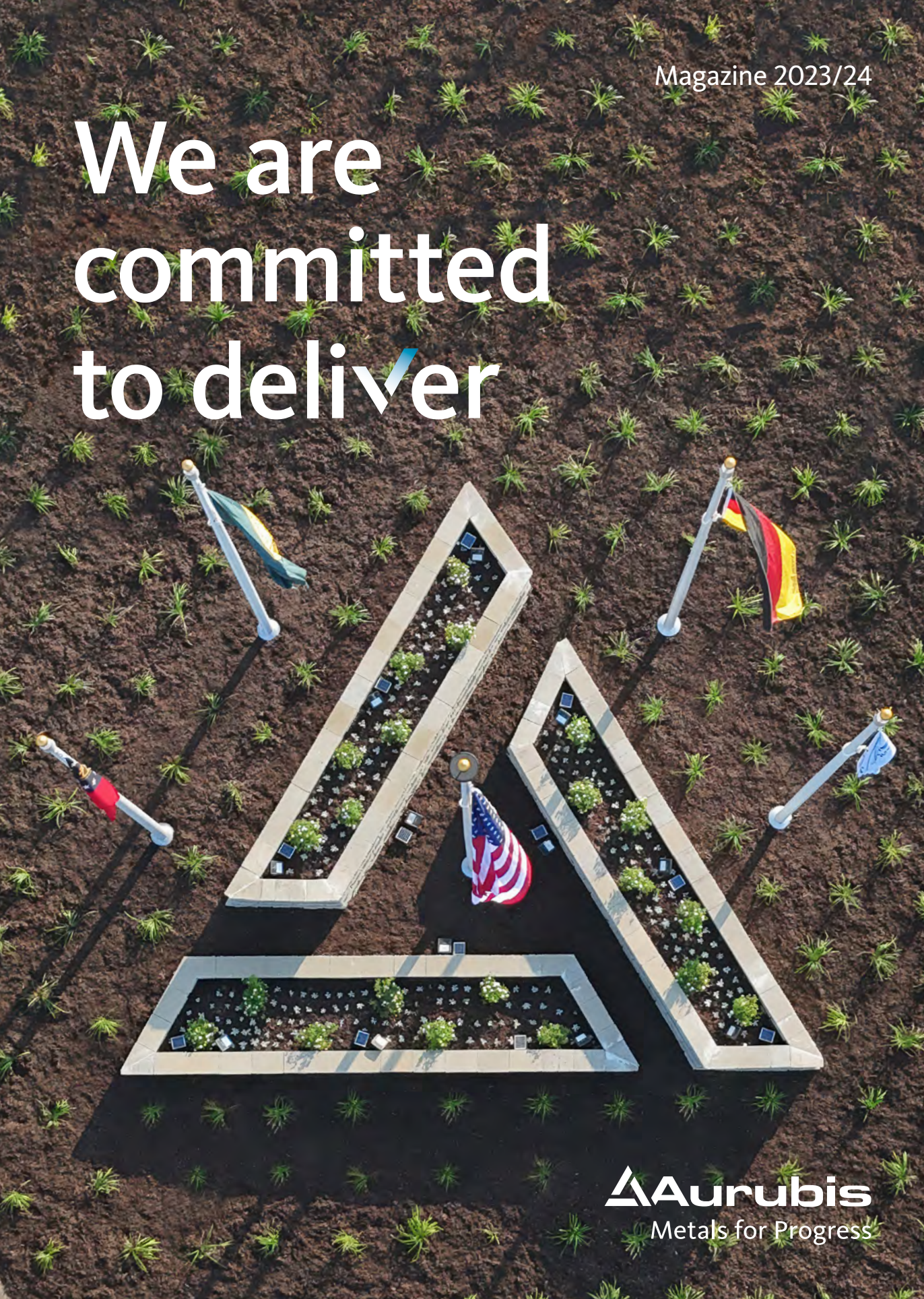


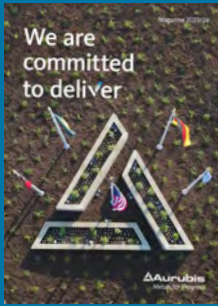
Magazine 2023/24

# We are committed to deliver



 **Aurubis**  
Metals for Progress





We completed our new plant in Richmond County, US this year. The title page features part of the site. Learn more about Richmond starting on page 22.

We set our sights high at Aurubis. Because the only way to achieve great things is to set your sights high and follow through. Our targeted realization of our strategic projects is proof of our high standards. We are consistently advancing our core business in our unique smelter network — using recycling as a value driver and the key to more sustainability, for example — and taking on a leadership role.

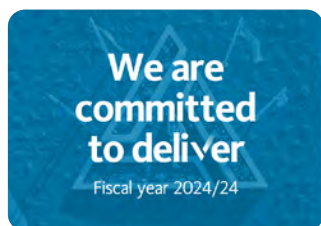
That is all achieved with a lot of innovative power and the unwavering commitment and expertise of our employees. We know that their dedication is what fuels our performance. We are driving our growth with purpose and making targeted investments in projects to reinforce the trust of our stakeholders over the long term.

This approach puts us in an optimal position for the future. We remain true to our strategic course and consistently deliver top performance — to benefit our customers, suppliers, business partners, employees and shareholders.

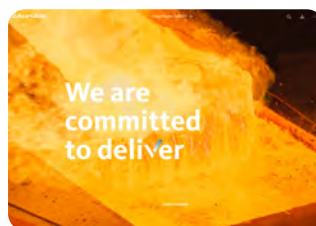
**We are committed to deliver.**

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The fiscal year in 170 seconds:  
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For more exciting information online, click on  
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# We are the new team

Aurubis has set its sights high with a historic growth agenda. A new Executive Board also came together this year after the serious challenges of 2023. With an explicit promise: We deliver. In an interview, the four-person team talks about how crucial it is to consistently implement investment projects, keep expanding the smelter network, and strengthen our multimetal business. The Executive Board team has set clear priorities including heightening trust in Aurubis among all stakeholders.

**Toralf Haag, you already knew Aurubis well from your time as CFO of Norddeutsche Affinerie. After your first few months as CEO: What is new, what has stayed the same?**

**TORALF HAAG** The company is considerably larger and more complex and international than it was in the early 2000s. We produce more metals in larger amounts and are better equipped to handle the huge variety of raw materials. We are following a clear strategic plan. This includes a number of approved investment projects that we are currently realizing, with the dedication of the entire Aurubis team. We plan to deliver — and we will! Along with the still very robust business model, I've seen a lot of familiar faces from back then too. This has shown me just how exceptionally loyal the employees are to the company, a sign of real strength. We will continue to put our faith in this stability, consistency and teamwork in the future as well.

**What is your plan of attack?**

**T. H.** After very honestly taking stock of the company, I have to say: We've still got some challenges to face. Expanding occupational safety, investing in plant security, reinforcing people's trust in Aurubis — to name just three. We are also targeting further enhancements to our financial performance in harmony with our environmental and decarbonization targets. It won't happen overnight, but we'll get there.

And of course we'll put the long-term assumptions of our strategy through their paces, adjust them where needed, and fine-tune our strategy. It's important to me that we do this as a team. On the Executive Board, throughout the company. As the Executive Board, we'll also be driving cultural aspects forward too.

**Tim Kurth, plant security was already mentioned. Where does Aurubis stand today and where do we go from here?**

**TIM KURTH** We've already rolled out comprehensive measures to heighten security step by step — this applies to plant security and work safety alike. All the sites are contributing. Making changes today is one aspect; ensuring these changes last and adjusting them to the changing threat level whenever necessary is another important aspect. We have identified around 400 measures for upping plant safety, and are implementing the 100 most important quickly and systematically. Some are rather obvious, like more efficient surveillance of critical equipment, while others are more complex, like developing and utilizing highly automated sampling systems. We are also working on heightening the awareness of our employees through impactful campaigns, for example. We are protecting our employees to ensure no one becomes a malicious insider.



From left to right  
Steffen Hoffmann (CFO), Inge Hofkens (COO),  
Dr. Toralf Haag (CEO), Tim Kurth (COO)



**And how are you improving occupational safety?**

**T. K.** We're taking a similar approach. Our objective is clear: zero work-related accidents at Aurubis. But we can't just impose rules and make it so. Along with technical and organizational measures, aspects of company culture are also incredibly important for behavior-based work safety. Our method is to have every site work on its individual challenges because every site has different conditions. We are also defining Group-wide standards. Everyone I've spoken to has expressed great willingness to drive us in the right direction.

**Aurubis is growing, especially in recycling. Inge Hofkens, what is the most important project to you?**

**INGE HOFKENS** The great thing about our growth strategy is that we are not 'putting all our eggs' in one project. We're advancing all our sites. Each according to an individual blueprint to judiciously expand our smelter network, further optimize material flows, and keep even more metals in the loop. This is how

we are conserving society's resources and increasing our independence from other regions of the world in Europe and the US. Recycling is an aspect of what we do at almost all our major sites. Around two-thirds of the investment funds greenlit for the strategy are going towards this growth area. This is our direct contribution to important political initiatives like the Critical Raw Materials Act and the circular economy. Every project at Aurubis has its own charm and added value for the smelter network. In sheer size though, our investment in the US stands out.

**Because of the high sum invested?**

**I. H.** In part, but it's more than that. We are very proud to be bringing the first secondary smelter of this kind for complex recycling materials in the US to life. The project has a lot going for it: The market is attractive, large and growing. The broad parameters are competitive and pro-business and the transport connections ideal. Policymakers and US suppliers on the ground really value how we are strategically closing loops for critical metals and acting as a



**INGE HOFKENS**  
Chief Operations Officer

local buyer. We will successively ramp up the plant's capacity in 2025. Our goal is to be the market leader in multimetal recycling in the US. We've set our sights on nothing less.

**Aurubis is known for its solid financing. Steffen Hoffmann, is the largest investment agenda in the history of Aurubis endangering this strength?**

**STEFFEN HOFFMANN** Absolutely not. Aurubis is on — and is staying on — solid financial footing. An equity ratio of over 55% and very little outside debt gives us a lot of latitude. We will have no problem handling the currently approved projects totaling €1.7 billion, over 50% of which has already been invested. Of course we are seeing the launching costs for strategic projects in our financial statements, since earning contributions will come later. This goes hand in hand with temporarily negative cash flow. That's normal as well. On the Executive Board we are in agreement that clear priorities have positive cash flows.

**With the financial statements fresh in your mind, do you see any major hurdles?**

**S. H.** I don't see any major hurdles, but maybe some things to pay attention to. We will be keeping a closer eye on the cost factors in the future. It's not easy to walk that tightrope between a growth phase on the one hand and a lean organization on the other. Our investments in digitalization and automation will help us here in the future: using computer-assisted decision-making templates to make production processes 'smart' while managing our naturally fluctuating inventories even better than before. I see these as important issues to address.

**Toralf, more than 40% of approved strategic funding is going to the US. What role will Europe play for Aurubis in the future?**

**T. H.** A large one. Europe is and will remain our core market. Starting up in the US and focusing on Europe is not either/or: We can absolutely do both! Aurubis Richmond is an investment in the North American regional growth market, diversification that makes



**STEFFEN HOFFMANN**  
Chief Financial Officer

sense for us. It rounds out our business in Germany and Europe and adds even more stability to our business model. We are investing around €750 million in our Hamburg headquarters alone, this year and in the coming five years. Projects to advance our multimetal strategy, to optimize processes, but also in climate and environmental conservation. This is the approach we are taking to the entire smelter network. We are strengthening our key core business, copper concentrate smelting, in particular. At the same time, we're driving a lot of decarbonization and environmental projects to help us reach our goal of going carbon-neutral before 2050. Today, we produce our copper cathodes with 60% lower CO<sub>2</sub> emissions than our global competitors. Yes, Aurubis is energy intensive. But we are also very energy efficient.





