C0. Introduction

C0.1

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

<Business Overview>

The AGC Group consists of AGC Corporation and its 227 consolidated and unconsolidated subsidiaries (as of the end of March 2022) with headquarters located in Japan. Globally, we have established a global business infrastructure in Japan, Asia, Europe, and Americas. With our diverse business in glass, electronics, chemicals, and ceramics domains, we are taking on the challenge of creating new value by leveraging our strengths in world-class diverse materials technologies, a wide range of customer base, and advanced production technologies that we have cultivated for more than 110 years. In addition, based on our relationship and trust from our customers since the founding of AGC, we have been working to resolve social issues in response to the demands of the times by taking on the challenge to research, develop, and commercialize with a long-term perspective. We provide products such as glass for buildings and houses, mirrors for solar thermal power generation, green refrigerants, etc. that contributes to the realization of an environmentally friendly smart city.

<Efforts on Sustainability>

The trend toward sustainability in recent years leads to huge changes in the business environment that the magnitude of changes can be considered equally comparable to the impact of globalization and the spread of the Internet. To adapt to these major changes, changing what should be changed and firmly maintaining what should be maintained is the basic concept of the AGC Group's sustainability management strategy. Based on changes in the business environment and business conditions, the AGC Group has identified long-term social issues (materiality issues) that the Group should recognize as important opportunities and risks. As a result, AGC group then formulated the "Vision for 2030" and has incorporated basic strategies and measures to realize these goals into the current medium-term management plan.

<Response to Climate Change>

We regard opportunities and risks associated with climate change as factors that have a major impact on the realization of a value creation model and determination of business strategies across the entire value chain (including raw material procurement, production, logistics, sales, and disposal). In addition, AGC also endorses the recommendations of the Climate-Related Financial Disclosure Task Force (TCFD) established by the Financial Stability Board. The AGC Group emits about 20 million t-CO2eq of GHGs with Scope1, 2, and 3 combined. Approximately 55% of Scope 1+2 emissions are emitted from glass, electronics, and other businesses while 45% is emitted from chemicals business. The main sources of GHG emissions are the use of energy in the glass manufacturing process in the glass business, and the use of electricity and direct use of energy in the salt electrolysis process in the chemicals business.

Our responsibilities for Scope 1, Scope 2 are to achieve net zero carbon emissions by 2050. As a midpoint, to reduce GHG emissions by 30% and GHG emissions per unit of sales by 50% (both compared to 2019 levels) as our milestone targets for 2030. We also aim to continue contributing to the realization of carbon net zero in the world through our products and technologies.

As an industry leader, we are developing and introducing world-class implementation-saving glass manufacturing technologies to reduce GHG emissions in the manufacturing process. In addition to progressively introducing existing technologies and facilities, such as oxide burning and electric boosters, we are also engaged in the development of innovative technologies that will generate significant impact in the future. Specifically, we launched the development of fuel ammonia burning technology in collaboration with industry and academia at the end of December 2021. We will also further expand our contribution to the prevention of global warming through our products and technologies. Under both core business and strategic business, we have set a strategic policy of technological development and business development in the environment and energy fields. To align with these strategical policies, we are promoting initiatives to expand the use of building materials integrated solar cells and a next-generation environmentally friendly refrigerant and solvent, AMOLEA.

Forward-looking statements

This response in the report may contain forward-looking statements that are based on current assumptions and projections made by our group management. A variety of known and unknown risks, uncertainties and other factors could cause actual future performances, financial condition, developments, and results to differ materially from those anticipated in this response report. We assume no responsibility to update these forward-looking statements or to align them with future events or developments.

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 2021	December 31 2021	No	<Not Applicable>

C0.3

(C0.3) Select the countries/areas in which you operate.

Austria
Belarus
Belgium
Brazil
Bulgaria
Canada
China
Croatia
Czechia
Denmark
Estonia
Finland
France
Germany
Greece
Hong Kong SAR, China
Hungary
India
Indonesia
Italy
Japan
Kazakhstan
Latvia
Lithuania
Luxembourg
Malaysia
Mexico
Morocco
Myanmar
Netherlands
Philippines
Poland
Portugal
Republic of Korea
Romania
Russian Federation
Saudi Arabia
Singapore
Slovakia
Spain
Sweden
Switzerland
Taiwan, China
Thailand
Turkey
Ukraine
United Arab Emirates
United Kingdom of Great Britain and Northern Ireland
United States of America
Viet Nam

C0.4

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

JPY

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.

Equity share

C-CH0.7

(C-CH0.7) Which part of the chemicals value chain does your organization operate in?

Row 1

Bulk organic chemicals
Polymers

Bulk inorganic chemicals
Chlorine and Sodium hydroxide
Hydrogen
Other industrial gasses

Other chemicals
Specialty chemicals
Specialty organic chemicals

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	JP3112000009
Yes, a CUSIP number	00109C103

