

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Aurubis AG is the world's leading provider of non-ferrous metals. The company processes complex metal concentrates, copper scrap and metal-bearing recycling materials into metals of the highest quality. Among other items, Aurubis produces more than 1 million t of copper cathodes per year, and from them diverse copper products, such as wire rod and shapes, rolled products, strip, and specialty wire and profiles made of copper and copper alloys. In addition, Aurubis is the world's largest copper recycler. With its wide range of services, Aurubis is a forerunner in the industry. Its main area of expertise is the processing and optimal utilization of concentrates with complex qualities. Consequently, it has a broad product portfolio. The portfolio includes precious metals, selenium, lead, nickel and a series of other products such as sulfuric acid and iron silicate. Aurubis has production sites in Europe and the USA and an extensive service and sales system for copper products in Europe, Asia and North America. The largest production centers are in Germany, Belgium and Bulgaria. The Aurubis Group is managed centrally from the corporate and administrative headquarters in Hamburg, where key production facilities are also concentrated. 6,673 employees worked for the Aurubis Group worldwide as of September 30, 2018. Of this number, 57 % worked at the German plants and 43 % worked in other countries. Customers of Aurubis include companies in the semis industry, the electrical engineering, electronics and chemical industries, as well as suppliers of the renewable energies, construction and automotive sectors. Aurubis is oriented to growth and to increasing corporate value. The main focuses of our strategy are on expanding our leading market position as an integrated copper and metal producer, entering new markets by offering metals for industries of the future, utilizing growth opportunities and practicing a responsible attitude when dealing with people, resources and the environment. Aurubis AG was founded in Hamburg in 1866 under the name Norddeutsche Affinerie AG. Following various changes in the ownership structure, an IPO was carried out in 1998. The company was renamed Aurubis as a result of a resolution passed at the company's Annual General Meeting on February 26, 2009. Aurubis shares are part of the Prime Standard Segment of the Deutsche Börse and are listed in the MDAX and the Global Challenges Index (GCX).

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Row 1	January 1 2018	December 31 2018	No	<Not Applicable>

C0.3

(C0.3) Select the countries/regions for which you will be supplying data.

Belgium
 Bulgaria
 Finland
 Germany
 Italy
 Netherlands
 United States of America

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

EUR

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Operational control

C-MM0.7

(C-MM0.7) Which part of the metals and mining value chain does your organization operate in?

Row 1

Mining

Please select

Processing metals

Copper

Gold

Platinum group metals

Silver

Nickel

Zinc

Lead

Other non-ferrous metals (please specify) (Selenium Tellurium Tin)

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	Energy and climate related targets are part of the sustainability strategy. The sustainability strategy is reviewed and cleared by the CEO. The CEO oversees major capital expenditures for energy investments, e.g. the 21,7 Mio. € for the district heating project in Hamburg. There are several reports on energy and climate targets that are cleared by the CEO, e.g. the CDP questionnaire.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	Energy and climate related targets are part of the sustainability strategy. The sustainability strategy is reviewed and cleared by the CEO. The sustainability strategy is part of the groups business strategy. An example of how a governance mechanism selected contributes to the boards oversight is that the CEO oversees major capital expenditures for energy investments, e.g. the 21,7 Mio. € for the district heating project in Hamburg. There are several reports on energy and climate targets that are cleared by the CEO, e.g. the CDP questionnaire. Furthermore climate related risks are monitored and reported quarterly to the board. On a weekly basis are discussed (among other core businesses) exposures to climate related costs, with a discussion of mitigation actions.

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	Other, please specify (The sustainability strategy is reviewed and cleared by the CEO. The sustainability strategy is part of the groups business strategy.)	Please select
President	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Environment/ Sustainability manager	Assessing climate-related risks and opportunities	More frequently than quarterly
Energy manager	Both assessing and managing climate-related risks and opportunities	Not reported to the board

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

Senior Vice President Corporate Energy & Climate Affairs and Energy Managers: The development and implementation of the group-wide energy strategy is the central responsibility of the head of Corporate Energy & Climate Affairs, who reports directly to the CEO. This includes the local energy supply and purchasing strategy, CO₂ management and the coordination of the local energy management systems and the energy efficiency network. Such composition ensures an appropriate overview for the CEO related to important and emerging climate topics and enables short decision paths. In weekly Jour Fixes status of measures are reported, for example progress in energy efficiency projects, by the team of six Energy Managers. Planned local investments with effects on energy consumption, energy efficiency and CO₂ emissions are coordinated together with the plant managers and/or energy officers.

Vice President Environmental Protection and Environment Managers: The Senior Vice President Operations and the Vice President of Corporate Environmental Protection are responsible for the strategic positioning of environmental protection in the Group. Corporate Environmental Protection reports directly to the Senior Vice President Operations.

Standards are implemented by the head of Corporate Environmental Protection together with the plant managers at the sites. Together with the sites' environmental officers, Corporate Environmental Protection supervises adherence to the legal environmental requirements, regulatory provisions, standards and business demands. Environment Managers request environmental KPI (including carbon emissions and energy consumption) on a yearly basis from all plants for reporting and monitoring.

Important current issues and developments are reported more frequently to the Executive Board.

Sustainability managers: Sustainability is organized within the company in Investor Relations & Corporate Communications. The Vice President Investor Relations & Corporate Communications reports directly to the Executive Board. Sustainability Management serves as the interface between the headquarters and the sites and coordinates all of the processes related to this topic. It is also responsible for continuously reviewing and developing the Sustainability Strategy at the same time. The Sustainability Management cooperates with the respective divisions and departments in the Aurubis Group and assists with the operative implementation of sustainability measures. The targets and measures are monitored and reviewed in close coordination with the involved departments and the Executive Board. Climate Change targets are part of the Sustainability Strategy. The Supervisory Board is informed monthly about current sustainability developments.

Executive Director Corporate Risk Management: Standard risk reporting, which also includes reporting on climate risks, takes place bottom-up each quarter using a uniform, group-wide reporting format. Within this reporting format, the identified risks and risks beyond a defined threshold are explained and evaluated on the basis of their probability of occurrence and their business significance. Measures to manage them are then outlined.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

Yes

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Who is entitled to benefit from these incentives?

President

Types of incentives

Monetary reward

Activity incentivized

Efficiency project

Comment

The Senior Vice President Corporate Energy and Climate Affairs has yearly target agreements, which form the basis for the additional rewards. Energy efficiency is included in these targets due to its great importance for Aurubis. This also covers the emission reduction targets, projects and initiatives.

Who is entitled to benefit from these incentives?

President

Types of incentives

Monetary reward

Activity incentivized

Emissions reduction target

Comment

The Vice President Corporate Environmental Protection has yearly target agreements, which form the basis for additional rewards. In these targets for environmental managers, Environmental Key Performance Indicators are of great importance and are therefore included.

Who is entitled to benefit from these incentives?

Energy manager

Types of incentives

Monetary reward

Activity incentivized

Efficiency project

Comment

Managers have yearly target agreements, which form the basis for additional rewards. Energy efficiency is included in these targets due to its great importance. This covers the project management of the initiatives mentioned in CC 4.3a

Who is entitled to benefit from these incentives?

Environment/Sustainability manager

Types of incentives

Recognition (non-monetary)

Activity incentivized

Supply chain engagement

Comment

Managers have yearly target agreements, which form the basis for additional recognition. In these targets for sustainability managers, compliance with the Sustainability Strategy is of great importance.

Who is entitled to benefit from these incentives?

All employees

Types of incentives

Monetary reward

Activity incentivized

Emissions reduction project

Comment

At Aurubis AG, there is a company suggestion scheme (Betriebliches Vorschlagswesen, BVW). This allows employees to submit their suggestions and ideas. If the ideas are successfully implemented, employees receive monetary compensation. These suggestions include any ideas that contribute to improvements, for example in the area of occupational health and safety, health

and environmental protection, resource efficiency or the effectiveness of social institutions.

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	0	1	
Medium-term	1	3	
Long-term	3	10	

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	Risk management is an important part of the centralized and decentralized planning, management and control processes and includes all of the main sites, business areas and key functions (e.g. environmental, energy and climate change) of the Aurubis Group. The planning and management system, regular risk reporting, an open communication culture and routine risk reviews at the sites provide transparency about our risk situation.

C2.2b

(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.

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 in Hamburg manages the network. The RMS is documented in a corporate policy. Standard risk reporting takes place bottom-up each quarter using a uniform, group-wide reporting format. Within this format the identified risks and risks beyond a defined threshold are explained and evaluated on the basis of their probability of occurrence and their business significance, and measures to manage them are outlined. The risks registered with Group headquarters are qualitatively aggregated into significant risk clusters by Corporate Risk Management and reported to the entire Executive Board. The report also establishes the basis for the report to the Audit Committee of the Supervisory Board ("Audit Committee") as well as external risk reporting. In the report to the Executive Board and the Audit Committee, the qualitatively aggregated risk clusters are assessed with due regard to risk management measures (net perspective) based on their probability of occurrence and the potential effect on earnings pursuant to the spreads included in the table, and are classified as low, medium or high. Risks are clustered according to their potential effect on earnings, determined by the probability of occurrence and financial impact of occurrence. A risk that is clustered with a high probability of occurrence and will have a financial impact exceeding 50 million € is classified as a high risk (substantive financial impact). One relevant risk issue is energy that amongst others identifies the risk of increasing carbon costs due to politics' goal to comply with the Paris Agreement to combat climate change. Also customer's demand for transparent goals and strategies regarding effective production processes, energy and carbon efficiency is incorporated in the risk management and countered by reporting to CDP.

C2.2c

(C2.2c) Which of the following risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	One example are financial burdens resulting from changes in potential cost drivers such as the EU Emission Trading Scheme (ETS). Aurubis is covered by the EU ETS for six installations throughout the EU, with total direct emissions amount of ~ 450.000 t CO2e in 2018. Other Burdens resulting from changes in potential cost drivers such as the German Renewable Energys Act (EEG), the emissions trade, grid charges and the eco-tax are quantified in the climate-related risk assessments in order to the possible loss of exemptions due to not qualifying or drastic changes in regulation. However we have climate-related risk assessments that analyze the maximal magnitude of risks, if total exemption cases are lost. Inclusion in risk assessment: Aurubis actively takes part in the political dialogue to counter the challenges that regularly arise from changes to regulatory requirements. Corporate Energy and Climate Affairs and Corporate External Affairs monitor the regulatory situation and create regular updates in exchange with trade associations. Based on this is a quarterly risk assessment done to quantify the impacts and estimate the likelihood.
Emerging regulation	Relevant, always included	Aurubis is covered by the EU ETS for six installations throughout the EU, with total direct emissions amount of ~ 450.000 t CO2e in 2017. The fundamental retention of the special Carbon Leakage status for certain sectors starting in 2021 with regard to the allocation of free Emission Trading allowances and CO2 electricity price compensation stands out politically. The completion of the decision-making for the CO2 electricity price compensation is still pending. However, we expect to see a rise in CO2 costs due to increases in CO2 prices resulting from the supply shortage of available CO2 certificates in the coming trading period as well olicy actions like the market stabilization reserve. Inclusion in risk assessment: Aurubis assesses and values the risk quarterly and actively takes part in the political dialogue to counter the challenges that regularly arise from changes to regulatory requirements. Corporate Energy and Climate Affairs and Corporate External Affairs monitor the regulatory situation and create regular updates in exchange with trade associations.
Technology	Relevant, sometimes included	Due to rising burdens by CO2, Aurubis evaluates alternative low or zero carbon technologies as alternatives. Example, on the one hand Aurubis started initiatives for decarbonization (e.g. industrial heat utilization or power to steam) that normally do not fulfil the financial requirements for project approval of Aurubis. But due to the assessment of future demands in a low carbon future, decisions are made to approve these projects, by taking into account these climate related risks (higher CO2 costs, fluctuating electricity supply by renewables). Inclusion in risk assessment: Aurubis assesses and values the risk quarterly. However, it has to be stated that Aurubis currently cannot offset its own CO2 emissions against the amount of CO2 reduction resulting from projects like "Industrial heat".
Legal	Relevant, always included	The violation of laws can have serious consequences for Aurubis as a Group and also for its employees and business partners. Therefore we consistently follow all legal requirements. Example: For the climate-related risks, assessments are conducted by using scenario analysis of changing legislations and resulting increased burdens. These Burdens resulting from changes in potential cost drivers such as the German Renewable Energys Act (EEG), the emissions trade, grid charges and the eco-tax are quantified in the climate-related risk assessments in order to the possible loss of exemptions due to not qualifying or drastic changes in regulation. Inclusion in risk assessment: Significant compliance risks are identified, analyzed and communicated by Compliance Management. We counter legal and tax risks with organizational procedures and clear management structures. There is always a risk that environmental or regulatory provisions could become more stringent, leading to added costs or limitations in product fabrication and marketing.
Market	Not relevant, explanation provided	On the customer side, increasing demands for transparent goals and strategies as relating to effective production processes, energy and CO2 efficiency could represent an influence on future copper product sales, particularly in terms of customer acquisition and retention. Several customers ask us to answer CDP Climate Change questionnaire. We monitor customer expectations through close contact and exchange with customers and general market surveys. As counter steps we do the annual climate reporting and the evaluation of this reporting by means of the CDP. As copper is a commodity with worldwide equal prices, at the moment, customers do not pay more for premium products like "green copper". Due megatrends like e-mobility, renewable energy production, digitization a rising demand for copper is expected for the future.

