

# Task Force on Climate- Related Financial Disclosures (TCFD) Report 2023/24

# Introduction

Climate change is a profound global challenge with far-reaching impacts on ecosystems, the economy and society. Changing temperatures, extreme weather events and a loss of biodiversity are globally threatening the basis of our existence. Targeted prevention measures and a long-term perspective are essential for countering these and other future challenges and risks.

Aurubis is Europe's largest copper producer and one of the largest copper recyclers worldwide. Due to technology, our processes are energy intensive and currently give rise to indirect and direct CO<sub>2</sub> emissions. Direct CO<sub>2</sub> emissions are primarily generated by the use of natural gas in the smelting process, while indirect CO<sub>2</sub> emissions arise chiefly from the consumption of electricity during the copper refining process. However, the products we manufacture significantly contribute to reducing CO<sub>2</sub> emissions in the economy and society because they play a central role in the transmission of renewable energies, in applications that boost energy efficiency, and in electric vehicles. Aurubis actively assumes responsibility for climate protection in this role. Our sense of responsibility is reflected by our extremely energy-efficient production processes and in the progressive decarbonization of our production, for example. Even with this responsible approach in place, it is essential to adequately consider the impacts and risks of the changing global climate in order to prepare appropriate countermeasures and optimize the business model.

We determine climate-related opportunities and risks and the countermeasures derived from them by linking our risk management with our energy, decarbonization and environmental strategies, which are integrated into the overarching company strategy. In the 2023/24 fiscal year as well, we are again voluntarily reporting in line with the TCFD (Task Force on Climate-Related Financial Disclosures) framework, in part because we view this report as a good foundation for preparing the CSRD that will be required the future. Our first TCFD report was released as part of the Sustainability Report for fiscal year 2021/22. This report details the integration of climate-based risk management into the controlling, planning and strategy processes at Aurubis.



# Governance

To ensure we meet the challenges of climate change and the related need for strategic and economic adaptations, oversight of these issues in the company rests with the highest possible management level. In the Aurubis Group, the Executive Board is responsible for the company strategy, including all projects and targets relevant to climate matters.

On a quarterly basis, performance reviews take place at the large smelter sites with the involvement of the Executive Board. In these reviews, both the financial and operational KPIs of the plants are intensively discussed and the status of each large-scale investment/decarbonization project is reviewed — such as the Industrial Heat project and hydrogen-ready anode furnaces in Hamburg (Germany), the solar park in Pirdop (Bulgaria), the steam accumulator in Lünen (Germany), and the contract regarding sourcing electricity from wind turbines in Olen (Belgium). The implementation statuses of the site-specific decarbonization roadmaps, which focus on achieving the 2030 targets in particular by reducing Scope 1 and 2 emissions by 50 % (2018 baseline), are also reviewed. Furthermore, Corporate Risk Management presents its quarterly risk report and annual strategic risk portfolio to the Executive Board. This facilitates extensive, regular discussion of climate risks and corresponding risk mitigation measures. Based on this risk reporting, the Executive Board may initiate additional measures or projects to further reduce risk. The Executive Board approves measures relevant to climate aspects before they are sent to the Supervisory Board for further approval.

In weekly Group Financial (GFM) meetings, the CEO, the CFO and the Finance and Energy & Climate Affairs Group functions are updated on the development of price and cost drivers as well as the resulting risks and opportunities, among other things. This includes climate risk drivers. Where necessary, positions are hedged accordingly on the basis of this analysis.

Moreover, the Aurubis Group Sustainability & External Affairs division works with the responsible department, offering support and managing relevant projects and activities, along with their development, with extensive sustainability KPIs, including climate KPIs. Aurubis Group Sustainability & External Affairs reports directly to the CEO. This allows us to proactively address challenges and introduce appropriate countermeasures at an early stage.

As part of Corporate Sustainability & External Affairs, Group Decarbonization is responsible for managing the Group-wide decarbonization strategy and targets and coordinates the advancement and realization of the Aurubis sites' individual decarbonization roadmaps, which are regularly discussed as part of the Strategy Committee (StratCo) and in the quarterly site reviews (QSRs). Group Decarbonization includes Corporate Energy & Climate Affairs in the process with a view to identifying and controlling the impacts on Group-wide CO<sub>2</sub> management in good time.

The Corporate Environmental Protection division has an environmental risk analysis completed of all the smelter sites once a year with the assistance of an external assessor. The smaller sites are assessed every three years. In addition to conventional environmental risks such as soil contamination and emissions, this risk analysis also includes climate risks such as flooding, the effect of heavy rainfall and water shortages caused by drought. The results of the risk analyses are then incorporated into Corporate Environmental Protection's risk reporting to Corporate Risk Management.

The Aurubis Supervisory Board handles climate-relevant topics and decisions in two main areas: The approval of key investment decisions that involve climate aspects, and consulting on the company strategy, which includes climate-relevant issues and projects. The Audit Committee of the Supervisory Board is involved in monitoring the accounting processes, sustainability and risk management. At quarterly meetings, it follows a consistent agenda that covers sustainability (including the status of the decarbonization roadmap) and risk management, and therefore climate risks. The Executive Board approves the investment budget as part of the medium-term planning, as well as individual projects related to the climate, before they are passed on to the Supervisory Board for additional approval.

