Task Force on Climate-Related Financial Disclosures (TCFD) Report 2022/23

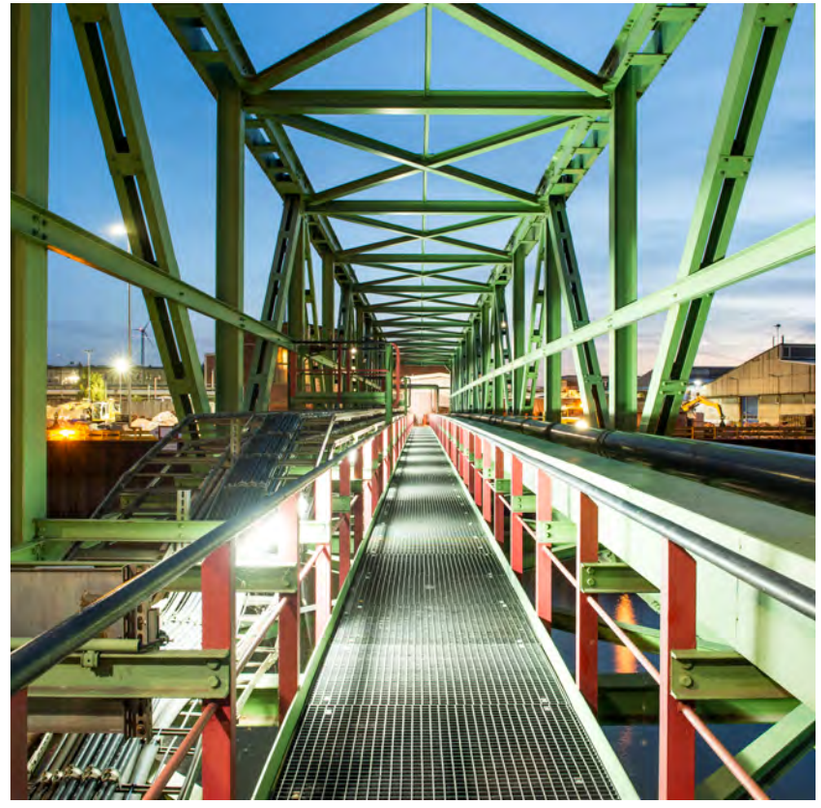
Aurubis
Metals for Progress

Introduction

Climate change is not an isolated challenge. Over the coming decades, rising temperatures will impact nearly all areas of life. The effects of climate change have significant implications for our ecosystems, society, and public health, among other aspects. This, in turn, also means damage that risks impacting the entire global economy.

Aurubis is Europe's largest copper producer and one of the largest copper recyclers worldwide. Our processes are energy intensive and currently give rise to indirect and direct CO_2 emissions. However, the products we manufacture significantly contribute to reducing CO_2 emissions in business and society because they play a central role in the transmission of renewable energies, in applications that boost energy efficiency, and in electric vehicles. In this role, Aurubis actively assumes responsibility for climate protection. This responsibility is reflected in the highly energy-efficient setup of our production processes and in the gradual 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 the appropriate measures and adjustments to the business model.

We identify climate-related opportunities and risks and the measures derived from them by linking risk management with our energy and environmental strategy. We have taken on the task of transparently reporting these exact company processes since fiscal year 2021/22, when we reported in accordance with the Task Force on Climate-Related Financial Disclosures (TCFD) framework for the first time. That report was prepared as part of our general sustainability reporting; as such, this TCFD report is the first standalone publication in this context. In the following pages, we provide a comprehensive report on the integration of climate-related risk management in Aurubis' general governance structure, how the results can be included in the company strategy, and what targets and measures we derive from them. The accompanying metrics provide corresponding context.



Governance

Our objective: to proactively address challenges and introduce appropriate countermeasures early on

In order to face the challenges of climate change and the related strategic and economic adjustments that have to be introduced, responsibility for these topics 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, the large smelter sites report their plants' financial and operational KPIs to the Executive Board, which, in turn, follows up on critical developments and issues. As part of this performance review, the status of each large-scale investment project is discussed — such as the Industrial Heat project in Hamburg (Germany), the solar park in Pirdop (Bulgaria), and the contract for sourcing electricity from wind turbines in Olen (Belgium). Furthermore, Corporate Risk Management presents its quarterly risk report and annual strategic risk portfolio to the Executive Board. This facilitates extensive, routine discussions of climate-related 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 any measures related to the climate before they are passed on to the Supervisory Board for further approval.