**TIM KURTH**  
Chief Operations Officer

### **Which projects specifically?**

**T. H.** We're building captive solar parks on a large scale in Bulgaria, and our Belgian plant in Olen runs almost exclusively on offshore wind power and innovative energy sources. We're also identifying more potential for energy efficiency in our processes. This is how we are closing loops, and the benefits go well beyond Aurubis. Our Industrial Heat project is an excellent example. In 2024, we laid the groundwork for significantly expanding existing capacity. Since 2018 we have been supplying heat from a sub-process of copper production to Hamburg's HafenCity East district; now, starting in the 2024/25 heating period, this will heat up to 28,000 more Hamburg households — avoiding up

to 120,000 t of CO<sub>2</sub> emissions in the city of Hamburg every year. Another significant sustainability project that shows that industry is a crucial piece in the energy and heat transition puzzle. We were awarded the 2024 German Sustainability Award for our work in sustainability and recycling — gratifying recognition of the performance of the entire Aurubis team.

### **Tim, recycling won't be enough to cover global demand for copper. What are you doing to get our core business, copper concentrate processing, fit for the future?**

**T. K.** We're investing in equipment, processes and know-how. This year, we completed the largest planned maintenance shutdown in the Hamburg site's history. Next year, we'll be comprehensively updating the equipment in our Bulgarian plant to state of the art. We regularly use scheduled maintenance shutdowns to make our processes better, more efficient and more innovative. The new anode furnaces in Hamburg are one example. They are H<sub>2</sub>-ready and fit for the hydrogen age. But that's not all: We were involved in designing the anode furnaces, which are also 30% more energy efficient even when using conventional natural gas. This not only directly benefits us; it is good for the environment too. I am completely confident that Aurubis will continue to utilize enormous potential through process improvements and innovations in the coming years. Potential that we will leverage to combat rising costs in areas like energy procurement and competition for the best employees.

### **How much more potential is there at Aurubis to produce even more copper for the energy transition?**

**T. K.** We are spending a lot of money to expand the capacities of our tankhouses, especially in Bulgaria right now. This will ultimately give us a 50% rise over production today. In Lünen as well, we successfully concluded a year of work refurbishing the tankhouse in 2024 — an investment that will yield an around 10% capacity increase in copper cathode output. This is how Aurubis is directly contributing to ensuring



that European industry has access to the metals it so critically needs for the energy transition in Europe. This is good for the environment and good for prosperity in the regions we are active in.

**Everyone is talking about responsibility in the supply chain. Inge, what progress did Aurubis make in the most recent fiscal year?**

**I. H.** To my mind, the Copper Mark certification at our sites in Beerse, Belgium and in Stolberg, Germany was a significant milestone in 2024. In part because it marked a huge success for all the employees who contributed to the process. But also because it means all our large smelter sites, and with them the majority of our smelter network, have been certified with the gold standard of the copper industry. More than 95% of Aurubis cathode production complies with the Copper Mark standards, which draw on the 33 internationally recognized sustainability criteria set out in the Risk Readiness Assessment of the Responsible Minerals Initiative (RMI). In the coming year, the Copper Mark certification of Aurubis subsidiary Deutsche Giessdraht GmbH is planned along with a number of recertifications. And we'll keep moving forward!

**Steffen Hoffmann, aside from financial factors, what do you see as the most important factor for Aurubis' future success?**

**S. H.** It might seem surprising coming from a CFO, but for me our employees are our most valuable element. They are the foundation of our success — for day-to-day business and financial results. We closed out the past year successfully too, as is clear from €413 million in operating earnings and an around 11.5% return on capital employed. At the same time, we achieved great cash flow at €537 million, on par with the level of the previous year. It is the people at Aurubis who make all these successes and all our investments possible in the first place.

**Toralf, where would you like to steer Aurubis in the coming three to five years? What are your key objectives?**

**T. H.** To win back trust in Aurubis! We have the potential to become the benchmark for occupational safety and plant security in our industry. We will also continue to raise profitability, expand recycling — an industry of the future — and drive our multimetal strategy. We are an important global supplier of metals that are essential for the transition to a more sustainable global economy, so we are supplying an important megatrend. We have excellent prospects for the future because we continue to fortify our robust business model with organic growth projects, and to better our unique smelter network with additional processes and processing capabilities. We want to be and remain the partner of choice for suppliers, for customers, and for the society in which we live and work!



**DR. TORALF HAAG**  
Chief Executive Officer

# Our strategy



As a world leader in copper recycling and supplier of non-ferrous metals, Aurubis processes complex metal concentrates, scrap metals, and metal-bearing recycling raw materials into metals of the highest purity. Offering around 20 metals, we are essential for the transformation to a more sustainable, carbon-neutral economy.

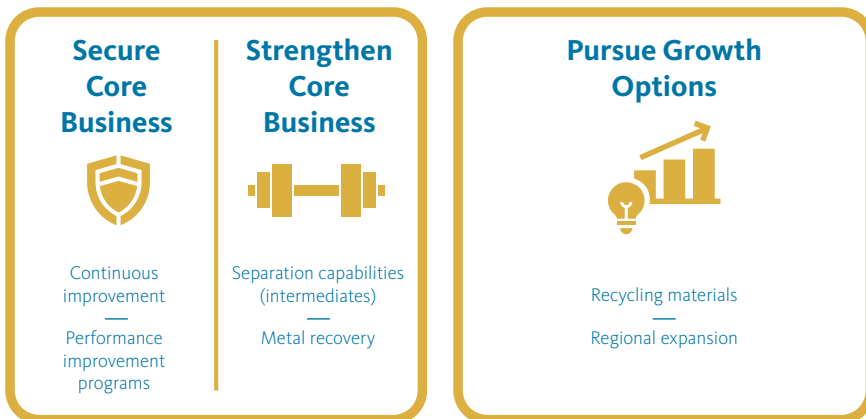
Our core strength lies in our unique network of copper smelters, recycling sites, and highly specialized metal processing facilities. This unique structure and enormous know-how allow us to process a wide range of materials efficiently and profitably.

Our Metals for Progress: Driving Sustainable Growth strategy is based on three pillars: securing and strengthening the core business, pursuing growth options, and expanding an industrial pioneering role in sustainability. Digitalization, automation in production, strategic resource planning, and personnel

management are key factors for success. We leverage targeted, long-term growth projects to optimize and expand our network with the aim of bolstering and consistently broadening our position as one of the most efficient and sustainable multimetal producers in the world.

### Securing and strengthening the core business


Processing metal-bearing raw materials from concentrates and recycling materials is our core business. We consistently invest in our sites, expanding processing capabilities and increasing metal yield



**Expand industry leadership in sustainability**

Enablers: » Digitalization, automation and “Plant of the Future”  
» Strategic resource management, talent and personnel development





“Our strategic projects are ambitious — because the future is made of metals!”

Dr. Toralf Haag, CEO

in the smelter network. We aim to further optimize material flows among the plants to take even greater advantage of synergies. With projects like Complex Recycling Hamburg (CRH), we are driving internal value creation, building up recycling capacities, and furthering the circular economy.

### Pursuing growth options

The recycling business is growing in importance in Europe and the US, and is a key driver of growth for us. We see ourselves as pioneers in sustainable metal recycling with our new plant, Aurubis Richmond in Georgia, US. The site strengthens our smelter network and offers new diversification opportunities beyond Europe.

We also see huge potential in battery recycling, especially in the recycling of black mass from lithium-ion batteries.

### Industry leadership in sustainability

Sustainability is an integral part of our strategy. We are planning a 50% reduction in Scope 1 and 2 emissions by 2030 — through the use of green hydrogen, by electrifying our production processes, and by expanding the captive generation of clean electricity. We are also targeting a 24% drop in our Scope 3 emissions per ton of copper cathode and increasing the recycling proportion by up to 50% by 2030 as well.

Today we already produce copper cathodes with around 60% lower CO<sub>2</sub> emissions than the global average and we are steadily working on widening this gap.

## Status quo and outlook

In the coming three years, we will execute a series of additional projects to raise the performance of our smelter network even higher.

**Aurubis Richmond Module 1**  
(Georgia, US)

**Bleed treatment Olen Beerse (BOB)**  
(Olen, BE)

**Solar Park 3 & 4**  
(Pirdop, BG)

**FY**  
**2023/24**

**FY**  
**2024/25**

**Advanced Sludge Processing by Aurubis (ASPA)**  
(Beerse, BE)

**Anode Furnace 2.0**  
(Hamburg, DE)

**Industrial Heat II**  
(Hamburg, DE)

**Solar Park 2**  
(Pirdop, BG)



**FY**  
**2025/26**

**FY**  
**2026/27**

**Aurubis Richmond Module 2**  
(Georgia, US)

**Complex Recycling Hamburg**  
(Hamburg, DE)

**Tankhouse Expansion**  
(Pirdop, BG)

**Precious Metals Refinery**  
(Hamburg, DE)

**Slag Treatment**  
(Pirdop, BG)



# We secure

We leverage innovative power, investments and sustainability to increase the strength and scope of our core business. With future-focused processes and state-of-the-art technologies, we are safeguarding our competitive edge and generating lasting value.



A large industrial facility, likely a copper refinery, with complex piping and a forklift carrying a stack of copper sheets. The word "business" is overlaid in white text with a blue checkmark.

# business ✓

# Innovative ASPA recycling plant opens in Beerse

We celebrated the opening of the Advanced Sludge Processing by Aurubis (ASPA) plant at our Aurubis site in Beerse, Belgium in early September 2024. “ASPA, a new, state-of-the-art hydrometallurgical process developed completely in-house, is another excellent example of Aurubis’ innovative power. We are pioneers in sustainable metal production and taking recycling to a whole new level,” COO Multimetal Recycling Inge Hofkens said.

## Greater efficiency in metal recycling

The ASPA facility processes anode sludge, a valuable intermediate product from electrolytic copper refining at the recycling sites in Beerse and Lünen. The new technique was developed completely in-house using Aurubis expertise and offers two major advantages: quicker recovery of precious metals and the complete recovery of lead and tin from anode sludge. ASPA strengthens recycling in the Group and creates great value for the circular economy.



### ASPA

Opening	September 4, 2024
Investment	~€33 million
Higher recovery of	Precious metals, tin
New jobs	~ 20

Construction on the completely new area started in December 2022, and the grand opening took place in September 2024. This around €33 million investment is a clear signal of Aurubis’ commitment to continuing to advance the Beerse site. ASPA links the European sites more closely than ever before. We are generating additional synergies by optimizing preliminary product flows.

ASPA is one of the largest investment projects in Aurubis’ strategic roadmap. It helps us strengthen our position as one of the most efficient and sustainable integrated smelter networks in the world.