# Strategy

Our company strategy is based on a thorough risk analysis. We categorize climate risks as either physical and transition risks.

Transition risks result from the transition to a lower carbon economy and society. Transition risks break down into policy, legal and technological shifts of the market, which can also influence an organization’s reputation. Acute (event driven) or chronic (permanent) changes in climate patterns are physical risks. They result from anthropogenic climate change and endanger the organization.

Impacts include direct financial damage to assets or supply chain disruptions.

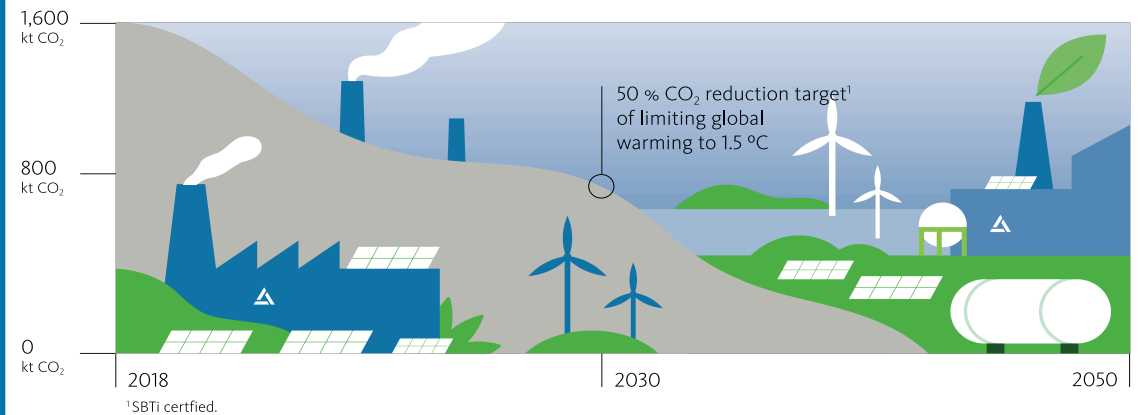
## Identifying transition and physical risks

The table below shows the transition and physical risks for our own business activities as well as the physical risks for our suppliers. The individual risk categories are divided into different risk types, which we use to describe the risks in more detail. We order them by chronological term of impact and assign them to the segment or site affected. For suppliers, we focused on one of our most important raw materials — copper concentrates — and closely analyzed the 22 largest mines by volume. These mines account for about 70 % of our concentrate throughput Group-wide. We only specify the associated countries and not the mine locations and companies for reasons related to competition.

In the chronological categories, we distinguish between a short-term (up to three years), a medium-term (four to ten years), and a long-term time frame (eleven to 30 years). We also divide the physical risks in the tables below into acute extreme weather events and chronic climate shifts.

Our decarbonization strategy encompasses carbon-neutral production well before 2050. We aim to cut our absolute Scope 1 and Scope 2 emissions by 50 % by 2030 (2018 baseline), putting us in line with the Paris Agreement to limit global warming to 1.5°C. Our life cycle analyses show we are making good progress here, as we are already producing many of our metals with less than half the global average CO<sub>2</sub> footprint today.