Furthermore, the CEO and CFO take part in the weekly Group Financial Meeting (GFM), which also includes managers from the Finance and Energy & Climate Affairs Group functions. One purpose of the GFM is to monitor the development of price and cost drivers as well as the resulting risks and opportunities, among them climate-related risk factors. Where necessary, positions are hedged accordingly on the basis of this analysis.

In addition, together with the responsible departments, the Aurubis Group Sustainability division supports and manages relevant projects and activities, along with their development, with extensive sustainability KPIs, including climate-related KPIs, and reports directly to the CEO. The objective is to proactively address challenges and introduce the appropriate countermeasures early on.

Group Sustainability is responsible for managing the Group-wide decarbonization strategy and coordinates the development and implementation of the Aurubis sites' corresponding decarbonization road maps, which are regularly presented in the Strategy Committee (StratCo). Group Sustainability includes Corporate Energy & Climate Affairs in the process with a view to identifying and controlling the impacts on Group-wide CO_2 management in good time.

Aurubis' Supervisory Board handles climate-relevant topics and decisions in two main areas: the approval of key investment decisions that involve climate-related aspects, and consulting on the company strategy, which includes climate-relevant issues and projects. The Supervisory Board's Audit Committee is involved in monitoring the accounting processes, sustainability and risk management. In its quarterly meeting, it follows a consistent agenda that covers sustainability and risk management, and therefore climate-related 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. With regard to climate-related risks, we distinguish between physical and transition risks. Transition risks result from the transition to a lower-carbon economy, while physical risks reflect the direct impacts of climate change on an organization. Political, legal and technological market changes can represent a transition risk during the transition to a lower-carbon economy and may negatively influence an organization's reputation. In contrast, physical risks can endanger an organization due to certain events (acute) or longer-term changes in climate patterns (chronic) and, as such, harm the assets of the organization or within the supply chain.