C1. Governance

C1.1

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

C1.1a

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

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	The CEO is responsible for the all decisions made by the Board of Directors. We recognize that responding to climate change is a materiality issue (important opportunities and risks) when promoting sustainability management within the AGC Group. Matters concerning responses to climate change that are subjected to discussion and reporting at the Board of Directors' meeting are deliberated by the "Sustainability Committee", and the criteria for implementing the discussions are set in the "Sustainability Committee agenda items and the criteria for reporting to the Board of Directors." Agenda items to be discussed by the Sustainability Committee are as follows: 1. Decide policies related to sustainability; 2. Determine decisions sustainability objectives, progress management, and implementation measures; 3. Share information on sustainability: 4. Deliberate and decide important agenda items to report to the Board of Directors. All the agenda items mentioned above encompass responses to climate change. At the Board of Directors meeting, the Chairman (Executive), CEO (Representative Director, and also President), CFO and also CCO (Representative Director and Executive Vice President), CTO (Director, Senior Managing Executive Officer), and Outside Directors decides important matters such as management targets and responses to risks and opportunities related to climate change issues. The CEO is then responsible for executing decisions made by the Board of Directors regarding climate change responses. Prior to deliberation by the Board of Directors, the Sustainability Committee (chaired by the CEO and is established as a subordinate body of the Management Council) deliberates on the AGC Group's sustainability management strategies including climate change. In addition, AGC Group also formulates sustainability policies, particularly those related to climate change, as well as promotes risk management and controls information disclosure and other activities. The CEO reports the AGC Group's climate change strategy to the Board of Directors as appropriate. Following the 2020 Board of Directors resolution, in February 2021, the CEO decided and has announced externally the long-term management strategy and medium-term management plan, which includes the 2030 interim goals for realizing the 2050 Carbon Net Zero.
Chief Financial Officer (CFO)	The CFO (Representative Director and Vice President Executive Officer) concurrently serves as the General Manager of the Corporate Planning Division. The AGC Group's division in charge of sustainability, the Sustainability Promotion Department, is also established within Corporate Planning Division. The Sustainability Committee, an executive decision-making body headed and led by the Sustainability Promotion Department, deliberate climate change issues and reports the contents discussed to the Board under the responsibility of the CFO.
Other C-Suite Officer	In addition to the Technology Division and the Intellectual Property Division, the CTO oversees divisions such as the EHSQ General Division, Business Development Division, and Productivity Innovation Promotion Division. In 2050, the AGC Group declared its goal of becoming "Carbon Net Zero." To achieve this goal, the Environment, Safety & Quality Division and Technology Division are strengthening their cooperation with each internal company, and the Group is working together on various measures and technological development aimed at reducing GHG emissions.

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 Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<Not Applicable>	With the recognition that climate change is an important issue that affects corporate sustainability in society and the economy, directors of the AGC Group are expected to carry out their obligation to address climate-related risks and opportunities, as well as adaptation and mitigation of climate change issues. We recognize that both climate related physical risks and transition risks have a large impact on our business due to the specifics risks involves with our business characteristic. Nevertheless, the impact of other market risks, policy risks, and reputation risks can also not be neglected. In accordance with the duty of loyalty of directors to the company stipulated in the Japanese Companies Act in which the AGC Group Head Office is domiciled, directors are obligated to report to the company any facts that may harm the company, and they are responsible for establishing a risk management system to fulfil their responsibility to monitor and manage such problems. Recognizing that climate change can be one of these factors, the Board of Directors monitors, deliberates, and reports on major risks and opportunities associated with climate change at least twice a year in May-June and November-December. In addition, whenever important issues related to climate change response arise, additional deliberations and reports are made, and they are supervised by the directors. In 2021, the Board of Directors discussed and reported on the following matters: - Current status and long-term simulation of GHG emissions and action plans to achieve the 2030 GHG emission reduction targets - Implementation of internal carbon pricing - Expanding disclosures based on TCFD framework - Results of analysis of the current status of ESG performances, including those related to climate change In addition to the above matters mentioned, the deliberation of company-wide strategies, mid-term plans, annual budgets, individual capital investment, M&A projects, and their associated GHG emissions and future carbon cost burdens are constantly being verified by the executives. The outcomes of company-wide monitoring are also reported to the Board of Directors based on the integrated risk management mechanism described in detail in C2.1b. The report includes physical risks associated with identified climate change and the BCP responses for them. Henceforward, we will continue to strengthen our monitoring progress and oversight of quantitative and qualitative targets in regard to GHG emissions reductions. For information on the status of our corporate governance, please refer to the "Corporate Governance Report." https://www.agc.com/company/pdf/governance.pdf

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	The concept of balance, diversity, and size of the board altogther are important factors for the AGC Group's sustainable growth and medium-to-long-term improvement of corporate value, is described in the "Nominating Committee and Compensation Committee" section of the Annual Securities Report. Based on the above concept, the Company strives to ensure diversity by providing well-balanced Executives Committe and Audit & Supervisory Committee board members with skills align with the "Skills Matrix", which clarifies the skills that the Board of Directors and the Audit & Supervisory Board members should possess. "Sustainability" is also defined as a skill in the "Skills Matrix". Executives Committee and Audit & Supervisory Committee board memebers' required skills set are determined on the viewpoint of the functions, consistency with the management strategies, and business characteristics. Definition for each skill and the guideline for evaluating whether if such skill is met are also explained. When judging whether a committee members' skills are met, we evaluate whether the members have particularly high performance, abundant experience, advanced insight, etc. Regarding climate-change-related skills, we evaluate the members base on their "knowledge related to environmental issues and etc. that are necessary for achieving both the sustainable development of the earth, social, and the sustainable growth of our company."	<Not Applicable>	<Not Applicable>

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
Chief Executive Officer (CEO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	More frequently than quarterly
Chief Financial Officer (CFO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	More frequently than quarterly
Other C-Suite Officer, please specify (CTO)	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	More frequently than quarterly
Sustainability committee	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Half-yearly

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).

The Medium-Term Management Plan identifies important opportunities and important risks based on global social issues and future trends in risks, as well as social issues that our customers are working to resolve as AGC Group's material issues that may affect the long-term direction of AGC's management and corporate value. As a result, we have set sustainability targets aimed at leveraging these opportunities and addressing these risks.

Responding to climate change is one of our materiality issues, and progress is reported monthly at Board of Directors' meeting. The board closely review, approve and supervise plans and progress on climate change measures and strategies.