# State-of-the-art tankhouse commissioned in Lünen

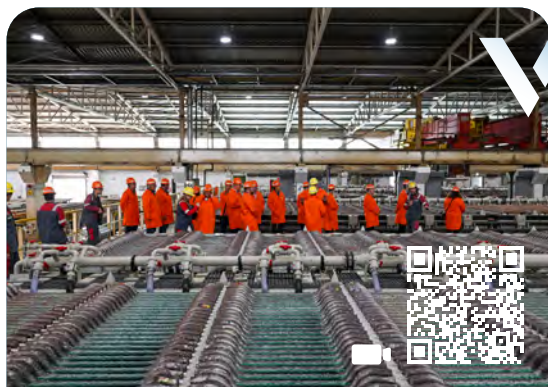
On June 6, 2024, Aurubis officially commissioned the modernized tankhouse at the Lünen recycling site. €60 million went into this comprehensive refurbishment, which increases production capacity by around 10% as global demand for raw materials rises. We will now be able to manufacture up to 210,000 t of copper cathodes in Lünen.

## Sustainable modernization

Future-proofing the site was an important factor for us. This investment is a commitment to both the site and to protecting the environment. With this long-term approach, we are investing in the plant's

future viability for the coming decades and further securing Lünen's position as one of the most important Aurubis multimetal recycling sites in Europe. Lünen is a powerful cornerstone of the circular economy and crucial to the success of the energy transition.

In addition to copper, Lünen also processes other metals — such as gold, tin and nickel — into intermediate products as part of operations. Our pioneering approach increases the overall availability of responsibly recycled metals. Modernization started in 2020 and included overhauling the tankhouse basins, renovating the infrastructure, and investing in state-of-the-art robotics. We were able to continue running the plant at about 80% capacity despite construction.



## The Lünen tankhouse

Opening	June 6, 2024
Investment	~ €60 million
Production capacity	+10%
Copper cathodes (p. a.)	210,000 t

## Electrowinning pure copper

Electrolysis is the final step in the copper refining process. Copper anodes — plates weighing about 400 kg with a copper content of up to 98%, recovered by melting down recycling raw materials in multiple upstream steps — are electrochemically dissolved in the tankhouse. The copper ions are deposited on stainless steel plates, resulting in 99.99% pure copper for optimal conductivity in downstream applications. The other substances contained in the anode, such as precious metals, precipitate out during electrolysis and are then separated out in additional steps and refined in the Aurubis Group network.



# Aurubis Hamburg completes the largest maintenance shutdown in its history

On July 11, 2024, we wrapped up the largest scale maintenance shutdown in the history of the Hamburg site.

This investment is a clear commitment to the Hamburg site. We completed around 500 individual projects during the scheduled maintenance and modernization work and invested roughly €95 million. The scope included important steps like technically inspecting the waste heat boiler, updating the flash smelting furnace, and installing a new heat exchanger in the contact acid plant. These projects considerably boost energy efficiency and enhance environmental protection. We also installed a tap hole drill and tamping machine, which will automate slag tapping in copper production in the future, heightening occupational safety.

We have invested extensively in the digitalization and automation of our production equipment during maintenance shutdowns in recent years. These modernizations allow for even more efficient and stable production processes and ensure challenges are identified at an early stage so countermeasures can be initiated in good time. This optimized basis allows us to extend the maintenance cycle at our primary smelters from two to three years. We are unwaveringly pursuing our goal of further increasing our already high system availability.

Key measures included technically inspecting the waste heat boiler, updating the flash smelting furnace, and installing a new heat exchanger in the contact acid plant.

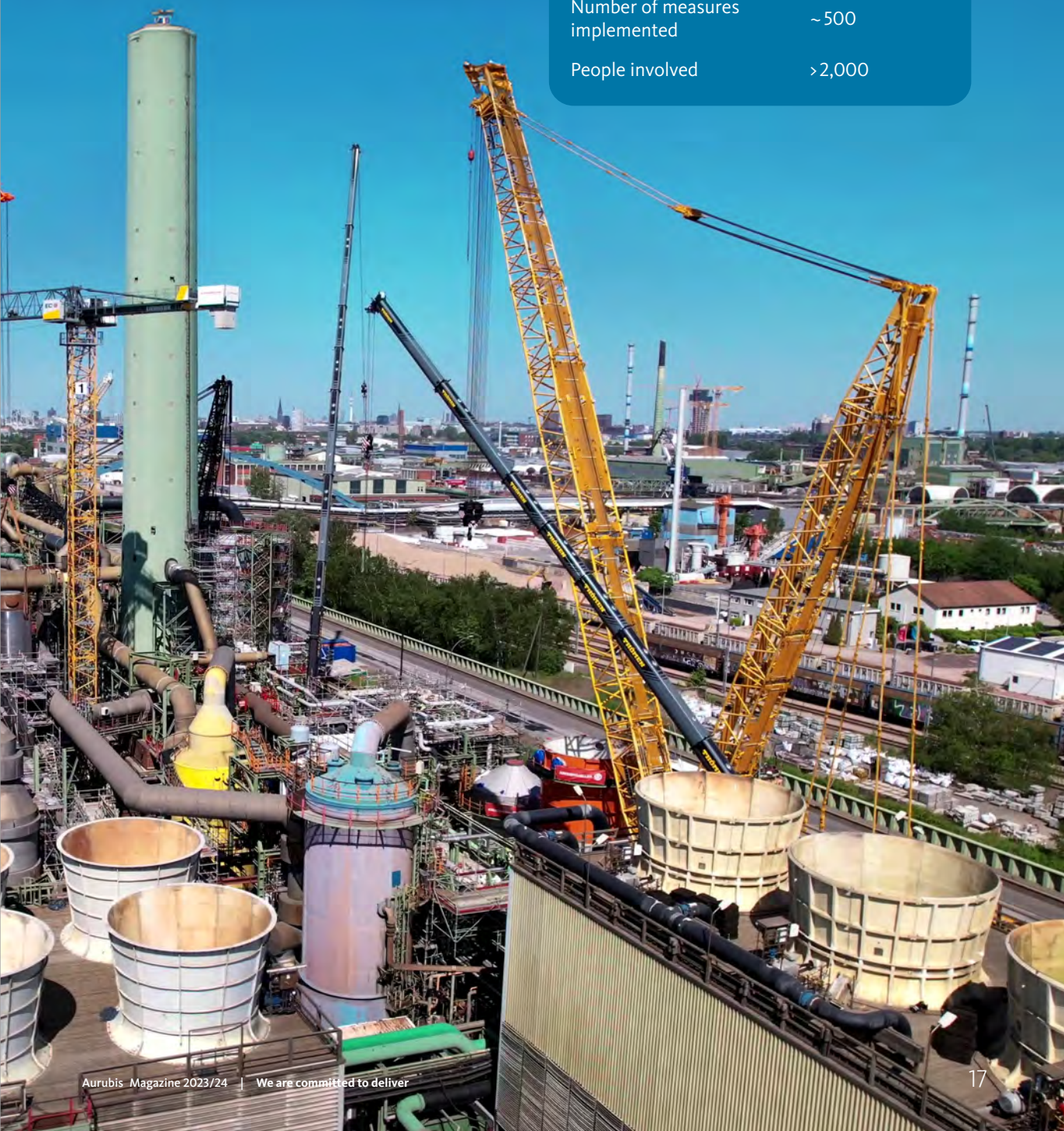




## Maintenance shutdown Hamburg



Concluded	July 11, 2024
Investment	~ €95 million
Number of measures implemented	~ 500
People involved	>2,000





The new plant under construction in early November 2024.

# BOB recovers metals from bleed

Aurubis inaugurated the new Bleed treatment Olen Beerse (BOB) plant at the Olen (Belgium) site in December 2024.

BOB uses a hydrometallurgical process to recover valuable metals such as nickel and copper from the electrolyte streams generated during electrolysis in metal production at the Aurubis Beerse and Olen sites (both in Belgium). The facility comprises a complete tankhouse purification system known as bleed treatment.

## Optimizing material flows

BOB allows Aurubis to take over another part of the multimetal value chain and optimizes Group-wide

### BOB — Bleed treatment Olen Beerse

Inauguration	December 2024
Investment	~ €85 million
Planned bleed capacity	~100,000 t
New jobs	+30

material flows by processing electrolyte streams from Beerse and Olen. BOB is an important building block in our strategy. We consistently strive to use raw materials and intermediate products even more responsibly to contribute to a powerful European circular economy.

## Pioneer in sustainability

The recycling plant also meets the strictest environmental standards in Belgium and Europe. More proof that Aurubis is a pioneer in sustainable metal production.



# A whole new level of the circular economy

At the heart of the Complex Recycling Hamburg (CRH) project is an innovative plant that will combine the separation and further processing of valuable raw materials and decisively increase our capacities for recovering metals from intermediate products resulting from copper production. CRH gives us the ability to process copper-lead matte, an intermediate that contains copper, lead, sulfur and precious metals, in-house in the future, extract valuable new raw materials like blister copper, sulfur dioxide, and lead oxide, and process them further in our smelter network. The project involves an investment volume of about €190 million and will allow us to treat an additional roughly 30,000 t of recycling material per year along with larger amounts of complex smelter intermediate products. This innovative process enables the highest value recovery rates and reliably closes important material cycles.

Developed especially for this project, the process improves the utilized capacity of our existing equipment and expands the metallurgical capabilities of the Aurubis smelter network. This means we can advance our competitive position and make precious metal processing more efficient through quicker process times.

**“No other growth project optimizes as many value streams and is so closely integrated into our smelter network as CRH.”**

Jürgen Jestrabek,  
Complex Recycling Hamburg Project Manager



## CRH — Complex Recycling Hamburg

Opening	FY 2025/26
Investment	~ €190 million
Anticipated recycling material throughput	~ 30,000 t/a



Copper-lead matte, consisting of copper, lead, sulfur and precious metals, is one of the intermediate products.



### The Pirdop tankhouse

Groundbreaking	April 25, 2024
Completion	FY 2025/26
Investment	~ €120 million
Production capacity increase	+ 50 %

## Aurubis gives the site and copper production a boost

In April 2024, we started the tankhouse expansion for copper production in Pirdop, Bulgaria. Bulgarian Minister of Economy and Industry Dr. Petko Nikolov was present for the official kick-off of an investment that impressively underscores our strategic focus, Driving Sustainable Growth. With a total investment of around €120 million, the project is a huge step forward for both the Pirdop site and for strengthening our core business in copper refining. Completion is scheduled for the 2025/26 fiscal year.

Expanding the tankhouse in Pirdop will increase annual production capacity on site by 50%, to a total

“The Pirdop site is a cornerstone of the smelter network for Aurubis.”

Tim Kurth,  
COO Custom Smelting and Products

of 340,000 t of refined copper. This essential metal for the energy shift and digitalization is in higher demand than ever. The capacity expansion in Pirdop is our contribution to meeting this growing demand and reinforcing European supply security. Our focus is on enhancing not only the volume but also the efficiency of our copper production, and processing all of the anode copper produced in Pirdop directly on site in the future. This also reduces our logistics costs and, consequently, our Scope 3 emissions.

The tankhouse expansion is part of an extensive investment program in Pirdop that aims to make the site fit for the long-term future. For example, we are installing around 460 high-efficiency engines and modernizing transformers and lighting technology, significantly improving energy efficiency. These modifications will prevent around 12,000 t of CO<sub>2</sub> emissions a year and are instrumental in helping us achieve our target of carbon-neutral production well before 2050.

Aurubis has been a key industrial investor in Bulgaria since 2008 and plays a decisive role in the country’s economy. The tankhouse expansion and resulting increase in copper output demonstrate our confidence in the Pirdop site and its further sustainable development.