Identifying transition and physical risks

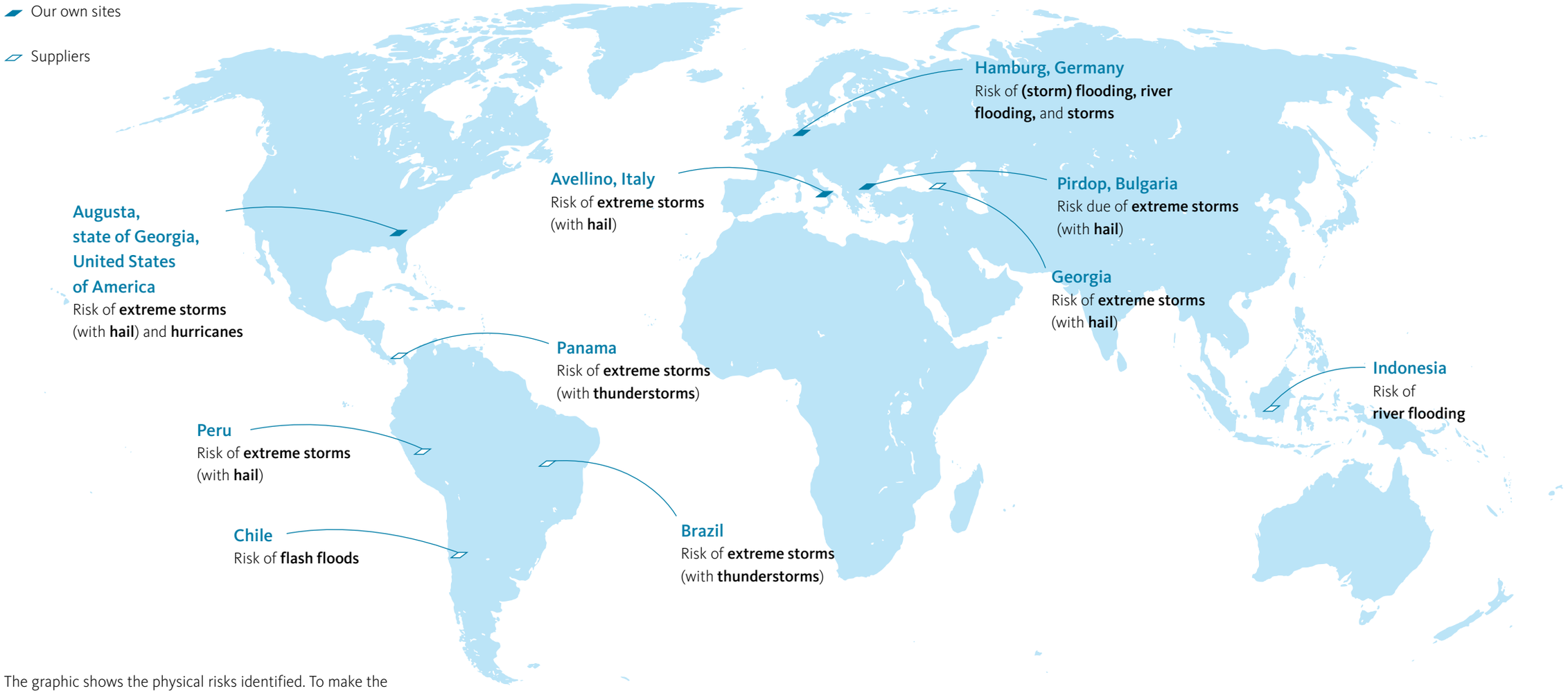
The table at right shows the transition and physical risks for our own business activities as well as the physical risks for our suppliers. The individual risk categories are divided into different risk types, which we use to describe the risks in more detail. We order them by chronological term of impact and assign them to the segment or site affected. For suppliers, we focused on our most important raw material, copper concentrates, and closely analyzed the 25 largest mines by volume. We only provide the associated countries and not the mine locations and companies for reasons related to competition. The 25 mines account for about 70 % of our concentrate throughput Group-wide. Our Supply Chain Management monitors the findings of the climate risk analysis for Panama, as there are already shortages of passage capacity in the Panama Canal. As a preventative measure, we have temporarily increased concentrate inventories for our sites in Hamburg and Pirdop to compensate for potential ship delays.

Overview of physical and transition risks

Risk category	Risk type	Description of the risk	Timeline	Segment/city/region affected
Transition risks (Aurubis)	Technological risk	Arises from the conversion of all carbon-emitting production processes to exclusively carbon-neutral processes by 2045, including carbon storage/utilization for raw material-related CO_2 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 risk	Results from global carbon 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 carbon-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
	Reputational and market risk	Arises from a failure to achieve decarbonization targets (e.g., negative impact on sales campaigns for Aurubis copper products)	Medium term	Custom Smelting & Products
Physical risks (Aurubis)	Acute extreme weather events	Flooding and river flooding, risk of an (extra)tropical cyclone, a tornado, heavy rain, and storms (including hail)	Short, medium, long term	Hamburg (DE), Augusta (US), Pirdop (BG), Berango (ES), Avellino (IT), Stolberg (DE)
	Chronic climate change	Change in precipitation patterns (e.g., heavy rain, drought), temperature increase, sea level rise	Long term	Hamburg (DE), Augusta (US), Pirdop (BG), Berango (ES), Stolberg (DE)
Physical risks (suppliers)	Acute extreme weather events	Flooding and river flooding, risk of an (extra)tropical/tropical hurricane, a tornado, heavy rain, and storms (including hail)	Short, medium, long term	Brazil, Bulgaria, Chile, Indonesia, Georgia, Peru, Panama
	Chronic climate change	Change in precipitation patterns (e.g., heavy rain, drought), temperature increase, sea-level rise	Long term	Brazil, Bulgaria, Chile, Peru, Panama

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 (11 to 30 years). We also divide the physical risks in the table above into acute extreme weather events and chronic climate shifts.

