, and environmental barriers. The energy sector will also need to play a role in designing low-carbon technologies that can be easily disassembled to enable minerals to be part of the circular economy.



# Unlocking



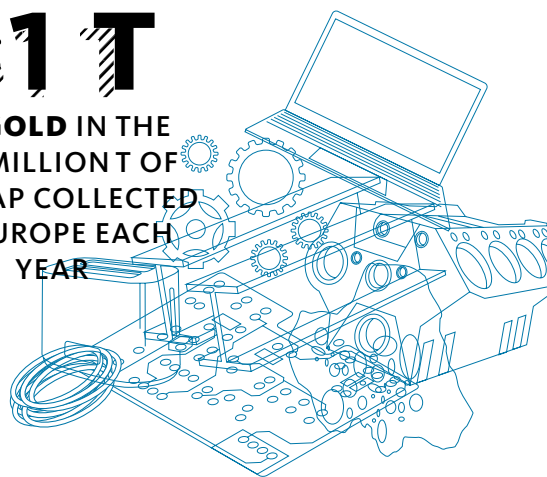
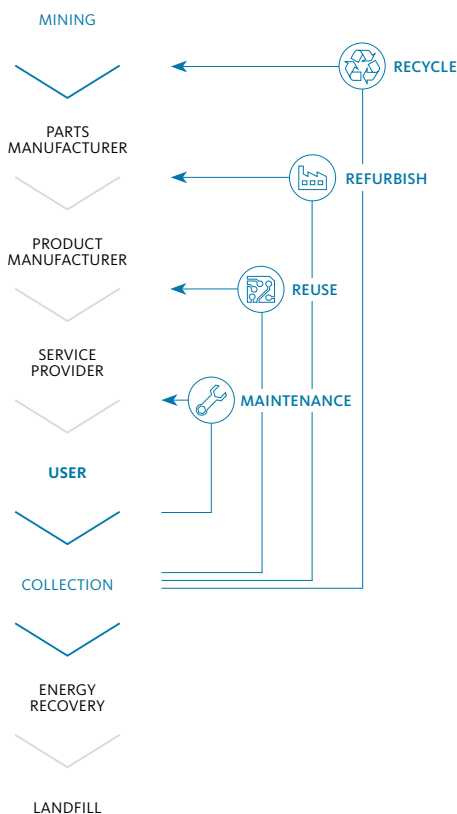
# value

50 million t of electrical and electronic scrap accumulate worldwide every year – and the trend is increasing. These materials hold massive amounts of valuable metals such as copper and gold. We would do well to recover these metals and use them for production, not only in light of scarce primary raw materials. This is called urban mining.

As a result, we have relied on urban mining for a long time at Aurubis. We use recycling materials as input for our production by recovering metals from electrical and electronic scrap with sustainable processes. This includes copper and copper alloy scrap as well as industrial residues that we purchase and process into high-quality products.

The high demands we place on ourselves with regard to responsibly processing electrical and electronic scrap are also documented in the different certifications and standards that we fulfill, such as the WEEE<sup>3</sup> End Processor Standard. And with the acquisition of the Metallo Group, our multimetal recycling expertise has expanded considerably again: sites in Beerse (Belgium) and Berango (Spain) joined our recycling center in Lünen. Our recycling returns end-of-life materials to the production cycle – fully in line with our “closing-the-loop” approach.

**31 T**  
**OF GOLD IN THE**  
**12.3 MILLION T OF**  
**E-SCRAP COLLECTED**  
**IN EUROPE EACH**  
**YEAR**

CIRCULAR ECONOMY MODEL FROM THE ELLEN MACARTHUR FOUNDATION<sup>4</sup>

<sup>4</sup> Based on: [www.ellenmacarthurfoundation.org/circular-economy/concept/infographic](http://www.ellenmacarthurfoundation.org/circular-economy/concept/infographic).



