AIXTRON SE - Climate Change 2021

C0. Introduction

C0.1

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

AIXTRON SE is a leading provider of deposition equipment to the semiconductor industry. The Company was founded in 1983 and is headquartered in Herzogenrath (near Aachen), Germany, with subsidiaries and sales offices in Asia, United States and in Europe. AIXTRON´s technology solutions are used by a diverse range of customers worldwide to build advanced components for electronic and optoelectronic applications based on compound or organic semiconductor materials. Such components are used in a broad range of innovative applications, technologies and industries. These include Laser, LED and display technologies, SiC and GaN power management and conversion, communication, signaling and lighting as well as a range of other leading-edge applications. AIXTRON's business activities include developing, producing and installing equipment for the deposition of semiconductor materials, process engineering, consulting and training, including ongoing customer support.

Demand for AIXTRON's products is driven by the sustained miniaturization, increased processing speed, improved efficiency, and reduced cost of ownership demands for current and emerging microelectronic and optoelectronic components. The ability of AIXTRON's products to precisely deposit thin material films and the ability to control critical surface dimensions in these components, enables manufacturers to improve performance, yield and quality in the fabrication of advanced microelectronic and optoelectronic devices. AIXTRON supplies to customers both full production-scale material deposition systems and small scale systems for R&D and pre-production use.
Environmental protection and the responsible use of resources are an essential part of AIXTRON's business strategy. The Company's engineers work diligently to continuously improve AIXTRON's systems, both in terms of resource conservation and environmentally-friendly design and function.

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
Reporting year	January 1 2020	December 31 2020	Yes	3 years

C0.3

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

China
Germany
Japan
Republic of Korea
Taiwan, Greater China
United Kingdom of Great Britain and Northern Ireland
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 chosen approach for consolidating your GHG inventory.

Financial control

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 Financial Officer (CFO)	The new Chief Financial Officer who joined this year has taken over the duties of the former Board member being responsible for climate-related issues. In this role, the CFO considers the strategic and financial planning. In this context, regularly meetings with the CSR manager, the energy team and risk management responsibles are planned. For example, the CFO scheduled a meeting in June 2021 so that AIXTRON can deal with the EU taxonomy as early as possible.

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	Scope of board-level oversight	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 Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures	<Not Applicable>	The Sustainability Working Group is scheduled by the Executive Board. Project meetings for CO2 reduction and energy saving measures are held separately with the Executive Board and colleagues from Energy Management. All sustainability topics and projects to reduce our greenhouse gas emissions are discussed and approved at Board level.

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)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Other, please specify (CSR Manager)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Quarterly
Sustainability committee	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Quarterly

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).

Our CSR manager is responsible for reporting as well as for advising, initiating and monitoring sustainability issues in the company. The CSR manager is a member of the internal energy team that develops and implements the respective projects to reduce C02 emissions. With regard to energy-related topics, this is also embedded in the energy management system (ISO 50001), which involves monitoring systems (e.g. energy consumption and trends), assessments (e.g. reasons for developments, unusualities and future projections) and action plans (e.g. energy efficiency, KPIs and decarbonization measures).

The Sustainability Committee, of which the Executive Board is also a member, as well as representatives of the different departments, initiates, monitors and supports sustainability projects together with the energy team, and provides the corresponding resources. This includes not only climate-related issues, but also all other sustainability issues. The head of our internal energy team is also a member of the Sustainability Committee.

C1.3

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

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	The Supervisory Board has issued sustainability targets to the Executive Board, which also include climate-related targets.

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).

Entitled to incentive	Type of incentive	Activity inventivized	Comment
Board/Executive board	Monetary reward	Energy reduction target	This Target is confidential. The information would then have to be submitted subsequently. Example: Energy consumption per year can be reduced by x percent (intensity) With regard to emissions in the future: Scope 3 emissions from upstream and downstream logistics are currently being determined and are to be reduced by X percent by 2025.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	1	
Medium-term	1	3	
Long-term	3	10	or from 3 years to say so

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

If effects (in this context climate-related risks) have a fundamental influence on our company, for example by positive or negative investment decisions of leading customers in our technologies or in technologies that have direct or indirect effects on our business model.

Substantial financial or strategic impacts are impacts that result in a significant change in the business result or the value contribution of individual technology areas to the overall contribution. These substantial financial or strategic impacts may not be due to normal changes in the market, the market environment or technical developments. They must be causally linked to climate-related opportunities and risks.

Material financial impacts are mainly caused by scenarios defined in terms of expected maximum damage (maximum damage multiplied by the probability of occurrence p.a.) and in terms of expected maximum losses (maximum loss multiplied by the probability of occurrence p.a.). They must have a comparatively high impact [>=10%] on the share capital of AIXTRON SE.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered
Direct operations
Upstream
Downstream

Risk management process
A specific climate-related risk management process

Frequency of assessment
Annually

Time horizon(s) covered
Short-term
Medium-term
Long-term

Description of process
Aixtron conducts an annual risk and opportunity assessment as part of the energy management system (ISO 50001). In this context, the energy team as well as CSR-relevant persons discuss the current status and future developments of energy-related risks and opportunities, including climate-related topics for direct operations as well as upstream and downstream value chain stages. The process includes a screening and an assessment that shows the potential impacts and the likelihood of occurrence for different time horizons. In addition, the process includes the identification of measures to address these issues. Physical risk: Due to climate change, it is very likely that temperatures will continue to rise, resulting in higher energy demand for cooling the building. At the same time, the cost of purchasing energy will increase. Therefore, Aixtron is willing to create a microclimate that reduces the impact of extreme heat by creating green spaces and water areas (green roof, shading of the building). To limit the impact of purchased electricity, Aixtron has already switched to purchasing green electricity. Furthermore, due to climate change, extreme events such as severe storms are likely to increase in frequency and intensity. This could have an impact on supply chains and transport systems, for both, upstream and downsream logistics. For example, it is possible that goods cannot be delivered in time by air due to a severe storm. Where possible, Aixtron therefore plans to work with multiple suppliers to respond to such issues. Transition risk: Due to the German emissions trading scheme, which was introduced with a CO2 price of EUR 25 per tonne in 2021 and will continuously increase, fuel-related energy will become more expensive in the coming years. Therefore, Aixtron is willing to reduce the consumption of fuel-related energy by switching to electricity-based energy systems such as heat pumps, waste heat and electric vehicles that can be powered by renewable energy. At the same time, emission reduction measures can be considered as opportunities, as costs can be reduced. It is planned to develop a climate-related risk management process in accordance with TCFD and integrate it into Aixtron's overall risk management assessment. Initial discussions on this have already taken place.

C2.2a

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Relevant due to regulations e.g. on energy sources (fossil fuels) and carbon prices, which can have a significant financial impact.
Emerging regulation	Relevant, always included	As with the point before, but with even greater implications (e.g. ban on the use of certain fossil fuels). In addition, stricter climate reporting obligations (e.g. EU taxonomy). In order to be up to date, several newsletters are taken into account.
Technology	Relevant, always included	In technology development there is already a very high understanding of the problem, since our plants need a lot of energy due to the process and we exhaust all technical possibilities to reduce the energy consumption of our plants.
Legal	Relevant, always included	Part of the compliance management. Currently not relevant for Aixtron, but awareness is there.
Market	Relevant, always included	Market changes are also taken into account with regard to new technologies and customer requirements. Costs for commodities could be higher in the future.
Reputation	Relevant, always included	Occasionally, there are applicants who contact us about our sustainability reports and specifically inquire about them. Through the permanent exchange with the capital market, there is also a higher awareness of the necessity here.
Acute physical	Relevant, sometimes included	Consideration of climate-related extreme weather events such as hurricanes, cyclones or floods that impact supply chain security.
Chronic physical	Relevant, sometimes included	Consideration of climate-related impacts such as heat waves, sea level rise, water scarcity that affects operations, the supply chain and employees.