In addition, the Sustainability Committee, chaired by the CEO and chaired by the CTO, CFO, and heads of each department, has been established as a decision-making body for sustainability-related efforts, and is held four times a year. The Sustainability Committee is positioned on par with the Management Council and is responsible for making decisions and monitoring the enforcement of sustainability and climate change related matters under the supervision of the Board of Directors.

Then based on the opportunities and risks associated with climate change, GHG emissions, other group monitoring results, and challenges derived from these, the sustainability committee deliberates on response policies.

The Sustainability Committee has the following roles:

1. Decide policies related to sustainability

2. Determine decisions on sustainability objectives, progress management, and implementation measures

3. Share information on sustainability

4. Deliberate and decide important agenda items to report to the Board of Directors

Major resolutions and reports on climate change at the Sustainability Committee held in 2021 are as follows:

(1) Climate change-related issues and current status toward achieving sustainability goals (management goals)

(2) Action plan for achieving the 2030 GHG emission reduction target (management target)

(3) Calculation rules for GHG emission reduction KPIs in investment projects

(4) Introduction of internal carbon pricing

Based on the resolution of the Sustainability Committee, the CFO and CTO will be responsible for executing the response measures according to their respective responsibilities. At the "Climate Change Response Strategy Meeting" hosted by the General Manager of the Sustainability Promotion Department of the Corporate Planning Division, strategies and responses to risks are discussed in a timely manner based on internal and external changes caused by climate change issues.

In addition, the "AGC Group GHG Emissions Reduction Promotion Steering Meeting" (led by the General Manager of the Environment, Safety & Quality Division, which is one of the departments under the jurisdiction of the CTO.) collaborates with other divisions with expertise in data management, technology innovation, energy management, and supply chain management to reduce GHG emissions globally and across businesses, and is advancing various initiatives toward realizing the 2050 Carbon Pricing Net Zero.

<Reference Disclosure>

- Sustainability Promotion System

https://www.agc.com/csr/sustainability/index.html

- AGC Integrated Report 2022

https://www.agc.com/csr/pdf/agc_report_2022.pdf

P36～Promotion of sustainability-oriented management

P73～Governance on Climate Change Responses

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	

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 incentivized	Comment
Director on board	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target Behavior change related indicator Environmental criteria included in purchases Supply chain engagement Company performance against a climate-related sustainability index	Renumeration Decision-making Process Based on the remuneration principle, the Compensation Committee deliberates on the remuneration system for directors and executive level officers, proposes the renumeration system to the board of directors, and verifies the results of remuneration payments to improve the objectiveness and transparency of the whole remuneration determination process. Composition of Directors' Compensation For AGC Group, we believe in addition to the business strategy decided for each fiscal year, providing materials and solutions for development with a long-term perspective, mid-to-long-term technology development and investment in human resources & facilities are the sources of our competitiveness. Similarly, AGC's executives have been introduced an incentive system, one of the balanced approaches that give incentives to increases directors' willingness to achieve the goals set in the short, medium, and long terms. For variable compensation, in addition to bonuses linked to organizational performance in a single fiscal year, amount of the stock-based compensation awarded is determined based on the medium-term management plan performances and other factors that linked with strengthening the non-financial capital and measures done to address climate change issues. Under the stock-based compensation plan, the executives are obliged to continue holding shares granted during their tenure. The purpose is to increase their willingness to continue to contribute to enhance corporate value over medium-to-long term and to further align their interests with our shareholders.
All employees	Monetary reward	Emissions reduction project Emissions reduction target Energy reduction project Energy reduction target Efficiency project Efficiency target Behavior change related indicator Environmental criteria included in purchases	The following award systems are being implemented at the AGC Group's factories: Awards are given when an employee, individually or in collaboration with two or more employees, engages in activities that fall into one of the following performance of operations categories (including those related to safety and the environment), such as increasing production, improving yields, improving quality, lowering costs, and introducing new systems and innovations. Awards for outstanding environment-related activities, including climate change responses, are given based on the following criteria, with a maximum award of 120,000 yen. ・When a staff belonging to a department other than the department in charge of environmental safety at each factory takes actions that prevents the trouble from expanding. ・When a staff of the relevant department and/or the staff of the Environment and Safety Department's performance are outstanding (Considering the actions that prevents the troubles or prevent the troubles from expanding, even if the work conducted are within the extent of their own duties.)

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	Normally, business plans are formulated over a span of three to five years, and business plans for a single fiscal year are reviewed annually based on the results of the previous fiscal year and the medium-term management plan.
Medium-term	1	3	Normally, business plans are formulated over a three-to five-year span. Currently, under the "AGC plus-2023" medium-term management plan, which covers the three-year period from 2021 to 2023, the main measures are to accelerate business growth in strategic business areas, pursue "management with ambidexterity" to explore new business areas (energy-related areas, etc.), promote sustainability management to accelerate the resolution of social issues through material innovation, and strengthen competitiveness by accelerating DX.
Long-term	3	30	Currently, we are implementing the long-term business strategy "Vision for 2030" formulated in 2021. To address climate change issues, we are committed to contributing to a sustainable global environment through our business activities. We have also declared that we will aim for carbon net zero by 2050 and have set 2030 as the milestone.

C2.1b

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

The AGC Group has established a vision for 2050 of aiming for net zero emissions from its business activities and contributing to the realization of a global carbon net zero by leveraging its products and technologies.