	Relevance & inclusion	Please explain
Reputation	Relevant, always included	The growing interest and increasing requirements from the surrounding environment validate our actions, as Aurubis is an energy intensive company emitting more than 1,45 Mio. tCO2 (direct and indirect) in 2018. For example meanwhile, our customers are attaching more value to topics such as environmentally sound products, climate protection, modern production processes and a responsible and reliable supply of raw materials. In addition to investors, our customers are also paying heightened attention to whether Aurubis participates in climate reportings such as the "CDP" (formerly Carbon Disclosure Project). Inclusion in risk assessment: Our responsible departments monitor the expectations of different stakeholders closely and engage in dialogues. Our external affairs, sustainability, communication and environmental departments monitor the reputation especially in the local surrounding of the plants and reports the risk assessment to the risk management. We work for a good relation to the local authorities. Therefore we work together with the local authorities in initiatives (like Hamburger Klimabündnis) and monitor emissions more than legally required. Additionally, we engage in projects like low carbon industrial heat for municipal heat supply.
Acute physical	Relevant, always included	At certain times, today's climate and weather conditions have an economic impact on companies such as Aurubis. Example: Occasionally, weather and climate disrupt the smooth operation of the supply chain in raw material procurement, such as when shipping lines carrying vital supplies of anodes and cathodes have to keep their vessels tied up because of hurricanes in the Atlantic. Another scenario is when storms and rain make it impossible to unload copper concentrate at Brunsbüttel, the port of discharge at the mouth of the Elbe River used by Aurubis Hamburg. These settings can result in delays and shortfalls in supply, and Logistics has to come up with an answer so that production does not grind to a halt. Inclusion in risk assessment: During every winter season, when acute extreme weather conditions could occur at our site in Hamburg, a special seasonal team "Ice Age Team" assesses weather risks by analyzing weather reports and develop alternative solutions with potential service providers for the case that the sea routes are not usable because of certain weather conditions. Furthermore, we are monitoring for some sites the water levels and temperatures of nearby rivers (e.g. Rhine in Emmerich or Elbe in Hamburg) due to the availability of sufficient cooling water. In cases of warm water or low tides we are going to start up alternative cooling concepts.
Chronic physical	Relevant, always included	As we purchase concentrates from all over the world, climate change related impacts on transportation routes (rise of sea level, extreme weather conditions, etc.) can be one of several risks for securing our raw materials supply. We deal with logistics risks by implementing a thorough, multi-step acceptance process for service providers, by avoiding single sourcing as far as possible, and by preventively developing back-up solutions. We have an international network of qualified service providers at our disposal and, for instance, prevent weather-related risks in the transport chain by minimizing contingency risks through contractual arrangements that provide for appropriate alternatives. Example: Water related risks are also substantial for mines and one of the reasons for negative impacts on production . Our diversified supplier base regarding different countries and region reduces this risk. Environmental impact is one of our criteria in our business partner screening to minimize sustainability risks in our supply chain.
Upstream	Relevant, always included	We also counter risks within the supply chain with our Business Partner Screening, that lists our business partners, including all our raw materials suppliers. Using this instrument, existing and potential business partners are analyzed to assess their integrity in relation to social and ecological criteria, among other factors. For example, Aurubis purchases copper concentrates from all over the world, more than 50% from South America. Inclusion in risk assessment: The focus of our interest is on topics such as compliance, anti-corruption, human rights and environmental protection. Non-Compliance with these issues can impact Aurubis' reputation and security of concentrate supply. The decision to enter into a contract with business partners with increased risk will only be made after extensive review, and in consultation with the Sustainability and Compliance departments. Example: Water related risks are also substantial for mines and one of the reasons for negative impacts on production. Our diversified supplier base regarding different countries and region reduces this risk. Environmental impact is one of our criteria in our business partner screening to minimize sustainability risks in our supply chain.
Downstream	Relevant, always included	As stated above, we counter risks within the supply chain with our Business Partner Screening, that which lists our business partners, including all our customers . Using this instrument existing and potential business partners are analyzed to assess their integrity in relation to social and ecological criteria, among other factors. Example: The focus of our interest is on topics such as compliance, anti-corruption, human rights and environmental protection. Non-compliance with these issues could impact our sales/ earnings and our reputation negatively . Example: Our customers are also paying heightened attention to whether Aurubis participates in climate reportings such as the "CDP" (formerly Carbon Disclosure Project). The decision to enter into a contract with business partners with increased risk will only be made after extensive review, and in consultation with the Sustainability and Compliance departments.

C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

Risks and opportunities are elements of our business activities and management of these is essential to the company's success. As part of our operating business and our strategic management, we continually assess opportunities and risks. We try to identify and evaluate opportunities as early as possible. 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) suited to our activities. Identifying and observing risk development early on is of major importance. The risks registered with Group headquarters are qualitatively aggregated into significant risk clusters by Corporate Risk Management and reported to the entire Executive Board. The report, together with external risk reporting, serves as the basis for the report to the Audit Committee. Furthermore, we strive to limit negative effects on earnings caused by risks by implementing appropriate and economically sound countermeasures.

Climate related opportunity management:

In addition to risk management, opportunity management is an important element of the Aurubis Group's planning, management and control processes. Its objective is the early identification of internal and external opportunities that could positively impact our economic success. These opportunities are assessed and weighed against the risks associated with them. The next step is to define initiatives and measures to help tap this potential. The process of identifying and assessing opportunities is part of our annual integrated strategy and planning process. In order to promptly recognize opportunities that arise, we continually monitor and analyze the supply and demand aspects of our markets, the competitive landscape, and global trends. Identifying potential opportunities is a daily management responsibility – on the level of both the operational areas and the Group. For Aurubis, Energy is the largest driver of direct and indirect CO2 emissions related to production. At the operational level, the current implementation of the new ISO 50.001 strengthens the requisite energy management with integrated opportunity management methods. Efficiency improvement measures resulting from the ISO audits are recorded and an auditor regularly reviews the implementation. The improvement measures target an improvement of Aurubis' energy-related performance, which leads to CO2 reductions.

Example Physical Opportunity:

Through our collaboration with our customers, we learn a great deal about requirements and the recycling materials of the future. We stay in a continuous dialogue, creating a mutual understanding among different actors in the value chain. For example, Aurubis and Grillo are working together with state-of-the-art technology to achieve a verifiable, closed material cycle. Lünen produces a zinc-bearing substance we call KRS oxide, which is processed into zinc sulfate at a Grillo plant about 60 km away. The process forms a residue containing copper, tin and lead that Aurubis takes back. We then use it in our recycling facilities to recover the materials it contains. Going forward, we intend to form more partnerships to further increase the efficiency and reduce logistic efforts.

Example Transition Opportunity:

Aurubis is the world leading recycler of copper and complex secondary raw materials. Since sustainability continues to be a focal point emphasizing resource efficiency across industries, Aurubis expects demand for recycling solutions to continue growing. Furthermore, energy transition and global trends such as E-mobility drive demand for metals (Copper, Nickel, etc.).

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Policy and legal: Increased pricing of GHG emissions

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

All companies that emit carbon dioxide must have the corresponding rights for this. Six of our European sites are in the scope of the EU-ETS, covering 86% of total Scope 1 emissions. These local additional CO costs reduce the competitiveness of European industry in an international comparison. To balance these effects, so-called carbon leakage sectors were established, including the copper industry. This status currently softens the effect of the general reduction of allocated CO₂ certificates to a great extent. In order to protect the copper industry from disadvantages in international competition, the European Union (EU) has already authorized limited compensation for electricity price increases stemming from CO₂ emissions trading. Some EU member states, including Germany, have adopted corresponding funding guidelines. Due to EU regulations for the copper industry, however, the compensation approved in Germany, where about 60% of our production facilities are located, is only 50 % effective. This leads to a significant remaining load due to indirect CO₂ costs, despite our existing carbon leakage protection. The fundamental retention of the special carbon leakage status for certain sectors starting in 2021 with regard to the allocation of emission trading allowances and CO₂ electricity price compensation stands out politically. The completion of the decision-making for indirect compensation process is still pending. However, we expect to see a rise in CO₂ costs due to increases in CO₂ prices resulting from the supply shortage of available CO₂ certificates in the coming trading period (2021–2030). This circumstance was envisaged by politicians with the goal of complying with the Paris climate accord. In addition to the European regulations, an increase in the CO₂ price is also being discussed in Germany. We expect costs to increase in the medium term overall, which could lead to significant strains.

Time horizon

Long-term

Likelihood

Likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

1000000

Potential financial impact figure – maximum (currency)

50000000

Explanation of financial impact figure

The potential financial impact of critical developments due to changes in ETS legislation is registered by our risk management in a risk cluster as “medium”. According to our risk cluster stated in the Annual Report 2017/18 page 86, a medium risk means the additional operational costs will exceed € 1 million and could even reach levels of over € 50 million, depending on probability and underlying context. Carbon price forecasts and a prognosis of Aurubis’ emission balance have been taken into account.

Management method

Our objective is to help shape the legal conditions for environmentally sound copper production in Europe with our knowledge and many years of experience. The areas of raw materials, energy and environmental protection and the reduction of trade restrictions are at the forefront of our dialogue with policymakers. Our partners are members of the European Parliament, the German Bundestag, representatives of the European Commission (EC), federal and state ministries and civil society groups. Aurubis regularly participates in public consultations, either directly or indirectly through associations. During the reporting period, this took place via the German Federal Ministry for Economic Affairs and Energy on the electricity market law, on the EC’s Circular Economy Package and on the planned reform of the EU ETS. Aurubis also actively takes part in the political dialogue to counter the challenges that regularly arise from changes to regulatory requirements. For example, in Germany we participate in the Energy Efficiency Platform led and initiated by the BMWi in 2014. Working groups meet regularly on topics like energy management. The development of joint solutions is discussed together with the relevant stakeholders from business, civil society, science, public departments and the federal states. As a result a joint Green Paper on Energy Efficiency was published in 2017. How the figure was calculated: Cost of Energy and Climate Department, that manages these issues.