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 & Primary climate-related risk driver

Current regulation	Carbon pricing mechanisms

Primary potential financial impact
Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
The national emissions trading system for fossil fuels (heating and transport), which was introduced in Germany in 2021, results in additional costs for Aixtron, since the energy providers forward the costs from the CO2 price. For Aixtron, this mainly affects the gas consumption. For Aixtron, this mainly affects gas consumption. We think that this can cause costs of up to 10,000 euros per year. This certainly depends on how high the CO2 price will ultimately rise.

Time horizon
Long-term

Likelihood
Very likely

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)
10000

Potential financial impact figure – maximum (currency)
24000

Explanation of financial impact figure
The figures are generated by multiplication of CO2e emissions from gas consumption with the estimated CO2-Price per ton after 2025 (50 to 120 EUR). Showing the costs per year.

Cost of response to risk
0

Description of response and explanation of cost calculation
The sosts cannot be determined at present, as the assessment is still ongoing. The idea is to switch to heat pumps or possibly also geothermal energy (which still needs to be checked).

Comment

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation	Other, please specify (The currently upcoming EU taxonomy and the resulting changes in reporting, as well as the explanations that our technologies will support climate targets.)

Primary potential financial impact
Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
The currently upcoming EU taxonomy and the resulting changes in reporting have already led to an internal working group to prepare for the coming requirements. This is being done with the help of an external consulting firm. These requirements lead to further administrative costs as well as external consulting costs. We estimate that the internal and external costs will amount to 20 to 30 thousand euros.

Time horizon
Medium-term

Likelihood
Very likely

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)
1

Potential financial impact figure – maximum (currency)
1

Explanation of financial impact figure
The financial outlay cannot be estimated at present, as the full requirements are not yet known.

Cost of response to risk
30000

Description of response and explanation of cost calculation
The currently upcoming EU taxonomy and the resulting changes in reporting have already led to an internal working group to prepare for the coming requirements. This is being done with the help of an external consulting firm. These requirements lead to further administrative costs as well as external consulting costs. We estimate that the internal and external costs will amount to 20 to 30 thousand euros.

Comment

Identifier
Risk 3

Where in the value chain does the risk driver occur?
Downstream

Risk type & Primary climate-related risk driver

Acute physical	Increased severity and frequency of extreme weather events such as cyclones and floods

Primary potential financial impact
Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Due to extreme weather events, we see the risk that our products/ plants, which basically always have to be transported by air, cannot be delivered to the customer on time. We are also aware of this risk on the purchasing side. Similar to the pandemic as with SARS-Cov 2, this ultimately also led to a collapse of existing supply chains and had a massive impact on the semiconductor industry. Costs of up to 50,000 euros can be incurred here, depending on the severity and duration of the impact.

Time horizon
Long-term

Likelihood
Likely

Magnitude of impact
Medium-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)
10000

Potential financial impact figure – maximum (currency)
50000

Explanation of financial impact figure
Due to extreme weather events, we see the risk that our products/ plants, which basically always have to be transported by air, cannot be delivered to the customer on time. We are also aware of this risk on the purchasing side. Similar to the pandemic as with SARS-Cov 2, this ultimately also led to a collapse of existing supply chains and had a massive impact on the semiconductor industry. Costs of up to 50,000 euros can be incurred here, depending on the severity and duration of the impact.

Cost of response to risk
1

Description of response and explanation of cost calculation
It is important to us to be able to draw on different suppliers within the supply chain and thus to be able to circumvent any regional weather-related failures (example: flood disaster in our region in 2021).

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?
Downstream

Opportunity type
Products and services

Primary climate-related opportunity driver
Development and/or expansion of low emission goods and services

Primary potential financial impact
Increased revenues through access to new and emerging markets

Company-specific description
Electronics are the basis for the future development of megatrends such as mobility, energy supply or communication. One key to their efficient use lies in power electronics, which can be found in many areas of our everyday life - in the power supply of a mobile phone as well as in the electric motor, in industrial production plants as well as on high-voltage lines. Electromobility in particular has become unthinkable without power electronics. This is because it increases the performance of vehicles and enables the rapid expansion of a powerful charging infrastructure. Depending on the application, power electronics make it possible to switch efficiently between direct and alternating current, thus increasing running times or ranges, reducing charging times and cutting costs. Modern power electronics are used, for example, in the wireless or fast charging of mobile devices as well as in drive trains of electric vehicles such as cars and trains or in charging columns, but also in components such as converters or frequency converters that are used in electrical drive technology, in the generation and grid feeding of regenerative energies from the sun and wind. Silicon carbide (SiC) and gallium nitride (GaN) are two promising materials for the power electronics of the future. Both switch electricity much more efficiently than the currently still predominant silicon (Si), which emits more heat losses when converting direct current to alternating current and thus provides less energy. The use of components made of silicon carbide and gallium nitride thus additionally saves expensive and bulky cooling systems. AIXTRON is the technology leader in this future-oriented technology. Our equipment enables our customers to manufacture power electronics based on gallium nitride (GaN) and silicon carbide (SiC), thus reducing CO2 consumption. With silicon carbide alone, energy losses can be almost halved and switching times increased tenfold. It has ten times the dielectric strength and three times the thermal conductivity of silicon. These properties can be used, for example, to reduce the volume and weight of important electronic components for electric vehicles by up to 50%. Vehicle batteries become correspondingly smaller and cheaper. Experts estimate that power electronics could save up to 35 percent of the current energy demand. In 2020, this would correspond to the capacity of 115 large power plants with a Europe-wide energy consumption of 4,000 TWh.

Time horizon
Long-term

Likelihood
Very 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)
150000000

Potential financial impact figure – maximum (currency)
500000000

Explanation of financial impact figure
These are still very rough figures at present, as the concrete effect cannot yet be estimated in its full dimension. At the moment, the market is very dynamic, especially as Europe wants to become less dependent on Asia and the USA in the semiconductor industry. Experts estimate that power electronics could save up to 35 percent of today's energy demand. In 2020, this would correspond to the output of 115 large power plants with a Europe-wide energy consumption of 4,000 TWh.

Cost to realize opportunity
96000000

Strategy to realize opportunity and explanation of cost calculation
In the field of power electronics, different materials are used for the production of electronic components. On the one hand, our customers manufacture gallium nitride (GaN) semiconductor components, on the other hand, they manufacture silicon carbide (SiC) components on our CVD systems. We are already the market leader in the production of GaN components. In the area of SiC components, we would like to become the market leader soon. Research and development plays a central role here in order to realise the opportunities of the market and defend our top position.

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 more efficient production and distribution processes

Primary potential financial impact
Reduced direct costs

Company-specific description
We strive to use all possibilities for energy saving through state-of-the-art technical optimisation. This enables us to reduce our energy demand and thus our energy costs, and also to reduce our CO2 emissions. For example, we have already completely switched to LED lighting at our two German sites and at our site in the UK. This proeces is embedde into our energy management system.

Time horizon
Long-term

Likelihood
Very likely

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
4500

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
We have estimated an energy saving in electricity consumption of about 10 % (in the long term). Therefore, the financial impact will also be 10%. However, the figure is confidential.

Cost to realize opportunity
1

Strategy to realize opportunity and explanation of cost calculation
In the framework of our energy management system, we have assessed several energy efficiency measures (lighting, cooling, ventilation) and generated the return of investment. For example, we have already completely switched to LED lighting at our two German sites and at our site in the UK. In this context, we calculated the energy consumption of the conventional lighting (connected load, operating hours and utilization) and compared it with the new connected load of the LED luminaires. This has enabled us to save about 40 % of the energy consumption and the corresponding costs (confidential).