Climate risk analysis for Aurubis sites and suppliers



The graphic shows the physical risks identified. To make the graphic more readable, it is limited to the Aurubis sites and suppliers with a medium or higher risk of possible damage due to climate-related natural disasters, primarily storms 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. The conditions for this role are good. 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_2-reduction targets. The Science Based Targets initiative (SBTi) validated these CO_2-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. Furthermore, Aurubis is a member of the German CEO Alliance for Climate and Economy (Stiftung KlimaWirtschaft).

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 into the North American market, we aim to realize additional earnings potential for Aurubis, while actively conserving resources and the climate by returning highly valuable metals from complex recycling materials 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

Our Industrial Heat project is another important initiative. Today, district heating in Hamburg is still mainly supplied using fossil fuels. We have been providing heat to the HafenCity East quarter since 2018. Starting in 2024/25, we plan to significantly boost our heat supply in the context of converting a sub-process of copper production. Our industrial heat will then be available to heat 20,000 households, preventing up to 100,000 t of CO_2 annually ("avoided emissions"), further shrinking our carbon footprint in the Life Cycle Assessment pursuant to ISO 14040, which is already more than 60 % below the global average for copper cathodes. In addition, we continue to work towards reducing our absolute CO_2 emissions (Scope 1 and 2) by 50 % by 2030 and to make our production climate-neutral well before 2050.

We see another "avoided emissions" opportunity in our integrated smelter network: Along with copper, gold, silver, platinum, palladium, additional precious metals, and building materials such as iron silicate stone are also recovered in copper production. If produced by other companies using alternative processes, the additional metals would generate significantly higher CO_2 emissions. Aurubis doesn't generate these emissions due to our energy-efficient processes and the advantages of the smelter network. As a result, the metals we produce (including copper) have a very small CO_2 footprint.

The company's internal 10 MW Aurubis-1 solar park at the Aurubis site in Pirdop (Bulgaria) represents yet another measure to reduce our CO_2 footprint. It came on stream at the end of 2021. It is currently the largest solar plant for in-house electricity production for a company in Bulgaria and comprises over 20,000 solar panels on a remediated and recultivated 100,000 m^2 landfill. The site's goal is to cover 20 % of its total energy needs from renewable sources by 2030. Two expansion phases for the solar plant are currently being implemented for this purpose. The first expansion phase (Aurubis-2) will have 7.6 MW of power, and the additional expansion phase (Aurubis-3) 6.0 MW. The construction work is scheduled to conclude in late March 2024. For all three plants combined, we expect an annual CO_2 reduction of 34,000 t.

Up to
100,000 t of CO_2
savings through
future use of
our industrial heat

-50 %
Scope 1 and Scope 2
emissions by 2030

Identifying and managing risks

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

- **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 starting around 2035.
- **Pirdop** (risk: hailstorms; increasing drought periods 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 constructed to withstand the anticipated wind speeds. Furthermore, emergency generators are on hand in case of unforeseen power outages, and employee air conditioning was included in construction. The additional costs of these measures were included the construction costs.

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 possible 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. These scenarios (referred to as Representative Concentration Pathways, or RCPs) were developed by the Intergovernmental Panel on Climate Change (IPCC). We considered two specific scenarios: a 1.5°C scenario (RCP 2.6) and a 4°C scenario (RCP 8.5), each for the year 2050. The 1.5°C scenario envisions a reduction in emissions to net zero by 2050 in accordance with the Paris Agreement on Climate Change, i.e., ambitious reduction efforts. In contrast, no significant efforts to mitigate the progression of climate change are assumed in a 4°C scenario.

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_2 emissions (Scope 1 and 2) and for outlining an appropriate decarbonization road map to achieve the Group-wide target of climate-neutral production well before 2050. In this process, Group Sustainability coordinates the road maps across the Group and ensures that they are integrated into company planning and the Group strategy.
- **Political risks:** We are addressing the high energy prices in Europe and especially in Germany, 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 road maps previously mentioned can be implemented on the basis of stable and competitive general conditions. At the same time, we are advocating for the recognition of carbon-free industrial heat recovery for the district heating supply in the context of the EU-ETS (European emissions trading system) or alternative compensation mechanisms.