Definition of Substantive Impacts

Regarding business and other risks, including risks arising from climate change in our group, we have defined items that may have a significant impact on investors' decisions as substantive impacts and have determined using net assets / ordinary income / net income as a threshold indicator. Then the threshold (damage amount) is decided based on 3% of net assets or 30% of ordinary income / net income, whichever is the smallest value (37.2 billion yen in 2021) is used as the threshold value.

Short-to medium-term risk

Regarding short-to medium-term risks, based on the "Risk Management System" described in our Annual Securities Report, we have established the "AGC Group Integrated Risk Management Basic Policy," a basic policy related to the Group's risk management system, and have established a risk management and crisis response system.

Risk Management

In accordance with internal regulations, important risk factors for the Group are defined, and the status of risk management is regularly discussed and monitored by our Management Committee and the Board of Directors. In addition, the Corporate Functional Divisions, Internal Companies, and SBUs (Strategic Business Units) analyse risks and consider countermeasures for each business and project and deliberate them at the Executive Committee and the Board of Directors, as necessary, with respect to individual risks in the operation of our Group's business. Regarding the Group's risks related to compliance, the environment, disasters, quality, etc., each division in charge of the Group establishes and disseminates guidelines, conducts training, audits, etc. as necessary. Important risk factors are reviewed on a regular basis, considering the degree of impact on Group’s management and the possibility of risk occurrence.

Response to Discovered Risks

Based on our internal regulations, we have established a contingency report line to enable prompt and reliable reporting and sharing of information with the CEO based on the concept of "Bad News First" in preparation for unforeseen events that may have a material impact on the Group's operating results and financial position. In addition, based on the judgment of the CEO, we can immediately establish a Group Emergency Headquarters and established a system to ensure a prompt and appropriate initial response.

Long-term risk

The Medium-Term Management Plan identifies important opportunities and important risks that could affect the long-term direction of corporate management and corporate value as materiality for the Group considering future trends in global social issues and risks, as well as social issues that customers are working to resolve. In addition, we have set sustainability targets aimed at leveraging opportunities and addressing risks. We have established the Sustainability Committee, chaired by CEO and consisted of CTO, CFO, and the heads of each division, as decision-making bodies for initiatives related to sustainability. Regarding the important risks, under the supervision of the Board of Directors, the Committee decides the response policy and deliberates on future measures based on the progress of the objectives.

Business opportunities

In order to achieve carbon net zero in 2050, the Group is working to implement measures to reduce emissions according to GHG sources, such as the development of manufacturing technologies and facilities with low GHG emissions. At the same time, taking climate change issues as an important opportunity, we are striving to expand sales of products that have energy-saving and energy-creating effects over the product life cycle and build a business model that contributes to the popularization of renewable energy. As a specific mechanism, we are promoting business portfolio management for long-term sustainable growth. For our business evaluation, we determined the evaluation indicators that are strong against market fluctuations, reflects high growth rate, asset efficiency, and demonstrate excellent carbon efficiency (low GHG emissions per sales). By adopting these evaluation indicators, we are striving to sustainably improve profitability and implement business strategies that consider both the opportunities and risks of climate change. We also use internal carbon pricing to make business and capital investment decisions. In addition to quantitatively assessing the risks associated with climate change, this initiative aims to strategically pursue decisions and implementation of operation and capital investment that take advantage of climate change as an opportunity.

(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
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
Annually

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

Description of process
[Identification of risks]
With a span of short-term to medium-term, risks that are expected to have a significant impact on business management when they occur are defined as "important risk factors", and a mechanism is in place for the management to grasp the management status across the group.

In order to develop and operate the risk management system of the Company and its Subsidiaries, the basic policy, roles, and responsibilities, etc. are defined in the "AGC Group Integrated Risk Management Basic Policy" based on Section 4, Article 100, Paragraph 2, "Regulations and Other Systems for Managing Risk of Loss" of the Company Act Enforcement Rules, which encompasses risks associated with climate change. The development and operation of a risk management system refers to 1) the development and operation of procedures and systems to prevent the realization of such risks after identifying risks, and 2) the development and operation of methods and systems for responding to the occurrence of such risks after identifying risks.

The AGC Group's basic approach to integrated risk management, including risks associated with climate change, is as follows:
a. Involvement of the management
The AGC Group considers integrated risk management initiatives to be day-to-day business tasks and the management itself is actively involved in the Group's integrated risk management initiatives accordingly. Specifically, management sets basic policies for integrated risk management from the viewpoint of group-wide optimization and monitors these efforts to implement a PDCA cycle as a group.

b. Group Efforts for Integrated Risk Management
Based on the basic policies established by the management, each in-house company and SBU (Strategic Business Unit) and corporate division, including affiliated companies under their jurisdiction, will promote their respective integrated risk management initiatives. Meanwhile, the Corporate Planning Division centrally and comprehensively grasps the risk management status of important risks that should be managed as a group, including the response when the risks occur.

c. Ensuring Effectiveness and Efficiency in Integrated Risk Management
The AGC Group engages in integrated risk management with the aim of achieving both effectiveness and efficiency. Specifically, the group's policies and priority areas related to integrated risk management are shared, and efforts are being made "effectively" with a sense of unity. In addition, we promote integrated risk management as an initiative with high "efficiency" without duplication or excessive feeling, taking into consideration the degree of impact of risk on management, probability of occurrence, business scale, etc.

■ Short-to medium-term risk
Regarding short-to medium-term risks, based on the "Risk Management System" described in our Annual Securities Report, we have established the "AGC Group Integrated Risk Management Basic Policy," a basic policy related to the Group's risk management system, and have established a risk management and crisis response system

■ Long-term risk
The Medium-Term Management Plan identifies important opportunities and important risks that could affect the long-term direction of corporate management and corporate value as materiality for the Group considering future trends in global social issues and risks, as well as social issues that customers are working to resolve.