Comment

Identifier
Opp3

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Resilience

Primary climate-related opportunity driver
Participation in renewable energy programs and adoption of energy-efficiency measures

Primary potential financial impact
Reduced direct costs

Company-specific description
At the moment we use gas for heating and cooling and are considering switching to electricity-based heat pumps in the future. In view of the planned increase in the price of CO2 (at least in Germany), this will enable us to avoid costs and reduce operational emissions in the future (use of green electricity or expansion of the purchase of green electricity).

Time horizon
Long-term

Likelihood
Likely

Magnitude of impact
Medium

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)
10000

Potential financial impact figure – maximum (currency)
24000

Explanation of financial impact figure
The CO2 costs we estimate are in the range mentioned above, which in this case can be considered a saving. In addition, there would be costs for the conversion to heat pumps, which we are currently unable to quantify. Furthermore, the costs to run the heat pumps (electricity) migth be much more higher in comparison to gas.

Cost to realize opportunity
1

Strategy to realize opportunity and explanation of cost calculation
There would be costs for the conversion from gas fired heating to heat pumps. The purchase costs of a standard heat pump amount to 15,000 EUR. Operating costs amount to 2,000 EUR per year. The operating costs to run the heat pumps (electricity) migth be higher in comparison to gas. We are currently still in an early phase and sound potential analyses have not yet taken place. The exact calculations will then be carried out with the help of technical experts, with whom we have also worked successfully in the past.

Comment
There would be costs for the conversion from gas fired heating to heat pumps. The purchase costs of a standard heat pump amount to 15,000 EUR. Operating costs amount to 2,000 EUR per year. The operating costs to run the heat pumps (electricity) migth be higher in comparison to gas. We are currently still in an early phase and sound potential analyses have not yet taken place. The exact calculations will then be carried out with the help of technical experts, with whom we have also worked successfully in the past.

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?

Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Is your organization's low-carbon transition plan a scheduled resolution item at Annual General Meetings (AGMs)?

	Is your low-carbon transition plan a scheduled resolution item at AGMs?	Comment
Row 1	No, but we intend it to become a scheduled resolution item within the next two years	One of the megatrends concerns the field of electromobility. AIXTRON has been investing heavily for years in the development of new equipment technology for the promising new materials GaN and SiC, which can revolutionize power electronics . We are already the market leader in SiC. As electromobility is becoming more and more important, we have also decided to invest massively in the area of GaN technology in order to take the leading position in this area as well.

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

No, but we anticipate using qualitative and/or quantitative analysis in the next two years

C3.2b

(C3.2b) Why does your organization not use climate-related scenario analysis to inform its strategy?

We have recognised the sense and the necessity of carrying out a systematic, climate-related scenario analysis. The topic was discussed and initiated internally with the new Chief Financial Officer (CFO) at the beginning of June 2021. There will be a working group that will deal intensively with the topic. Therefore, we cannot make any statements at the moment on the extent to which climate-related scenario analysis will influence our strategy.

A working group will be formed by the new Finance Board, which will be made up of a wide variety of specialist areas, in order to be able to comprehensively assess the effects and possible consequences of global warming on our business model. For this purpose, we will work with different scenarios (temperature change of 1 to 4 degrees and their socio-economic development). It is important here to also consider the consequences in different time horizons. It is also important for us to consider the aspect of population growth and the resulting implications (scarcity of resources such as water, soil and mineral resources) in this analysis.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	As silicon-based power semiconductors are reaching their limits and there is an increasing demand for new, more energy-efficient solutions due to climate change and changes in the market, we see very good opportunities and prospects in the area of power electronics, which we are keen to exploit. Therefore, this area is an essential part of our corporate strategy, which has become significantly more important in recent years. This can be considered as climate change mitigation in both for the short and long term.
Supply chain and/or value chain	Yes	This mainly results in being aware of supply chain disruptions due to extreme weather events such as storms or floods affecting air transport (upstream and downstream logistics). Extreme events are already occurring today and will most likely be more frequent and intense in future. Also due to this trend, different suppliers are involved into our business strategy, as far as possible. This can be seen as adaptation to climate change.
Investment in R&D	Yes	Climate-related risks and opportunities have an impact on our R&D strategy. We are already a leader in GaN technology, and we have invested massively in SiC technology to become the world leader in this area as well. This contributes to climate change mitigation.
Operations	Yes	Climate-related risks and opportunities have influenced our energy procurement strategy. This mainly concerns the procurement of green electricity and the decarbonisation of heating and the vehicle fleet. This contributes to mitigating climate change in both the short and long term.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Indirect costs	Climate-related risks and opportunities have influenced our financial planning in the following areas: e.g. higher direct costs due to investments in new, more energy-saving technologies (e.g. LED lighting, decentralised consumption recording for targeted control, energy monitoring system, heat pumps, vehicle fleet) and possible operating costs. This has short- and long-term implications for our financial planning. Higher costs could also arise from the expansion of reporting requirements (EU taxonomy). Furthermore, possible consequences of the budget adjustment due to increased CO2 prices. Due to expansions in R&D activities into new technologies, revenues may be affected.

C3.4a

(C3.4a) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

For internal budget planning, the upcoming changes due to the EU taxonomy were taken into account.

Due to the trend towards a low-carbon economy and the resulting requirements for new, energy-saving technologies, it was decided to invest more in the previously neglected area of SiC technology. Through the investments in the SiC (silicon carbide) area, corresponding resources were built up to further develop this energy-saving technology and bring it to market maturity.

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

Year target was set
2015

Target coverage
Company-wide

Scope(s) (or Scope 3 category)
Scope 1+2 (market-based)

Base year
2015

Covered emissions in base year (metric tons CO2e)
7411

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)
100

Target year
2025

Targeted reduction from base year (%)
80

Covered emissions in target year (metric tons CO2e) [auto-calculated]
1482.2

Covered emissions in reporting year (metric tons CO2e)
711

% of target achieved [auto-calculated]
113.007691269734

Target status in reporting year
Achieved

Is this a science-based target?
Yes, we consider this a science-based target, but it has not been approved by the Science-Based Targets initiative

Target ambition
1.5°C aligned

Please explain (including target coverage)
Scope 1 covers direct emissions from fuel consumotion of stationary plants (gas), from mobile source (vehicle fleet, petrol, diesel) and process emissions. Scope 2 covers indirect emissions from the purchase of electricity and district heating. The target for Scope 1 and 2 has already been achieved through a variety of energy efficiency measures (e.g. switching to LED) as well as through the procurement of electricity from renewable energy sources. We will set new CO2 reduction targets this year (both for Scope 1 + 2 and Scope 3, especially with regard to the Scope 3 category of purchased goods and services, which accounts for a high proportion of emissions).

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?
Target(s) to increase low-carbon energy consumption or production

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number
Low 1

Year target was set
2020

Target coverage
Site/facility

Target type: absolute or intensity
Absolute

Target type: energy carrier
Electricity

Target type: activity
Production

Target type: energy source
Renewable energy source(s) only

Metric (target numerator if reporting an intensity target)
kWh

Target denominator (intensity targets only)
<Not Applicable>

Base year
2020

Figure or percentage in base year
0

Target year
2025

Figure or percentage in target year
718893

Figure or percentage in reporting year
0

% of target achieved [auto-calculated]
0

Target status in reporting year
Revised

Is this target part of an emissions target?
Yes, this target is part of our climate strategy to reduce CO2 emissions to become a low-carbon company. Currently, we already purchase green electricity, so the emissions in Scope 2 would not change. However, our goal is to increase the self-generated electricity through renewable energies.