Cost of management

2200000

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Customer

Risk type

Transition risk

Primary climate-related risk driver

Reputation: Increased stakeholder concern or negative stakeholder feedback

Type of financial impact

Reduced revenue from decreased demand for goods/services

Company- specific description

The public is more aware now than ever as to whether a company engages in responsible business practices. When compared within the global industry, our efforts have been successful and we hold a leading position in energy efficiency. However, as we increase productivity and efficiency, we also reach our technical limits. Efficiency enhancements that have already been achieved don't serve as a blueprint for future development because the more steps that have already been taken in energy efficiency, the more difficult it is to optimize energy demand further. Because there are technological limits to reducing energy consumption and emissions, a continued high level of investment leads to only marginal improvements compared to past years. Environmental protection already accounts for a large proportion of energy consumption at Aurubis, as the rising use of complex recycling raw materials with comparatively low copper content requires a higher amount of energy. At our plant in Lünen 30% of our electricity consumption is caused by environmental protection measures. This target conflict is not apparent at first sight, but states a big challenge for Aurubis.

Time horizon

Long-term

Likelihood

Unlikely

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

1000000

Potential financial impact figure – maximum (currency)

5000000

Explanation of financial impact figure

Reputation loss can result from various risk drivers and thus financial implications could reach 1 Mio € or more. The impact is estimated because the risk is substantial and we observe risks with a financial impact of more than 1 Mio. €. The actual impact is not predictable because of many variable components.

Management method

Aurubis regularly participates in public consultations, either directly or indirectly through associations. One example is the participation in the CDP, without this participation the reputation and transparency would drop down. Transparency underpins our aim to successfully manage Aurubis as a company that lives by its sustainability credentials and communicates this stance appropriately. This includes the diverse aspects of our supply chains, our strategy with regard to the environment, resources, the people at the heart of our daily work at Aurubis and our partners. Transparency helps us both in terms of our business and our sustainability targets. Transparent communication makes this possible – for customers, suppliers, investors, the people living near our facilities and, last but not least, for us – the people at Aurubis. (Nachhaltigkeitsbericht S.10) One example of how Aurubis engages in matters of transparency is the participation in CDP reporting since 2014. Additionally on customer's request we take part in the EcoVadis Supplier's Platform and are rated on our environmental, social and governance performance. For our performance in 2018 we got the Gold Status (like only 5% of all participants of EcoVadis). How figure in „Cost of management“ was calculated: No additional costs for management, as they are already part of organization. However, participating in the annual CDP report costs the participation fee, which doesn't exceed € 10,000.

Cost of management

Comment**Identifier**

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Acute: Other

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

At certain times, today's climate and weather conditions have an economic impact on companies such as Aurubis. Occasionally, weather and climate disrupt the smooth operation of the supply chain in raw material procurement, such as when shipping lines carrying vital supplies of anodes and cathodes have to keep their vessels tied up because of hurricanes in the Atlantic. Another scenario is when storms and rain make it impossible to unload copper concentrate at Brunsbüttel, the port of discharge at the mouth of the Elbe River used by Aurubis Hamburg. The yearly shipped amount of copper concentrate is 1.1 Mio. tons. Therefore, each day of supply disruption 3,000 tons of copper concentrate could not be processed. Furthermore, each day supply disruption leads therefore to a loss of ca. 1,100 tons of copper production. These settings can result in delays and shortfalls in supply, and Logistics has to come up with an answer so that production does not grind to a halt.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

1000000

Potential financial impact figure – maximum (currency)

50000000

Explanation of financial impact figure

The financial implications of a delay in supply are hard to quantify, according to our risk cluster a potential more extensive disruption in supply causing a standstill is classified as medium. According to our risk cluster stated in the Annual Report 2017/18 page 86, a medium risk means the additional operational costs will exceed € 1 million and could even reach levels of over € 50 million, depending on probability and underlying.

Management method

One management method to mitigate climate risks is the establishment of the "Ice Age Team" at Aurubis Hamburg in 2009. During the winter season, this team monitors weather scenarios and the logistical implications for the site. Every October, they start their work by analyzing the previous winter's data and develop alternative solutions with potential service providers for the case that the sea routes are not usable because of certain weather conditions. The team also discusses the correct stock of copper concentrate during the winter months, which ensures that production won't be interrupted but also doesn't exceed the capacities of storage. Also, Aurubis Hamburg has been cooperating more closely with the German weather service and the Hamburg Climate Institute in recent years to understand better how certain weather conditions develop. The Ice Age Team also makes sure that from November to March of each and every winter, an ice-going tugboat is made available exclusively to Aurubis within 24 hours upon request, and this vessel can break the ice in the channels and push or tow a loaded lighter (an unpowered barge). How figure in „Cost of management“ was calculated: The management of this risk causes no additional costs, because the Ice Age Team consists of staff from different Aurubis departments and is thereby covered by organization.

Cost of management

0

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.**Identifier**

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Use of lower-emission sources of energy

Type of financial impact

Reduced operational costs (e.g., through use of lowest cost abatement)

Company-specific description

The EU and its member states are setting targets for enhancing energy efficiency and reduce carbon emissions across all sectors. There is an increasing pressure to think of new projects that are able to link sectors and their potential to contribute to the climate targets. Aurubis is able to extract residual heat from its production processes. The use of residual heat replaces fossil fuels in the heat and steam production and therefore not only increases the level of energy efficiency, but also reduces carbon emissions. In October 2018, Aurubis commissioned a 3.7-km-long pipeline that transfers excess heat from our Hamburg plant to our partner enercity AG, who then supplies the neighbourhood HafenCity East with heat. We avoid 20,000 t of CO₂ per year as a result. For this purpose, Aurubis extracts heat that is formed when sulfur dioxide – a by-product of copper smelting – is converted to sulfuric acid. This industrial waste heat is nearly free of CO₂ and its utilization reduces CO₂ emissions by more than 20,000 t per year. About half of this reduction results from the replacement of natural gas used to produce steam on the Aurubis plant premises, while the other half is saved by delivering the waste heat to enercity. In Hafencity East alone, about 4,500 t of CO₂ will be saved each year in the final expansion (target 2029). The supply of residual heat to the HafenCity East ramped up end of 2018 and is expected to increase due to the construction of new buildings. The internal use is expected to ramp up in mid of 2019. The first stage of the industrial heat project was honoured with several awards, e.g. dena Energy Efficiency Award, German Renewables Award 2018 etc.

Time horizon

Current

Likelihood

Virtually certain

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)250000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Replacing fossil fuels via residual heat utilization constitutes an economic counter value. One part of the recovered waste heat is used in the "Hafencity East" in Hamburg. The other part is used to substitute the use of natural gas for heat production at our site. By saving natural gas we save up to 10.000 tCO₂ at our plant. The current CO₂ price is 25€/t. Total savings amount up to 250.000 €/a. In addition it is a reduction of operational costs.

Strategy to realize opportunity

Aurubis takes a close look at all types of waste heat produced from its processes. In Aurubis Hamburg plant 87% of process steam needs are covered by waste heat. Aurubis joined forces with energy service provider enercity AG to launch Germany's largest industrial heat project and we are now supplying the Hamburg neighbourhood Hafencity East with industrial heat from Aurubis. This award-winning project saves around 20,000 t of carbon dioxide (CO₂) emissions per year through the reuse of heat. This is equivalent to the emissions of 10,000 mid-range cars driving 12,000 km per year. About half of the reduction results from avoiding the use of natural gas to produce steam on our plant premises; we save the other half by delivering the waste heat to enercity AG. Furthermore, our contact acid plant no longer has to be cooled with river water, so we use about 12 million m³ less cooling water – the volume of around 4,800 Olympic-sized swimming pools. The total potential heat volume that could be extracted at Aurubis amounts to up to 500 million kWh, which could cover more than a tenth of Hamburg's district heating needs and prevent about 140,000 t of CO₂. How figure was calculated : Aurubis invested roughly € 20 million to convert the facilities and move the heat pipeline to the plant boundary. Aurubis received funding for about 30 % of its investments from the German Federal Ministry for Economic Affairs and Energy (BMWi) via the Development Loan Corporation (KfW).

Cost to realize opportunity

20000000

Comment**Identifier**

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Use of recycling

Type of financial impact

Other, please specify (Increased revenues)

Company-specific description

Metals are an important prerequisite for technical progress as well as a high standard of living. Given a constantly increasing demand paired with a limited availability of resources on the other side, metal recycling plays an important role as raw material source. Aurubis is the worldwide leading recycler of copper and complex secondary raw materials. In light of the rising importance of resource efficiency with regard to sustainability, we expect demand for recycling solutions to continue growing. This is also supported and promoted by increasingly strict national and international legislation. Thanks to our multi-metal recycling activities and proximity to our copper product customers, we consider ourselves to be in a good position to offer expanded closing-the-loop solutions. Due to higher consumption levels and shorter product lifecycles, the supply of recycling raw materials is also growing more quickly. In order to utilize the rising volume of secondary raw materials from the IT and telecommunications sectors, for instance, we are expanding the processing capacities for these types of e-scrap, working on new technologies and investing in state-of-the-art facilities. Aurubis processes about 700,000 t of recycling materials every year, and the trend is increasing. The input material portfolio is diverse. It extends from production waste such as clean wire scrap, stamping waste, and copper cable, to end-of-life recycling raw materials. These include old gutters, pipes, electronic scrap and used electrical appliances. However, we do not rely on the circular economy for copper alone. Nearly all of the other metals from the recycling materials are converted into marketable products at Aurubis. Roughly 50 % of our precious metal output comes from recycling. Complex recycling material input in the Kayser Recycling System (KRS) at the Lunen site reached 267,000 t in fiscal year 2017/18 (previous year: 270,000 t).

Time horizon

Current

Likelihood

Virtually certain

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

1000000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The Aurubis' revenues from precious metals amounted to 2,383 Mio € in fiscal year 2017/18. Revenue development significantly depends on metal price development. This revenue results mainly from the processing of concentrates and the outcome of the recycling of complex materials. Roughly 50 % of our precious metal output derives from recycling materials. Therefore, our estimation is that a potential financial impact could reach 1000 Mio or more in revenues.

Strategy to realize opportunity

In the metal industry, recycling is an prerequisite for efficient and sustainable business. Given that copper can be recycled without loss of quality, recycling is important for Aurubis. Our strategic reorientation to becoming a multi-metal company implies that we are investing more in recycling processes for metals. We have set the target in both the Corporate Strategy and the Sustainability Strategy to extract many metals besides copper through recycling. In this way, we contribute to a circular economy and thus to the conservation of natural resources beyond our key expertise in copper recycling. The Aurubis recycling centre produces converter copper as well as a complex, zinc-bearing residue. Our long-term Partner for this is Grillo, which guarantees environmentally sound recycling and produces zinc sulfate from the KRS oxide. Other elements are separated at Grillo and disposed of appropriately. Aurubis takes back the resulting residue, which contains copper, tin and lead. On May 22, 2019, Aurubis signed a share purchase agreement for the acquisition of the Belgian-Spanish Metallo Group to continue actively pursuing its recycling strategy. The closing of the transaction is subject to approval by the relevant antitrust authorities and is expected to take place by the end of 2019. How figure was calculated: The share purchase agreement stipulates a purchase price of € 380 million and is another proof for Aurubis intent to invest in recycling and sustainability.