In addition, we have set sustainability targets aimed at leveraging opportunities and addressing risks. We have established the Sustainability Committee, chaired by CEO and consisted of CTO, CFO, and the heads of each division, as decision-making bodies for initiatives related to sustainability. Regarding the important risks, under the supervision of the Board of Directors, the Committee decides the response policy and deliberates on future measures based on the progress of the objectives.

[Risk Assessment]
Important risks are reviewed and set annually, considering the degree of impact on group management at the time of risk occurrence and the possibility of occurrence. Of the important risks, each in-house company / SBUs conduct risk analysis and consider countermeasures for each business or project, and the management monitors them as necessary.

Regarding risks related to the environment, disasters, quality, etc., including compliance and climate change, while each department of the in-house company / SBUs work on various measures to raise its own risk management level, the corporate department in charge of the downside risk provides advice and supports for these efforts through the establishment and dissemination of guidelines, trainings, etc.

For downside risks, each department of the internal company and SBU regularly self-inspects its own risk management level, and the management monitors the results. Specific arrangements regarding the development and operation of risk management mechanisms are stipulated in the "AGC Group Risk Management Implementation Regulations" and are being implemented.

In 2021, we conducted the downside risk self-inspection evaluation that focus on identifying the risks of direct operation, upstream and downstream business interruption due to sudden events such as typhoons, hurricanes, cyclones, etc. because of climate change and has identified the high-risk business bases. For facilities, which we directly operate, identified with high risks, we are implementing risk reduction measures and formulating a business continuity plan that defines important businesses that should be continued even in the sudden event.

[Response to Risks]
In accordance with our internal regulations, important risk factors for the Group are defined, and the status of risk management is regularly discussed and monitored by our Management Committee and the Board of Directors.

In addition, in regard to individual risks in the business operations of the Group, the corporate function department, internal company, and SBUs (strategic business unit) examine risk analysis and countermeasures for each business/ project and deliberated by the management committee and the board of directors as necessary.

Regarding the Group's risks related to compliance, the environment, disasters, quality, etc., each division in charge of the Group establishes and disseminates guidelines, conducts training, audits, etc. as necessary. Important risk factors are reviewed on a regular basis, considering the degree of impact on Group's management and the possibility of risk occurrence.

Based on our internal regulations, we have established a contingency report line to enable prompt and reliable reporting and sharing of information with the CEO based on the concept of "Bad News First" in preparation for unforeseen events that may have a material impact on the Group's operating results and financial position.

Value chain stage(s) covered
Direct operations
Upstream
Downstream

Risk management process
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
More than once a year

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

Description of process
In order to achieve carbon net zero in 2050, the Group is working to implement measures to reduce emissions according to GHG sources, such as the development of manufacturing technologies and facilities with low GHG emissions. At the same time, taking climate change issues as an important opportunity, we are striving to expand sales of products that have energy-saving and energy-creating effects over the product life cycle and build a business model that contributes to the popularization of renewable energy.

Thus, the process of identifying, assessing, and responding to climate-related risks and opportunities covers the entire value chain, including upstream and downstream, as well as direct operations. In addition, looking ahead to the long-term 2050, the medium-term 2030 will cover the process of identifying and assessing opportunities and corresponding processes for the short-term of one year.

[Identification of Opportunities]
The AGC Group holds Business Strategy Meeting twice a year, which are meetings between the Group CEO and other members of management and the executives of each business division to discuss growth strategies and investment plans for the entire business over the medium term. At this meeting, we evaluate the business potential of each business unit from a variety of perspectives. In addition to the perspectives of market growth, profitability, and technological superiority, we also identify them from a non-financial perspective, including sustainability.

The time horizon discussed in this Business Strategy Meeting is mainly for the medium term, but from the perspective of long-term planning, carbon net zero ambition by 2050 is also covered in the strategy.

[Assessment of Opportunities]
Specifically, we assess risks and opportunities in climate change and other sustainability issues. Businesses with high GHG emissions at the manufacturing stage are judged to be risky over the long term, while businesses with a large contribution to reducing GHG emissions at the use stage through products are evaluated as leading to business opportunities over the long term. From these diverse perspectives, we make long-term and comprehensive decisions to allocate management resources. After management and business division executives share strategies, these decisions lead to business expansion without missing opportunities.

In addition to the above-mentioned Business Strategy Meeting, long-term strategic discussions are held every spring in the year we formulate a new medium-term management plan. Currently, in our long-term business strategy, "Vision for 2030," we have determined that we will contribute to the realization of a sustainable society through the provision of unique materials and solutions, as well as be an excellent company that continuously grows and evolves, and we are working to realize this goal.

Regarding responding to climate change, AGC Group has determined to contribute to a sustainable global environment as one of the social values it wants to create, and is implementing initiatives accordingly.

Currently, we are promoting business portfolio management for long-term sustainable growth. For our business evaluation, we determined the evaluation indicators that are strong against market fluctuations, reflects high growth rate, asset efficiency, and demonstrate excellent carbon efficiency (low GHG emissions per sales). By adopting these evaluation indicators, we are striving to sustainably improve profitability and implement business strategies that consider both the opportunities and risks of climate change.

[Response to Opportunities]
Internal carbon pricing is used for business investment and capital investment decisions. In addition to quantitatively assessing the risks associated with climate change, this initiative aims to strategically pursue decisions and implementation of operation and capital investment that take advantage of climate change as an opportunity.