## Optimizing slag processing

Aurubis is investing around €46 million in an improved slag treatment process at the Bulgarian site. This project makes an important contribution to protecting the environment. In the future, slags will no longer be cooled in pits but in over 200 slag pots instead. Although the current process is considered good practice in the industry, we are raising the bar for environmental protection with the new method that goes well beyond current standards. It allows us to increase occupational safety on site while also considerably lowering the diffuse emissions produced during slag processing. This investment in an optimized slag treatment process will play a role in getting us to our target of an additional 15% reduction in specific dust emissions by 2030 compared to the 2018 baseline.

In addition to positively impacting environmental protection and occupational safety, the new process also reduces copper losses in slag and improves metal yield. This allows us to keep an even higher percentage of copper in the production loop. Once scheduled commissioning is complete in 2026/27, we will be able to extract around 500 t of additional copper a year.

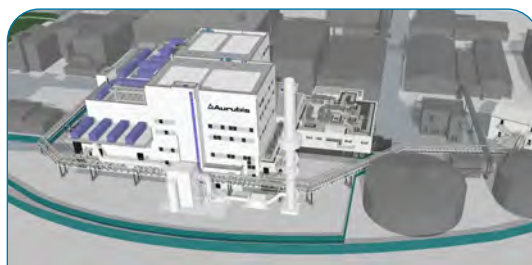
### Slag treatment Pirdop

Opening	FY 2026/27
Investment	~€46 million

## Aurubis is heightening security and setting new standards in process technology and systems engineering

Aurubis is investing around €300 million in a new, innovative precious metals processing plant at the Hamburg site. In combination with the existing equipment, the Precious Metals Refinery (PMR) represents a new, integrated high-security area for precious metal processing at the site. The new refinery is expected to launch in fiscal year 2026/27.

The Precious Metals Refinery in Hamburg brings the entire precious metals processing chain together in one closed security area. The project not only heightens plant and precious metals security and occupational safety; it also sets new standards with innovative process technology and systems engineering. The newly developed metallurgical process will considerably reduce throughput times for materials containing precious metals and lower operating costs by around 15%. We are significantly raising production capacity for precious metals with this optimization and laying the groundwork for additional strategic growth projects.



### Precious Metals Refinery

Opening	FY 2026/27
Investment	~€300 million



# We pursue

We develop future-focused business areas and expand global capacities to satisfy the rising demands of a sustainable economy. This is how we are strengthening our position as a leading company in multimetal recycling and contributing to driving the circular economy.



# growth

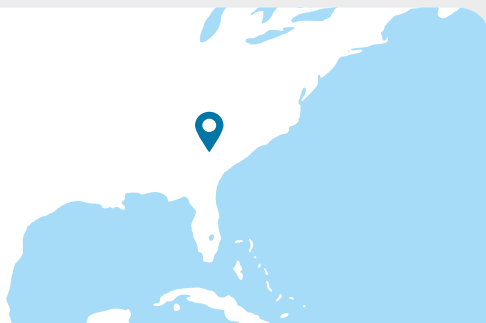




## A huge step

Aurubis Richmond in the US state of Georgia is the first recycling plant specialized in multimetal recycling in the US. We are tapping into an exceptionally attractive market with a growing volume of recycling materials.





## Aurubis Richmond

Site	Georgia, US
Number of modules	2
New jobs following phase 2	~ 230
Complex recycling materials	180,000 t/a
Total investment	~€740 million

Follow the Aurubis Richmond team:



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Current videos



Insights and impressions



Wrap-up of Ribbon-Cutting Ceremony

Where four years ago there was just fallow land, today more than 160 people are at work now that full operations have started at Aurubis Richmond LLC in Augusta, Georgia, US. Around 300 guests attended the symbolic Ribbon-Cutting Ceremony on September 20, 2024. Together with employees and representatives of the Executive Board and Supervisory Board, numerous high-ranking guests from politics, the business community, and society celebrated the official kick-off of gradual ramping-up. Guests included Governor of Georgia Brian Kemp and Mayor of Augusta Garnett L. Johnson.

### Enabling growth

Our new plant is a central building block in the Aurubis Metals for Progress: Driving Sustainable Growth company strategy. Growth is one pillar of this strategy — and the US was identified as an attractive growth market for recycling when the strategy was being developed. “Investing here in the US is absolutely the right move: Until now, the majority of US e-waste was exported, landfilled or not collected at all, causing valuable

The ribbon cutting took place with Governor of the State of Georgia Brian Kemp in attendance on September 20, 2024.



# 2020

## Over the course of 2020

The foundation is laid: The rough design and the basic engineering are completed. They form the basis for calls for initial bids.

critical and strategic raw materials to be lost to local industry. Awareness of sustainability has grown in the meantime, and recycling materials are now increasingly seen as a critical source of raw materials as resources grow scarcer. “We are creating capacity for recovering precisely these raw materials,” David Schultheis explains. Starting in October 2020, he headed the strategy process at Aurubis and has been Managing

Marc Neidhart and his team are responsible for supplying the plant with recycling materials like e-waste.



Director of Aurubis Richmond since July 2023.

“The new plant is a great example that has confirmed our prognoses — and shows what we can achieve together as a team.”

## Securing supply chains

Aurubis Richmond is groundbreaking work and is making an important contribution to more sustainability and supply chain security in the US economy by recovering valuable raw materials — primarily copper, which is now on the Critical Materials List in the US — from recycling materials. With growing awareness of sustainability in the US, and as export rates fall, the supply of complex recycling material is rising.

## Strengthening the network

After the second stage is completed, Aurubis Richmond will be able to process more than 180,000 t of e-waste and other complex recycling materials in a way that is sustainable and environmentally sound. For Aurubis, the new plant in Augusta is an important expansion of the integrated international smelter network and an attractive new site. It diversifies the business and project portfolio beyond Europe and considerably expands the supplier market for recycling material. This will raise the recycling percentage for our base and minor metals in the Aurubis Group in the future.

2021

**By summer 2021**

Various possible sites have been identified and evaluated. In September 2021 the decision is made in favor of Augusta in Richmond County, Georgia.

**Leading the way**

Getting from the idea to the new plant has been a long process that needed to be achieved in the shortest possible time. “We want to be a pioneer in recycling in the US, which is why we had to act very fast. Now we are opening nothing less than the first multimetal recycling plant in the US here,” Inge Hofkens says. She closely supervised the project as COO Multimetal Recycling.

**Pioneering work**

Aurubis Richmond is the first greenfield project in 110 years of company history: When work began on the project, there was no site, no local contacts, and no experience with developing a site from scratch. “But we had the complete support of the Executive Board and Supervisory Board — and from every individual we asked for help from here,” Project Manager Hans Rosenstock recalls. He emphasizes that this support shaped the entire project.

**Looking for a site**

In the first half of 2020, a small core team started by developing the technical concept, defining the equipment needed and the framework so the first call for bids could go out to suppliers. As soon as these parameters were defined, the right site had to be

found. Important aspects in selecting a site included logistics for our suppliers, a close port to link it to Europe, a secure energy supply at competitive prices, availability of sufficient recycling materials and, not least, suitable workers. With external support, around 100 properties were identified; of these, eight were

**“We are entering new territory in every sense and have shown that we make good on our word.”**

David Schultheis, President & Managing Director  
Aurubis Richmond



How it all began — the selected site in 2022.

**September 2021**

The company is founded: Aurubis Richmond LLC is legally founded and officially registered.

**On November 10, 2021**

The Supervisory Board approves the construction of a new multimetal recycling plant in Augusta.



On November 10, 2021, Aurubis and Pat Wilson, Commissioner of the US state of Georgia, sign a memorandum of understanding (MoU).

ultimately seriously in the running. Just visiting them all was not an easy task. It was summer 2021, with the coronavirus pandemic and associated travel restrictions. The project team was only able to visit the US with a National Interest Exemption. Aurubis was one of the first companies to profit from the new travel regulations in the US.

**Great interest**

The COVID-19 lockdown presented unique challenges — not just in terms of the necessary potential site tours, but also for establishing relations on the ground. At the same time, it was repeatedly

apparent that American decision-makers were very interested in sustainable, industrial value creation, economic growth, creating new jobs and educational opportunities, securing raw materials, and protecting the climate. Aurubis' plans were positively received since they addressed all of these. Interest was especially keen in Richmond County in the US state of Georgia, which was ultimately selected. In Augusta the project was warmly welcomed, whether by the mayor, residents, educational institutions like the Technical College, all the way up to the state governor, and has received great support in all areas since.

**Supervisory Board approval**

The plans for Aurubis Richmond were presented to the Supervisory Board for approval on November 10, 2021. A lot of groundwork had been laid in the run-up, starting with research for project pipeline development as part of the strategy process. Furthermore, the framework conditions had already been negotiated with the local authorities and the company was officially founded as Aurubis Richmond LLC (limited liability company); Engineering had planned the construction and facilities in cooperation with external partners; Purchasing had negotiated the bids and worked with Legal to prepare the contracts.

**From planning to implementation**

Approval from the Supervisory Board followed, and the thorough preparations meant the project could



2022

**June 17, 2022**

Representatives from the government, business partners, and Aurubis attend the groundbreaking. Construction starts on the new plant.

shift directly from planning into implementation mode. On the day of the Supervisory Board meeting, a delegation from Augusta traveled to Hamburg so that the first contracts could be signed right after the meeting. The signatures to order the equipment followed a few days later. Here it was particularly evident how unique Aurubis' expertise in metallurgical processes truly is — configuring the new equipment for the complex production processes necessitated close cooperation between Aurubis experts and equipment manufacturer SMS.

**The plant grows**

The groundbreaking in June 2022 kicked off construction on the new plant in a green field roughly 20 km southeast of the city of Augusta as the crow flies. At the same time, work began on a completely new organization — with all the necessary divisions from Occupational Safety and Plant Security to Finance, Purchasing and Sustainability. This included establishing networks with suppliers, neighbors and the entire region. This was also crucial for another important area: personnel planning and recruitment.

**A growing team**

Finding and qualifying enough employees was a key aspect in the search for a site, and is still relevant today. So the newly created plant team worked closely with the City of Augusta, local schools, technical colleges, and the university. Now, with just over 160

jobs, the first secondary smelter in the US has become an important employer in the Augusta metropolitan region and offers valuable educational opportunities and scholarships to train the experts of tomorrow. A community benefit agreement was concluded with Augusta Technical College and Aiken Technical College as well as with the Richmond County School system for scholarships and vocational training programs for young employees.

**Active in the region**

The company and the entire team are also involved in social engagement in a variety of ways. Everyone at Aurubis Richmond is granted time for volunteer

Representatives from the government, business partners, and Aurubis at the groundbreaking on June 17, 2022.



### December 2022

While construction continues on Module 1, the Supervisory Board greenlights the plans for Module 2, thus doubling capacity.

### July 2023

David Schultheis takes over the operational management of the new plant as President & Managing Director.

# 2023



Aurubis Richmond raises its profile with a lot of outside activities, drawing attention to Aurubis in the local community.

work alongside their regular work — an opportunity many take advantage of. Aurubis now enjoys an excellent reputation and good network that extends far beyond the Central Savannah River Area (CSRA), which is reflected in the number of applications. “We held a recruiting event in spring and 350 people participated — a number that speaks for itself,” David Schultheis says with satisfaction.