Cost to realize opportunity

380000000

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Supply Chain

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Use of recycling

Type of financial impact

Other, please specify (revenue increase)

Company-specific description

In the discussion about climate change the aspect of resource efficiency is more important than ever. The responsible handling of natural resources is not only vital in economic but also in environmental matters. It is important that products are recycled over and over again at the end of their lifecycles. This ensures that valuable raw materials are reused, resources are conserved and environmental impacts are prevented. Therefore the direct return of valuable production scrap back into production is an important component to implement a resource efficient economy. Aurubis fabricates about 1.16 million t of copper cathodes with a purity level of 99.995% per year. Thanks to Aurubis's distinct expertise in recycling, approximately 40% of these cathodes come from reprocessed copper scrap. In addition to copper cathodes, Aurubis offers its customers processed copper in form of preliminary products such as wire rod, shapes, pre-rolled strip, specialty wire and alloys.

Time horizon

Current

Likelihood

Virtually certain

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

34000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Ca. 40% of Aurubis Group cathode output come from reprocessed copper scrap. Taking into account Aurubis copper premium of 86 USD/t in calendar year 2018, we are speaking here about more than 34 Mio. € in additional revenue. In addition to copper cathodes, Aurubis offers its customers processed copper in form of preliminary products such as wire rod, shapes, pre-rolled strip, specialty wire and alloys. Moreover additional financial impact results from scrap refining charges.

Strategy to realize opportunity

Aurubis' business model allows bringing copper scrap back into the production cycle without any detours 1st, Aurubis closes the loop between different areas. Production scrap and intermediate products that occur during the fabrication of copper products are directly sent to our smelters to be used in the production of new cathodes. 2nd, Aurubis is working closely together with direct costumers and offers to collect their production scrap and returns it to the production process of copper. In this way, customers become suppliers at the same time. Our partners include renowned companies like ABB based in Switzerland. 3rd is our multi-metal recycling, that makes end-of-life products again. In addition to the raw materials recovered in production, the close cooperation with our customers enables the logical recycling of products that have served their purpose. The long partnership between Telekom and Aurubis' subsidiary CABLO is testament to this. Establishing and developing "closing-the-loop" systems as a result of new or intensified cooperation with original manufacturers, retailers or customers is one of the measures defined in the Aurubis Sustainability Strategy 2018-2023. The target is to increase the number of "closing-the-loop" systems with direct and indirect product customers from the metal value chain at least by 10 by 2022/23 (base FY:2017/18). How figure was calculated: No additional cost, because the objective of the existing raw material procurement changes.

Cost to realize opportunity

0

Comment

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

	Impact	Description
Products and services	Impacted	Impact on business area: Copper is one of the most important metallic raw materials. Demand for copper is aligned with world economic growth, especially in the electrical, electronics, construction and automotive industries. Global trends such as increasing energy scarcity, rising urbanization, the growth of the world's middle class, digitalization and electric vehicles will continue to not only increase copper demand in the long term, but also the demand for technology metals such as tellurium, nickel, platinum and palladium. Magnitude of impact: If the economy and the demand for our products develop more favorably than currently expected in the markets relevant for us, this could have a positive influence on the Aurubis Group's earnings.
Supply chain and/or value chain	Impacted	Opportunity: Aurubis is the worldwide leading recycler of copper and complex secondary raw materials. Impact on this business area: In light of the rising importance of resource efficiency with regard to sustainability, we expect demand for recycling solutions to continue growing. This is also supported and promoted by increasingly strict national and international legislation. Thanks to our multi-metal recycling activities and proximity to our copper product customers, we consider ourselves to be in a position to offer expanded closing-the-loop solutions. Magnitude of impact: If national and international recycling regulations broaden and demand for recycling solutions in our markets grows more strongly than expected, this could positively affect the Aurubis Group's procurement situation and therefore its earnings. This potential supports our recently announced acquisition of Metallo which grows our recycling capabilities. Risk: (not yet impacted) At least 50% of Aurubis' total emissions arise from services performed by third parties in our supply chain. The implementation of the Business Partner Screening, that lists our business partners, including all our raw material suppliers and the participation in several reportings are part of Aurubis' strategic approach to increase the transparency in the supply chain and manage supply chain risks.
Adaptation and mitigation activities	Impacted	Opportunity: Climate policy and the energy transition place high demands on energy-intensive companies such as Aurubis. Since 1990 we decreased our specific energy consumption by 44%. For adaption to energy transition and the increase in flexibility in consumption concepts are developed for using primarily electricity during phases of oversupply. To investigate potentials of flexibility of electricity consumption Aurubis is participating in NEW 4.0. NEW. 4.0 is a large scale project – funded by the German Ministry of Economy and Energie (BMWi) with more than 50 partners in Hamburg and the Federal State of Schleswig-Holstein. Several departments at Aurubis are involved in this project to investigate potentials to flexibilize energy consumption of Aurubis Hamburg. The findings should be transferred to other Aurubis plants. Our sustainability target is to increase the electricity flexibility to at least 10%.
Investment in R&D	Impacted	The Aurubis Group's R&D expenditures in fiscal year 2017/18 amounted to € 12 million. A significant part of these expenditures was spent to prevent negative environmental impacts.
Operations	Impacted	Risk: Impact on business area: The individual production steps in our value chain are complex and very energy-intensive overall. For us, the efficient use of energy is an issue of ecological and economic responsibility. As a result, all of our sites utilize energy as sparingly as possible. Increasing productivity and efficiency is part of our everyday work in the Aurubis Group. The Energy and Climate Affairs Department oversees the corresponding coordination of the measures across the Group. When compared within the global industry, our efforts have been successful and we hold a leading position in energy efficiency. Magnitude of impact: However, environmental protection already accounts for a large proportion of energy consumption at Aurubis, as the rising use of complex recycling raw materials with comparatively low copper content requires a higher amount of energy. At our plant in Lünen 30% of our electricity consumption is caused by environmental protection measures. This target conflict is not apparent at first sight, but states a big challenge for Aurubis.
Other, please specify	We have not identified any risks or opportunities	

C2.6

(C2.6) Describe where and how the identified risks and opportunities have been factored into your financial planning process.

	Relevance	Description
Revenues	Impacted	Opportunity: Both primary and secondary raw materials are becoming more complex, in that their copper contents are decreasing and the concentrations of tramp elements and impurities are increasing. A particular strength of Aurubis already consists of processing complex primary and secondary raw materials. Indeed, the company's strategy is dedicated to expand this and contributes to achieving efficient and resource-friendly production processes for the raw materials of the future.
Operating costs	Impacted	Risk: In order to protect the copper industry from disadvantages in international competition, the European Union (EU) has already authorized limited compensation for electricity price increases stemming from CO ₂ emission trading. Some EU member states, including Germany, have adopted corresponding funding guidelines. Due to EU regulations for the copper industry, however, the compensation approved in Germany, where ~60% of our production facilities are located, is only 50 % effective. This leads to a significant remaining load due to CO ₂ costs, despite our existing carbon leakage protection. Magnitude of impact: Due to 909,344 t CO ₂ scope 2 (market based) emissions in EU a double up of CO ₂ prices from 25 to 50 €/t would led with 50% compensation rate to more costs of € 11.4 Mio. Opportunities: Replacing fossil fuels via residual heat utilization constitutes an economic counter value. One part of the recovered waste heat in the district heating project initiated by Aurubis, energcity AG and the city of Hamburg is used to substitute the use of natural gas for heat production at our site. Magnitude of impact: By saving natural gas, we save up to 10.000 t CO ₂ at our plant. The current CO ₂ price is 25€/t. Total savings amount to up to 250.000 €/a.
Capital expenditures / capital allocation	Impacted	Opportunity: To reduce the environmental and climate impact our operations have, Aurubis invested more than € 540 Million in environmental protection measures since 2000. One project that was also awarded as a "lighthouse Project" by the German Energy Agency (dena) is the "district heating project" in Hamburg. In February 2017 Aurubis and energcity Contracting Nord GmbH signed a contract for the use of industrial residual heat for the energy supply in the Hamburg district Hafencity East. Magnitude of impact: Aurubis invested roughly € 20 million to convert its facilities and move the heat pipeline to the plant boundary. The ramp up was done end of 2018, substantial internal use is awaited in 2019. CO ₂ emissions reductions of 20,000 tons p.a. are awaited.
Acquisitions and divestments	Not yet impacted	Opportunity: With our strategy „Growth, Efficiency, and Responsibility“ Aurubis is pursuing the next step, from a copper producer to a multi-metal producer. This could include the expansion of existing capacities, but also acquisitions if they make sense and are a good fit in terms of context and geography. Magnitude of impact: On Mai 22, 2019, Aurubis signed a share purchase agreement for the acquisition of the Belgian-Spanish Metallo Group to continue actively pursuing its recycling strategy. The closing of the transaction is subject to approval by the relevant antitrust authorities and is expected to take place by the end of 2019. The share purchase agreement stipulates a purchase price of € 380 million and is another proof for Aurubis intent to invest in recycling and sustainability.
Access to capital	Impacted	Opportunity: Aurubis' and energcity AG project delivers CO ₂ -free waste heat for Hafencity East in Hamburg. Magnitude of impact: The two participating companies invested over € 20 million each, 30 to 40 percent of which was publicly funded. Aurubis received funding from the German Reconstruction Loan Corporation (KfW), while energcity received support from the European Regional Development Fund (ERDF) and the KfW. The funding was initiated by the German Federal Ministry for Economic Affairs and Energy (BMWi) and the Hamburg Authority for Environment and Energy (BUE).
Assets	Impacted	Opportunity: Aurubis' investments in environmental protection and energy efficiency, such as the 'district heating project' are also impacting the assets. Magnitude of impact: Aurubis invested in 2018 € 31 Mio. in environmental protection.
Liabilities	Not impacted	According to Aurubis' Risk and Opportunity Report Liabilities have not been impacted by identified risk or opportunities.
Other	Not impacted	

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?

Yes, qualitative

C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b

(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b)
Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.

In development, we plan to complete it within the next 2 years

C3.1c

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

Measures to counter climate change require careful use of resources to reduce the environmental impact to a minimum, while acting responsibly towards and with people and ensuring economic success. All of these aspects are integral parts of Aurubis' business and Sustainability approach. The Sustainability department is a part of the Investor Relations and Corporate Communications Department. The Vice President of Investor Relations & Corporate Communication reports directly to the Chief Executive Officer and the Aurubis Board. The Sustainability department is responsible for reviewing and developing the company's Sustainability strategy and coordinates activities between headquarters and all Aurubis sites. Energy, climate and environmental targets and measures, set by the relevant departments Corporate Energy & Climate Affairs (ECA) and Corporate Environmental Protection (EP), are monitored and reviewed in close collaboration among the respective departments, the Sustainability department, the Chief Executive Officer and the Aurubis Board. The Aurubis Supervisory Board is regularly briefed on relevant Sustainability developments. One of Sustainability department's key tasks is to actively communicate our sustainability strategy and firmly anchor it with our employees, in ongoing operating processes, as well as externally with our group-wide stakeholders. In our communication with external stakeholders, the Group's representative offices in Berlin and Brussels play an essential role as key interfaces to policymakers, administrative bodies, associations and other institutions. Finally, Aurubis' Sustainability Strategy and targets are reflected in our environmental protection principles and corporate policies, which are binding across the Group.

Climate change makes it even more important to balance economic interests, ecology and social aspects. Aurubis' Sustainability Strategy reflects all of these aspects: ensuring economic stability, promoting innovation, advancing social responsibility, increasing resource efficiency and reducing CO₂ emissions by >100.000 t by FY 2022/23 (base FY: 2012/13).