Is this target part of an overarching initiative?
Science-based targets initiative

Please explain (including target coverage)
The potential analysis of whether our own photovoltaic system could be installed on our sites was carried out in 2020. Due to the evaluation, the measure was put on hold for the time being. However, it was re-examined in 2021 and due to the internal incentive system regarding the board, it can be assumed that a PV plant will be installed. The amount given refers to the annual production volume (in kWh). Our goal is to implement the system in a timely manner. The target is in line with the science based targets initiative ACA 1.5D scenario.

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	0	0
To be implemented*	4	1
Implementation commenced*	0	0
Implemented*	3	32
Not to be implemented	0	0

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

Initiative category & Initiative type

Energy efficiency in production processes	Machine/equipment replacement

Estimated annual CO2e savings (metric tonnes CO2e)
30.4

Scope(s)
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
9860

Investment required (unit currency – as specified in C0.4)
0

Payback period
1-3 years

Estimated lifetime of the initiative
3-5 years

Comment
Originally, at one of our two locations in Herzogenrath, the electrical voltage was generated with a rotating motor/generator combination. Such a device is not the best solution ecologically and economically for very varying outputs. We have replaced this motor/generator combination with an electronic device (similar to a switched-mode power supply, only much, much larger). In the partial load range, the efficiency is now significantly better. This saved 57,600 kWh per year at our main site by the end of 2020 and thus 30.4 t of CO2 equivalents per year. This saving corresponds to about 3.7 per cent of the electricity consumption in the production area.

Initiative category & Initiative type

Energy efficiency in production processes	Cooling technology

Estimated annual CO2e savings (metric tonnes CO2e)
0

Scope(s)
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
0

Investment required (unit currency – as specified in C0.4)
0

Payback period
1-3 years

Estimated lifetime of the initiative
6-10 years

Comment
Due to issues with monitoring, the savings could not have been derived yet.

Initiative category & Initiative type

Low-carbon energy consumption	Other, please specify (Conversion from conventional lighting to LED lighting)

Estimated annual CO2e savings (metric tonnes CO2e)
225

Scope(s)
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
66000

Investment required (unit currency – as specified in C0.4)
220000

Payback period
4-10 years

Estimated lifetime of the initiative
11-15 years

Comment
In 2017, we started converting the lighting from conventional light bulbs/fluorescent tubes to LED. The project was fully completed for both sites in 2020. The amortisation period (payback period) refers to the last investment made in the reporting year. All other figures refer to the project as a whole, i.e. over the entire project duration.

C4.3c

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

Method	Comment
Dedicated budget for energy efficiency	We consider all consumption and (also with the support of external partners) develop proposals for energy saving / CO2 reduction, draw up project and investment plans and then present these to the Executive Board. Whether a project will be implemented and at what point in time will be decided by the Executive Board. A case-by-case assessment is made for all projects. The amount of the budget for investments depends on the planned measures for the following year.

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
AIXTRON technologies help reduce CO2 emissions Our facilities in the field of power electronics are used, for example, for the production of gallium nitride (GaN) semiconductor components for more compact and more powerful power supply units in consumer electronics, for the efficient power supply of data centres and mobile phone infrastructure. In addition, GaN is also used for wireless data transmission in mobile communications (especially in the area of 5G). The GaN components required for this are also produced on our facilities. These components allow a significant reduction in the energy consumption and size of the power supplies of servers, smartphones and notebooks, thus enabling a reduction in the carbon footprint. Finally, customers use our facilities to manufacture silicon carbide (SiC) components that are used, for example, in electric vehicles as well as their charging infrastructure and in inverters for renewable energies (solar and wind). It is consistently geared towards the growing e-mobility market, for which the SiC material system with high energy efficiency enables the increase of vehicle range and thus lower CO2 emissions.

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

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions
The EU Taxonomy for environmentally sustainable economic activities

% revenue from low carbon product(s) in the reporting year
21

% of total portfolio value
<Not Applicable>

Asset classes/ product types
<Not Applicable>

Comment
The systems developed by AIXTRON are repeatedly part of national and Europe-wide research projects to develop the latest energy-saving equipment and technologies. There has been no systematic classification (Taxonomy, project or methodology) of these systems as low-carbon products. Rather, the systems provide the prerequisite for the production of more energy-efficient products. In this context, we refer to the presentation of current research projects and completed research projects on our website. https://www.aixtron.com/en/innovation/research-development/current-research-projects https://www.aixtron.com/en/innovation/research-development/completed-research-projects

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)
1116.4

Comment
AIXTRON began the systematic collection of energy data in 2012. Only the consumption of the main business location is included in the Scope 1 calculation, since only electricity is used at all other locations. For this reason, gas consumption from 2012 at the main business location is used as the base year for the Scope1 calculation.

Scope 2 (location-based)

Base year start
January 1 2012

Base year end
December 31 2012

Base year emissions (metric tons CO2e)
7157.9

Comment
In 2012, the stated values are only the Scope 2 emissions of the main site (company headquarters) in Herzogenrath. A systematic recording of energy consumption and emissions at the other sites was only carried out at a later date. A company-wide CO2 balance was possible for the first time in the 2018 reporting year.

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
The Greenhouse Gas Protocol: Scope 2 Guidance

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)
322.84

Start date
January 1 2020

End date
December 31 2020

Comment
Scope 1 emissions include the use of company vehicles, natural gas and a small amount of sulphur hexafluoride (SF6). Due to special circumstances (operating), more SF6 was consumed in the reporting year 2020. This increased consumption is essentially responsible for the increase in Scope 1 emissions in comparison to last year. In the reporting year 2020, the calculation of emissions was placed on a new, uniform calculation basis. This time, the data from the vehicle rental companies was not taken over, but determined by our own calculations. This resulted in an increase in emissions.

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)
183.28

Start date
January 1 2019

End date
December 31 2019

Comment
The reported value is still the value reported in last year's sustainability report. Due to the new, uniform basis of calculation, the value is slightly higher than that stated here last year. The value for Scope 1 emissions reported last year was 170.8 tonnes of CO2.

Past year 2

Gross global Scope 1 emissions (metric tons CO2e)
194.18

Start date
January 1 2018

End date
December 31 2018

Comment
Since we collected sulphur hexafluoride (SF6) for the first time in the 2019 reporting year, the amount of emissions in 2019 should still be somewhat higher and is therefore not comparable in all respects.

Past year 3

Gross global Scope 1 emissions (metric tons CO2e)
131.4

Start date
January 1 2017

End date
December 31 2017

Comment
The scope 1 emissions of sulphur hexafluoride (SF6) and the emissions of company vehicles from the other sites are also missing in the 2017 reporting year. These were collected globally for the first time in the 2018 reporting year. The value reported here should therefore be higher.

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
In accordance with the GHG Protocol since 2018 we have used the location based approach. For our sites in Germany und UK we purchase green electricity and therefore the emission factor is net zero. However we consider to contact our energy supplier in order to get information about the market based emission factor for all of our sites.

C6.3

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

Reporting year

Scope 2, location-based
398.14

Scope 2, market-based (if applicable)
0

Start date
January 1 2020

End date
December 31 2020

Comment
The emissions calculation was placed on a uniform calculation basis in the 2020 reporting year. For this purpose, the CO2 data of the business partners (Deutsche Bahn, travel agency, car rental companies, etc.) were no longer used, but were calculated by an external partner on the basis of the current electricity mix. This led to an increase in CO2 emissions.

Past year 1

Scope 2, location-based
170.8

Scope 2, market-based (if applicable)
406.6

Start date
January 1 2019

End date
December 31 2019

Comment

Past year 2

Scope 2, location-based
194.18

Scope 2, market-based (if applicable)
6184

Start date
January 1 2018

End date
December 31 2018

Comment
The high value of CO2 emissions results from the fact that no electricity from renewable energies was used at this time.