### Aurubis on a path to net zero



Overview of physical and transition risks

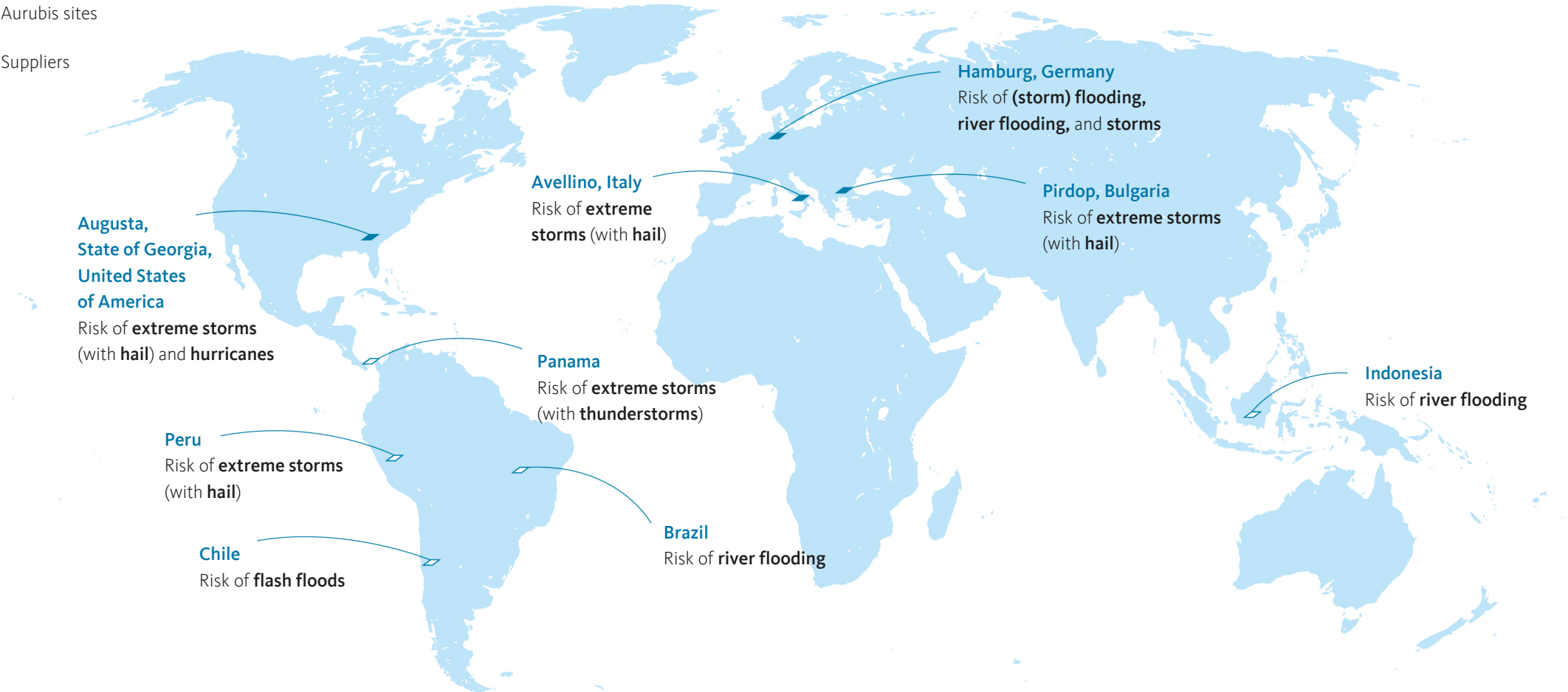
Risk category	Risk type	Description of the risk	Timeline	Segment/city/region affected
<b>Transition risks (Aurubis)</b>	Technological risks	Arise from the conversion of all carbon-emitting production processes to exclusively carbon-neutral processes by 2045, including CO <sub>2</sub> storage/utilization for raw material-related CO <sub>2</sub> emissions (e.g., risk of high investment and operating costs, such as with the use of hydrogen)	Medium, long term	Custom Smelting & Products, Multimetal Recycling
	Political risks	Result from global CO <sub>2</sub> tax regulations, the European Carbon Border Adjustment Mechanism (CBAM), and other political factors that lead to further increases in energy prices; also linked to the continued insufficient recognition of CO <sub>2</sub> -free industrial heat supplied for district heating within the framework of the EU-ETS (European emissions trading system) or alternative compensation systems	Short, medium term	Custom Smelting & Products, Multimetal Recycling
	Reputation and market risks	Result from non-achievement of decarbonization targets (e.g., negative impact on marketing campaigns for Aurubis copper products)	Medium term	Custom Smelting & Products
<b>Physical risks (Aurubis)</b>	Acute extreme weather events	Flooding and river flooding, risk of an (extra)tropical cyclone, a tornado, heavy rains and storms (including hail)	Short, medium, long term	Hamburg (DE), Augusta (US), Pirdop (BG), Avellino (IT), Stolberg (DE)
	Chronic climate change	Changes in temperature and precipitation patterns (e.g., heavy rain, drought, heat ), sea-level rise	Long term	Hamburg (DE), Augusta (US), Pirdop (BG), Berango (ES), Stolberg (DE), Avellino (IT)
<b>Physical risks (suppliers)</b>	Acute extreme weather events	Flooding and river flooding, risk of an (extra)tropical cyclone, a tornado, heavy rains and storms (including hail)	Short, medium, long term	Brazil, Bulgaria, Indonesia, Peru
	Chronic climate change	Changes in temperature and precipitation patterns (e.g., heavy rain, drought, heat ), sea-level rise	Long term	Brazil, Bulgaria, Chile, Indonesia, Peru



## Climate risk analysis for Aurubis sites and suppliers

▬ Aurubis sites

▬ Suppliers



The graphic shows the physical risks identified. For reasons of clarity, the chart is limited to Aurubis and supplier sites with a medium or higher risk of possible damage from climate-related natural disasters. These are primarily severe weather events and flooding for the sites analyzed.

## Taking advantage of opportunities

Based on the risk analysis, Aurubis leverages opportunities as an ambitious first mover engaged in decarbonizing the global economy — a role we are well-suited for. At the end of 2019, Aurubis joined the UN Global Compact Business Ambition for 1.5°C, thereby expressing its commitment to developing science-based CO<sub>2</sub>-reduction targets. The Science Based Targets initiative (SBTi) validated these CO<sub>2</sub>-reduction targets in 2021, confirming that achieving our targets would contribute to limiting global warming to 1.5°C pursuant to the Paris Agreement on Climate Change.

We anticipate strong demand for our metals to facilitate the success of the energy transition in Europe as part of the EU Green Deal and for global decarbonization projects. With a number of strategic projects, we have positioned ourselves for this rise in demand and set extensive growth targets with our Metals for Progress: Driving Sustainable Growth strategy. Here we have placed particular emphasis on expanding our recycling activities, including investments in our new recycling plant in Augusta, Georgia (US). With this strategic step onto the North American market, we want to realize additional earnings potential for Aurubis as well as actively conserve resources and protect the climate by returning high-grade metals from complex recycling materials back to the economic cycle. A detailed description of our measures and targets related to recycling solutions is available in our current Non-Financial Report.