Aurubis revised its Sustainability Strategy in 2018 and established new targets to be achieved by 2023. The Sustainability Strategy is part of Aurubis Corporate Strategy. Aurubis' strategy „Growth, Efficiency, and Responsibility“ includes that we excel in metallurgy and are a leader in sustainable processing of primary and also secondary raw materials. Not only do we feel responsible for sustainability in our own plant operations, but we also exert influence on our entire value chain. Together with our customers and suppliers, we develop value-creating solutions, for example with view to resource-efficiency and the circular economy. Risks and opportunities are key elements of the Aurubis business activities and essential to the company's success. Climate change entails both risks and opportunities and thus impacts the current and future overall business strategy. Capturing corresponding opportunities could mean a strategic competitive advantage through both, generating profit and also reducing carbon emissions. In this context, the recently announced acquisition of Metallo has been driven by our strategic objective to extend our recycling capabilities.

Aurubis AG joined forces with the energy service provider energcity AG to launch Germany's largest industrial heat project. We are now supplying the Hamburg neighborhood HafenCity East with industrial heat from Aurubis. This award-winning project saves around 20,000 t of carbon dioxide (CO₂) emissions per year through the reuse of heat. This is equivalent to the emissions of 10,000 mid-range cars driving 12,000 km per year. About half of the reduction results from avoiding the use of natural gas to produce steam on our plant premises; we save the other half by delivering the waste heat to energcity AG. Furthermore, our contact acid plant no longer has to be cooled with river water, so we use about 12 million m³ less cooling water – the volume of around 4,800 Olympic-sized swimming pools. The total potential heat volume that could be extracted at Aurubis amounts to up to 500 million kWh, which could cover more than a tenth of Hamburg's district heating needs and prevent about 140,000 t of CO₂.

The Paris Agreement sets the global framework for regional climate policies like the EU-ETS and the German Klimaschutzplan 2050. These policies have an impact on companies such as Aurubis, which strive for balancing economic success, careful use of resources, reduction of environmental impacts to a minimum as well as acting responsibly towards and with people.

C3.1d

(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenarios	Details
IEA 450	<p>The IEA 450 scenario models a 2°C future until 2050. The inherent energy transformation from fossil to renewable, the vitally needed significant energy efficiency enhancements and revolution in industrial processes will have an impact on our production and our business model. Aurubis participated actively in the development of the BDI's study "Climate paths for Germany". The cross-sectoral debates pointed out, that only a global approach to combat climate change is suitable to achieve to meet the 2° target. Which is why the IEA 450 scenario and its price projections were used for further analysis. Aim of the analysis was to investigate industrial processes and the industrial energy consumption regarding the challenges of a 2° scenario. Therefore, we gave input about our operations and productions and possible ways to decarbonize these. The Study results were reviewed in Corporate Energy & Climate Affairs and were also used as in input during the development of the Business Strategy „Growth, Efficiency, and Responsibility“ at Aurubis. For an energy intensive company like Aurubis the main result of the 2° scenario is a significant increase of the carbon price. While the study showed that the 2° target is only achievable when climate action takes place globally, the more realistic scenario is a higher ambition level in Europe compared to the rest of the world. To project possible carbon prices Aurubis discussed intensively with other industry partners in the course of the development of Study "Climate Paths for Germany". BCG projected, depending on the different parameters a price of up to 124€/ tCO2 in 2050. Energy & Climate Affairs adopted this price into its scenario analysis. For 2030 we adopted the target carbon price of the EU Commission of 30€/ tCO2. With these assumptions we projected the inherent cost burden for Aurubis. Two main action approaches were derived from this: Primarily, Aurubis' carbon emissions must be reduced. Additionally, Aurubis' engagement with policy makers has to point out the necessity to provide Carbon Leakage protection for sectors that compete internationally. An example how the business strategy has been directly influenced by the scenario analysis is the carbon reduction target set in our sustainability strategy that is part of our business strategy. We aim to reduce our CO2 by > 100,000 t by FY 2022/23 (base FY: 2012/13). The carbon reduction target was approved by the CEO. The target and inherent measures are monitored and reviewed in close coordination among the relevant departments and the Executive Board. The anticipation of increasing carbon prices as a result of politics goal to comply with the Paris Agreement is published in our Annual Report 2017/2018. We are also using scenario analysis to assess future development of the EV sector, because it has direct impact on such commodity segments as metals and mining. Another field, where we are using scenario analysis is around the growth of the recycling sector. An example where the business strategy has been directly influenced by the scenario analysis is the target for strategic growth in our secondary business – 100 % volume growth in direct sourcing of complex recycling materials from collection points until fiscal year 2022/23 (Baseline: fiscal year 2016/17).</p>

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Absolute target

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Scope

Scope 1 +2 (market-based)

% emissions in Scope

100

Targeted % reduction from base year

8.6

Base year

2013

Start year

2013

Base year emissions covered by target (metric tons CO2e)

1162321

Target year

2022

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

% of target achieved

73

Target status

Underway

Please explain

The absolute reduction target in the medium term is primarily an energy efficiency target which has been translated into tons of CO2. In fiscal year 2013 we launched our Group wide Sustainability Strategy, which aims to reduce CO2 emissions by 100.000 tCO2 by 2022/2023 (updated in 2018 in line with the Vision 2025). The program is being implemented through concrete Projects at individual sites.

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	24	180740
To be implemented*	9	3349
Implementation commenced*	6	22768
Implemented*	6	19154
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative type

Energy efficiency: Processes

Description of initiative

Heat recovery

Estimated annual CO2e savings (metric tonnes CO2e)

20000

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

500000

Investment required (unit currency – as specified in C0.4)

20000000

Payback period

4 - 10 years

Estimated lifetime of the initiative

16-20 years

Comment

This is the internal use of the in 2018 implemented heat recovery project, that will generate savings from 2019 on. There are additional income by sale of the industrial heat. The savings only reflect the savings by CO2 emission reduction (20,000 t CO2 x 25 €/t CO2). Contract is running 20 years, therefore the lifetime is set to 20 years.

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

2425

Scope

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

394095

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

>30 years

Comment

By cleaning the busbars of the tankhouse every 3 weeks, an improvement in voltage can be achieved. The savings are 6063 MWh, which leads to 2425 t CO₂ (scope 2 savings). Savings are calculated as electricity savings, no investment needed.

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO₂e savings (metric tonnes CO₂e)

1179

Scope

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

120000

Investment required (unit currency – as specified in C0.4)

560000

Payback period

4 - 10 years

Estimated lifetime of the initiative

11-15 years

Comment

The target of the measure is to replace a 20 bar steam heating by direct natural gas heating (burners). The positive effect is a reduced energy consumption of natural gas of 17,8% and additionally a small portion of additional electricity production in the turbines.

C4.3c**(C4.3c) What methods do you use to drive investment in emissions reduction activities?**

Method	Comment
Internal price on carbon	When investments in process optimization or new facilities reduce emissions, they are valued with a CO ₂ price forecast. The resulting savings are taken into account for investment calculations and are therefore a driver for investment decisions. For example 1.000 MWh savings of natural gas lead to 25.000 € savings (at a natural gas price of 25 €/MWh) and additionally to reductions of 200 tons CO ₂ emissions, what leads to another 5.000 € savings. Therefore CO ₂ is with 17% a substantial driver of fuel savings.
Compliance with regulatory requirements/standards	Investments in emissions reductions are done in alignment with EU-ETS reduction targets (at the moment only binding target) to avoid the obligation for additional certificate purchase.
Internal incentives/recognition programs	New ideas could be submitted via a company suggestion system and in case of implementation they are honoured with a bonus depending on the savings. Furthermore certain managers have individual bonus payouts depending on climate related targets that also consist emission reductions.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Group of products

Description of product/Group of products

We produce our main product, copper, from copper concentrates and recycling materials. It is an ideal metal for reprocessing, as it isn't fully used up but can be returned to the cycle as often as desired without a loss of quality. Copper therefore fulfills sustainability and resource efficiency requirements to a large extent. Looking forward, Europe's sustainable energy future depends on a partnership between energy efficiency and renewable energy. The more efficiently energy services are delivered, the faster renewable energy can become an effective and significant contributor in primary energy production. Copper is an essential material in building the energy systems of the future. It plays an important role in renewable energy systems, such as solar, wind, tidal, hydro, biomass, and geothermal. Copper is the most highly rated thermal and electrical conductor among the metals used in infrastructure and product design. Power systems utilising copper generate, transmit and use energy with higher efficiency, thus reducing greenhouse gas emissions and optimising life cycle costs.

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product and avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify (Life Cycle Assessment (LCA))

% revenue from low carbon product(s) in the reporting year

57

Comment

57% of our revenues in fiscal year 17/18 were generated by copper product Groups.

Level of aggregation

Group of products

Description of product/Group of products

The copper content in copper cathodes derived from recycled materials

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product and avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify (LCA)

% revenue from low carbon product(s) in the reporting year

35

Comment

35% of the copper content in copper cathodes derived from recycled materials in FY 17/18. 19% of our total revenues are derived from copper cathodes.

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1 2012

Base year end

December 31 2012

Base year emissions (metric tons CO2e)

518789

Comment

Scope 2 (location-based)

Base year start

January 1 2012

Base year end

December 31 2012

Base year emissions (metric tons CO2e)

905666

Comment

Added as new information in this CDP reporting.

Scope 2 (market-based)

Base year start

January 1 2012

Base year end

December 31 2012

Base year emissions (metric tons CO2e)

1176993

Comment

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

European Union Emission Trading System (EU ETS): The Monitoring and Reporting Regulation (MMR) – General guidance for installations

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

521746

Start date

January 1 2018

End date

December 31 2018

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

808486

Scope 2, market-based (if applicable)

934023

Start date

January 1 2018

End date

December 31 2018

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source

Emissions from driving vehicles

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

No emissions from this source

Relevance of market-based Scope 2 emissions from this source (if applicable)

No emissions from this source

Explain why this source is excluded

Not relevant, because below 1% of global emissions.

C6.5

(C6.5) Account for your organization's Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

1427813

Emissions calculation methodology

Calculation based on Greenhouse Gas Protocol Scope 3 Standard, using specific regional emission factors for primary raw materials from LCA databases, and hybrid physical/financial model for other materials.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

84367

Emissions calculation methodology

Calculation based on Greenhouse Gas Protocol Scope 3 Standard, using monetary-based emission factors.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

177349

Emissions calculation methodology

Calculation based on Greenhouse Gas Protocol Scope 3 Standard, using physical emission factors. Including upstream (WTT) emissions of all fuels balanced under Scope 1, as well as upstream (WTT) emissions of purchased electricity.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

236162

Emissions calculation methodology

Calculation based on Greenhouse Gas Protocol Scope 3 Standard, using physical emission factors. Including transport of primary and secondary input materials and intralogistics.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Waste generated in operations

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

4785

Emissions calculation methodology

Calculation based on Greenhouse Gas Protocol Scope 3 Standard, using physical emission factors. Differentiates between deposited/burned waste and recycled materials.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Business travel

Evaluation status

Not relevant, calculated

Metric tonnes CO2e

1956

Emissions calculation methodology

Calculation based on Greenhouse Gas Protocol Scope 3 Standard. Using physical emission factors and reported data from service providers.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Employee commuting

Evaluation status

Relevant, calculated

Metric tonnes CO2e

10866

Emissions calculation methodology

Calculation based on Greenhouse Gas Protocol Scope 3 Standard. Using physical emission factors and average distances and modal splits.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Explanation

There are no significant upstream leased assets to be accounted for.

Downstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

137743

Emissions calculation methodology

Calculation based on Greenhouse Gas Protocol Scope 3 Standard, using physical emission factors per transport mode. Including transport of main- and by-products.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

Explanation

Processing of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Explanation

Aurubis is a producer of base materials. Due to the nature of our products and the innumerable variants of processing and end-of-life treatment, it is impossible to make valid assumptions about the related emissions. It is therefore regarded as not relevant based on the criteria established by the Greenhouse Gas Protocol Standard.

Use of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Explanation

Aurubis is a producer of base materials that do not cause any direct use phase emissions.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Explanation

Aurubis is a producer of base materials. Due to the nature of our products and the innumerable variants of processing and end-of-life treatment, it is impossible to make valid assumptions about the related emissions. It is therefore regarded as not relevant based on the criteria established by the Greenhouse Gas Protocol Standard.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Explanation

There are no significant downstream leased assets to be accounted for.

Franchises

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Explanation

There are no franchises to be accounted for.

Investments

Evaluation status

Not relevant, explanation provided

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Explanation

There are no significant investments that are not already covered in the other scopes and categories.

Other (upstream)

Evaluation status

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Explanation

Other (downstream)

Evaluation status

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Explanation

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.00012449

Metric numerator (Gross global combined Scope 1 and 2 emissions)

1455770

Metric denominator

unit total revenue

Metric denominator: Unit total

11694000000

Scope 2 figure used

Market-based

% change from previous year

15.9

Direction of change

Decreased

Reason for change

Due to overall emission reduction and increasing revenues the intensity figure decreased. For changes of overall emissions please see C7.9a

Intensity figure

218.158189

Metric numerator (Gross global combined Scope 1 and 2 emissions)

1455770

Metric denominator

full time equivalent (FTE) employee

Metric denominator: Unit total

6673

Scope 2 figure used

Market-based

% change from previous year

13.3

Direction of change

Decreased

Reason for change

Due to overall emission reduction the intensity figure decreased. For changes of overall emissions please see C7.9a

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

No

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
United States of America	37436
EU28	484310

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By facility

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Hamburg, Germany	165029	53.521576	10.03331
Pirdop, Bulgaria	57771	42.703374	24.177048
Lünen, Germany	166918	51.60646	7.50755
Olen, Belgium	44775	51.177305	4.879092
Stolberg, Germany	4016	50.759048	6.234986
Buffalo, USA	37436	42.948404	-78.892807
Zutphen, Netherlands	5391	52.157565	6.206821
Pori, Finland	7976	61.462226	21.861253
Avellino, Italy	15963	40.914388	14.790612
CABLO Metall-Recycling und Handel GmbH, Fehrbellin, Deutschland	47	52.79407	12.76509
E.R.N., Hamburg, Germany	27	53.526343	10.029339
Retorte, Hamburg, Germany	329	49.49038	11.24973
Peute Baustoffe, Hamburg, Germany	9	53.51133	10.05728
Deutsche Giessdraht, Emmerich, Germany	16060	51.82784	6.26501

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility generation activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	521746	<Not Applicable>	
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
United States of America	14596	24680	27643	133310
EU28	793890	909344	1529523	0

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By facility

C7.6b

(C7.6b) Break down your total gross global Scope 2 emissions by business facility.

Facility	Scope 2 location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Hamburg, Germany	293543	409213
Pirdop, Bulgaria	310263	227597
Lünen, Germany	82826	115280
Olen, Belgium	37380	75440
Stolberg, Germany	18159	24242
Buffalo, USA	14596	24680
Zutphen, Netherlands	26932	21334
Pori, Finland	8969	6434
Avellino, Italy	5747	4673
Cablo, Germany	5758	8027
E.R.N, Germany	138	192
Retorte, Germany	918	1280
Peute Baustoffe, Germany	198	276
Emmerich, Germany	7201	3922

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization’s total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	808486	923281	
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	
Other emissions reduction activities	19154	Decreased	1.2	Proactive emissions reduction initiatives or activities, for example those listed in question C4.3a+b. Emissions value (percentage) = 19,154/1,634,694x100
Divestment	89696	Decreased	5.5	Sale of engines of oxygen plant Hamburg reduced accountable electricity consumption (only scope 2). Emissions value (percentage) = 89,696/1,634,694x100
Acquisitions	0	No change	0	
Mergers	0	No change	0	
Change in output	50676	Increased	3.1	Increase of production by 3,1% overall products. Emissions value (percentage) = 50,676/1,634,694x100
Change in methodology	0	No change	0	
Change in boundary	101891	Decreased	6.2	Exclusion of subsidiary Schwermetal Halbzeugwerke due to only 50% ownership and therefore not under operational control and consolidated in any report. (Scope 1+2) . Emissions value (percentage) = 101,891/1,634,694x100
Change in physical operating conditions	0	No change	0	
Unidentified	0	No change	0	
Other	18858	Decreased	1.2	Sum of all measured changes in scope 1+2 emissions, each of this is negligible. Emissions value (percentage) = 18,858/1,634,694x100

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization’s energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	3470	1701122	1704592
Consumption of purchased or acquired electricity	<Not Applicable>	133310	1557166	1690476
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	0	5045	5045
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	29442	<Not Applicable>	29442
Total energy consumption	<Not Applicable>	166222	3263333	3429555

C-MM8.2a

(C-MM8.2a) Report your organization’s energy consumption totals (excluding feedstocks) for metals and mining production activities in MWh.

	Heating value	Total MWh
Consumption of fuel (excluding feedstocks)	HHV (higher heating value)	1704592
Consumption of purchased or acquired electricity	<Not Applicable>	1690476
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	5045
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	29442
Total energy consumption	<Not Applicable>	3429555

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	No
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Natural Gas

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

1207398

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

66493

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

Fuels (excluding feedstocks)

Liquefied Petroleum Gas (LPG)

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

53178

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

Fuels (excluding feedstocks)

Diesel

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

11829

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

Fuels (excluding feedstocks)

Distillate Oil

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

11078

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

414

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

Fuels (excluding feedstocks)

Residual Fuel Oil

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

297284

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

Fuels (excluding feedstocks)

Coking Coal

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

86589

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

Fuels (excluding feedstocks)

Landfill Gas

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

3470

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

Fuels (excluding feedstocks)

Butane

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

33766

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

Comment

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Butane

Emission factor

66.27

Unit

kg CO2 per GJ

Emission factor source

Individual National Emission factors of Butane. Verified by an external auditor during regular audits. If the fuel is used at several sites, the average emission factor is stated.

Comment

Coking Coal

Emission factor

111.5

Unit

kg CO2 per GJ

Emission factor source

Individual National Emission factors of Coke. Verified by an external auditor during regular audits. In Lünen und Hamburg for example coke is being sampled to determine the emission factor. If the fuel is used at several sites, the average emission factor is stated.

Comment

Diesel

Emission factor

74.1

Unit

kg CO2 per GJ

Emission factor source

National Emission factor of Diesel, in Germany for example we use th DEHSt list of Standard factors provided by the national agency (source: https://www.dehst.de/DE/service/archivsuche/archiv/SharedDocs/downloads/DE/Berichterstattung_2005-2007/EB2007_Stoffliste.html)

Comment

Distillate Oil

Emission factor

73.75

Unit

kg CO2 per GJ

Emission factor source

National Emission factors of Heizöl EL, in Germany for example we use the DEHSt list of Standard factors provided by the national agency (source: https://www.dehst.de/SharedDocs/downloads/DE/stationaere_anlagen/Emissionsbericht_Leitfaden_Anhang4.pdf?__blob=publicationFile&v=3)

Comment

Landfill Gas

Emission factor

0

Unit

kg CO2 per GJ

Emission factor source

Landfill gas is a biogenic fuel

Comment

Liquefied Petroleum Gas (LPG)

Emission factor

64

Unit

kg CO2 per GJ

Emission factor source

National Emission factor of Diesel, in Germany for example we use th DEHSt list of Standard factors provided by the national agency (source: https://www.dehst.de/DE/service/archivsuche/archiv/SharedDocs/downloads/DE/Berichterstattung_2005-2007/EB2007_Stoffliste.html)

Comment

Natural Gas

Emission factor

55.7

Unit

kg CO2 per GJ

Emission factor source

National Emission factor of Diesel, in Germany for example we use th DEHSt list of Standard factors provided by the national agency (source: https://www.dehst.de/DE/service/archivsuche/archiv/SharedDocs/downloads/DE/Berichterstattung_2005-2007/EB2007_Stoffliste.html)

Comment

Residual Fuel Oil

Emission factor

78

Unit

kg CO2 per GJ

Emission factor source

Individual National Emission factors of Coke. Verified by an external auditor during regular audits. In Lünen und Hamburg for example coke is being sampled to determine the emission factor. If the fuel is used at several sites, the average emission factor is started.

Comment

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	29442	29442	29442	29442
Heat	0	0	0	0
Steam	327884	327884	261392	261392
Cooling	0	0	0	0

C-MM8.2e

(C-MM8.2e) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed for metals and mining production activities.

	Total gross generation (MWh) inside metals and mining sector boundary	Generation that is consumed (MWh) inside metals and mining sector boundary
Electricity	29442	29442
Heat	0	0
Steam	327884	327884
Cooling	0	0

C8.2f

(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

Basis for applying a low-carbon emission factor

Power Purchase Agreement (PPA) without energy attribute certificates

Low-carbon technology type

Hydropower

Region of consumption of low-carbon electricity, heat, steam or cooling

North America

MWh consumed associated with low-carbon electricity, heat, steam or cooling

133310

Emission factor (in units of metric tons CO₂e per MWh)

0

Comment

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C-MM9.3b

(C-MM9.3b) Provide details on the commodities relevant to the metals production activities of your organization.

Output product

Copper

Capacity (metric tons)

1411055

Production (metric tons)

1411055

Annual production in copper-equivalent units (thousand tons)

1411

Scope 1 emissions (metric tons CO2e)

434492

Scope 2 emissions (metric tons CO2e)

837375

Scope 2 emissions approach

Market-based

Pricing methodology for-copper equivalent figure

Production represents copper output from our smelter sites. Scope 1 Emissions Copper output: Scope 1 emission, (Hamburg, Lünen, Olen, Pirdop) = 434,492 tCO2 Scope 2 Emissions Copper Output: Scope 2 (Hamburg, Lünen, Olen, Pirdop) = 837,375 tCO2

Comment

With our current production output we use nearly 100% of our capacity.

Output product

Other non-ferrous metals (Please specify) (Copper fabrication sites)

Capacity (metric tons)

638668

Production (metric tons)

638668

Annual production in copper-equivalent units (thousand tons)

638

Scope 1 emissions (metric tons CO2e)

86842

Scope 2 emissions (metric tons CO2e)

86872

Scope 2 emissions approach

Market-based

Pricing methodology for-copper equivalent figure

Output "Copper Fabrication Sites" includes copper products like rod and flat rolled products. Scope 1 Emissions Output Copper Fabrication Sites: Scope 1 emissions (Pori, Zutphen, Stolberg, Buffalo, Deutsche Giessdraht, Avellino) = 86,842 tCO2 Scope 2 Emissions Output Copper Fabrication Sites: Scope 2 emissions (Pori, Zutphen, Stolberg, Buffalo, Deutsche Giessdraht, Avellino) = 86,872 tCO2

Comment

With our current production output we use nearly 100% of our capacity.