Past year 3

Scope 2, location-based
5275.3

Scope 2, market-based (if applicable)
8117.3

Start date
January 1 2017

End date
December 31 2017

Comment
The CO2 emissions from 2017 do not include the emissions from the Asian sites. The missing emissions are exclusively electricity.

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?
No

C6.5

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

Purchased goods and services

Evaluation status
Relevant, calculated

Metric tonnes CO2e
119377

Emissions calculation methodology
To calculate these emissions the spend-based method was taken into account. The activity data itself was provided by the Controlling and Procurement departments. According to the cost of each material/purchased good, a corresponding emission factor was used (EEIO, systell). The type of goods purchased was assigned to the corresponding category of the emission factor and, if necessary, clustered into an overarching category.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
The goods and services purchased are within the system boundaries relevant to us. For the first time, AIXTRON has prepared a complete carbon footprint for the past reporting year.

Capital goods

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>

Please explain
There were no significant purchases of capital goods (machinery, vehicles, buildings) in this reporting year. Therefore, the category is not considered relevant.

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

Evaluation status
Relevant, calculated

Metric tonnes CO2e
401

Emissions calculation methodology
This Scope 3 category includes upstream emissions from purchased fuels and upstream emissions from purchased electricity and district heating. The average data method was used to calculate the emissions (average emission factors for upstream emissions per unit of consumption). As usual, consumption for energy-related activities was already collected for Scope 1 and Scope 2 emissions. Therefore, these activity data were taken into account for the calculation of Scope 3.3 emissions. In this context, various databases such as DEFRA, DIN EN 16258 and GEMIS were used.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain

Upstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
520

Emissions calculation methodology
The transport of purchased goods to the company's own locations generates additional greenhouse gases. Emission factors for so-called tonne-kilometres are available for different modes of transport such as ship, rail, truck or plane. These represent the emissions that occur on average when a tonne of freight is transported over a distance of one kilometre by the respective means of transport. The emission factors refer to the DEFRA database. In this context, a supplier-specific method combined with an spend-based method was used. AIXTRON SE contracts three major freight forwarders for logistics services: DB Schenker, Fedex and TNT. Two of the logistics companies, DB Schenker and Fedex, provided the activity data to AIXTRON. This showed which freight weight was transported over which route. In addition, the table showed the specific greenhouse gas emissions for all transports (both for WTT, and for TTW). According to the spend for the logistics companies, we assume that the provided figures covers about 80% of overall scope 3.1 emissions.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
80

Please explain

Waste generated in operations

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>

Please explain
As we produce comparatively small amounts of in-house waste at Aixtron, we do not consider this category to be relevant. In addition, the waste is either recycled or used for energy recovery via our disposal partners.

Business travel

Evaluation status
Relevant, calculated

Metric tonnes CO2e
1297.2

Emissions calculation methodology
The distance-based method was used for this category. The emissions resulting from the travel activities of employees are calculated on the basis of the information on the means of transport used (air, rail, car, local public transport) and the distances travelled, as well as using the corresponding emission factors (DEFRA and GEMIS). The distances were accurately recorded by Aixtron SE. The greenhouse gas emissions generated by flights were calculated according to the UNEP "Guidelines for Calculating Greenhouse Gas Emissions" of the GHG Protocol. The calculation of flight emissions begins with the determination of the distance between the departure and destination airports. In accordance with the UNEP Guidelines, it is distinguished between short-, medium- and long-haul flights. Accordingly, short-haul flights correspond to a distance of up to 483 km, medium-haul flights to a distance of up to 3,700 km and long-haul flights to a distance of over 3,700 km. The background to this is that, in addition to the emission of greenhouse gases, air traffic at the cruising altitudes reached on medium and long-haul routes has other climate-warming effects, such as increased ozone formation and the formation of contrails and cirrus clouds. This overall effect of the climate impact of aviation can be expressed as a multiple of CO2 emissions and is balanced by the so-called Radiative Forcing Index (RFI). According to an IPCC estimate, an RFI of 2.7 is used for medium- and long-haul flights.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Our travel agency has provided us with the relevant data on distances.

Employee commuting

Evaluation status
Relevant, calculated

Metric tonnes CO2e
261

Emissions calculation methodology
Based on the number of employees, the usual working days per year as well as the average distances and the common modal split.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
For the first time, AIXTRON prepared a complete carbon footprint for this category using the average data method in the past reporting year. The expected number of working days of 220 days for an employee was determined using assumptions for working days, public holidays and vacation days. At the current time, it was not possible to obtain a survey or sample from the employees to be taken into account regarding their exact journey. For this reason, a statistic from the Federal Ministry of Transport and Digital Infrastructure from 2020 was used with regard to the distribution of means of transport (modal split). The following distribution or average simple distance is assumed: - by foot/ bicycle: 22%, 4.1 km - by train: 6%, 24.8 km - by public transport: 12%, 8.5 km - by car: 60%, 17.1 km The distribution relates primarily to the German site, but was used for all sites and countries in view of the distribution of employees (513 employees out of a total of 745 employees). Emissions were calculated on the basis of the number of employees, the distance to work and the number of working days, using average values for the means of transport (e.g. average car). A survey is planned for the following year.

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>

Please explain
Leased assets in the upstream supply chain do not play a role for us and are therefore not part of our system boundaries.

Downstream transportation and distribution

Evaluation status
Relevant, calculated

Metric tonnes CO2e
152

Emissions calculation methodology
For downstream transports, the same applies to the calculation as for upstream transports. AIXTRON SE has information on all significant transports in the year under review. For each country, the emissions could be calculated using the ton kilometer data and the emission factors of the DEFRA database (WTT and TTW).

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain

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>

Please explain
For the most part, our sold products are not further processed and can be used directly. Therefore, the category was classified as not material.

Use of sold products

Evaluation status
Relevant, not yet calculated

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>

Please explain
The category "use of sold products" was assessed as a relevant category. For AIXTRON, emissions are generated during the direct-use phase. Since the core business of AIXTRON SE comprises the production of technical machines, emissions are primarily caused by electricity consumption during the use of the products sold. The power consumption per year can be estimated very roughly based on the connected load of the machines and the average service life, and thus the underlying operating hours and capacity utilization. Similar to Scope 2, the emissions can be determined using corresponding emission factors. However, AIXTRON is still in the process of collecting the data in cooperation with the customers and therefore cannot provide any data yet.

End of life treatment of sold products

Evaluation status
Relevant, not yet calculated

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>

Please explain
The category "end of life treatment of sold products" was assessed as a relevant category using the waste type specific method. As the products and machines sold by AIXTRON are primarily recyclable materials such as steel, aluminum or copper, it can be assumed that the individual materials will be used in new products and that no emissions will therefore be generated during recycling, as these emissions will be credited to future customers. Only the transport of the machines or the components to the recyclers is necessary here. These emissions can be roughly estimated on the basis of the number of machines sold and the material composition. However, AIXTRON is still in the process of collecting the data in cooperation with the customers and therefore cannot provide any data yet.

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>

Please explain
Downstream leasing is not part of our business model and is therefore not within the defined system boundaries.

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>

Please explain
Franchise is not part of our business model and is therefore not within the defined system boundaries.

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>

Please explain
Investments are not part of our business model and is therefore not within the defined system boundaries.

Other (upstream)

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>

Please explain
Further upstream activities are not part of our business model and is therefore not within the defined system boundaries.

Other (downstream)

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>

Please explain
Further downstream activities are not part of our business model and is therefore not within the defined system boundaries.

C-CG6.6

(C-CG6.6) Does your organization assess the life cycle emissions of any of its products or services?