### Giant steps

The Supervisory Board approved the second stage back in December 2022 — which means that planning

to expand the plant began while the first stage was still under construction. In July 2023, the time came to separate the project and operations. Dirk Wouters from Beerse took over managing construction, while as Managing Director David Schultheis oversaw establishing the operating team and preparing to start operations. More milestones were quickly reached, such as the commissioning of the shredder facility and the smelter furnace along with the first deliveries of recycling materials.

### Highlights

In November 2023, US First Lady Dr. Jill Biden visited the new plant and the topping out was celebrated. “This was a memorable moment that celebrated how

The Aurubis Richmond workforce with two members of the Executive Board on November 8, 2023. More than 160 people are now employed at the site.



**October/November 2023**

The first materials are delivered in a small ceremony. The shredder and smelter furnace start operations.

**November 8, 2023**

Visit from US First Lady Dr. Jill Biden. The topping out is celebrated at the same time.

**“I am very proud of the performance of the entire team that built this cutting-edge recycling plant in just over two years.”**

David Schultheis, President & Managing Director  
Aurubis Richmond

smoothly we were able to work hand in hand as a team and with our external partners,” David Schultheis recalls. The entire team takes particular pride in the fact that the new plant is outfitted with cutting-edge technology. The equipment complies with the environmental standards set by the State of Georgia and by federal authorities, and is designed to ensure that operations have the least possible impact on the water, air and soil. Aurubis Richmond was planned as the first zero-discharge plant. All the process water and rainwater are captured, cleaned and returned to the cycle.

**An enthusiastic team**

A growing, highly motivated team has been bringing the new plant to life: By February 2024, Aurubis Richmond had grown from five employees to more

than 100 in just one year, a number that increased to 160 by the Ribbon-Cutting Ceremony in September. This rapid growth has also necessitated setting up and constantly fine-tuning work processes and communication paths. There is also a need to establish a company culture, with in-house and external employee events playing a part in this, from team and charity events to blood drives. Aurubis Richmond is also involved in social events in the region and showing what it means to be an attractive and responsible employer — whether at the local Christmas parade or events at the college.

US First Lady Dr. Jill Biden visited the site on November 8, 2023.





# 2024

## February 1, 2024

The team numbers 100 people for the first time; it was just five roughly a year ago.

## September 20, 2024

The ribbon cutting marks the start of the gradual ramp-up of the new plant.



The ribbon cutting took place on September 20, 2024. President & Managing Director Aurubis Richmond David Schultheis, Augusta Mayor Garnett Johnson, Aurubis Supervisory Board Chairman Prof. Fritz Vahrenholt, Governor Brian Kemp, CEO Toralf Haag, and COO Inge Hofkens (from left to right) cut the ribbon together and symbolically inaugurate the new recycling plant.

### The ribbon cutting

The time had finally come on September 20, 2024: After just over two years of construction, Aurubis Richmond was ready for its grand opening. “With Aurubis Richmond, we are positioning ourselves as a pioneer for multimetal recycling in the US,” Aurubis CEO Dr. Toralf Haag said in his keynote address. He added: “This new site will recover strategically important metals for the American market — bolstering the independence of local supply chains here. Aurubis

Richmond clearly shows how Aurubis combines profitable growth and sustainable business activity, and is an impressive example of how we are responsibly transforming raw materials into value for an innovative and sustainable world.”

Following the festivities, the focus is very clearly on the next large milestone, when the equipment in Module 1 is commissioned step by step. Smelting operations will gradually come online in a ramp-up curve.

# All signs point to growth

The need for multimetal recycling is growing in the US. So while we are ramping up the new multimetal recycling plant Aurubis Richmond step by step, the expansion, Module 2, is being built. One of the things that makes the new site unique is its scalability, which allows production to adjust to meet market demand.

The rising importance of resource independence in the US is leading to higher recycling rates and lowering exports of recycling materials, resulting in a growing regional supply of complex recycling materials. So there is a huge need for sustainable processing capacity in the US. The local market offers a great deal of development potential and cannot cover the high demand. For us as experts in multimetal recycling, this is an excellent opportunity to invest in a fast-growing environment and to recycle valuable materials directly in the US in the future.

## Growing network

Aurubis is already one of the most sustainable companies for multimetal recycling worldwide. We are expanding our global, integrated network by investing in Augusta. This investment of around €740 million is also a contribution to our ambitious sustainability targets for protecting the climate and conserving natural resources across borders in the EU and the US. We are convinced that the circular



The Aurubis Richmond site at the start of December 2024.

economy is the future and are targeting becoming carbon-neutral well before 2050. Blister copper and other intermediate products will be manufactured in the US that we can then either largely further process into various industrial and precious metals at our European smelter sites or sell directly on the US market. These metals are crucial for manufacturing wind power stations, high-voltage cables, electric vehicles, and batteries, for example. This is how Aurubis is making an important contribution to the energy transition and offering products and solutions

**“There is a growing market in the US for recovering valuable metals for the circular economy. We will leverage this potential.”**

Inge Hofkens, COO Multimetal Recycling



### 3 questions for David Schultheis

President & Managing Director Aurubis Richmond

#### What do you think makes Aurubis Richmond special?

Aurubis Richmond is the first greenfield project in over 110 years of company history. We are entering new territory in every sense. The way we do what we do and how the team is working with such great dedication are fantastic.

#### Where does this passion come from?

Purpose! I think everyone understands what we are doing and why: Issues like recycling and megatrends like electric vehicles and sustainability are relevant and on the tip of everyone's tongue. We are also seeing the results of our work here every day, how the plant is growing.

#### What do you expect from the future?

We are all confident that this project will be an important success and is the start of something bigger. The market offers enormous potential and Aurubis is well positioned to take advantage of these unique opportunities.

for accelerating decarbonization. The US State of Georgia is focusing on electric mobility and sustainability, another factor that contributed to the final site selection. Aurubis fits right in with this strategy and received support from the word go.

#### An eye on growth

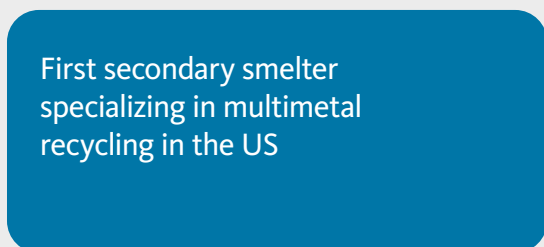
With the new site, Aurubis is now the largest multimetal recycling provider in the United States. All signs have pointed to growth from the very start. The recycling technique used in Aurubis Richmond is unique for its scalability. This means facilities can be expanded as need arises in the future. Additional components can be added to the plant for a custom fit. The Supervisory Board's approval of the second stage in December 2022 was the first step in this process: The expansion to double capacity is being built while the first stage is commissioned step by step. The top blown rotary converter (TBRC) is the core plant technology, a key step in processing complex recycling materials into blister copper. "Scalability means we can plan a strategy for our recycling markets that allows us to respond flexibly to supply in the US," COO Multimetal Recycling Inge Hofkens explained. This innovative concept offers great scope for planning with maximum flexibility in a fast-growing segment.

#### Outlook

Aurubis Richmond opens up further growth prospects for us along the metallurgical value chain in the US. The scalable recycling technology in use at Aurubis Richmond also enables us to leverage attractive prospects in the growing market for recycling materials based on need.



## The project



# Battery recycling: Demonstration plant ramps up

Using resources responsibly is a key element in what we do. We see keeping valuable metals in the material loop as our responsibility. This is also true for a trend of the future — electric mobility.

We expect an increase in the number of batteries from electric and hybrid vehicles to drive an additional growth market in recycling over the long term. This is where our recycling expertise comes into play: Using an innovative process developed in-house, we can recover valuable raw materials from used lithium-ion batteries that can be used for new products.

Aurubis developed and tested a patented process for responsibly recovering the metals from black

mass. Black mass is what is left after an end-of-life battery has been disassembled and shredded: It is a powder-like substance that contains the valuable elements from the battery, including lithium, nickel, cobalt and manganese. In the battery recycling pilot plant at our Hamburg site, we successfully developed special technologies in a relatively short time that have since been patented. This innovative process offers an exceptionally high recovery rate: In our smelter network, we recover around 95% of the battery metals from black mass — including lithium, a light metal that is economically crucial and can only be mined in a few regions in the world. With the high metal recycling efficiency of the process we have developed, Aurubis is already considerably surpassing EU guidelines and targets that stipulate minimum recycling efficiencies for some metals in lithium-ion batteries.

## Process for recovering metals from black mass



Aurubis is now taking the next step and building a demonstration plant. The plant for testing a subprocess on an industrial scale was set up in calendar year 2024, and the first campaigns for extracting metals from black mass have begun. The main unit in the demonstration plant is 50 times larger than in the pilot plant and will continue to deliver findings about operating on an industrial scale. In addition to expanding our metallurgical expertise, Aurubis has also entered into other partnerships, such as with the Talga Group Ltd., an Australian battery material and technology company. With this development project, Aurubis aims to extend the Talga technology to all Aurubis graphite products through closer collaboration between both companies. Initial test series have shown promising results.



A glimpse into the demo plant, developed in-house at the Hamburg site.

This is how we are developing the building blocks for a flexible market entry strategy tailored to the technical and economic requirements of this future market.

## Advantages of the Aurubis hydrometallurgical recycling technique for black mass



Innovative and patented process for black mass using ozone



Ability to process black mass that does not contain nickel by recovering lithium first



Extracting lithium at the beginning of the process chain leads to high lithium recovery



Flexible use of raw materials — no recycling raw materials are identical



Separation of graphite as intermediate



Modularity — compatible with other refining and processing steps





# We drive

With a pioneering spirit and technological excellence, we set new standards in the metals industry. We devise efficient, sustainable solutions for future challenges by actively advancing the automation and digitalization of our processes.

# innovation ✓

# Autonomous sample preparation in Lünen

In February 2024, we launched an innovative system for fully automated e-scrap sample preparation at the Lünen site. The new equipment reduces the steps that need to be done by hand, increases work safety, and boosts efficiency. A flagship project for the entire Aurubis Group.



used to be carried out manually in up to twelve stages and could take up to five days. We are setting new standards in the recycling industry while also increasing our efficiency and improving occupational safety for our team.

Complex materials are processed at the Lünen recycling site to recover valuable metals like copper, gold, silver and palladium. Before they can be recycled, the materials have to be sampled to determine their metal content and the value of it, as well as to decide how best to process them. Aurubis specialists in the laboratory analyze material samples to answer all these questions. The samples have to be ground very fine and must have exactly the same composition as the entire shipment. The new equipment ensures both.

## Sample preparation in Lünen

Commissioning in February 2024

Capacity Up to 10,000 samples a year

### Efficient and safe

In Lünen, sample preparation of feed materials, such as e-scrap, is now fully automated with the help of cutting-edge robotics. The system now efficiently and securely delivers reliable samples for the laboratory in just an hour — for a sample preparation process that

### A pilot project for the future of recycling

Processing up to 10,000 samples a year, the system in Lünen is the most powerful of its kind in our sector. It is also the first in the Aurubis Group and a model for other sites. We are investing in a similar system for the Hamburg plant as well, which is scheduled to go online at the start of 2025. The Aurubis plants in Bulgaria, Belgium and the US will follow. And e-waste is just the beginning; thanks to the options the new equipment offers, it will also be possible to efficiently and safely sample copper concentrates and intermediate products such as slags in the future.





The goal of the Digital Factory program is to get the right information to the right place at the right time, at the right quality and format so that a person or machine can initiate the right action for efficient production.