Output product

Other non-ferrous metals (Please specify) (Production sites other than copper)

Capacity (metric tons)

699970

Production (metric tons)

699970

Annual production in copper-equivalent units (thousand tons)

700

Scope 1 emissions (metric tons CO2e)

412

Scope 2 emissions (metric tons CO2e)

9776

Scope 2 emissions approach

Market-based

Pricing methodology for-copper equivalent figure

Output "Production Sites Other Than Copper" include products as: Selenium, Brass and Aluminium granulates, Iron Silicate, etc. which are produced at our sites. Scope 1 Emissions Output "Production Sites Other Than Copper": Scope 1 emissions (Cablo, Retorte, E.R.N., Peute) = 419 tCO2 Scope 2 Emissions Output "Production Sites Other Than Copper": Scope 2 emissions (Cablo, Retorte, E.R.N., Peute) = 9531 tCO2

Comment

With our current production output we use nearly 100% of our capacity.

C-MM9.6

(C-MM9.6) Disclose your organization's low-carbon investments for metals and mining production activities.

Investment start date

January 1 2018

Investment end date

December 31 2018

Investment area

Property, plant and equipment

Technology area

Other, please specify (District heating project)

Investment maturity

Full/commercial-scale demonstration

Investment figure

20000000

Low-carbon investment percentage

0 - 20%

Please explain

In February 2017 Aurubis and enercity Contracting Nord GmbH signed a contract for the use of industrial residual heat for the energy supply in the Hamburg district Hafencity East. In the contract, the partners agree to use industrial residual heat from the Hamburg Aurubis plant to provide energy-efficient district heating to Hafencity East. For this purpose, Aurubis extracts heat that is formed when sulfur dioxide – a by-product of copper smelting – is converted to sulfuric acid. This industrial residual heat is nearly free of CO2, and utilizing it will reduce CO2 emissions by more than 20,000 t per year. About half of this reduction results from the replacement of natural gas used to produce steam on the Aurubis plant premises, while the other half is saved by delivering the residual heat to enercity. On top of this additional heat extraction with CO2 savings potential of approximately 120,000 t CO2 per year would also be possible. Aurubis is currently working on the technical, financial and contractual aspects of the implementation options. Other projects for waste heat recovery are currently in the planning phase. Aurubis is investing roughly € 21,7 million to convert the facilities and move the heat pipeline to the plant boundary and will receive funding for about 30 % of its investments from the German Federal Ministry for Economic Affairs and Energy (BMWi) via the Development Loan Corporation (KfW). A similar

level of funding is planned for enercity Contracting Nord from the European Regional Development Fund (ERDF) via the funding program of the city of Hamburg's Authority for the Environment and Energy (BUE), as well as the BMWi.

Investment start date

October 1 2017

Investment end date

September 30 2018

Investment area

R&D

Technology area

Other, please specify (Resource efficiency)

Investment maturity

Applied research and development

Investment figure

12000000

Low-carbon investment percentage

0 - 20%

Please explain

re Complex Metallurgy (FCM). Its goal is to increase the throughput for complex input materials by means of innovative processes. Furthermore, it should enable the processing of complex primary and secondary raw materials, which previously were not employable at Aurubis. We have therefore developed a metallurgical process which, among other things, improves the recovery of copper and precious metals from intermediate products. A further key area of activity with long-term orientation was the optimization of existing core processes in the primary copper production sector. This relates to the improvement of process stability and process control, and the optimization of the metal yield. We have combined metallurgical expertise, modern characterization, modeling and simulation methods, as well as online analytics for this purpose. The aim was to drive forward the automatization of the procedures and to further increase process efficiency. The mathematical modeling of complex material flows was also an important component of our work. Such modeling is aimed at optimizing operational production planning with regard to commercial and technical aspects. The corresponding planning tools have in the meantime been implemented in the areas of procurement and production planning. In the next step we will work on refining and adjusting material flows at the operational level. The recovery of precious metals from raw materials is a significant performance factor for Aurubis. The production processes present here are therefore subject to constant review and were the object of investigations regarding improvement measures.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	No third-party verification or assurance

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 and/or Scope 2 emissions and attach the relevant statements.

Scope

Scope 1

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

CDP_Statement_aurubis_lünen_2017_rev1.pdf

CDP-verification 2018.pdf

CDP_Statement_aurubis_hh_2017_rev1.pdf

CDP_Statement_aurubis_dg_2018.pdf

Page/ section reference

Relevant standard

European Union Emissions Trading System (EU ETS)

Proportion of reported emissions verified (%)

78

Scope

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

CDP Bestätigung_Aurubis AG_signed.pdf

Page/ section reference

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

60

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

In progress

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

EU ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.

EU ETS

% of Scope 1 emissions covered by the ETS

86.4

Period start date

January 1 2018

Period end date

December 31 2018

Allowances allocated

812810

Allowances purchased

0

Verified emissions in metric tons CO₂e

450552

Details of ownership

Facilities we own and operate

Comment

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

By operating state-of-the-art, innovative plant technologies, Aurubis holds a leading position in climate and environmental protection in primary and secondary copper production. Today, continued high capital expenditure for environmental protection leads to relatively small improvements, as a leading global environmental standard has already been achieved and there are technological boundaries in some instances, as in the case of emission reduction. Aurubis is since 2013 part of the EU-ETS. We have been one of the forerunners in adapting to new emission-lowering technologies. We have started early on to invest in efficient technologies and continue to further optimize our processes also in the future. For us, as a multi metal producer we are in a price taking position, additional costs cannot be handed to customers. Therefore, investing into energy efficiency is an important aspect of our strategy, since it helps us to maintain our current competitive position. Furthermore, the system of the EU-ETS is set-up in a way that producers, who use their energy multiple times, benefit from certificates they would otherwise need to produce the energy. Additional costs are not only caused by the Emission Trading Scheme, but also from the administrative burden connected to it, as well as increased electricity prices through the included CO₂-component. Especially for us as an energy intensive industry these also make up a big share of costs as well, because only 50% of our indirect carbon costs are compensated. Therefore, it is of our own interest to further reduce emissions. The certificates that we get are needed to cover part of the additional electricity costs, which cannot be handed down the value chain.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Navigate GHG regulations
Stakeholder expectations
Change internal behavior
Drive energy efficiency
Drive low-carbon investment
Stress test investments
Identify and seize low-carbon opportunities

GHG Scope

Scope 1
Scope 2

Application

The internal price of carbon is used for our medium-term planning of energy prices as well as the medium-term planning of our CO2 Strategy.

Actual price(s) used (Currency /metric ton)

25

Variance of price(s) used

For short term projections the current EEX Price of carbon is used. For projections until 2030 the 2030 target price of the EU Commission is used, which is 30€.

Type of internal carbon price

Implicit price

Impact & implication

Aurubis is since 2013 part of the EU-ETS. The EU-ETS means direct and indirect carbon costs for Aurubis. With an implicit carbon price we are able to describe this cost burden today, but also in the future. All new projects with relevance to the energy supply and consumption are checked by Corporate Energy and Climate Affairs and/or the responsible energy departments on site. Within the assessment of the project, carbon costs are considered, either as direct costs or as indirect costs in the electricity price or both.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our customers
Yes, other partners in the value chain

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Collaboration & innovation

Details of engagement

Other – please provide information in column 5

% of customers by number

20

% Scope 3 emissions as reported in C6.5

11.5

Please explain the rationale for selecting this group of customers and scope of engagement

Aurubis' customers are generally companies in the processing industry. When copper is processed to fabricate final products, production waste and residues accumulate. This includes materials with very high copper contents, such as turnings and millings. Residue fractions, such as slags and industrial residues, result from other processing methods. Aurubis offers its customers collection options for most production residues and wastes and guarantees professional, environmentally sound recycling conforming to the highest standards. Aurubis is in a position to reintroduce a large variety of metallic scrap to the material cycle. In this way, Aurubis customers can obtain the copper again within a short time and use it in their own production.

Impact of engagement, including measures of success

Our multi-metal recycling ensures that the material cycle for copper and other metals is closed. Copper used in products can be recycled over and over again. This ensures that valuable raw materials are used, resources are conserved and environmental impacts are minimized. To measure the success of this engagement we monitor the level of target achievement of our Sustainability Goal to establish a "closing the loop" system with a minimum of five customers until 2018. With the implementation of the "closing-the-Loop" System our Scope 3 emissions can be reduced. For example, the emissions caused by upstream transportation of raw materials which account for 10% of our total Scope 3 emissions can be reduced by this approach.

C12.1c

(C12.1c) Give details of your climate-related engagement strategy with other partners in the value chain.

Strategy for prioritizing engagement:

Climate protection is established in the Aurubis Sustainability Strategy. Responsibility in the supply chain was identified as an important issue during the Sustainability Strategy development process. We are intensifying the dialogue along the value chain to strengthen environmental and social standards. We also prioritize engagements in the field of climate friendly mobility management with regard to the following criteria:

- Contribution to a successful business (identification of relevant mobility figures as basis of improvement measures, reducing mobility costs and increasing efficiency)
- Benefit for the employees of the sites (loyalty and motivation, health promotion, safe work route)
- Benefit for people and the environment located in the region of the sites (environmental and climate protection)

Methods of engagement:

We try to minimize transports in the supply chain. We maintain for example a dialogue with suppliers and customers to tap additional logistics synergies. We are engaged in initiatives and decided to commit to the "Partnership for Air Quality and Low-emission Mobility", a way to reduce emissions caused by employees and initiated by the city of Hamburg, which was signed by Aurubis and 11 other companies in September 2012. The objective of the partnership is to reduce nitrogen dioxide emissions, which are caused by private transport in particular. As part of the air quality partnership, an action week was held with the employees at the Hamburg site, during which a number of ideas were developed and steps were coordinated. The newly developed concepts whose implementation is being reviewed include an offer for e-bike leasing, the construction of a bike shelter at the nearby Veddel train station and better access to the plant with public transportation options or a company bus shuttle. In 2016, Aurubis also started participating in a project, sponsored by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, called MOBIL.PRO.FIT. Part of the strategic approach is the participation of Aurubis managers in workshops regarding mobility-relevant topics. To transfer this new knowledge into a company-specific and emission-reducing mobility management model, external consultants and company representatives work closely together. This project aims to develop efficient and climate-friendly mobility management within the participating companies. An important part of this project is acquiring an analysis of commuting habits of employees to point out room for improvement in the form of going to work by bike, public transportation or forming carpools. This way Aurubis as a company and its employees work together to reduce the emissions of commuting as a part of the climate change strategy. The project fits perfectly into the Aurubis Sustainability Strategy because it is a clear objective of Aurubis that every employee should live the Sustainability Strategy each day and contribute to implementing the agreed measures and targets. Measures of success Aurubis will be certified as a "MOBIL.PRO.FIT-business" if the company achieves all contract-specific requirements. A committee of organization implementing the MOBIL.PRO.FIT project will therefore visit the company and examine if the required measures have been taken. Aurubis managers already participated in workshops. In addition, they will be involved further with this project. In September 2016, Aurubis Hamburg opened the "4. Aktionswoche der Luftgütepartner Hamburgs" for promoting low-emission mobility.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

- Direct engagement with policy makers
- Trade associations
- Funding research organizations