🔗 [www.aurubis.com/en/responsibility/reporting-kpis-and-esg-ratings](https://www.aurubis.com/en/responsibility/reporting-kpis-and-esg-ratings)

Our Industrial Heat project is another important initiative. Today, district heating in Hamburg is still mainly generated from fossil fuels. We have been providing heat to the HafenCity East quarter since 2018, potentially preventing around 20,000 t/a of CO<sub>2</sub>. Starting in the 2024/25 heating period, we plan to significantly boost our heat supply by converting a sub-process of copper production. Our industrial heat will then, as planned, be available to supply around 20,000 households, preventing up to 100,000 t CO<sub>2</sub> a year (avoided emissions). This will further shrink our CO<sub>2</sub> footprint in the Life Cycle Assessment pursuant to ISO 14040, which is already considerably below the global average for copper cathodes. In addition, we continue to work towards reducing our absolute CO<sub>2</sub> emissions (Scope 1 and 2) by 50 % by 2030 and our ambition of carbon-neutral production well before 2050.

We see another opportunity for avoided emissions in our integrated smelter network: Along with copper, we also recover gold, silver, platinum, palladium and additional precious metals, as well as building materials such as iron silicate stone during copper production. If produced by other companies using alternative processes, the additional metals would generate significantly higher CO<sub>2</sub> emissions. Aurubis does not generate these emissions due to our energy-efficient processes and the advantages of the smelter network, so the metals we produce (including copper) have a small CO<sub>2</sub> footprint.

For more on how we are reducing our CO<sub>2</sub> footprint, please see our non-financial report. 🔗 [www.aurubis.com/en/responsibility/reporting-kpis-and-esg-ratings](https://www.aurubis.com/en/responsibility/reporting-kpis-and-esg-ratings)

## Identifying and managing risks

As with all other risks, each Aurubis site is responsible for managing any identified climate risks and mitigating them with suitable countermeasures as part of a risk management system. Below is a selection of the most important measures for limiting climate risks at our largest sites. Some of them have already been implemented or incorporated in investment planning.

Not all risks can be fully eliminated with early and economically feasible measures, however, which is why we also have extensive insurance protection for a number of these potentially damaging circumstances or operational interruptions.

## Analyzing climate scenarios

We have closely reviewed the resilience of our business model and our strategy, taking different climate scenarios into account. Here we have applied the latest scientific findings of the Intergovernmental Panel on Climate Change (IPCC) as representative. The IPCC provides regular assessments of and updates on the status of hundreds of global climate models. The Sixth Assessment Report introduced the “Shared Socioeconomic Pathways (SSPs), which models projected greenhouse gas trends and socioeconomic development. We have specifically assessed two scenarios: A 1.5°C scenario (SSP 1: “Taking the green road”) and a >4°C scenario (SSP 5: “Taking the highway”), both assessed up to 2050. The best-case scenario (SSP 1) would enable internationally coordinated development in keeping with the Paris Agreement. Ambitious climate protection would allow global warming to be limited to 1.5 degrees Celsius compared to the pre-industrial age.

Then there is the opposite, the worst-case scenario (SSP 5). The social and economic development of a rapidly changing world based on the active and growing use of fossil fuel resources, which goes hand-in-hand with energy-intensive lifestyles worldwide. Climate change mitigation measures would be reduced to a minimum. The huge challenges of climate change adaptation would need to be tackled through international coordination.

Aurubis counters transition risks, particularly technological and political risks, with a package of site-specific and Group-wide measures:

- » Technological risks and reputational risks of decarbonization: Every site is responsible for its own CO<sub>2</sub> emissions (Scope 1 and 2) and for outlining an appropriate decarbonization roadmap to achieve the Group-wide ambition of climate-neutral production well before 2050. In this process, Group Decarbonization coordinates the roadmaps across the Group and ensures that they are integrated into company planning and the company strategy.
- » Political risks: We are addressing the high energy prices in Europe and in Germany in particular, which are expected to continue rising due to the energy transition, by pushing for the introduction of an internationally competitive industry electricity price so that the decarbonization roadmaps previously mentioned can be realized based on stable and competitive general conditions. At the same time, we are advocating for the recognition of CO<sub>2</sub>-free industrial heat recovery for the district heating supply in the context of the EU-ETS (European emissions trading system) or alternative compensation mechanisms.

- » **Hamburg** (risk: flooding due to storms): Investment in the construction of new flood protection systems is required. Aurubis will start the new construction in a larger investment project from around 2035.
- » **Pirdop** (risk: hailstorms; increasing droughts long term): Investments have already been made in hail-resistant solar modules. Investments are regularly made in the plant’s water supply infrastructure.
- » **Augusta** (risk: tropical storms, tornadoes with hail and heavy rain; heatwaves long term): Plant facilities and buildings are being built to withstand the anticipated wind speeds. Furthermore, emergency generators are on hand in case of unforeseen power outages, and employee air conditioning was included during construction. The additional costs of these measures were included in the construction costs.