1.5°C scenario – RCP 2.6 (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 Representative Concentration Pathway RCP 2.6; 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
- Limiting the global temperature increase to 1.5°C by 2100 (as established in the Paris Agreement)
- Global CO_2 emissions reach a level of net zero by 2050
- Developed national economies reach the net zero target before less-developed national economies
- Expectation of drastic and non-linear political adaptation measures to achieve the net zero target, which will in turn have the following impacts:
  - Rising CO_2 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 slowly developing supply from the opening of new mining deposits, with rising metal prices as a result
  - The development 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 section. Strategy, page 4
- Opportunities in this scenario include the projects mentioned above to expand our recycling activities, especially in Augusta, but also 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 – RCP 8.5

Methodology:

- A further increase in global CO_2 emissions by 2050 compared to today, with fossil fuels making up the majority of the energy supply
- An increase of more than 4.1°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, which 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/our strategy
- In this scenario, there is no transformation towards a climate-neutral society and as such identifiable transition risks
- No discernible opportunities for our business model or our strategy

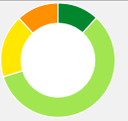
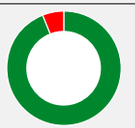
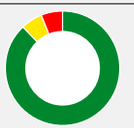
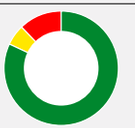
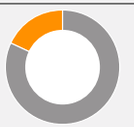
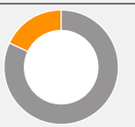
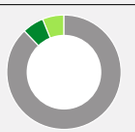
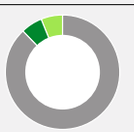
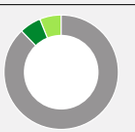
Evaluation

In our assessment, opportunities are predominantly present in the RCP 2.6/NZE 2050 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, for instance those related to decarbonization.

In contrast, we don't see any workable opportunities for our business model in the RCP 8.5 scenario, while 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. Only two extreme scenarios (adherence to the Paris Agreement vs. no efforts to mitigate climate change) 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
	2023	2050 RCP 2.6 (1.5°C)	2050 RCP 8.5 (4°C)	
Heat stress				While currently only 6 % of the sites are considered at moderate risk from heat stress for a 1.5°C scenario in 2050, the proportion increases to 35 % for a 4°C scenario. The site in Augusta, Georgia (US), is the most affected by heat stress.
Forest fires/wildfires				Based on a 1.5°C scenario, the percentage of sites at risk of wildfires differs little from current levels. For a 4°C scenario, the wildfire/bushfire risk increases at 12 sites still classified as low risk in 2022.
Heavy rainfall				Currently, 18 % of the sites are at moderate or elevated risk of heavy rainfall. This proportion rises to 24 % in 2050 for both scenarios since the Berango (ES) site would additionally be exposed to moderate risk.
Drought				For a 1.5°C scenario, only the site in Pirdop (BG) will be subject to a moderate risk of drought in 2050. For a 4°C scenario, however, 29 % of the sites will be at moderate or increased risk of drought.
Fluvial flooding		[1] 		The Hamburg (DE) site is particularly affected by a high risk of river flooding. Based on a 2.6°C scenario,[1] the Berango (ES) site and for a 4°C scenario the Stolberg (DE) site would also be subject to a moderate or elevated risk of river flooding.
Sea level rise		[2] 	[2] 	Rising sea levels pose an increased risk for the Aurubis Hamburg (DE) site in both a 1.5°C scenario and a 4°C scenario in 2100.[2]
Tropical storms		[1] 		For both a 2.6°C scenario[1] and a 4°C scenario, the Aurubis sites in Augusta, Georgia (US), and Buffalo (US) would be at a low risk of tropical storms.

no danger · very low · low · moderate · high · very high

[1] RCP 4.5 (2.6°C scenario) used because no RCP 2.6 (1.5°C scenario) is available.
[2] Mapped for 2100 since no data is availalbe for 2050.

Risk Management

In this chapter, we describe the Aurubis risk management system, which fully considers climate-related risks and their management.