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Cap and trade	Support with minor exceptions	Aurubis contributes constructively to the policy dialogue at Member State and EU institution level and at each stage of policy development, such as stakeholder consultation, amendment discussions, policy reviews etc., directly as well as through associations such as IFIEC, Eurometaux, ECI, Agoria, WVM, etc.	The price taker characteristic of exchange-traded commodities such as copper should be recognized as an eligibility criterion to receive the highest degree of carbon leakage protection, by receiving full free allocation for direct emissions and full compensation in all Member States, for indirect emissions at the best performance level, in a predictable way. This carbon leakage protection will ensure that the investments to expand production and to innovate further will continue to be made in the most energy-efficient European plants. These plants produce products in the most environmentally friendly way possible to help the decarbonization of European society and the world.
Energy efficiency	Support with minor exceptions	Intense discussions regarding the implementation of article 8 of the European Energy Efficiency Directive (EED) into national law and the practical implementation, especially in Germany (EDL-G), via position papers, direct engagement with policymakers and national authorities.	EU energy efficiency directive requires companies in article 8 to perform energy audits unless they are small/medium enterprises (SMEs). Owing to the definition of the Commission, subsidiaries of the Group are not accepted as SMEs even though their energy consumption is insignificant. This could result in a disproportionate amount of audits to be performed across Europe and hence defies the intention of the Commission to generate an instrument that benefits industry without burdening it unnecessarily with administration. In Aurubis' opinion, this should be considered in the revision of the directive or should be harmonized via national legislation in coordination with the EU.
Other, please specify (Circular Economy)	Support	The European Commission published a Circular Economy Package (CEP) in December 2015, which includes three very concrete revisions of key legislations the Waste Framework, the Packaging and the Landfilling Directive, as well as a comprehensive Action Plan setting out further measures until 2018. In general Aurubis very much supports the Circular Economy Package as it will foster recycling and requests a coherent harmonised implementation by Member States (MS) to avoid inconsistencies for companies who are present in various European Union MS.	Aurubis supports the idea of strengthening eco-design measures towards more Circular Economy and the request to Circular Europe Network to develop standards for product recyclability. - Aurubis asks for measures to stop illegal shipments of electrical waste to non-EU countries. - In the framework of the circular economy, some call for banning or substituting hazardous materials to reduce their presence in material loops and recycled materials. In the context of metals recycling however it is often complex or even currently impossible to substitute them as metals have unique properties which support given functionalities. As new metals cannot be invented substituting a metal is often done by using another metal. In this respect Aurubis supports the Action Plan which proposes the analysis of policy options to address the interface between chemicals, products and waste legislation. - Applying a strictly hazard-based REACH authorization process for substances commonly present in metal production/recycling could then lead to a decrease in the amount of waste recycled in Europe and would most likely trigger disposal and landfill or (illegal) shipment of valuable materials outside the EU. - Aurubis supports the new definition of "final recycling process" which comprises all steps of the recycling value chain as well as we support the proposal for EU standards of material efficient recycling of electronic waste. - Aurubis welcomes the general requirements for Extended Producer Responsibility (EPR) as a step towards more transparency and efficiency of the EPR schemes especially on household electronic goods. - Aurubis strongly recommends to secure regular monitoring of end-of-waste export flows and to avoid the proliferation of national end-of-waste status which would trigger confusion and challenges to control the validity of the status. - In general: The Action Plan contains 54 measures throughout the life cycle from production to waste disposal. It is important to achieve a proper implementation of the action plan and revisions of the Directive.

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

Eurometaux

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Eurometaux consistently strives to ensure a balance between energy, climate and industrial policies for the best performing company level. Furthermore, Eurometaux supports sustainability, the circular economy and increased Recycling.

How have you influenced, or are you attempting to influence their position?

Aurubis is represented in the governing body of Eurometaux and is the Chair of the Energy and Climate Change committee. Additionally, Aurubis is the Chair of the Sustainability committee promoting topics such as the circular economy and recycling. Aurubis actively participates in enforcing Eurometaux's climate change agenda, which is raising the bar for all EM members on the issues of decarbonization, sustainability, circular economy and innovation, by leading a continuous and constructive dialogue with EU institutions to maintain the competitiveness of energy-intensive industries in Europe.

Trade association

European Copper Institute

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

ECI Annual Report 2015: The copper industry needs transparent, long-term energy and climate change policies that will deliver competitively priced energy. Reforms to the Emissions Trading Scheme must address the competitiveness gap faced by the EU's energy-intensive industries. The ambitious outcomes from COP21 must not result in undue costs for Europe's best performers. Continued recognition that the copper sector is a price taker, due to commodity prices being global, must be taken into account when determining the risk of carbon leakage. Finally, a more harmonized, EU-wide scheme needs to provide full compensation for both direct and indirect emissions based on actual production levels.

How have you influenced, or are you attempting to influence their position?

Aurubis is represented on the Board of Directors of ECI and therefore is able to contribute to the strategic Position on climate change. Additionally, Aurubis experts in the domains of energy and climate change strongly influence this position by participating in the relevant thematic workshops organized by ECI.

Trade association

International Copper Association

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Europe's copper industry shares the EC's vision for a low-carbon economy and will pursue it with all of the resources at its disposal. The Support of EC and other policymakers is needed for a reasoned balance between the energy needed to manufacture the building blocks of that new economy and the overarching goals for reduced energy demand and carbon emissions.

How have you influenced, or are you attempting to influence their position?

Aurubis is represented on the Board of Directors of ICA and therefore is able to contribute to the strategic position on climate change. Additionally, Aurubis experts in the domains of energy and climate change strongly influence this position by participating in the relevant thematic workshops organized by ECI.

Trade association

Wirtschaftsvereinigung Metalle

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The Non-Ferrous metals industry believes that society, economy and politics have a responsibility to make the energy transition a success and climate protection as effective and economically efficient as possible. This is only feasible together with the industry.

How have you influenced, or are you attempting to influence their position?

Aurubis as a member of the Executive Committee contributes actively in shaping the association's position.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

No

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Within the Aurubis Group, we coordinate our political activities on a monthly basis in a routine meeting led by our CEO. The participants are the members of the Executive Board and Energy & Climate Affairs as well as the Sustainability Manager, the Corporate Environmental Department and heads of corporate functions involved in political issues. The aim of the call is to report on relevant political developments and streamline our positions for the Aurubis strategy.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

Aurubis_AR2017-18.pdf

Page/Section reference

Strategy: p. 40 (magazine) Risks & opportunities: p. 86f Emissions figures: p. 43 Other metrics (base data): p. 77f

Content elements

Strategy
Risks & opportunities
Emissions figures
Other metrics

Comment

Publication

In voluntary sustainability report

Status

Complete

Attach the document

Aurubis_Sustainability_Report_2017_18.pdf

Page/Section reference

Emission targets and strategy: p. 30

Content elements

Strategy
Emission targets

Comment

Publication

In voluntary communications

Status

Complete

Attach the document

2019_aurubis_ag_environmental_statement_en.pdf

Page/Section reference

Emission figures: p. 19f Other metrics: p. 56f

Content elements

Emissions figures
Other metrics

Comment

C14. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Chief Executive Officer	Chief Executive Officer (CEO)

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	11694000000

SC0.2

(SC0.2) Do you have an ISIN for your company that you would be willing to share with CDP?

Yes

SC0.2a

(SC0.2a) Please use the table below to share your ISIN.

	ISIN country code (2 letters)	ISIN numeric identifier and single check digit (10 numbers overall)
Row 1	DE	0006766504

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

SC1.2

(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges
Diversity of product lines makes accurately accounting for each product/product line cost ineffective	The establishment of a common approach to enable the private sector to assess, display and benchmark the environmental performance of products, services and companies based on the comprehensive assessment of environmental Impacts over the life-cycle.

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?

Yes

SC1.4a

(SC1.4a) Describe how you plan to develop your capabilities.

Aurubis continues its involvement in the Environmental Footprint project. With the development of the environmental footprint, the EU Commission wants to create a consistent method for calculating the environmental performance of products and organizations throughout Europe, assess them and facilitate comparisons. In 2013 the Commission published the Environmental Footprint (EF) methodology to measure and communicate the life cycle environmental performance of products (Product Environmental Footprint, PEF) and organizations (Organisational Environmental Footprint, OEF), and launched a pilot phase. Aurubis was active in both areas. Aurubis took a leading role in the OEF pilot on "Copper Production", which was coordinated by the research center of the EU Commission (Joint Research Center, JRC). For the PEF pilot phase, Aurubis worked together with the European organization Eurometaux, the European Copper Institute and other companies from the non-ferrous metals and steel industries on the pilot project "Metal Sheet Metal for Various Applications". In 2017 we finalised the OEF sector-specific rules for copper production and tested how to communicate Environmental Footprint information to stakeholders and the effectiveness of the communication vehicle. The OEF sector rules for copper production have been successfully approved by the Steering Committee on 15 February 2018. The Copper OEF develops a harmonized method to measure and communicate the life cycle environmental performance of copper producing companies, and well demonstrates the positive aspects of copper metallurgy and multi-metal recycling. The PEF category rules for metal sheet have been also finalised and are expected to be approved in November 2018. The Environmental Footprint pilot phase ended in April 2018 and a transition phase is now established until possible adoption of policies implementing the Product Environmental Footprint (PEF) and Organisation Environmental Footprint (OEF) methods. Aurubis will continue to contribute to the further developments of the EF methodology during the transition phase. As part of its commitment to sustainable Development, the copper industry is committed to providing data and information to enable users of copper to evaluate its impacts and benefits across the life cycle, from raw material extraction to end-of life recycling. Aurubis has been involved for many years in life cycle assessment of copper cathode and contributed to the generation of cradle-to-gate life cycle inventory (LCI) that evaluates the environmental impacts associated with global copper cathode production (in cooperation with the International Copper Association). The latest update of the environmental profile of global copper cathode has been released by the International Copper Association at the beginning of 2018. Aurubis has also performed life cycle assessment studies with the purpose to conduct Environmental product declarations (EPD) on the basis of EN 15804 and ISO 14025 for copper and copper alloys sheets used for architectural applications. The Environmental Product Declarations (EPD) for six Aurubis Nordic products of copper /copper alloys sheets are published by the Institut Bauen und Umwelt e.V.. A challenge remains: the yearly update of the database.

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?

No

SC3.1

(SC3.1) Do you want to enroll in the 2019-2020 CDP Action Exchange initiative?

No

SC3.2

(SC3.2) Is your company a participating supplier in CDP's 2018-2019 Action Exchange initiative?

No

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?

Yes, I will provide data

SC4.1a

(SC4.1a) Give the overall percentage of total emissions, for all Scopes, that are covered by these products.

8.5

SC4.2a

(SC4.2a) Complete the following table for the goods/services for which you want to provide data.

Name of good/ service

Copper Production

Description of good/ service

Copper production refers to primary and secondary copper production at the Hamburg, Lünen, Olen, and Pirdop sites. The product level data refers to the Scope 1 emissions.

Type of product

Final

SKU (Stock Keeping Unit)

tons

Total emissions in kg CO2e per unit

210

±% change from previous figure supplied

10

Date of previous figure supplied

August 15 2018

Explanation of change

More complex raw materials lead to an increase of direct CO2 emissions.

Methods used to estimate lifecycle emissions

Other, please specify (Scope 1 emissions certified acc. to EMAS)

SC4.2b

(SC4.2b) Complete the following table with data for lifecycle stages of your goods and/or services.

SC4.2c

(SC4.2c) Please detail emissions reduction initiatives completed or planned for this product.

Name of good/ service	Initiative ID	Description of initiative	Completed or planned	Emission reductions in kg CO2e per unit
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SC4.2d

(SC4.2d) Have any of the initiatives described in SC4.2c been driven by requesting CDP Supply Chain members?

No

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	Public or Non-Public Submission	I am submitting to	Are you ready to submit the additional Supply Chain Questions?
I am submitting my response	Public	Investors Customers	Yes, submit Supply Chain Questions now

Please confirm below

I have read and accept the applicable Terms