The current medium-term management plan is available here:
https://www.agc.com/ir/library/briefing/pdf/2021_0205_2.pdf

Our long-term strategy, "Vision for 2030," can be found here:
https://www.agc.com/company/2030/index.html

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	With respect to current regulations, the following risks are assessed: ・Risk of rising carbon prices and increasing operating costs; ・Risk of countries' carbon emission targets and policies that leads to increase in operating costs to reduce GHG emissions; ・Risk of increased operating costs resulting from the utilization and disallowance for fossil fuel subsidies; ・Risk of increased operating costs resulting from the utilization and disallowance for renewable energy, etc. subsidies. In Japan, the "Global Warming Carbon Tax" is applied as carbon pricing. This carbon tax adds 289 yen per t-CO2 and 0.7 yen per liter of fossil fuels (crude oil and petroleum products, LPG/LNG, and coal) as part of the petroleum and coal tax. The AGC Group's domestic facilities emit 1,860k t-CO2 of Scope1 & 2 GHG from energy consumption. If global warming related countermeasures tax increases, the AGC Group's manufacturing costs may also increase. The "Law on the Rational Use of Energy", which also is called the Energy Conservation Act, was enacted in 1979 in response to the oil crisis. Certain companies, such as plants and business establishments that use 1500 kl (kiloliters) or more of energy per year in crude oil equivalents, are required to report on their medium-and long-term plans concerning energy use and energy conservation. The Ministry of Economy, Trade and Industry and the Agency for Natural Resources and Energy, which have jurisdiction over this law, provide energy conservation supports to companies by providing tax incentive, low-interest loans support, grants to purchasing equipment. Energy conservation grants are provided partially or in full amount when a company takes necessary measures to conserve energy. We are also using this subsidy program to take measures to reduce GHG emissions. If we are unable to achieve the reduction rate, which is a requirement for receiving grants, then executing subsequent measures to reduce GHG emissions will be hindered, which will affect the reduction of GHG emissions.
Emerging regulation	Relevant, always included	Regarding new regulations, the following risks are assessed: ・Risk of rising carbon prices and increasing operating costs; ・Risk of countries' carbon emission targets and policies that leads to increase in operating costs to reduce GHG emissions; ・Risk of increased operating costs resulting from the utilization and disallowance for fossil fuel subsidies; ・Risk of increased operating costs resulting from the utilization and disallowance for renewable energy, etc. subsidies. The Paris Agreement and the trend toward decarbonization in countries are becoming more pronounced, and the financial impact of responding to laws and regulations to implement them will be a risk. In addition, countries have established NDCs under the Paris Agreement, and accordingly, countries that have introduced a carbon tax are implementing and considering increasing the carbon tax rate. This could have a financial impact in the countries where the AGC Group is located. In addition, developments in Carbon Border Adjustment Mechanism (CBAM) affect us. Currently, there is a potential implementation of a border-adjusted carbon tax in the EU, which could also have a financial impact on us if it is being implemented. China Carbon Market Scheme (Glass Manufacturing will be Applicable from 2021 onward) Japan's carbon tax rate is said to be low comparing to the rest of the world and the tax rate is likely to be raised in the future. To realize 2050 Carbon Neutral, there is a possibility that a nationwide system may be newly established based on the existing "Act on Promotion of Global Warming Countermeasures" system. In Japan, the Ministry of Economy, Market and Industry (METI) announced the "GX League Basic Concept" as a framework for companies with ambitious carbon reduction targets in 2022 to conduct voluntary emissions trading aimed at achieving their targets while making investments to reduce emissions. Full-scale operation is scheduled for fiscal 2023. Regarding the details of GX League, it is stated that it will be a platform for voluntary emissions trading. Although AGC endorses the "GX League Basic Concept" and may participate in emissions trading, it is a voluntary participation and AGC has no obligation to trade. : The Republican Party has proposed a carbon tax, which if implemented, it may impose levy on our group locations in US. Carbon pricing systems are also in operation in emerging countries.
Technology	Relevant, always included	In terms of technology, we evaluate the following risks; ・Increase in direct costs associated with fossil-derived energy substitution ・Risk of increasing investment costs for low carbon technologies ・Risk of increasing investment costs associated with the spread of renewable energy and energy-saving technologies ・Risk of increasing investment costs associated with the development of next-generation technologies [Process] In glass manufacturing, fossil-fuel consumption in the melting process is a large factor in Scope 1 GHG emissions. We recognize that achieving our GHG emission reduction goals requires a shift to manufacturing methods that are not dependent on fossil fuels. If we are unable to convert, continue to use a large amount of fossil fuels and if fossil fuels become difficult to obtain or prices rise globally, we recognize that the impact on glass production itself would be significant. In the chemical products business, Hydrogen is generated from the electrolytic cell in the salt electrolysis process together with the general-purpose chemical products' caustic soda (sodium hydroxide) and chlorine. Technological improvements have been made since we began practical use of our ion-exchange membrane salt electrolysis technology in 1975, and its performance is among the highest in the world. On the other hand, the salt electrolysis industry itself is an energy-intensive industry, and we are continuing our efforts to conserve energy and reduce costs. However, the electricity market has the characteristic of being easily affected by the progressing of electrification, so we own our own in-house power generation facilities. Since the fuel of this self-generation facility is derived from fossil fuels, we recognize that if fossil fuels become difficult to obtain or prices rise worldwide, glass production itself will be significantly affected. [Products and services] Increasing demand for LEED certifications and ZEBs in buildings requires appropriate product specifications, and the expenses associated with technological developments may have a financial impact.
Legal	Relevant, always included	When climate change-related risks are stated in the securities report, information such as the impact on finance and business activities may be subject to proceedings as a false statement.
Market	Relevant, always included	Automobile Glass Business is one of the Company's main businesses and the demand to reduce GHG emissions during the product manufacturing stage is gradually increasing, particularly amongst European automakers customers. Over the medium to long term, if we are unable to adequately respond to such demands, there is a risk of shrinking or losing business opportunity.
Reputation	Relevant, always included	Regarding reputation, the following risks are assessed: ・ Risk of lower customer evaluation of our ESG initiatives due to changes in customer perceptions ・ Risk of lower customer evaluation of our ESG initiatives due to changes in investor perceptions In ESG evaluation, the importance of assessments related to climate change responses is increasing year by year, and particular emphasis is placed on us due to our relatively high volume of GHG emissions. Low evaluations of CDP and other ESG estimates regarding climate change responses pose a risk of not being chosen by investors and the corporate value will decline. [EU TAXONOMY] Currently, not only the AGC group but also other Japanese companies are basically not subject to disclosure obligations, but it is anticipated that European investors and companies will need to disclose the EU taxonomy compliance ratio. In addition, there is a risk that requests for disclosure of related information will intensify from European investors. On the other hand, aggressive information disclosure may attract growth funds from Europe and become competitive in transactions. In addition, there is a possibility that it might become the global standards by reflecting other principles and standards (ICMA, ISOs, etc.), which are the risks that our company will be subject to disclosure based on standards such as having a base in Europe, and related information disclosure., pressure risks from investors and NGOs if not disclosing related information. Furthermore, when Brown Taxonomies are formulated, it may become the divesting criteria for investors.