	Assessment of life cycle emissions	Comment
Row 1	No, but we plan to start doing so within the next two years	At the last internal CSR meeting, the topic was presented to all colleagues for the first time and discussed internally. We are now planning the next steps on how to approach the topic and how we want to deal with it in the future.

C6.7

(C6.7) Are carbon dioxide emissions from biogenic 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
2.68

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
720.98

Metric denominator
unit total revenue

Metric denominator: Unit total
269200000

Scope 2 figure used
Location-based

% change from previous year
20

Direction of change
Increased

Reason for change
Last year, so-called tracer gas tests using the climate-damaging gas sulphur hexafluoride (SF6) were carried out more frequently. Due to the high climate impact of this gas, there was an increase in emissions. However, this was a one-time necessary procedure that will not be repeated in the future with the same intensity.

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)
Germany *The vast majority of Scope 1 emissions are generated at the company's headquarters. It is made up of the company vehicles, natural gas and the use of SF6 (sulphur hexafluoride).*	291.33
United States of America *No Scope 1 emissions incurred*	0
United Kingdom of Great Britain and Northern Ireland *Scope 1 emissions at the UK site are caused exclusively by the company vehicles used. Company vehicles are used in Germany, UK, Taiwan and Korea.*	3.21
China *No Scope 1 emissions incurred*	0
Japan *No Scope 1 emissions incurred*	0
Republic of Korea *Scope 1 emissions at the South Korea site are caused exclusively by the company vehicles used. Company vehicles are used in Germany, UK, Korea and Taiwan.*	26.12
Taiwan, Greater China *Scope 1 emissions at the Taiwan site are caused exclusively by the company vehicles used. Company vehicles are used in Germany, UK, Korea and Taiwan.*	2.18

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
Herzogenrath, Dornkaulstraße 2, Germany	291.33	50.82333	6.079128
Herzogenrath, Kaiserstraße 98, Germany	0	50.829219	6.081924
Anderson Road Buckingway Business Park Cambridge CB24 4FQ	3.21	52.274627	-0.010913
#201, 2F, GWell Estate 160 Dongtanbanseok-ro Hwaseong, Gyeonggi-do 18454 South Korea	26.12	37.199493	126.831189
Main Office: 6F-1, No.3 Lane 91 Dong Mei Road Hsinchu City 30070 Taiwan R.O.C.	2.18	24.801851	121.001226

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 for in Scope 2 market-based approach (MWh)
Germany *By switching from conventional electricity (grey electricity) to regenerative electricity (green electricity), emissions have been completely reduced.*	268.23		11844.73	10444.47
United Kingdom of Great Britain and Northern Ireland *By switching from conventional electricity (grey electricity) to regenerative electricity (green electricity), emissions have been completely reduced.*	0		972.95	972.95
United States of America *By switching from conventional electricity (grey electricity) to regenerative electricity (green electricity), emissions have been completely reduced.*	0		25.61	25.61
China *Due to the low volumes, it is not possible to switch from conventional electricity to renewable electricity in China. This is purely a service and sales location. For this reason, the CO2 emissions generated in China were fully offset for the first time in the 2019 reporting year. The CO2 emissions were also offset in 2020.*	14.33		22.88	0
Japan *Due to the low volumes, it is not possible to switch from conventional electricity to renewable electricity in Japan. This is purely a service and sales location. For this reason, the CO2 emissions generated in Japan were fully offset for the first time in the 2019 reporting year. The CO2 emissions were also offset in 2020.*	19.21		38.53	0
Republic of Korea *Due to the low volumes, it is not possible to switch from conventional electricity to renewable electricity in South Korea. This is purely a service and sales location. For this reason, the CO2 emissions generated in Korea were fully offset for the first time in the 2019 reporting year. The CO2 emissions were also offset in 2020.*	55.3		102.5	0
Taiwan, Greater China *Due to the small volumes involved, it is not possible to switch from conventional electricity to renewable electricity in Taiwan. For this reason, the CO2 emissions generated in Taiwan were fully offset for the firDue to the low volumes, it is not possible to switch from conventional electricity to renewable electricity in Taiwan. This is purely a service and sales location. For this reason, the CO2 emissions generated in Taiwan were fully offset for the first time in the 2019 reporting year. The CO2 emissions were also offset in 2020.st time in the 2019 reporting year.*	41.07		65.59	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 (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Germany (Herzogenrath)	268.23	
United Kingdom (Cambridge)	0	0
USA (Santa Clara)	0	0
Japan (Shinagawa-ku, Tokyo)	19.21	
China (Shanghai)	14.32	
Taiwan (Main office: Hsinchu City) / (Tainan City)	41.07	
South Korea (Hwaseong, Gyeonggi-do)	55.3	

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?

Increased

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	The share of purchased renewable energy remained the same for the locations in Germany, the US and the UK. The difference between scope 1 and 2 emissions from 2019 (577 t CO2e) compared to 2020 (710 t CO2e) is only due to the different consumption quantities, but not because we use more electricity from renewable energies. The difference also takes into account the increased turnover.
Other emissions reduction activities	32	Decreased	5.5	As mentioned in question C4.3b we implemented some emission reduction initatives such as energy efficincy measures, so that we could reduce ghg emissions by 32 t CO2e. In comparison to the total scope 1 and 2 emissions in 2019, we could therefore reduce emissions by 5.5% (32t CO2e / 577t CO2e). internal: needs to be in line with C4.3b, only measures that affect the emissions, no renewable electricity
Divestment		<Not Applicable>		no changes/ not relevant
Acquisitions		<Not Applicable>		no changes/ not relevant
Mergers		<Not Applicable>		no changes/ not relevant
Change in output	22.5	Increased	3.9	An increase in Scope 1 and 2 emissions also results from the increase of our business output/ turnover (269 million EUR compared to 259 million EUR in 2019; incoming orders 301 million EUR in comparison to 233 million EUR in 2019). According to this increase, our scope 1 and 2 emissions could have partially increased by 3.9 % or 29.2%, meaning additional 22.5 t CO2e (577 t CO2e * 3.9%) or up to additional 168 t CO2e (577 tCO2 * 29.2%).
Change in methodology	100	Increased	17.33	This time, the calculations were put on a uniform calculation basis. A direct comparison is therefore not possible. Due to the changed emission factors for district heating at the german site, the CO2e emissions for the reporting year 2020 increased compared to the previous year, although consumption decreased (1.96 GWh compared to 1.4 GWh). This results in an overall increase of 17.33 % in comparison to 2019 (100 t CO2e / 577 t CO2e)
Change in boundary		<Not Applicable>		no changes: the system boaundary (organizational and operational) for scope 1 and 2 remained the same
Change in physical operating conditions	50.56	Increased	41	In the case of natural gas, there was a weather-related increase in consumption and emissions rose accordingly.
Unidentified		<Not Applicable>		not relevant
Other	91.8	Increased	15.9	The increased use of sulphur hexafluoride (SF6) for the mandatory tracer gas tests led to a significant increase in CO2 emissions. We assume that this extraordinary event was only necessary to the extent in the reporting year and that lower use will be necessary again in the coming years. This results in an increase by 15.9 % (91.8 t CO2e / 577 t Co2e).

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?

Location-based

C-CG7.10

(C-CG7.10) How do your total Scope 3 emissions for the reporting year compare to those of the previous reporting year?

Increased

C-CG7.10a

(C-CG7.10a) For each Scope 3 category calculated in C6.5, specify how your emissions compare to the previous year and identify the reason for any change.