Our objective with risk management is to manage and monitor the risks associated with our business with the help of a risk management system (RMS) suited to our activities. The early identification and monitoring of risk development is extremely important. 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 bottom-up each quarter using a consistent, Group-wide reporting format. It explains 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 deliberately includes climate risks and creates the basis for the report 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, there is an annual process at Aurubis to prepare a strategic risk portfolio with a time frame of up to 30 years. This strategic risk portfolio includes climate-related risks as well as measures already underway or that will be initiated, and this portfolio is discussed in detail with the Executive Board and Audit Committee.

The climate risk and scenario analysis outlined in the previous section is based on the following process: 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 MunichRe. One component of our scenario analysis was chronic changes to the climate.

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 on the basis of 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" section, considers the development of physical risks for different points of time and for different RCPs.

Q Strategy, page 4

The introduction of TCFD reporting represents a significant expansion of how physical climate risks have been mapped to date, as it is the first analysis of our sites (and key suppliers) with relation to the warming scenarios described above. We will specifically take the information gleaned in the process into account in our long-term investment planning, among other things.

We recently significantly expanded our mapping of physical climate risks.

Metrics and Targets

In the following, we have defined 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 analysis of climate risks described here, and integrate the results in our planning process. The risks associated with these emissions are described in the previous section.

Reduction in energy consumption through individual projects

	Unit	2022/23
Total	MWh	**11,880**
Operational optimization of anode furnace channel burner, Hamburg (DE)	MWh	5,909
Adjustment of heating curves, temperature reduction in rooms, Hamburg (DE)	MWh	2,839
Electric heat exchanger to increase methane gas combustion temperature, Avellino (IT)	MWh	2,324
Integration of steam condensate in rinsing water — heat, Olen (BE)	MWh	261
Frequency control of the Delmet exhaust air fan, Olen (BE)	MWh	189
Installation of compressed air limiters, Avellino (IT)	MWh	188
Integration of steam condensate in rinsing water — electricity, Olen (BE)	MWh	170

Reduction in CO_2 emissions through individual projects

	Unit	2022/23
Total	t	**2,293**
Operational optimization of anode furnace channel burner, Hamburg (DE)	t	1,075
Adjustment of heating curves, temperature reduction in rooms, Hamburg (DE)	t	516
Electric heat exchanger to increase methane gas combustion temperature, Avellino (IT)	t	462
Integration of steam condensate in rinsing water — heat, Olen (BE)	t	35
Frequency control of the Delmet exhaust air fan, Olen (BE)	t	75
Installation of compressed air limiters, Avellino (IT)	t	61
Integration of steam condensate in rinsing water — electricity, Olen (BE)	t	68

CO_2 emissions

	Unit	2022	2021	2020
Scope 1 (emissions produced as a direct result of burning fuels in internal facilities)	in 1,000 t CO_2	555	559	540
Scope 2 (emissions related to purchased energy, e.g., electricity)	in 1,000 t CO_2	772	1,047	1,023
Total (Scope 1 + 2)	in 1,000 t CO_2	**1,327**	**1,605**	**1,563**
Scope 3[1] (other indirect emissions)	in 1,000 t CO_2	4,113	6,181	5,940

[1] To calculate the Scope 3 emissions for calendar year 2022, we were able to draw on mine data for the category of purchased goods and services for over 60 % of the copper concentrate purchased. This allowed us to use more exact and supplier-specific data. For the remaining volume, we used the ICA average, which was adjusted in September 2022 and is significantly lower. For transport, more differentiated data was available on the type of transport. This made it possible to better differentiate the modes of transport and evaluate them using the associated, more specific emission factors.