WE HAVE A CLEAR OBJECTIVE:

# WE WANT TO BECOME THE MOST EFFICIENT AND SUSTAINABLE SMELTER NETWORK WORLDWIDE

Building on our strategy, the three pillars of **growth, efficiency, and responsibility**, we want to continue developing Aurubis from a copper producer to a multimetal group until 2025, and become the most efficient and sustainable smelter network in the world. Copper, our main carrier metal, will continue to play a key role in the future because no other metal is accompanied by such valuable additional elements.

We will process a higher quantity of complex copper concentrates while continuing to expand the proportion of recycling materials we use as input. Through internal growth and sensible acquisitions, we will further strengthen our smelter network and therefore our position. We will keep optimizing structures and processes to ensure Aurubis' cost efficiency and investment strength in the long term. And in all of our activities, our conduct is based on a sustainable economic approach in accordance with our mission of responsibly transforming raw materials into value – to provide metals for an innovative world.



# WE HAVE GROWTH POTENTIAL.

An interview with **DR. THOMAS STURM**,  
Senior Vice President Corporate Development



## WE WANT TO TALK ABOUT GROWTH. WHAT IS AURUBIS CONCENTRATING ON AT THE MOMENT?

Growth is an important objective of our strategy – especially when it comes to multimetal. Concretely, this means that we're boosting our capacity and expertise in processing valuable metals that are contained in our raw materials.

The acquisition of Metallo was therefore the perfect strategic step. At the same time, however, we're also working on a variety of internal projects to grow in our central business, copper. Here, the focus is on enhancing efficiency and productivity.

## THE ACQUISITION OF THE METALLO GROUP MEANS MORE METALS, MORE CAPACITIES, MORE RECYCLING ...

Metallo ideally complements the existing smelter network – especially due to their added skills in the separation of copper, nickel, tin, zinc, and lead. With the sites in Lünen, Olen (Belgium), and Beerse (Belgium), we have a “recycling triangle” in which we can process a broad range of recycling materials highly efficiently and recover the most important metals in a marketable form, including further processing in Hamburg.

## WHAT OBJECTIVE IS AURUBIS PURSUING BY BUILDING UP ITS SMELTER NETWORK?

We're focused on the following goal: Aurubis processes raw materials with environmentally friendly, sustainable, and efficient methods, recovering valuable metals and making them available for further processing – and returning valuable recycling material back to the cycle at the end. This helps us conserve resources and provide important metals for future applications in our industrial sector and elsewhere.

## AURUBIS STANDS FOR MULTIMETAL. WHICH PROJECTS CONTRIBUTE TO THIS PART OF THE STRATEGY?

One project in Hamburg, for example, has the purpose of improving and expanding the capacity for processing complex, multimetal materials from internal and external sources. However, we're also working on other projects to increase our nickel processing. Then there are projects and ideas arising from our collaboration with Metallo. Following the initial integration phase, we're now in the process of consolidating, prioritizing, and positioning the strategic projects of both companies for the long term.

## COPPER REMAINS THE CENTRAL BUSINESS. WHAT LEVERAGE FOR GROWTH DOES THIS AREA OFFER?

As a reliable, high-performance partner, we are firmly established in the copper industry. We see significant potential in digitalization and automation. For instance, we will take advantage of the expertise offered by azeti [Focus, page 14](#) to optimize our production processes in a targeted approach because increasing throughput means more efficiency and better cost-effectiveness.

# LEANER, BETTER INTER- CONNECTED, MORE DIGITAL

**Aurubis' cost efficiency and investment strength have to be secured in the long term – even in an uncertain economic environment. This is why Aurubis established the Performance Improvement Program (PIP).**

The fact is, Aurubis is in a challenging, internationally competitive environment. Treatment and refining charges in particular (an important driver of earnings for the company) have come under significant pressure and will stay that way for the foreseeable future. Moreover, the company's personnel and administrative costs have risen significantly in the last several years, causing earnings before taxes to decline. At the same time, Aurubis also has to be in a position to invest in the sites in the future. As a result, Aurubis is taking action now and has established the Performance Improvement Program (PIP), which is focused on reducing costs and increasing throughput to generate a contribution to earnings of at least € 100 million until fiscal year 2022/23.