	Relevance & inclusion	Please explain
Acute physical	Relevant, always included	The following risks are assessed with respect to the acute physical risks: ・Operational instability due to severe extreme weather conditions Plants with glass melting furnaces and basic chemical factories are located along the coast and are therefore susceptible to typhoons. If we are unable to operate due to the impact of typhoons, this could lead to a decrease in sales. In addition, there is a risk of losing customers if we are unable to fully implement risk reduction measures.
Chronic physical	Relevant, always included	The following risks are assessed with respect to the chronic physical risks: ・Increase in operating costs due to increase in average temperature ・Increase in operating costs due to changes in rainfall and weather patterns ・Increase in operating costs due to the impact of rising sea levels Plants with glass melting furnaces and factories with basic chemicals are located in coastal areas, which can be affected by storm surges and sea level rise. Failure to operate will lead to a decrease in sales. In addition, there is a risk of losing customers if we are unable to fully implement risk reduction measures. In addition, we may be affected by extreme weather conditions due to the need to procure raw materials that involve long-haul shipping. In that case, there is a risk that the manufacturing process will stop and production will not be possible, resulting in a decrease in sales. In addition to the above, the AGC Group has high-temperature workplaces such as glass melting furnaces, and employees are in an environment that is prone to heat stroke. In addition, as the temperature rises, there is a risk that the cost of heat stroke prevention measures (air conditioners, etc.) will increase.

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

Of the GHG emissions in 2021, the Scope 1,2 GHG emissions in Japan is approximately 2.61 million tons-CO2, accounting for approximately 23% of the Scope 1,2 GHG emissions of the entire Group.

In order to realize a low-carbon society, Japan introduced renewable energy and strengthened measures to combat global warming (measures to reduce emissions of energy-originated CO2) including energy conservation measures. In 2012, the "Tax for Combating Global Warming" was enacted in stages, and fossil fuels are currently taxed at 289 yen per ton of CO2 emissions, which can be counted as carbon pricing. This global warming countermeasure tax is levied by utilizing the current petroleum and coal tax collection scheme based on all fossil fuels and adding the above tax rate to the petroleum and coal tax.

At AGC sites in Japan, taxes occur at the stage of purchasing fossil fuels for use in business activities. In particular, complete decarbonization and electrification in glass melting kilns and chemical manufacturing processes, which are major GHG emission sources, are difficult to drastically change in a short period of time from the viewpoint of plant and equipment life. Therefore, we believe that the financial impact would be significant if the tax rate for "taxes for global warming countermeasures" were to increase.

In addition to this, in February 2022, the Japanese government's Ministry of Economy, Trade and Industry announced the "GX League Basic Concept." "The GX League Basic Concept" is a framework for companies with ambitious carbon reduction targets to conduct voluntary emissions trading aimed at achieving their targets while making investments to reduce emissions. Full-scale operations are scheduled for fiscal 2023.

Under this initiative, we plan to start voluntary emissions trading under the GX League after 2023. The price is temporarily set at 20 USD / t-CO2, which is the J-credit level, and the target emission amount under the system can be determined by oneself, so no substantial impact is expected.

Time horizon

Medium-term

Likelihood

Unlikely

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)
678600000

Potential financial impact figure – maximum (currency)
4410900000

Explanation of financial impact figure
The carbon price forecast for 2030 announced by the IEA is expected to be 120 USD / t-CO2 for APS (Announced Pledge Scenario) and 130 USD / t-CO2 for NZE (Net Zero Emissions by 2050 Scenario).

Based on these forecasts, Japan's carbon price is expected to be in the range of 20 USD / t-CO2 to 130 USD / t-CO2, so 10% of the 2021 Scope 1,2 GHG emissions will be subject to emissions trading. Assuming this is true, we expect a financial impact of 20USD * 330,000USD to 130USD * 330,000USD. The exchange rate between USD and JPY is converted at 130 yen/USD.