## 1.5°C scenario — SSP 1 (and IEA NZE 2050)

### Methodology:

- » Due to certain similarities in the approach, we use the NZE 2050 Scenario of the IEA (International Energy Agency) in addition to Shared Socioeconomic Pathway 1 (SSP 1); NZE 2050 stands for Net Zero Emissions by 2050 and can be used for approximation purposes as a reference scenario for the European Union's Green Deal, which calls for compliance with the Paris Agreement on Climate Change.
- » The 1.5-degree pathway describes a sustainable development pathway in which greenhouse gas emissions are radically reduced by 2030 in part because society highly prioritizes the use of renewable energy.
- » Global CO<sub>2</sub> emissions reach a level of net zero by 2050; more CO<sub>2</sub> is absorbed than produced.
- » Developed national economies achieve the net zero target before less-developed national economies
- » Expectation of drastic political adaptation measures to achieve the net zero target, which will in turn have the following impacts:
  - » Rising CO<sub>2</sub> price up to US\$ 250/t in 2050
  - » Falling commodity prices for fossil fuels such as oil, gas and coal — but at a high price level
  - » Introduction of systems comparable to the European ETS in many additional countries (including the US, China)
  - » Subsidies to promote the green energy transformation, for example the US Inflation Reduction Act

- » Global decarbonization efforts will trigger a significant increase in demand for the metals required for the green energy transition such as copper and nickel, and this demand will be met by a gradually expanding supply from the opening of new mining deposits; metal prices rise as a result
- » The expansion of mining deposits will be restricted/limited due primarily to (Western) society's increasing focus on sustainability (environmental protection, human rights as recognized in Germany's Act on Corporate Due Diligence Obligations in Supply Chains (LkSG) and the EU's Corporate Sustainability Due Diligence Directive (CSDDD))
- » The previous two points will lead to stronger political support for recycling activities, at least in the Western hemisphere (see the US Critical Minerals Act, which recently added copper to the list of critical and strategically important metals for the energy transformation)

### Results:

- » We described the physical and transition risks in the preceding Strategy chapter
- » Opportunities in this scenario include the projects mentioned above to expand our recycling activities, especially in Augusta, and the Industrial Heat project
- » The entire Aurubis smelter network would probably benefit in the long term from the significant metal price increases expected in this scenario because of the company's metal gain, but also from the anticipated increased refining charges for scrap and recycling materials

## >4°C scenario — SSP 5

### Methodology:

- » In contrast to the 1.5 degree scenario, we selected a worst-case scenario with SSP 5. This scenario represents a world strongly focused on economic growth and technical innovation. Great importance is attached to fossil fuels for maximizing growth, which results in high energy consumption.
- » A further increase in global CO<sub>2</sub> emissions by 2050 compared to today; fossil fuels make up the majority of the energy supply
- » An increase of more than 4°C in the average global temperature by 2100 compared to the pre-industrial age
- » Global climate crisis with heatwaves, forest fires and wildfires, droughts and shortages of clean, potable water on the one hand, and flooding due to sea level rise and more tropical cyclones on the other
- » Rising number of regional crises, but also global geopolitical conflicts triggered by clashes over the distribution of scarce water and food resources due to the climate crisis

- » Global migration waves from climate crisis locations and geopolitical conflicts
- » The climate crisis leads to a reduction in global assets due to natural disasters coupled with a strong decline in insurance coverage
- » The result is decreasing global GDP

### Results:

- » This scenario holds increased physical climate risks for our sites, and these risks are accompanied by a lower level of insurance protection
- » Global climate crisis, geopolitical conflicts, migration waves, and lower global GDP with (currently unquantifiable/unscalable) risks for our business model and our strategy
- » In this scenario, there is no transformation towards a climate-neutral society and as such no identifiable transition risks
- » No discernible opportunities for our business model or our strategy

## Evaluation

In our assessment, opportunities are predominantly present in the best-case scenario, especially in the long-term view. In the short and medium term, we will mitigate the transition risks in particular by consistently implementing our strategic targets, such as those related to decarbonization.

In contrast, we do not see any workable opportunities for our business model in the worst-case scenario, where the physical risks to our sites would increase. The potential impacts and risks of the climate crisis for the global economy and society cannot be predicted from today's perspective.

This scenario analysis reinforces our view that we have embarked on the right path in aligning our strategy with the Paris Agreement on Climate Change. Two extreme scenarios were analyzed. In reality, future developments could lie somewhere between these two scenarios.

Scenario analysis for the development of physical risks at our sites

Risk	Impact on our sites			Explanation
	2024	2050 SSP 1 (1.5°C)	2050 SSP 5 (>4°C)	
Heat stress				Although currently, and in a 1.5°C scenario, only one of the assessed sites is considered at moderate risk from heat stress in 2050, the proportion increases to 38 % for a 4°C scenario. The site in Richmond (US) is the most affected by heat stress.
Drought				Currently all the sites are exposed to a very low risk of droughts. IN a 1.5°C scenario, around 80 % of the sites will be subject to a moderate risk in 2050. Over 90 % will be at risk in a >4°C scenario, and Avellino (IT) at very high risk.
Storm surges				The risk of storm surges remains very high for our Aurubis site in Hamburg (DE). The impact of storm surges might also be intensified by the anticipated rising sea level.

no danger
  very low
  low
  moderate
  high
  very high

<sup>1</sup> SSP2 scenario considered since no SSP1 scenario was available.