In the course of a careful review, the company has identified, evaluated, and in some cases already implemented about 350 individual measures. "The PIP measures are appropriate and important," emphasizes CFO Rainer Verhoeven. "Global conditions have intensified considerably for Aurubis. And the coronavirus pandemic shows how quickly the economic environment can change – even if the program, with its special focus on cost reduction, started before the outbreak of the pandemic."



The measures will make Aurubis leaner, better interconnected, and more digital. With new, modern structures and processes, duties and jobs at Aurubis will change and in some cases be cut. Apprenticeships won't be impacted, however, and investments will continue to be made in vocational training. At the same time, Aurubis will cut about 210 jobs in the next two-and-a-half years. "We are aware that the reduction of personnel costs and the job cuts related to this impact people's lives," states CEO Roland Harings. "That's painful. We will try to do this in the most socially responsible manner possible." Aurubis will avoid redundancies wherever possible, forgo filling jobs that open up, and take advantage of voluntary resignations and job changes. The early retirement program has also been significantly overhauled.

**"The PIP measures are appropriate and important. The global conditions have intensified considerably for Aurubis."**

**RAINER VERHOEVEN**  
Chief Financial Officer



# RESPONSIBLY PLANNING THE FUTURE

**In turbulent times, it's important to direct our focus to the right things, the important things, and to transform momentum into opportunities. At Aurubis, many of the topics presented in this magazine preoccupied us and, in some cases, challenged us.**

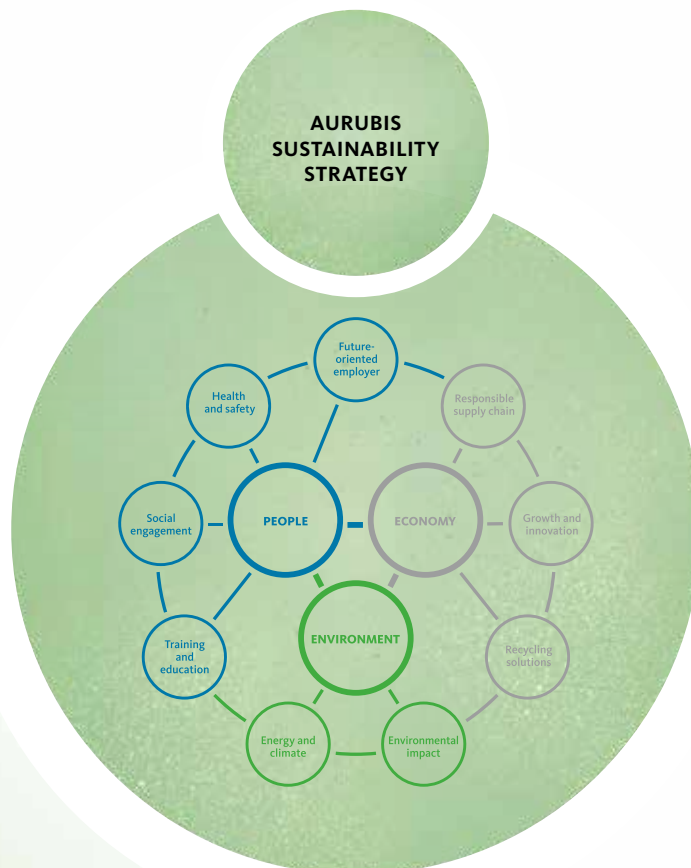
The health of our employees has been at the very top of our sustainability agenda, and not just since the start of the coronavirus. Nevertheless, since the pandemic began, we have been advocating much more for the continued health of our employees while monitoring social and overall economic developments. In contrast to the impacts of the pandemic, there has been a great deal of positive momentum for Aurubis' sustainability agenda with the Metallo acquisition, the new digitalization strategy, and the investments in our training centers and environmental protection measures.

Sustainability is a fundamental part of the Aurubis strategy. In this context, our objective is to align economic, environmental, and social aspects: for instance, improved environmental performance at our plants is accompanied by increased occupational health and more

security for the company sites. Expanding our recycling activities contributes to the circular economy, protects resources, and safeguards raw materials.