Purchased goods and services

Direction of change
First year of reporting this category

Primary reason for change
<Not Applicable>

Change in emissions in this category (metric tons CO2e)
<Not Applicable>

% change in emissions in this category
<Not Applicable>

Please explain
<Not Applicable>

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

Direction of change
First year of reporting this category

Primary reason for change
<Not Applicable>

Change in emissions in this category (metric tons CO2e)
<Not Applicable>

% change in emissions in this category
<Not Applicable>

Please explain
<Not Applicable>

Upstream transportation and distribution

Direction of change
First year of reporting this category

Primary reason for change
<Not Applicable>

Change in emissions in this category (metric tons CO2e)
<Not Applicable>

% change in emissions in this category
<Not Applicable>

Please explain
<Not Applicable>

Business travel

Direction of change
Decreased

Primary reason for change
Other, please specify (Due to the Corona measures, there was a significant decline in business travel, especially in air travel.)

Change in emissions in this category (metric tons CO2e)
2584.4

% change in emissions in this category
66.58

Please explain
Buiness travel caused 3.881,6 t CO2e in 2019 compared to 1.297,2 in 2020 resulting in a decline of 2.584,4. Due to the Corona measures in the reporting year, there was a significant decline in business travel, especially in air travel. This led to a considerable decrease in CO2 emissions.

Employee commuting

Direction of change
First year of reporting this category

Primary reason for change
<Not Applicable>

Change in emissions in this category (metric tons CO2e)
<Not Applicable>

% change in emissions in this category
<Not Applicable>

Please explain
<Not Applicable>

Downstream transportation and distribution

Direction of change
First year of reporting this category

Primary reason for change
<Not Applicable>

Change in emissions in this category (metric tons CO2e)
<Not Applicable>

% change in emissions in this category
<Not Applicable>

Please explain
<Not Applicable>

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 undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	Yes
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	No

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 (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	Unable to confirm heating value	0	858.59	858.59
Consumption of purchased or acquired electricity	<Not Applicable>	11443.03	229.5	11672.53
Consumption of purchased or acquired heat	<Not Applicable>	0	1400.26	1400.26
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total energy consumption	<Not Applicable>	11443.03	2488.35	13931.38

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	No
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
LHV (lower heating value)

Total fuel MWh consumed by the organization
858.59

MWh fuel consumed for self-generation of electricity
<Not Applicable>

MWh fuel consumed for self-generation of heat
<Not Applicable>

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration
<Not Applicable>

Emission factor
-99

Unit
kg CO2e per KWh

Emissions factor source
DIN EN 16258

Comment
At our main site, heat recovery is used to heat the building when generating cold out of electricity for production. Natural gas is required for the necessary residual heat of the heating system.

C8.2e

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

Sourcing method
Green electricity products (e.g. green tariffs) from an energy supplier, supported by energy attribute certificates

Low-carbon technology type
Wind

Country/area of consumption of low-carbon electricity, heat, steam or cooling
Germany

MWh consumed accounted for at a zero emission factor
10444.47

Comment
Only applies to electricity purchased and consumed in Germany.

Sourcing method
Green electricity products (e.g. green tariffs) from an energy supplier, supported by energy attribute certificates

Low-carbon technology type
Hydropower

Country/area of consumption of low-carbon electricity, heat, steam or cooling
United Kingdom of Great Britain and Northern Ireland

MWh consumed accounted for at a zero emission factor
972.95

Comment
Only applies to electricity purchased and consumed in UK.

Sourcing method
Green electricity products (e.g. green tariffs) from an energy supplier, supported by energy attribute certificates

Low-carbon technology type
Wind

Country/area of consumption of low-carbon electricity, heat, steam or cooling
United States of America

MWh consumed accounted for at a zero emission factor
25.61

Comment
Only applies to electricity purchased and consumed in the US.

C-CG8.5

(C-CG8.5) Does your organization measure the efficiency of any of its products or services?

	Measurement of product/service efficiency	Comment
Row 1	No, but we plan to start doing so within the next two years	There are calculations for the use of certain, energy-saving components and to what extent energy and ultimately CO2 emissions can be saved as a result. However, there is still no product-related overall calculation.

C9. Additional metrics

C9.1

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

Description
Other, please specify (CO2 emissions (tonnes) per revenues (EUR 1 million))

Metric value
2.63

Metric numerator
tonnes CO2e Emissions

Metric denominator (intensity metric only)
EUR million

% change from previous year
16.37

Direction of change
Increased

Please explain
Emissions only considered for scope 1 and 2 as system boundaries have changed (710 t CO2e in 2020, 587 t CO2e in 2019) Group revenues: 269, 2 million EUR in 2020 and 259,6 million EUR in 2019 -> intensity 2.26 t CO2e / million EUR in 2019 This trend is mainly due to the increase of SF6 consumption. Regarding scope 3 emisisons, a sharp decline in travel due to the measures imposed in connection with the pandemic resulted in a significant decrease in CO2 emissions related to one million euros of turnover.

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	

C-CG9.6a

(C-CG9.6a) Provide details of your organization's investments in low-carbon R&D for capital goods products and services over the last three years.

Technology area
Other, please specify (Optoelectronic (Laser))

Stage of development in the reporting year
Large scale commercial deployment

Average % of total R&D investment over the last 3 years
21 - 40%

R&D investment figure in the reporting year (optional)
17890754

Comment
When it comes to broadband cabling, real fibre-optic networks are much more energy-efficient than previous copper-based networks. This has been scientifically confirmed in a recent report by the Technical University of Central Hesse (Prof. Dr.-Ing. Kristof Obermann). The savings potential increases with the data rate. In terms of electricity consumption per bit rate, the report concludes that copper-based networks consume three to seventeen times more electricity than real fibre-optic networks at an assumed utilisation rate of 50 to 100 percent. LED technology in the area of displays and lighting is also characterised by significantly higher energy efficiency than previous technologies. With the lasers produced on our systems, which are essential for optical data transmission, as well as the light-emitting diodes produced on our systems for displays and lighting, AIXTRON is creating the technical prerequisites for the best possible use of the aforementioned performance advantages and is thus making an important contribution to saving energy and thus to more climate protection and sustainability.

Technology area
Other, please specify (Power Electronic (Leistungselektronik))

Stage of development in the reporting year
Large scale commercial deployment

Average % of total R&D investment over the last 3 years
21 - 40%

R&D investment figure in the reporting year (optional)
17624479

Comment
Power electronics is a branch of electrical engineering that deals with the transformation of electrical energy in terms of voltage form, the level of voltage and current, and frequency using switching electronic components. Modern power electronics is based exclusively on semiconductors and works very efficiently, is cost-effective and technically compact. Power electronics are used in components such as converters or frequency converters, which are used in electrical drive technology and in the generation and grid feeding of regenerative energies from the sun and wind. Power electronics can be found in many areas of our everyday lives - in the power supply of a cell phone as well as in an electric motor, in industrial manufacturing plants as well as on high-voltage lines. Electromobility in particular would be inconceivable without power electronics. This is because it increases the performance of vehicles and enables the rapid expansion of a powerful charging infrastructure. Silicon carbide (SiC) and gallium nitride (GaN) are two promising materials for the power electronics of the future. Both switch electricity much more efficiently than the currently still predominant silicon (Si), which gives off more heat losses when converting direct current to alternating current and thus provides less energy. The use of components made of silicon carbide and gallium nitride thus also saves on expensive and bulky cooling systems. With silicon carbide alone, energy losses can be almost halved and switching times increased tenfold. It has ten times the dielectric strength and three times the thermal conductivity of silicon. These properties can be used, for example, to reduce the volume and weight of important electronic components for electric vehicles by up to 50%. Vehicle batteries will become correspondingly smaller and cheaper. Experts estimate that power electronics could save up to 35 percent of current energy requirements. With our equipment, AIXTRON enables its customers to manufacture these significantly more energy-efficient components based on silicon carbide (SiC) and gallium nitride (GaN).

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 emissions, and attach the relevant statements.