In our scenario analysis, we focused on how we predict the major physical climate risks would develop.

# Risk Management

In this chapter, we describe the Aurubis risk management system, which comprehensively assesses climate risks and corresponding risk management.

Our objective in risk management is to manage and monitor the risks associated with our business with the help of a risk management system (RMS) tailored for our activities. It is extremely important to identify and monitor risk development from an early stage. Furthermore, we strive to limit the negative effects of risks on earnings by implementing appropriate and economically sound measures.

Risk management is an integral component of the centralized and decentralized planning, management and monitoring processes and covers all of the Aurubis Group's main sites, business sectors, and central functions. The planning and management system, risk reporting, open communication culture, and risk reviews at the sites create risk awareness and transparency with regard to our risk situation, and promote our risk culture.

Risk management officers have been appointed for all sites, business sectors, and central functions, and they form a network within the Group. The Group headquarters manages the network. In addition to the risk management officer, the Aurubis Group has established a Corporate Risk Management function. The RMS is documented in a corporate policy.

Standard risk reporting takes place on a bottom-up basis each quarter using a consistent, Group-wide reporting format. It details the risks identified, along with risks that exceed a defined threshold. The likelihood of their occurrence and the extent of the damage they could cause are evaluated, and instruments and measures used to manage them are outlined. The risks registered with Group headquarters

are assessed, qualitatively aggregated into significant risk clusters by Corporate Risk Management, and reported to the entire Executive Board. The resulting risk portfolio specifically includes climate risks and serves as a basis for reports to the Audit Committee as well as external risk reporting.

In addition to the risk management system described above, in which every site is responsible for its own specific risks, Aurubis also prepares a strategic risk portfolio with a time frame of up to 30 years every year. This strategic risk portfolio includes climate risks as well as measures already underway or that will be initiated, and is discussed in detail with the Executive Board and the Audit Committee.

The climate risk and scenario analysis outlined in the previous section is based on the following method: For the climate risk analysis, we examined the 17 Aurubis sites and the sites of our key concentrate suppliers. For this purpose, we acquired a license for the Location Risk Intelligence Tool offered by Munich Re. Chronic changes to the climate served as one component of our scenario analysis.

As part of the climate risk analysis, we analyzed the Aurubis sites and the countries where the sites of our biggest concentrate suppliers are located using the Natural Hazards Assessment Network (NATHAN) risk score. The NATHAN risk score is grounded in data for various climate risks such as storms and flooding and helps to improve estimates of the risks concerning climate-related natural disasters. The scenario analysis, presented in a simplified form in the Strategy chapter, considers the development of physical risks for different points of time and for different SSPs. [↗ Strategy](#)

We will specifically take the information gleaned in the process into account in our long-term investment planning, among other things.

# Metrics and Targets

In the following, we define specific key performance indicators (KPIs) that help us measure our success and derive improvements accordingly. In the coming years, we will continue to refine these KPIs based on the climate risk analyses described here, and integrate the results into our planning process. The risks associated with these emissions are described in the previous chapter.

## Reduction in energy consumption through individual projects

	Unit	2023
<b>Total</b>	MWh	<b>347,418</b>
Air leak detection optimized using new tools, Pori (FI)	MWh	320,082
Furnace operation optimized to handle idle times, Buffalo (US)	MWh	17,574
Preheating methane gas: Electric heat exchanger installed to raise temperature, Avellino (IT)	MWh	2,322
Forklift fleet converted to electric forklifts, Hamburg (DE)	MWh	1,808
Methane gas and combustion air pipes insulated, Avellino (IT)	MWh	1,635
Grafana dashboard to optimize washer operation in the smelter furnace, Hamburg (DE)	MWh	1,274
Ebner bell annealing system replaced by electric bell annealing furnace, Stolberg (DE)	MWh	1,000
New air compression system incl. turbo compressors installed, Hamburg (DE)	MWh	872
Limestone replaced in the RWN, Hamburg (DE)	MWh	570
Oxygen control improved in the oxygen system, Hamburg (DE)	MWh	281

## Reduction in CO<sub>2</sub> emissions through individual projects

	Unit	2023
<b>Total</b>	t	<b>6,756</b>
Furnace operation optimized to handle idle times, Buffalo (US)	t	3,170
Limestone replaced in the RWN, Hamburg (DE)	t	900
New air compression system incl. turbo compressors installed, Hamburg (DE)	t	800
Ebner bell annealing system replaced by electric bell annealing furnace, Stolberg (DE)	t	455
Preheating methane gas: Electric heat exchanger installed to raise temperature, Avellino (IT)	t	424
Methane gas and combustion air pipes insulated, Avellino (IT)	t	298
Forklift fleet converted to electric forklifts, Hamburg (DE)	t	263
Grafana dashboard to optimize washer operation in the smelter furnace, Hamburg (DE)	t	232
Oxygen control improved in the oxygen system, Hamburg (DE)	t	211