We are observing a continuous rise in the sustainability expectations of customers, employees, the capital market, policymakers, and civil society, and we want to take advantage of this momentum for our sustainability vision. From a political perspective, we support fair competition and the ability of responsible companies to act with a sense of security, and we share our knowledge in public projects and initiatives. We rely on dialogue and cooperation because we can achieve the most when we work together.

Aurubis has been committed to the Ten Principles of the United Nations (UN) Global Compact since 2014 and has renewed its commitment during the UN's 75th anniversary year. We have done a great deal so far to fulfill these ten principles and our own Sustainability Strategy. We're currently adjusting this strategy, taking the European Green Deal into account: Aurubis will be carbon-neutral well before 2050, under the right political conditions, and is setting a science-based climate target. We have reached important milestones in responsible supply chain management with the Aurubis Human Rights Commitment and our participation in the Copper Mark [Forward, page 14](#).





## PEOPLE

### MANAGERS OF TOMORROW

EXPLORE! is the name of the training and networking program for Aurubis' potential managers of tomorrow. This 18-month journey kicked off for eight high-potential employees in October 2019. The group also includes two trainees who are taking part in a full-time qualification program. The name EXPLORE! indicates the program's objective. In addition to specialized project work, it includes the development of soft skills in particular, and that can't happen without the participants exploring themselves as individuals, their colleagues, and the company. The program centers on expanding the participants' personal leadership qualities – with the constant support of experienced professionals.



**18-**  
MONTH PROGRAM  
FOR POTENTIAL  
MANAGERS

SINCE

**2015**

**THERE HAS BEEN  
A SUSTAINABILITY  
WEEK FOR OUR  
APPRENTICES**

### EVERYTHING UNDER ONE ROOF

Our employees are our most important success factor, so it's up to us to keep them ready for the future. We foster a learning culture based on personal responsibility, flexible arrangements, dialogue, and digital skills. With the Learning Academy, continuing education and digital, self-guided learning have become even more accessible since mid-2020: the new platform is a central location for all qualification and learning opportunities, and the options have been expanded. Digital and innovative learning formats in particular, such as teaching videos and Learning Nuggets – short learning sessions by colleagues for colleagues – promote enthusiasm for learning and open up new, easy approaches to continued development.

### WE STICK TOGETHER

"Together we care." Solidarity is important – especially in challenging times! Rather than leave our partners alone during the coronavirus pandemic, we have opted to strengthen our social involvement, whether locally in the areas surrounding our plants or internationally in Peru and Chile. We help by providing laptops for homeschooling and disinfectant for families at our partner schools in South America. We support volunteers and organizations that are committed to assisting socially disadvantaged people and regions, educational programs for young people, nature conservation, and cultural institutions now and in the future. We view this as our contribution to a world worth living in – for future generations as well.



## ECONOMY

### CLOSING THE LOOP

Thanks to its integrated smelter network, Aurubis is able to process a broad range of materials, from industrial production waste to complex scrap from end-of-life products. Thanks to the acquisition of recycling specialist Metallo in 2020, we'll be able to do this even more efficiently in the future. In our relations with customers, we also consider the return of the accumulated recycling raw materials, developing targeted "closing-the-loop" partnerships. We have established over 50 partnerships of this kind in which our copper product customers also serve as suppliers of recycling materials.

OVER  
**50**  
"CLOSING-THE-LOOP" PARTNERSHIPS  
IN WHICH COPPER PRODUCT  
CUSTOMERS ARE ALSO  
SUPPLIERS

### STANDARDS FOR RESPONSIBLE METAL PRODUCTION

We see the biggest opportunities for sustainable metal production when every actor in the value chain takes responsibility and works on solutions together. This is why we support the Copper Mark industry initiative. The new quality seal promotes and verifies responsible copper production. Aurubis Bulgaria is the first Aurubis primary smelter to undergo the review process for the seal and has thus committed to fulfilling 32 sustainability criteria. The Copper Mark is putting forth promising efforts to develop a standard for responsible procurement that would cover other non-ferrous metals such as nickel, lead, and zinc as well. Several high-profile companies have already committed to the Copper Mark standards. [coppermark.org](https://coppermark.org)