# Laying the groundwork for the digital transformation

At Aurubis, the Digital Factory plays a key role in optimizing production processes with the help of digital technologies, automation and robotics. Realizing optimization potential quickly and efficiently is one of the innovation program's great strengths.

In an increasingly digital world, consistently assessing existing processes and using innovative technology to optimize them is no longer a competitive advantage; it is an economic necessity. The Digital Factory is one way we are meeting this challenge at Aurubis. This in-house innovation program makes a significant contribution to creating the safest and most secure, sustainable and efficient multimetal smelter network in line with our company strategy.

Behind the Digital Factory is an agile team that reports directly to the Executive Board and can quickly execute innovations with no bureaucratic hurdles. The Digital Factory identifies various projects in the five large plants, and the members work together with employees on the ground to identify optimization potential that they then develop and address by implementing concrete solutions. The Digital Factory's quantifiable successes to date speak for themselves.

### Turning potential into innovation

An energy management project concerning steam generation at the Hamburg site is one recent example of the rapid leveraging of optimization potential. Since August 2024, a system powered by artificial intelligence has ensured that electricity is automatically used to generate steam when prices are low or even negative. The gas-powered boiler takes over steam production as soon as the electricity price is higher than that of gas. Our experts from Energy Management worked as a project team with colleagues from Data Science, Data Engineering, and Operating Technology, and developed this solution for optimized energy utilization in just a few months. The system estimates the plant's steam and electricity needs every 15 minutes using process data. A link to the electricity market compares prices at the same time. A component supplied by Aurubis subsidiary azeti creates a secure interface between IT and production. This flexibility in energy usage saved €100,000 in the very first month, and could cut costs by an annual €840,000 in this facility alone.

### Digitalization along the entire value chain

Digitalization offers Aurubis an enormous opportunity to design production processes more precisely and efficiently than has previously been possible. All production processes from smelting to final processing are monitored and controlled using sensors. So digital solutions like artificial intelligence can be used along the entire value chain to help optimize processes, increase equipment availability, and lower the amount of maintenance needed. This transformation not only boosts production performance; it also reduces energy consumption and minimizes sources of error.

### More efficient, sustainable, safe

The Digital Factory is not a rigid structure. A variety of different divisions work together under the umbrella of this program, driving the digital transformation

of production processes at Aurubis: the Digital Transformation managers at the plant sites, Data Engineering, Data Science, Modeling and Optimization, IT Production, Group Continuous Improvement, Research & Development, and Operating Technology. Together we develop solutions tailored to meet the specific needs of the facilities and projects in the respective plants. This not only promotes the acceptance of new technologies; it also accelerates their implementation. Condition-based monitoring at the Olen, Belgium site is one example of this development. Sensors and real-time data are used to monitor the smelter furnace cooling blocks in order to detect potential problems early and conduct preventative servicing. This helps prevent unplanned shutdowns and extends the useful life of the equipment.

### Securing the future

We leverage the full potential of our integrated smelter network by linking the sites with real-time information and analyses. The focus here is on security, efficiency and sustainability. Automated processes and robotics also improve occupational safety and create a positive working environment that is centered on people and the activities they undertake to add value. The 2030+ target images developed by the Digital Factory show what these steps could look like in reality and which concrete projects are being realized. The target images unite our production processes with the innovation projects in implementation and provide a clear, project-based roadmap for the future. A simplified example of a 2030+ target image can be viewed on page 43.

In the years to come, the Digital Factory program will continue to play a key role in advancing and implementing forward-looking technologies at Aurubis. We are securing our future by means of intensive exchange between production sites and by continually tweaking all processes with technological innovations.

# Tankhouse target image

This picture shows what tankhouse processes might look like in the future: safer and more sustainable, with more throughput, less maintenance effort, and increased facility availability.

## WAREHOUSE

Autonomous transports and automated anode recognition boost throughput and safety.

## TANKHOUSE

From loading the anodes to removing the cathodes, automated production steps contribute to efficiency and safety.

## CATHODE TRANSPORT

Automated transport systems mean transparent inventories and more security.

## CONTROL & MAINTENANCE

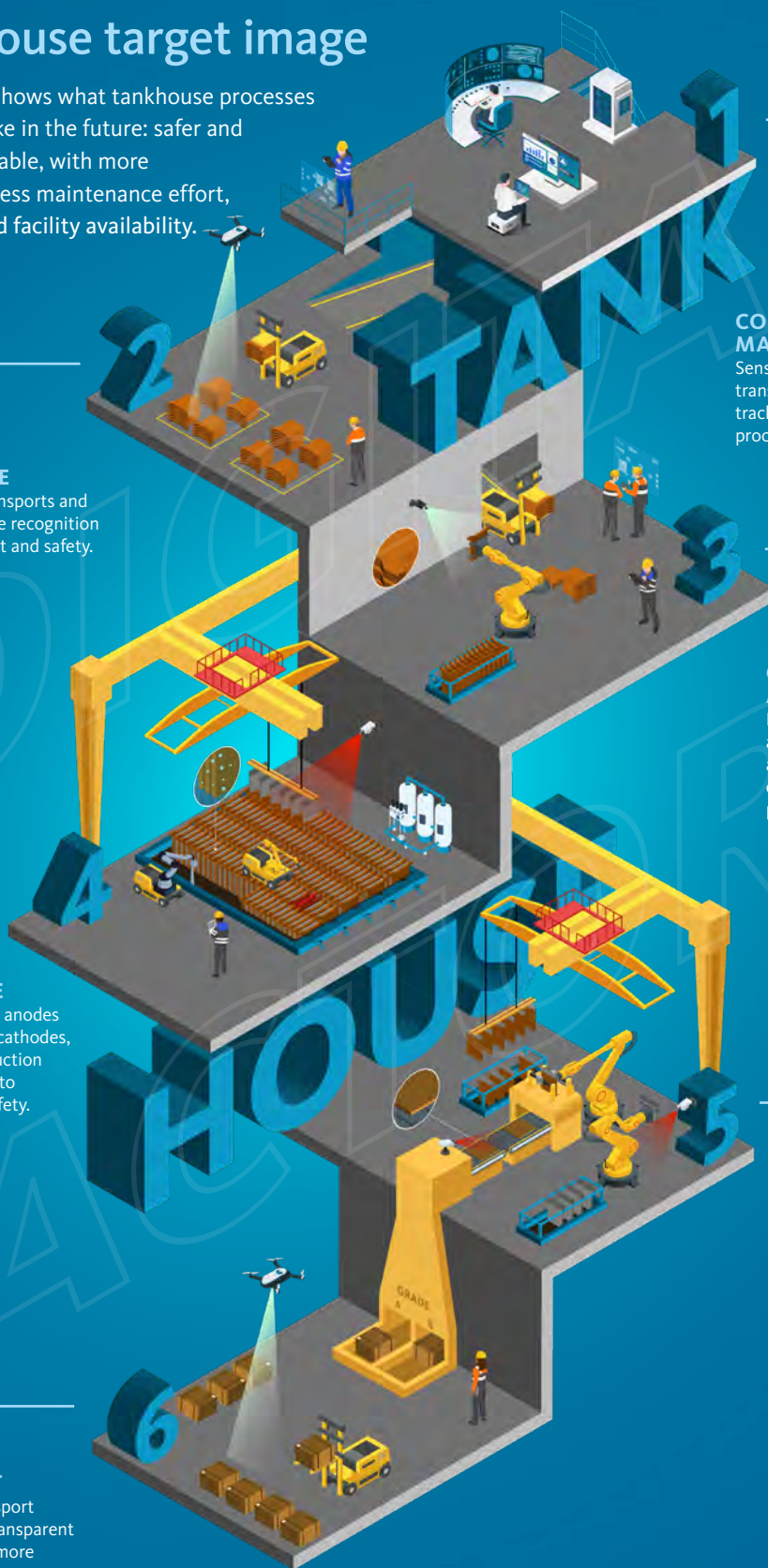
Sensor and camera data helps transparently and thoroughly track and control production processes.

## QUALITY ASSURANCE

Predictions made by artificial intelligence (AI) and depth cameras contribute to optimizing processes.

## CATHODE MANAGEMENT

Depth cameras analyze the cathodes to identify necessary maintenance or process improvements.







# We ensure

Sustainability is at the center of our actions. We are continuously working on using resources more efficiently, cutting emissions, and enhancing safety at Aurubis. We set benchmarks in the industry and promote the alignment of ecological, social and economic values. In doing so, we make an active contribution to protecting our planet and securing sustainable value creation for the coming generations.

# sustainability ✓

# Sustainability strategy and targets at Aurubis

Aurubis is pursuing an ambitious sustainability strategy, which is a fundamental part of the company strategy, Metals for Progress: Driving Sustainable Growth. Our company strategy is based on three pillars: securing and strengthening the core business, pursuing growth options, and expanding our industrial leadership in sustainability. We are demonstrating that economic success and sustainable activity are inextricably linked.

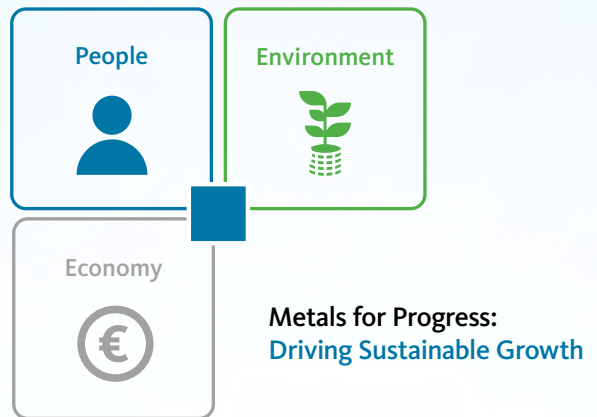
To achieve our strategic sustainability agenda, we have also significantly expanded our Sustainability department over the past two years. We have directly integrated the central topics of decarbonization and supply chain management in the organizational structure and created two specialized workstreams to address them effectively. The workstreams unite expert teams that work closely with the relevant departments. We ensure the new structure delivers targeted, effective implementation of the sustainability targets by consistently driving measures to reduce CO<sub>2</sub> emissions and optimize supply chain processes.

## 2030 sustainability targets

We have set ambitious targets until 2030 that are both specific and measurable, and allocated them to the action areas of people, environment and economy.

By extensively integrating sustainability in the company strategy, Aurubis demonstrates that economic success and sustainable activity go

hand in hand. The demanding targets for 2030 reflect our commitment to advancing sustainable solutions in every area, actively contributing to an innovative world that is ready to face the future.