## CO<sub>2</sub> emissions

	Unit	2023	2022	2021
Scope 1 (emissions produced as a direct result of burning fuels in the company's own facilities)	1,000 t CO <sub>2</sub>	564	555	559
Scope 2 (emissions related to purchased energy, e.g., electricity)	1,000 t CO <sub>2</sub>	613	679 <sup>1</sup>	1,047
<b>Total (Scope 1 + 2)</b>	1,000 t CO <sub>2</sub>	<b>1,177</b>	<b>1,234<sup>1</sup></b>	<b>1,605</b>
Scope 3 (other indirect emissions)	1,000 t CO <sub>2</sub>	4,630	4,113	6,181

<sup>1</sup> Values have been recalculated and adjusted.

## Energy

	Unit	2023	2022	2021
<b>Total energy consumption within the organization</b>	million MWh	<b>3.39</b>	<b>3.44<sup>3</sup></b>	<b>3.64<sup>3</sup></b>
<b>Total energy consumption from renewable energies</b>	million MWh	<b>0.46</b>	<b>0.42</b>	<b>0.13</b>
<b>Total primary energy consumption<sup>1</sup></b>	million MWh	<b>1.73</b>	<b>1.76</b>	<b>1.85</b>
Total fuel consumption from non-renewable sources	million MWh	1.73	1.76	1.72 <sup>3</sup>
– Natural gas	million MWh	1.24	1.29	1.29 <sup>3</sup>
– Heating oil	million MWh	0.00	0.00	0.00
– Liquefied petroleum gas (LPG)	million MWh	0.04	0.04	0.03
– Diesel	million MWh	0.05	0.04	0.01 <sup>3</sup>
– Fuel oil	million MWh	0.29	0.29	0.32
– Coke	million MWh	0.06	0.09	0.11
Total fuel consumption from renewable sources	million MWh	0.002	0.002	0.002
– Wood and wood waste	million MWh	0.00	0.00	0.00
– Landfill gas (LFG)	million MWh	0.002	0.002	0.002
<b>Total secondary energy consumption</b>	million MWh	<b>1.66</b>	<b>1.68<sup>3</sup></b>	<b>1.79<sup>3</sup></b>
<b>Total electricity consumption</b>	million MWh	<b>1.62</b>	<b>1.64<sup>3</sup></b>	<b>1.79<sup>3</sup></b>
Total bought-in electricity	million MWh	1.58	1.59 <sup>3</sup>	1.74 <sup>3</sup>
– from non-renewable sources	million MWh	1.12	1.17 <sup>3</sup>	1.62
– from renewable sources	million MWh	0.45	0.42 <sup>3</sup>	0.13
Consumption of internally generated renewable energies	million MWh	0.045	0.053	0.013 <sup>3</sup>
Consumption of bought-in steam	million MWh	0.03	0.03	0
<b>Energy intensity</b>	MWh/t	<b>2.32</b>	<b>2.16</b>	<b>2.39<sup>3</sup></b>

<sup>1</sup> Including energy consumption for on-site vehicle traffic.

<sup>2</sup> Values based on copper production, i.e., at the Hamburg, Lünen, Pirdop, Olen, Beerse and Berango sites.

<sup>3</sup> Values have been recalculated and adjusted.



**Aurubis 2030 sustainability targets**

Action area	Ambition	2030 targets
<b>€ Economy</b>		
Governance and ethics	We uphold the principles of responsible corporate governance	
Recycling solutions	We offer comprehensive value chain solutions for the circular economy.	Up to 50 % recycled content in copper cathodes on average <sup>1</sup>
Responsibility in the supply chain	We minimize negative impacts on people and the environment in our supply chains.	The improvement plan implemented considerably reduced the risk with all suppliers assessed as high risk.

<b>🌱 Environment</b>		
Energy and climate	We will be carbon-neutral well before 2050.	-50 % absolute Scope 1 and Scope 2 emissions (reference year 2018)  -24 % Scope 3 emissions per ton of copper cathodes <sup>2</sup> (reference year 2018)
Environmental protection	We produce with the smallest environmental footprint in our sector.	-15 % specific dust emissions in g/t multimetal copper equivalent (reference year 2018)  -25 % specific dust emissions in g/t multimetal copper equivalent (reference year 2018)

Furthermore, we define the sustainability targets outlined above that help us measure our success and derive improvements accordingly. We have divided the sustainability goals into the action areas environment (energy and climate, environmental protection), people and economy.

Action area	Ambition	2030 targets
<b>👤 People</b>		
Health and safety	We prevent work-related accidents, injuries and illnesses (Vision Zero).	LTIFR ≤1.0
Future-oriented employer	We create a work environment for close collaboration and promote diversity and commitment. We passionately work for the progress of the company and society.	100 % of the relevant employees receive unconscious bias training  >40 % <sup>3</sup> of employees take part in job rotation and job shadowing, with diversity fostered at the same time  At least 75 % <sup>3</sup> of the employees surveyed participate in pulse checks and feedback measures
Training and education	We provide high-quality vocational training and invest in forward-looking qualifications for employees.	100 % fulfillment of the continuing education allotment in hours (continuing education allotment: 18 hours per year for each employee)
Social engagement	Locally and internationally, we are a reliable partner that is making a lasting contribution to a livable environment.	90 % long-term partners (percentage of total budget)  0.8 % of operating EBT (5-year average) as annual budget for social engagement and at least €2 million

<sup>1</sup> Target adjusted due to changes in market conditions since target was set.  
<sup>2</sup> Refers to copper cathodes from internal production.  
<sup>3</sup> Over the period FY 2021/22 to 2029/30.