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
1

Page/ section reference
The independent auditors' report has been appended and can also be found in our Sustainability Report for the reporting year 2020 (see page 82 to 83).

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
100

C10.1b

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

Scope 2 approach
Scope 2 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement
1
DE_Indipendent Auditors Report 2020.pdf
EN_Indipendent Auditors Report 2020.pdf

Page/ section reference
The independent auditors' report has been appended and can also be found in our Sustainability Report for the reporting year 2020 (see page 82 to 83).

Relevant standard
ISAE3000

Proportion of reported emissions verified (%)
100

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)?
No, and we do not anticipate being regulated in the next three years

C11.2

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

C11.2a

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.

Credit origination or credit purchase
Credit purchase

Project type
Forests

Project identification
FOREST PROTECTION PROJECT IN MADRE DE DIOS (PERU) FC-Reg-Cert-704096

Verified to which standard
VCS (Verified Carbon Standard)

Number of credits (metric tonnes CO2e)
2234

Number of credits (metric tonnes CO2e): Risk adjusted volume
2234

Credits cancelled
Yes

Purpose, e.g. compliance
Voluntary Offsetting

Credit origination or credit purchase
Credit purchase

Project type
Energy efficiency: households

Project identification
ENERGY EFFICIENCY PROJECT IN KAMPALA (UGANDA) / energy-efficient cookers for households in the metropolitan region of Kampala, the country's capital city. FC-Reg-Cert-704096

Verified to which standard
Gold Standard

Number of credits (metric tonnes CO2e)
2234

Number of credits (metric tonnes CO2e): Risk adjusted volume
2234

Credits cancelled
Yes

Purpose, e.g. compliance
Voluntary Offsetting

C11.3

(C11.3) Does your organization use an internal price on carbon?
No, but we anticipate doing so in the next two years

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?
Yes, our suppliers
Yes, our customers

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement
Information collection (understanding supplier behavior)

Details of engagement
Collect climate change and carbon information at least annually from suppliers

% of suppliers by number
25

% total procurement spend (direct and indirect)

% of supplier-related Scope 3 emissions as reported in C6.5
80

Rationale for the coverage of your engagement
Supplier-related Scope 3 emissions relate to the purchase of goods. This category is by far the largest source of scope 3 emissions. With regard to the carbon inventory in 2020, we have considered the spend-based method, but our concern is to increase the share of supplier-specific information on emissions. Aixtron has developed a supplier questionnaire on general topics, including sustainability (e.g. have you established an environmental or energy management system, information on the emissions of the three scopes, product-specific emissions, disclosure via CDP, TCFD, GRI). The supplier engagement was considered according to the proportion of spend (in total 80%).

Impact of engagement, including measures of success
The aim is to collect data for Aixtron's Scope 3 emissions and also to create awareness of measures to reduce carbon emissions and develop a climate strategy in the supply chain. As this process was introduced in 2020, the impact has not yet been assessed.

Comment

C12.1b

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

Type of engagement
Collaboration & innovation

Details of engagement
Run a campaign to encourage innovation to reduce climate change impacts

% of customers by number
28

% of customer - related Scope 3 emissions as reported in C6.5
32

Portfolio coverage (total or outstanding)
<Not Applicable>

Please explain the rationale for selecting this group of customers and scope of engagement
Costumer-related Scope 3 emissions relate to the use of sold products. We maintain a very close and trusting cooperation with the selected customers that has grown over many years. It is also essential that the necessary technical and process knowledge is available, which is indispensable for these requirements. In addition, they must be customers with whom a certain volume (number of plants) is achieved, otherwise cooperation would make little sense.

Impact of engagement, including measures of success
The aim is to reduce the product specific emissions, that are at the same time the scope 3 emissions of the costumers. Furthermore, the intention is to create awareness of measures to reduce carbon emissions and develop a climate strategy. This will increase Aixtron`s competitiveness and at the same time reduce energy operating costs for customers.

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?
Other

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

Due to our comparatively small size, our ability to directly influence policy makers is very limited. AIXTRON is involved in the development of high-performance and energy-saving components through a variety of research projects, e.g. the development of highly efficient solar cells or the improvement of energy efficiency in power electronics. From our point of view this is where AIXTRON has the greatest influence on policy makers..

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?

If our activities have an impact on policy, an impact assessment would be carried out. However, as described in the question above, only our R&D (i.e. our participation in research projects as well as our energy-efficient technology) has a small impact on policy makers, which at the same time leads to climate change mitigation. Therefore, there is no concern here.

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, incorporating the TCFD recommendations

Status
Complete

Attach the document

Page/Section reference
Page 37 to 51

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures

Comment
The above page numbers refer exclusively to the topic of environment/CO2 emissions. Statements on risks and opportunities, corporate governance and strategy can be found in the previous chapters.

C15. 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.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	CSR Manager	Environment/Sustainability manager

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	1

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	000A0WMPJ6

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.

Requesting member
Robert Bosch GmbH

Scope of emissions
Scope 1

Allocation level
Facility

Allocation level detail
This only refers to the german facility.

Emissions in metric tonnes of CO2e
0.24

Uncertainty (±%)
30

Major sources of emissions
Scope 1 emissions include fossil fuel consumption of stationary plants and mobile plants (heating via natural gas, vehicle fleet) and process emissions.

Verified
No

Allocation method
Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
According to the revenue generated with Bosch in comparison to the total revenue of last year, the share of emissions was estimated. The next step will be the calculation of product-specific carbon footprints, which will be adressed in the next years. 288 t CO2e for Scope 1: one machine, production started in December 2020, overall 100 maschines in 2020 288*1/12*1/100 = 0.24 t CO2e

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Requesting member
Robert Bosch GmbH

Scope of emissions
Scope 2

Allocation level
Facility

Allocation level detail
This only refers to the german facility.

Emissions in metric tonnes of CO2e
0.22

Uncertainty (±%)
30

Major sources of emissions
Scope 2 emissions include the purchase of a small amount of district heating (as the purchase of electricity is renewable and therefore zero).

Verified
No

Allocation method
Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
According to the revenue generated with Bosch in comparison to the total revenue of last year, the share of emissions was estimated. The next step will be the calculation of product-specific carbon footprints, which will be adressed in the next years. 268 t CO2e for Scope 2: one machine, production started in December 2020, overall 100 maschines in 2020 268*1/12*1/100 = 0.22 t CO2e

---

Requesting member
Robert Bosch GmbH

Scope of emissions

Scope 3

Allocation level
Company wide

Allocation level detail
<Not Applicable>

Emissions in metric tonnes of CO2e
101.72

Uncertainty (±%)
30

Major sources of emissions
Scope 3 emissions include purchase of goods and services, upstream energy related activities, business travels, employee commuting as well as upstream logistics. In general: - purchase of goods (scope 3.1) - upstream energy-related activities (scope 3.3) - upstream logistics (scope 3.4) - business travel (scope 3.6) - employee comutting (scope 3.7) Optional: - downstream logistics (scope 3.9) - use of sold products (scope 3.11) - end of life treatment for sold products (scope 3.12)

Verified
No

Allocation method
Allocation based on the market value of products purchased

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
According to the revenue generated with Bosch in comparison to the total revenue of last year, the share of emissions was estimated. The next step will be the calculation of product-specific carbon footprints, which will be adressed in the next years. 122,069 t CO2e for Scope 3: one machine, production started in December 2020, overall 100 maschines in 2020 122.069*1/12*1/100 = 101.72 t CO2e

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	It would be necessary to calculate a specific carbon footprint for each product, which is quite a big effort. However, we plan to do this in the next few years, at least for our major customers.

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.

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

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?
No, I am not providing data

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

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

Please confirm below

I have read and accept the applicable Terms