Energy

	Unit	2022	2021	2020
Total energy consumption within the organization	million MWh	**3.61**	**3.79**	**3.72**
Total energy consumption from renewable energies	million MWh	**0.42**	**0.13**	**0.15**
Total primary energy consumption[1]	million MWh	**1.76**	**1.85**	**1.72**
Total fuel consumption from non-renewable sources	million MWh	1.76	1.85	1.71
Natural gas	million MWh	1.29	1.31	1.21
Heating oil	million MWh	0	0	0
Liquefied petroleum gas (LPG)	million MWh	0.04	0.03	0.04
Diesel	million MWh	0.04	0.05	0.05
Fuel oil	million MWh	0.29	0.32	0.27
Coke	million MWh	0.09	0.11	0.11
Total fuel consumption from renewable sources	million MWh	0.002	0.002	0.002
Wood and wood waste	million MWh	0	0	0
Landfill gas (LFG)	million MWh	0.002	0.002	0.002
Total secondary energy consumption[2]	million MWh	**1.85**	**1.94**	**2.00**
Total electricity consumption	million MWh	**1.81**	**1.87**	**1.93**
Total bought-in electricity	million MWh	1.76	1.77[4]	1.88
from non-renewable sources	million MWh	1.36	1.62	1.79
from renewable sources	million MWh	0.42	0.13	0.11
Consumption of internally generated renewable energies	million MWh	0.053	0.032[4]	0.046[4]
Consumption of bought-in steam	million MWh	0.03	0	0.05
Energy intensity[3]	MWh/t	**2.27**	**1.94**	**2.00**

[1] Including energy consumption for on-site vehicle traffic.
[2] Including electricity for oxygen generation.
[3] Values based on copper production, i.e., at the Hamburg, Lünen, Pirdop, Olen, Beerse and Berango sites.
[4] Values have been recalculated and adjusted.

Aurubis 2030 sustainability targets

Economy

Action area	Ambition	2030 targets	2022/23 milestones[1]
Governance & ethics	We uphold the principles of responsible corporate governance.		
Recycling solutions	We offer comprehensive value chain solutions for the circular economy.	**50 %** recycled content in copper cathodes	
Responsible supply chain	We minimize negative impacts on people and the environment in our supply chains.	With all suppliers for which a high risk was identified, the implemented improvement plan significantly reduced the risk.	» Human rights, environmental protection, and safety clauses in 100 % of long-term contracts for primary raw materials » Continued roll-out of Aurubis Business Partner Screening » Copper Mark certification at four sites

Environment

Action area	Ambition	2030 targets	2022/23 milestones[1]
Energy & 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 t of copper cathodes[2] (reference year 2018)	» ISO 50001 at all production sites
Environmental protection	We produce with the smallest environmental footprint in our sector.	**-15 %** specific dust emissions in g/t of multimetal copper equivalent (reference year 2018) **-25 %** specific metal emissions to water in g/t of multimetal copper equivalent (reference year 2018)	» ISO 14001 at all production sites » Reduction of specific metal emissions to water by 50 % in g/t of copper (Cu) output (reference year 2012) » Reduction of specific dust emissions by 15 % in g/t of Cu output (reference year 2012)

People

Action area	Ambition	2030 targets	2022/23 milestones[1]
Occupational health & safety	We prevent work-related accidents, injuries and illnesses (Vision Zero).	LTIFR **≤1.0**	» ISO 45001 certifications at all production sites
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 received unconscious bias training **>40 %**[3] of employees take part in job rotation and job shadowing, while diversity is fostered at the same time At least **75 %**[3] of the employees surveyed participate in pulse checks and feedback measures	» Development of a diversity action framework
Training & education	We provide high-quality vocational training and invest in forward-looking qualifications for employees.	**100 %** fulfillment of the continuing education allocation in hours (continuing education allocation: 18 hours per year for each employee)	» 18 training hours per employee per year on average
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 (five-year average) as annual budget for social engagement, and at least **€ 2 million**	» Developing an impact monitoring system to evaluate sponsored projects