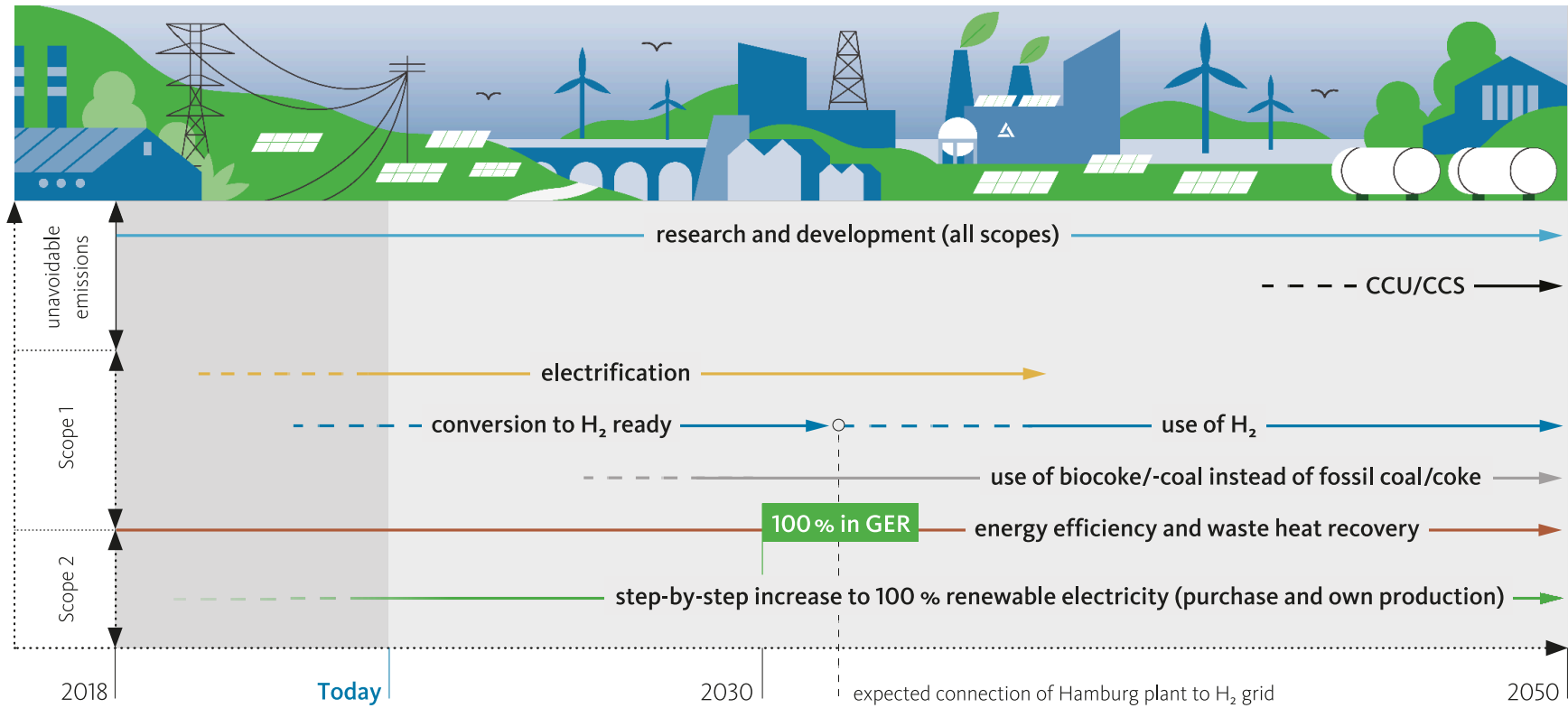
You can read more about all of our sustainability targets, including those not directly related to the climate, in our current non-financial report.

[www.aurubis.com/en/responsibility/reporting-kpis-and-esg-ratings](http://www.aurubis.com/en/responsibility/reporting-kpis-and-esg-ratings)

### Decarbonization targets

We are aiming for carbon-neutral production well before 2050. The challenge inherent in decarbonization: No one single technology will get us there. A diversified approach is needed, especially since our sites have very different requirements. Our path to carbon neutrality is a varied one, as the following Group-wide decarbonization roadmap shows. Renewable energy sources will be used at different points in time depending on their availability and the maturity of decarbonization technologies.

### Aurubis on a path to net zero



# Imprint

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## Disclaimer

This information contains forward-looking statements based on current assumptions and forecasts. The impact of various known and unknown risks, uncertainties and other factors could result in actual future results, financial situation, or developments that differ from the estimates given here. We assume no liability for updating forward-looking statements.