### INVESTMENT IN THE FUTURE OF THE LÜNEN SITE

Aurubis is investing a total of € 60 million in renovating the tankhouse at the Lünen recycling center. The extensive work is taking place in five phases over three years, so the tankhouse can be operated at up to 80% capacity at all times during this period. After this is completed, it will be possible to use anodes with a higher weight, increasing the tankhouse capacity by 10%. With this investment in the future, Aurubis is strengthening its Lünen site in the Group's smelter network and demonstrating once again its commitment to a sustainable circular economy.

**10 %**

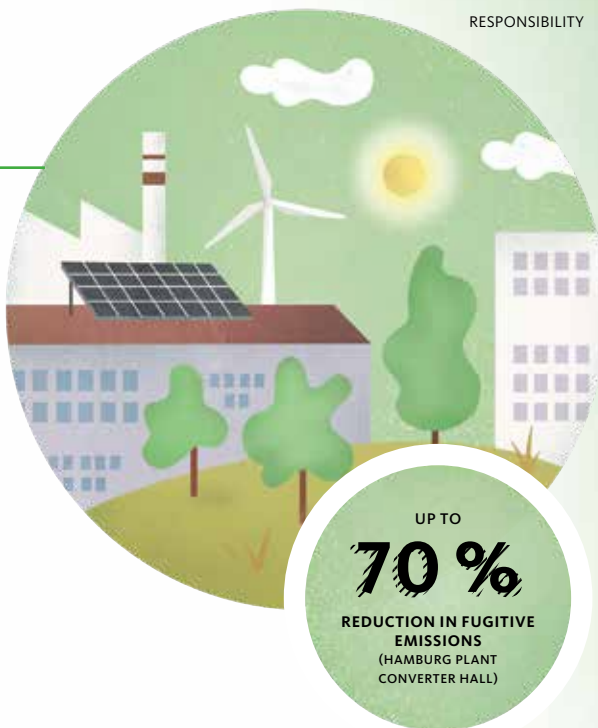
INCREASE IN  
TANKHOUSE  
CAPACITY



## ENVIRONMENT

### SOLAR ENERGY FOR COPPER PRODUCTION

Aurubis Bulgaria plans to construct a 10 MW photovoltaic installation on the plant premises – and thus to become the first industrial consumer in Bulgaria to invest in its own production of green energy on this scale. The contract with CEZ ESCO Bulgaria EOOD, a company of the CEZ Group, was signed in July 2020. Now the next steps will be implemented until the scheduled start of construction in spring 2021. “We want to generate 20% of the electricity that we need from internal renewable sources by 2030,” says Aurubis Bulgaria CEO Tim Kurth, describing the plant’s vision.



UP TO  
**70%**  
REDUCTION IN FUGITIVE  
EMISSIONS  
(HAMBURG PLANT  
CONVERTER HALL)

**10 MW**

PHOTOVOLTAIC INSTALLATION  
PLANNED FOR THE PLANT  
PREMISES  
(AURUBIS BULGARIA)

### COMING CLEAN

With one of the largest environmental protection projects since the 1980s, Aurubis continues to develop its technological edge in environmental protection: until 2023, fugitive emissions of fine particulates in the primary smelter at the Hamburg plant, which previously couldn't be collected, will be reduced by another 70%. With the RDE project (for “Reduzierung diffuser Emissionen,” or “Reducing Fugitive Emissions”), which has an investment volume of over € 100 million, Aurubis proves once again that modern urban development and copper production just a few kilometers from downtown Hamburg can sustainably coexist. Our primary smelters in Germany and Bulgaria are among the cleanest copper production facilities worldwide.