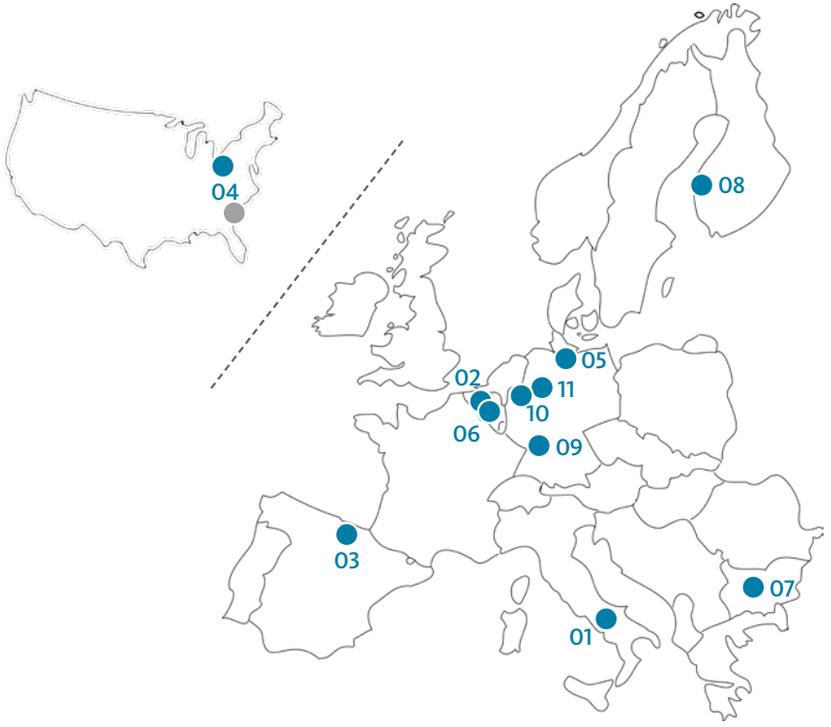
Furthermore, we have defined the sustainability targets outlined above that help us measure our success and derive improvements accordingly. We have divided the sustainability goals into the action areas environment (energy and climate, environmental protection), people and economy.

We have achieved our milestones, so we are on the right path towards our 2030 targets. 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

[1] The previous Sustainability Strategy with its 2018–2023 targets was assimilated as "2022/23 milestones" into the Group strategy mapped out through 2030 and supplements the 2030 sustainability targets.
[2] Refers to copper cathodes from internal production.
[3] Over the FY 2021/22 to 2029/30 period.

Decarbonization projects



- Waste heat use for internal processes
- Power-to-steam (integrated energy): generating steam using excess renewable energies
- Electricity sourced from renewable energies
- Industrial heat for the district heat supply
- Hydrogen use
- Wind turbines
- Solar plant
- Waste heat use for internal electricity generation
- Measures to optimize energy efficiency
- Alternative smelting processes

We have implemented various technologies at our different sites to achieve our decarbonization targets. The following list shows examples of the technologies used at selected sites:

Site	Tech-no-logy	In ope-ration since	CO_2 reduction/ year (in t)	Additional CO_2 reduction potential (in t)
01 Avellino (IT)		2021	1,250	
02 Beerse (BE)		Potential	–	2,000
03 Berango (ES)		2021	2,000	
		2021	200	
04 Buffalo (US)		2000	140,000	
05 Hamburg (DE)		2019	4,000	14,000[1]
		2018	20,000	100,000 (starting 2024)
		2024	5,700	>20,000
06 Olen (BE)		2016	6,000	
		2023	42,000	
07 Pirdop (BG)		2021	6,600	22,000
		Potential	–	30,000
		Potential	–	10,000

In the years ahead, we will continue to refine our targets based on the analysis of climate risks described here, and will integrate the results in our planning process. We will also continue to transparently chronicle our progress in our sustainability reporting.

Site	Tech-no-logy	In ope-ration since	CO_2 reduction/ year (in t)	Additional CO_2 reduction potential (in t)
08 Pori (FI)		2018 – 2020	565	
09 Stolberg (DE)		2016 – 2021	>500 (multiple measures)	
10 Emmerich (DE)		2017 – 2018	1,225 (multiple measures)	
05 Hamburg (DE) **09 Stolberg (DE)** **10 Emmerich (DE)** **11 Lünen (DE)**		2022	184,000	
07 Pirdop (BG) **05 Hamburg (DE)** **11 Lünen (DE)**		2014/ 2016[1]	14,000	16,000
05 Hamburg (DE) **10 Emmerich (DE)** **06 Olen (BE)** **01 Avellino (IT)**				100,000

[1] Replacement of the natural-gas-based auxiliary boiler for steam production.

Imprint

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