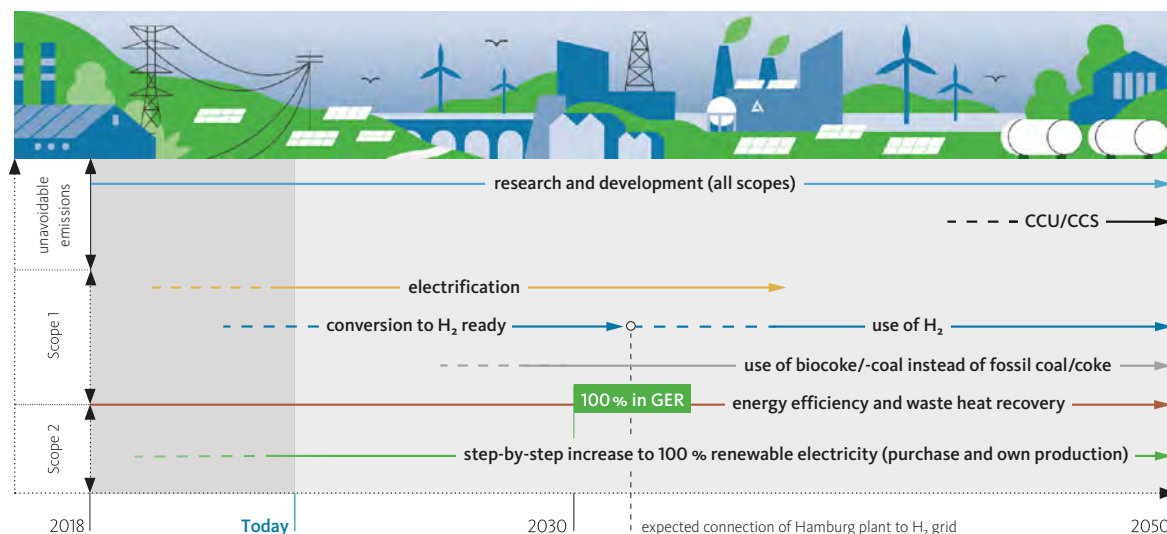


For more information visit:  
[www.aurubis.com/en/responsibility](http://www.aurubis.com/en/responsibility)





# Aurubis on the path to carbon neutrality



Aurubis set the target of cutting its direct (fuels) and indirect (electricity) CO<sub>2</sub> emissions in half by 2030 — compared to 2018. Furthermore, production should be carbon-neutral at all sites in the smelter network — that is, their processes should be fully decarbonized — well before 2050.

Christian Hein, Head of Decarbonization, and his team concentrate on exactly that: the further development and coordination of the Group-wide decarbonization strategy and the projects to uphold this roadmap and, in the best case, even speed it up.

“On the one hand, we have to think broadly and with an openness to all technologies because there’s not just one technology that we can use to decarbonize all of our different processes to the same extent and

at the same time,” says Christian Hein. One part of the solution is the use of hydrogen, for example. However, it’s not available in sufficient quantities or at competitive prices yet. Burner technology is not yet advanced enough either.


That is why Aurubis is currently researching and testing different decarbonization technologies and approaches to develop the best possible solution for everyone.

To facilitate an effective approach and develop best practice measures, the Decarbonization team has initiated three new formats. For instance, there is now an annual Group-wide decarbonization workshop for the sites and relevant Group functions. In addition, once per quarter working teams meet to discuss their experience with concrete projects and technologies — and on a specialist level, the Decarbonization team communicates with the sites about the current progress in achieving the targets, their individual challenges, and possible solutions.

## Hydrogen-ready anode furnaces

### Hydrogen-ready anode furnaces

Commissioning	July 2024
Investment	~ €40 million
Possible CO <sub>2</sub> reduction	Up to 5,000 t/a



Watch the video about our hydrogen-ready furnaces

Green hydrogen is considered a key technology for reducing industrial CO<sub>2</sub> emissions. For our anode furnaces too, we see great potential for this technology. We have installed two hydrogen-ready furnaces based on the promising results of a test series carried out in 2021. With an investment of €40 million, we will prevent up to 5,000 t of CO<sub>2</sub> per year in the future. This helps further reduce the carbon footprint of Aurubis copper, which is already low within the industry. Our new furnaces also provide additional flexibility for processing even more complex metal-bearing concentrates more efficiently.

## Industrial Heat expansion

### Industrial Heat

Commissioning	July 2024
Investment	~ €100 million
Cooperation partner	Hamburg Energiewerke

Since 2018 Aurubis has been using industrial waste heat from the production process at the Hamburg site to supply the Hafencity East neighborhood with CO<sub>2</sub>-free heating energy. As part of an additional project phase, Aurubis is cooperating with Hamburger Energiewerke, the city's energy utility, to convert a subprocess of copper production with an investment of about €100 million. Starting in the 2024/25 heating period, this will supply up to 28,000 households with heat, which will cut a total of up to 120,000 t of CO<sub>2</sub> emissions each year in Hamburg. The Industrial Heat project, which received funding from the German Ministry for Economic Affairs and Climate Action (BMWK), is the largest of its kind in Germany.



Aurubis received the 17<sup>th</sup> German Sustainability Award for the metals industry in November 2024. The Europe-wide prize honors our commitment to carbon-neutral production and the circular economy. The distinction confirms our intensive dedication to handling natural resources responsibly. We are pursuing ambitious

sustainability targets by means of a number of measures at the international sites for conscientious production that protects the climate and environment. Our commitment to responsible metal recovery contributes to our goal of being the most sustainable and efficient smelter network in the world. Aurubis pursues sustainable business activity driven by its company strategy; this is expressed in Tomorrow Metals, a promise to our customers.

## Expanding the Aurubis solar park in Pirdop — another stride towards decarbonization

As part of our long-term Metals for Progress: Driving Sustainable Growth company strategy, we began construction on two additional photovoltaic parks at our site in Pirdop, Bulgaria in April 2024. An additional expansion has already been approved. We have been expanding the captive solar park at the site since 2021, another investment in decarbonizing our production. The expansion will take place in multiple stages until 2024/25.

The energy generated in Pirdop flows directly into production processes at the site, allowing us to further reduce the amount of energy drawn from external sources and improve our production's energy efficiency. Expanding the solar park in Pirdop highlights our ongoing dedication to protecting the climate and promoting resource-efficient production, contributing to our target of becoming climate neutral well before 2050.

We are considerably increasing captive power generation with the four photovoltaic plants that will cover around 15% of the site's electricity needs with green energy in the future. Around 55,000 MWh of electricity will be generated every year, roughly the amount required to power a city of 25,000 people. And we will be avoiding around 25,000 t of CO<sub>2</sub> emissions per year. This investment in Pirdop increases Aurubis' independence from price fluctuations on the energy market and is an important step towards carbon-neutral production.

By expanding the solar park we are not just contributing to reaching our own climate targets; we are also helping meet the global climate targets set out in the Paris Agreement. Along with ecological benefits, expanding



### Pirdop solar park

Completion	2024/25
Total power generation per year after completion	~ 55,000 MWh
Investment for the expansion	~ €15 million
CO <sub>2</sub> reduction	~ 25,000 t/a

the solar park also helps stabilize energy costs, thus strengthening our competitiveness on international markets. As energy prices rise, this investment in renewable energy will be a decisive factor in securing our business model over the long term.

The strategic project is part of a comprehensive investment program that will make the Pirdop site more efficient and prepare it for the future. Enlarging the solar park also spotlights our role as a pioneer in sustainable industrial production. We will continue to promote innovative solutions to drive the circular economy and minimize our ecological footprint — for a sustainable future that conserves resources and protects the planet.



# Making Aurubis safer

After the serious incidents related to occupational safety and plant security last year, further expanding and improving the safety and security culture is one of the new Executive Board team's top priorities — and both are now the direct responsibility of COO Custom Smelting & Products Tim Kurth.

At Aurubis, we approach safety and security with a fresh perspective every day and actively put them into practice — hand in hand with productivity and quality. We want to be the benchmark for occupational safety and site security in our industry; this is a goal



that everyone in the company contributes to. We are working on Project SAFE for plant security and the TOGETHER occupational safety program to enhance our safety and security culture and to integrate preventative measures in order to achieve the goal of a safe, secure company without accidents or crime.

### Working safely

Safe work is the foundation of our company's business success. We are pursuing a clear vision: zero work-related accidents. Our TOGETHER program provides important leverage. With a multistage analysis involving the employees and gap assessments at all sites, we worked with the support of external experts to identify our potential for improvements in occupational and process safety.



**Please keep a safe distance**

A new forklift with an illuminated danger zone is being tested in Pirdop.

Example 1 of our safety measures

We are boosting our leadership culture and empowering our management when it comes to safety risks. We will better identify risk scenarios and the effectiveness of our existing safeguards while establishing suitable additional measures for improved process security.

In collaboration with the Group Health & Safety department, the plants are developing individual action plans to protect employees and the entire company as much as possible. This includes training, regularly exchanging information, and a wide range of technical precautions: from markings, signposting and control and warning systems to state-of-the-art personal protective equipment (PPE) that meets the respective requirements of the plants.

### Initial successes with the TOGETHER program

We are actively shaping a safe and sustainable occupational safety culture with the TOGETHER program. We offer coaching for management staff at the Hamburg plant, for example, to increase the effectiveness of in-house safety routines, and are applying new methods for minimizing risks and qualification control. This is leading to positive

“Productivity, quality and safety go hand in hand. We want to be the benchmark for occupational safety and site security in our industry, and to be a company free of accidents and crime.”

Tim Kurth, COO



A second example of our safety measures

### Improving traffic safety

In Berse the walkways, roadways and pedestrian crossings were repainted following an analysis of possible hazard situations.

changes: Awareness of existing hazards has grown considerably and open communication with managers is promoting the development of internal networks and the exchange of information about risks and possible solutions. All 1,800 production workers also completed comprehensive risk factor training at the Hamburg plant to ensure that unsafe situations can be recognized and prevented at an early stage.

### Safeguarding against crime

Organized crime is increasing: In 2024 alone, fraud and theft led to damage of over €55 billion<sup>1</sup> in Germany — a new record, unfortunately. Criminal activity is a growing threat for companies worldwide.

This illustrates that plant security is about more than just protecting our plant boundaries and entrances. It involves protection against terrorism, crime, theft and

<sup>1</sup> BITKOM association — Economic Security, 2024 report.



Occupational safety during high-temperature casting processes is extremely important at Aurubis.

fraud, but also sabotage and industrial espionage. We process valuable materials at Aurubis, and our products and intermediates are raw materials in high demand from a geopolitical perspective. Our threat intelligence monitors potential risks, both external and internal, including those related to digital, transport and travel security.

Our Project SAFE measures are continuously strengthening the level of security – and even leading the way in some disciplines, such as our new employee protection program. Our internal Group-wide communication campaign to prevent corruption, theft, fraud and information leaks – “It’s up to you. Make the right choice.” – started in mid-November 2024, with the objective of promoting an improved security culture and compliance with legal regulations, raising awareness of possible risks among employees, and providing them with assistance.

In 2024 we created more than 50 jobs and in some cases new functions at site and Group level, as well as bringing in additional IT support to allow us to meet the growing demands of process and plant security and to anchor and monitor the implemented measures in the long term.

### Better protected

A new 175 m long system protects the Stolberg plant from storm surges.





# “Our dedicated, highly qualified experts are committed to deliver.”

The passion and expertise of all employees drive our performance. Laura Zielinski has overseen Group Human Resources since July 1, 2024. In an interview, the manager talks about the challenges and opportunities of successful HR work and about promoting talents.

**Laura, you started managing Human Resources on an interim basis in October 2023, and now you have been head of the Group department since July 2024. How did the events of last year impact your work?**

**LAURA ZIELINSKI** Looking back, I'm proud of how we as a team have overcome the challenges and since been able to regain lost trust with energy and a spirit of optimism — despite difficult setbacks and a lot of upheaval. Our dedicated, highly qualified experts fully stand behind the Aurubis strategy and are committed to deliver. Aurubis Richmond is just one example of how a shared vision, individual performance, and a strong feeling of belonging and appreciative leadership bring about success. We are continuing to deliver on our strategy with the new Executive Board team — and that extends to a forward-looking work culture.