### RESEARCH FOR THE HYDROGEN TRANSFORMATION

CO<sub>2</sub> is generally formed during copper production. Natural gas is used to refine copper, drawing out excess oxygen bound in the copper. However, carbon dioxide (CO<sub>2</sub>) arises in the process in addition to steam. Replacing the natural gas with hydrogen as a reducing agent would eliminate this CO<sub>2</sub>, leaving only the steam. As soon as this metallurgical application of hydrogen proves to be cost-effective, Aurubis will be prepared for a possible switch in the future. Aurubis is currently researching a variety of possibilities for the use of hydrogen.

DEVELOPING

# DIGITALIZATION: COUNTLESS OPPORTUNITIES

Digitalization is a buzzword at the moment – including at Aurubis. The company isn't only relying on traditional IT, automation, and modern software, but is bundling its approach in its own digital strategy.

With the introduction of Microsoft 365 and its conferencing tool Teams, Aurubis did a lot of things right before the outbreak of the coronavirus pandemic. Colleagues across the Group were able to quickly shift to remote work; video conferences are more common now and a number of processes, even audits, have been digitalized. A boost for digitalization – but it's not quite enough. To stay ahead of the competition, Aurubis has to make its production processes more efficient and provide its customers with digital added value, according to Vice President IT Marcus Sassenrath. As a result, a digital strategy has been developed resting on three pillars: digitalization of administrative processes, digitalization of production, and digitalization of business models. "Together, they form a strong network – but each area nevertheless has enough space to independently work on innovative ideas," says Sassenrath. "When it comes to traditional IT, we've been in a good position for a long time. But production and customer relationships can benefit from digitalization, too. We have a lot of potential in this area."

**“When it comes to traditional IT, we’ve been in a good position for a long time. But production and customer relationships can benefit from digitalization, too.”**

**MARCUS SASSENATH**  
Vice President IT



Watch a short presentation by Marcus Sassenrath here.



## THREE PILLARS OF THE DIGITAL STRATEGY >>>

### PRODUCTION

To use the possibilities of digitalization for Aurubis' production as well, Aurubis acquired azeti GmbH in July 2020. The Berlin software company develops and markets an Internet of Things platform that integrates and evaluates production data. This helps in determining and using optimization potential – making production processes in metal production and recycling more flexible and efficient.



### BUSINESS MODELS

Aurubis wants to collaborate more with its customers digitally and to offer them digital added value. With these objectives in mind, the Aurubis Digital Innovation Lab, called the InnoLab for short, was established in early September. The InnoLab develops digital solutions that focus on customers and offer them digital added value, for instance in issues like price fixation or reviewing contracts. The goal: to draw customers and suppliers closer to Aurubis and to tap additional revenue potential.



### NEW DIGITAL ORGANIZATION ESTABLISHED

Working on innovative topics requires a different approach and is best in small, independent teams, which is why Aurubis has set up a new digital organization independent from traditional IT where ideas can be developed with some distance from daily business.

The new organization includes azeti GmbH, with their software platform for integrating and evaluating production data. Aurubis acquired the Berlin software company in July 2020, a smart strategic step that ensures that the platform will be developed to align with the needs of Aurubis and the industry in general in the long term. This also supports the work in the Analytics Center of Excellence, where a team of Aurubis experts works on projects focused on data modeling and artificial intelligence. And, finally, the Digital Innovation Lab established on September 1, 2020 also belongs to the new digital organization. Here, ideas are developed – together with the relevant specialist departments – to provide customers and product suppliers with digital added value.

### ADMINISTRATIVE PROCESSES

IT's main responsibility is still to make business processes more efficient through software and to create the necessary conditions, for example with the appropriate IT infrastructure. With a variety of different projects, IT has achieved a great deal in the past several years. A lot of energy continues to go into other projects – such as the current switch of our SAP system from R/3 to S/4.



# IS COVID-19 SHOWING US HOW WE'LL WORK IN THE FUTURE?

**A discussion with Prof. Dr. Werner Eichhorst, team leader at the Institute of Labor Economics in Bonn, Germany, and professor of labor market policy at the University of Bremen.**

## **WHAT'S BEHIND THE TERM "NEW WORK"?**

The term describes companies' attempts to become more innovative and productive, together with an enhanced group autonomy and self-fulfillment among employees. In practice, this usually means agile work that's more flexible than the classic understanding of work when it comes to structures and hierarchies, work times and locations, but in some cases also forms of compensation and participation.