**What does a forward-looking work culture in the organization entail?**

As a high-performing and reliable company with a clear purpose, we will continue to be guided by this stability in the future. It provides security and forms the foundation for our success at the same time. At



## 5 questions for Laura Zielinski

Head of Group Human Resources



Impressions from the HR Management Conference are available here

Aurubis we are focusing on occupational safety, plant security, and leadership — while continuing to develop our company culture, which is based on shared values, individual commitment, and a clear sense of being part of something. This culture development process requires time and the participation of the entire company. We can only remain successful together.



### What projects and tools do you use to develop and support employees?

There is a strong focus on performance management and talent promotion in order to activate both individual and collective performance and success. In HR we view ourselves as trailblazers and role models across all sites.

We rely on a number of measures. One central component is our Learning Academy, which provides extensive subject-specific and personal development offerings for employees. We also promote communication and learning with internal learning units. Our international O-Track talent promotion program enables participants to develop their leadership skills, specialized expertise, and project management knowledge. This is how we support ongoing personal and professional development and strengthen our talent pipeline.

### How is Aurubis' HR work perceived — including from the outside?

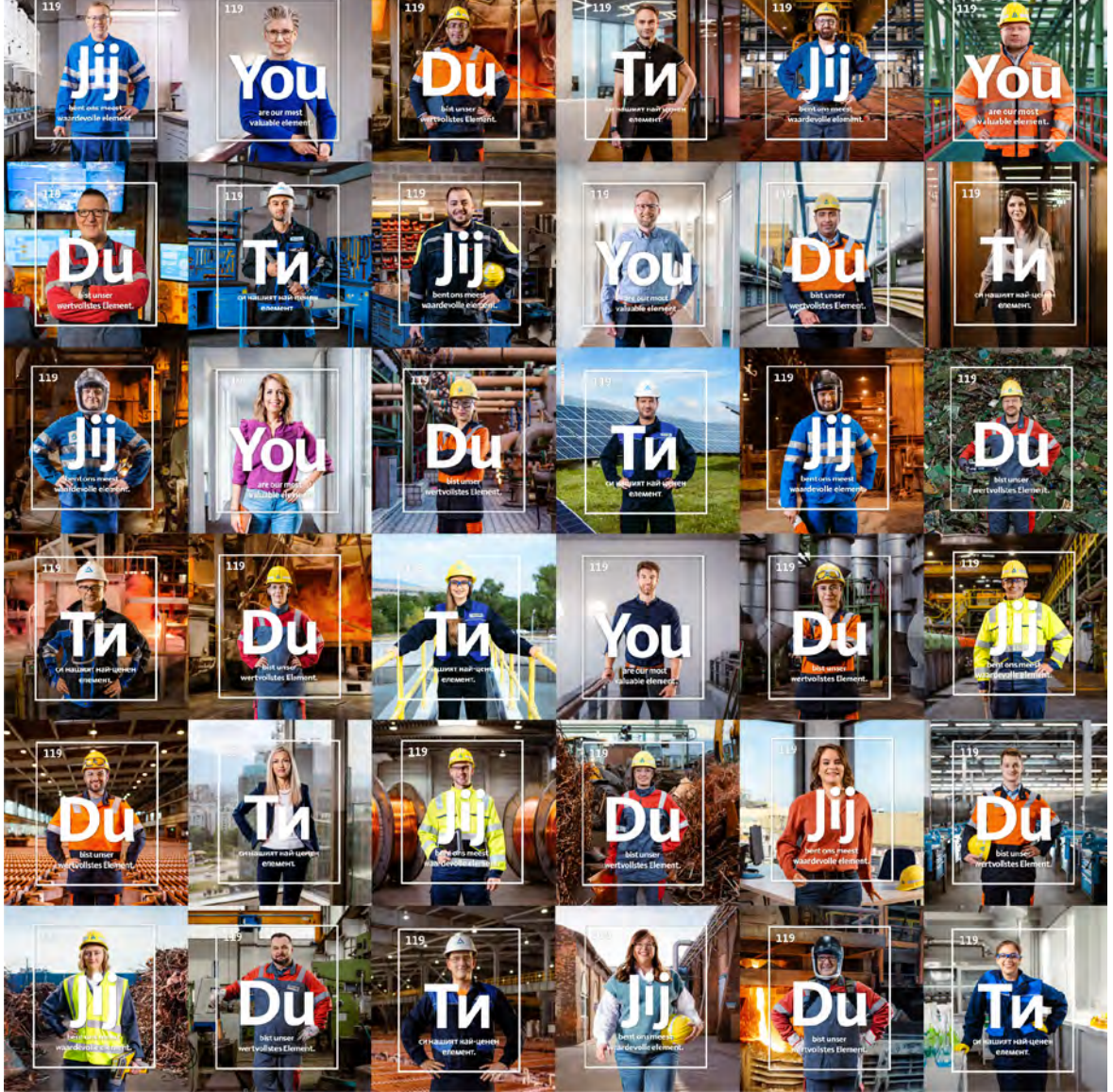
Our HR work is shaped by innovation, commitment and responsibility, and both internal and external feedback are positive. This demonstrates how high our standards are when it comes to international HR work.

This includes the kick-off of SAP SuccessFactors — which will help us depict the entire employee life cycle from hiring to retirement in the future — and the recognition of our policy on international assignments by the KPMG business consulting firm. I'm especially pleased about the reception of our Women4Metals initiative, which received the HR Excellence Award in 2023. The prize underlines our pioneering role in drawing more women to the industry. Additionally, our diverse mentoring program supports multigenerational dialogue and cross-site development of our talents.

We are sending important signals with respect to diversity, too: By signing the Diversity Charter and initiating sensitivity training relating to diversity issues in recruiting, we advocate for an inclusive company culture and raise awareness of age diversity. We have also introduced a new anti-discrimination policy and appointed a contact person in order to ensure a safe and respectful environment for everyone.

### What are some of the future targets and how will you achieve them?

One central target of our HR work is to further enhance trust in management, Aurubis as an employer, and our future as a company, and at the same time to foster a sense of fun about achieving strong performance and developing the Group as a whole. In light of the intense competition for future talents, it is crucial to attract and retain highly qualified employees in the long term. This year we executed a successful campaign to reinforce our employer brand (see page 55). It centers on people: In an industrial company that produces metals, our employees are the additional key element for our success. We want this initiative to attract talent and create an environment where they can develop and stay with us long-term.



More information  
on the campaign



## Aurubis employer brand: “You are our most valuable element”

Since the end of March 2024, Aurubis has been using this message to present itself as an appealing employer, with a focus on colleagues and their enthusiasm for Aurubis. Based on the periodic table and its 118 elements, the campaign currently includes 36 images from six sites, depicting employees as an additional 119th element — and placing them front and center. Three core elements summarize what makes Aurubis what it is:

**Rock-solid & rolling:** We stand for stability as an employer with our solid business model, even in times of crisis, while developing every day at the same time.

**Hands-on & high-tech:** We get down to business — with our passion for metallurgy. We are also advancing our technologies and processes all the time, setting new standards in our industry.

**Skilled & seriously sustainable:** We sustainably transform raw materials of various qualities into valuable metals and products daily.





## Comprehensive Copper Mark certification of the Aurubis smelter network

Aurubis is expanding its pioneering role in responsible and sustainable metal production by having its smelter network extensively certified by The Copper Mark.<sup>1</sup> The Copper Mark is the leading internationally recognized assurance framework for a sustainable and responsible supply chain in copper production.

Following previous certification of the the Pirdop (Bulgaria), Hamburg and Lünen (Germany), and Olen (Belgium) sites, the production sites in Beerse (Belgium) and the rolling mill in Stolberg (Germany) were successfully certified in 2024. Furthermore, the Bulgarian site in Pirdop successfully passed its routine recertification.

With these six sites, this means that all of the large smelters, and nearly the entire Aurubis global smelter network, are fully certified with the Copper Mark. This covers more than 95 % of cathode output that

### Aurubis sites certified by The Copper Mark

Pirdop, Bulgaria	Since 2021
Hamburg, Germany	Since 2022
Lünen, Germany	Since 2022
Olen, Belgium	Since 2023
Beerse, Belgium	Since 2024
Stolberg, Germany	Since 2024



More about  
The Copper Mark

we produce annually by sustainably processing concentrates and recycling materials. It also impressively documents Aurubis' Tomorrow Metals sustainability promise.

“Aurubis was one of the first supporters of the international Copper Mark assurance framework. This is an expectation we place on ourselves since we advocate for a sustainable copper value chain. We are pleased that all of the large smelter sites, and by volume nearly the entire Aurubis Group, have now been certified in accordance with these exacting sustainability criteria — a milestone for our company,” Dr. Toralf Haag explained.

<sup>1</sup> The Copper Mark is the leading assurance framework for copper, molybdenum, nickel and zinc, with the vision of a sustainable society enabled by the responsible sourcing, production and recycling of these metals. The Copper Mark is working to develop responsible value chains from mine level to the end product. Through the standards and assurance framework, The Copper Mark supports participants in identifying and making on-the-ground changes to their operations. The Copper Mark standards draw on the 33 internationally recognized sustainability criteria of the Risk Readiness Assessment of the Responsible Minerals Initiative (RMI), covering major environmental, social and governance issues. Over 100 copper industry sites have joined The Copper Mark since March 30, 2020. As of today, about 38 % of copper worldwide is produced by Copper Mark-certified sites.

## More metals from responsible production

**Codelco**

Cooperation agreement February 2024

With the goal of continuously improving the production of copper and other elements in alignment with the needs of the environment and people, in February 2024 Aurubis and Chilean mining group Codelco signed an extensive cooperation agreement focused on environmental protection, health and innovation.

Aurubis values long-term business partnerships with companies in the mining industry, such as Codelco. This strategy is crucial for fulfilling the growing global demand for responsibly produced metals. And even though multimetal recycling is playing an increasingly central role, primary raw materials will also be needed in the future to satisfy the growing need for metals for the green transformation. This strategy is how both companies are strengthening the European and global economy, making it more independent and robust in the face of supply chain disruptions.



## Our products' environmental profiles — small quantities, large impact

Copper, tin, silver and gold are key elements that make megatrends such as digitalization possible in the first place. It is therefore crucial for sustainable development that we find environmentally sound ways to produce these important metals.

Our life cycle assessments (LCAs) demonstrate once again that we are leading the way in the industry when it comes to sustainability: Aurubis already produces a number of metals with less than half the average CO<sub>2</sub> emissions of its global competitors. The results underline what the Tomorrow Metals label stands for:

### LCA — life cycle assessments

Number

9



More information about  
Tomorrow Metals

The carbon footprint of the main product, copper cathodes, has decreased by more than 40% since 2013. Furthermore, the footprint of the Aurubis plants is more than 60% lower than the global industry average. Aurubis is more than 55% below the global average for tin production, and causes over 50% fewer emissions in gold and silver production. These outcomes reflect the impact of our commitment to sustainable metal production. Our recycling and the effectiveness of our metal recovery play an important role in the results of our life cycle assessments. Recycled material accounted for 43% of the content of our copper cathodes in 2023, 56% for silver, and 23% for gold. For tin, the proportion of recycled material was even 100%.

# Aurubis at a glance

FY 2023/24 Group figures

Operating earnings  
before taxes (EBT)

€ **413** million

Operating return on capital  
employed (ROCE)

**11.5** %

Net cash flow

€ **537** million

Capital expenditure

€ **859** million

Operating equity ratio

**55.9** %

Recommended dividend

€ **1.50**



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