## **HAS THE COVID-19 PANDEMIC PUSHED THIS DEVELOPMENT?**

There was of course a trend toward remote work and digitalization of communication. This was necessary to ensure continuity in employment in the first place.

Our surveys also show that both companies and employees handled this well for the most part. Nevertheless, it's still too early to make a sweeping statement about whether the pandemic will have a permanent effect on business models and forms of employment, or even cause a structural shift.

## **WILL THE CHANGES IN WORK CONDITIONS STICK AROUND?**

The intensity of remote work will increase in the long term, but it won't lead to teams only being connected digitally. Companies and employees have given a clear signal that a considerable amount of work should happen in the same place, together, due in part to the informal, creative interactions this fosters. So in the future, there will be a frequent option for remote work, together with periods for meeting in a company environment.

## **WHAT IS REQUIRED TO ENSURE THAT THIS TYPE OF COLLABORATION WORKS?**

The coronavirus crisis has intensified existing trends. This is why it's important for teams to know each other personally in the analog world if digital collaboration is supposed to work. It's especially difficult for new employees during this time. Furthermore, work should be clearly delineated at home, in terms of both time and space. That requires self-discipline. And in the long term, there needs to be a solution for childcare during working hours because this means additional stress for everyone involved, and in the end, both of these responsibilities suffer for it.

## WHAT DEMANDS WILL BE PLACED ON SUPERVISORS?

When it comes to managing employees, it's also important for relationships to exist at a personal level. In this unique situation, it's more important than usual for supervisors to take employees' individual, in some cases personal, circumstances into account and to communicate well and frequently – as well as bilaterally. This requires learning processes on both sides. A management style based purely on control reaches its limits in this particular model. A leap of faith is required instead, which can improve the relationship between employer and employee. Our surveys indicate that this is working well for many companies and that the employees feel well informed.

## ARE THERE SPECIAL THINGS TO CONSIDER FOR COMPANIES WITH INTERNATIONAL LOCATIONS?

The number of live meetings involving business trips and conferences has of course dropped sharply recently, being replaced by digital dialogue. Digital communication has shifted to a higher level, which has made this dialogue easier and more intensive. Especially from an international standpoint, this can substantially improve relationships between colleagues if the communication accommodates the employees' individual circumstances.

Nevertheless, purely digital collaboration won't work – particularly across national and cultural borders. In some situations, personal meetings are indispensable, most notably for new employees or when employees have changed positions, because personal dialogue allows for an additional level of communication, for instance when spending breaks together.

PROF. DR.  
WERNER EICHHORST



**PROF. DR. WERNER EICHHORST** has worked at the Institute of Labor Economics (IZA) since July 2005, since January 2017 as Coordinator of Labor Market and Social Policy in Europe. Since November 2017, he has been an honorary professor for European and international labor market policy at the University of Bremen, affiliated with the Research Center on Inequality and Social Policy (SOCIUM). The main focuses of his work include the international comparative analysis of institutions and the development of labor markets, the comparison of labor market policy strategies and reform processes, the future of labor, and the transformation of the world of work.

## IN A PRODUCTION COMPANY, NOT EVERYONE CAN WORK FROM HOME...

Remote work is a feasible alternative for about one-fourth to one-third of employees. But the work situation for production workers is also changing. Their job profiles will change as automation advances, so the amount of routine work will decrease and be replaced by control, monitoring, and innovation tasks. In Germany especially, skilled workers have the qualifications to take on these more complex responsibilities. In the future, traditional blue collar workers will be "light blue" at the most.

Skilled workers therefore have to move into these employment sectors. In the same vein, companies have to be able to provide the corresponding training and transform their business models. Over the long haul, it won't be enough to handle this development by offering working models with reduced hours. This calls for creative solutions.