Minimum:261,000 t-CO 2 * 20 USD * 130 (USD/JPY) = 678,600,000 JPY
Maximum:261,000 t-CO 2 * 130 USD * 130 (USD/JPY) = 4,410,900,000 JPY

Cost of response to risk
4000000000

Description of response and explanation of cost calculation
[Status]
Of the AGC group GHG emissions, the actual GHG emissions from bases located in Japan in 2021 were 261,000 t-CO2, of which the majority of them were Scope 1 emissions subject to the carbon tax of 1,387,215 t-CO2. Compared to 2020

[Task]
Comparing to 2019 Scope 1 and Scope 2 GHG emissions, to achieve the overall AGC Group target of -30% by 2030, which is set as a milestone for achieving carbon net zero in 2050. Emissions from operations in Japan also need to be reduced by 30% by 2030. Going forward, we will strive to reduce absolute GHG emissions not only by improving the basic unit of sales, but also by further improving the efficiency of energy use and other measures, with the aim of creating a structure that is not affected by a carbon tax.

[Action]
In order to achieve the Group's objectives, we need to reduce Scope 1 emission through cold repair of glass melting furnaces, fuel conversion and further measures utilizing BATs (The best available technology) and reduce Scope 2 emission by actively introducing renewable energy. In 2021, we are taking measures such as glass furnace cold repair, introducing high-efficiency equipment at the timing of renewal of aging, and improving the process.

The investment for cooling and repairing is at least 4,000,000,000 in general

[Results]
While absolute scope 1 and scope 2 GHG emissions increased by approximately 5% compared to 2019, GHG emissions per unit of net sales in 2021 improved by 13%, which is an improvement of 0.753 thousand tons-CO2.

Comment

Identifier
Risk 2

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

Risk type & Primary climate-related risk driver

Acute physical	Flood (coastal, fluvial, pluvial, groundwater)

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 assumption amount of risk damage caused by floods and storm surges was calculated for the 7 sites belonging to AGC Corporation. These bases are the main bases for AGC Corporation, which manufactures glass and chemicals in Kanagawa, Chiba, Aichi, Ibaraki, and Hyogo prefectures.

We used the following data to estimate assumed amount of damage:
[Climate Change Scenario]
RCP 2.6 Scenario: This projection assumes a "2°C increase scenario" as the global average temperature at the end of the 21st century (2081-2100) is likely to increase by 0.9-2.3°C compared to pre-industrialization (*) . This corresponds to the possible climatic conditions in the world where the 2°C target of the Paris Agreement has been achieved. RCP2.6 is a scenario similar to the SSP1-2.6 of IPCC Sixth Assessment Report (AR6).

RCP 8.5 Scenario: This projection assumes a "4°C increase scenario" as the global average temperature at the end of the 21st century (2081-2100) is likely to increase by 3.2-5.4°C compared to pre-industrialization (*) . This corresponds to the state of the climate, which could be a world without additional mitigation measures. RCP8.5 is a scenario similar to SSP5-8.5 of IPCC AR6.

[Flood]
Inundation depth (hazard map): Maximum scale inundation depth and planned scale inundation depth assumed by hazard map (obtained from the inundation simulation and search system by site of the Ministry of Land, Infrastructure and Transport)
Rainfall standard value: Obtained from hazard maps of rivers that lead to inundation depth obtained from the inundation simulation and search system by location of the Ministry of Land, Infrastructure and Transport
Inundation depth (AQUEDUCT)

[Storm Surge]
Inundation depth (AQUEDUCT)

[Future Climate]
A proprietary downscaling method of a private weather company contracted by AGC Corporation that used the following:
d4pdf (Ensemble Climate Forecast Database Contributing to Global Warming Prevention) and a partial of Japan Region Model CMIP5 (Global Climate Research Program Phase V Joint Model Inter Comparison Project)
SI-CAT (Air Near-Future Projection Dynamic Downscaling Data)

Logic for calculating the amount of damage:
[Flood]
Cabinet Office Disaster Prevention Economy Consortium
Reference index tool for the impact of natural disasters on businesses (Flood damage version)
[Storm Surge]
Cabinet Office Disaster Prevention Economy Consortium
Reference index tool for the impact of natural disasters on businesses (Flood damage version)

Time horizon
Long-term

Likelihood
Very unlikely

Magnitude of impact
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)
0

Potential financial impact figure – maximum (currency)
395050540

Explanation of financial impact figure
The amount of damage caused by both floods and storm surges was calculated using the Cabinet Office Disaster Prevention Economic Consortium, a reference index tool for the impact of natural disasters on businesses (flood damage version), and AQUEDUCT.

[Flood]
Potential floods damage are determined by identifying the inundation depth (m) and rainfall (mm /h) from the hazard map's planned scale rainfall and the maximum expected rainfall published by the Ministry of Land, Infrastructure, Transport and Tourism. Then consider the current frequency of occurrence in 2030, 2040, 2050 in RCP8.5 and RCP2.6 and calculated based on AGC's assets and sales.
We also used AQUEDUCT to calculate the minimum, maximum, and average damage assumptions for 2030, 2050, and 2080 years, respectively, from property and sales, assuming a recurrence period of 100 years and 1000 years.

The summary of the calculated total damage estimation of 4 of the 6 bases is as follows. No risks were identified for both floods and storm surges at the other two locations.

The potential financial impact (maximum) was calculated by adding up the annual impact of each location.

Hazard Map Projected Scale of Rainfall:
Inundation depth (m):0～0.02
Rainfall (mm/24hrs):0～368
Frequency (RCP8 5) (times/year): 0 to 0.00904
Frequency (RCP2 6) (times/year): 0 to 0.00579
Annual impact (yen): 0 to 19,428,854

Hazard Map Estimated Largest-Scale Rainfall:
Inundation depth (m):0～0.63
Rainfall (mm/24hrs):0～632
Frequency (RCP8 5) (times/year): 0 to 0.00128
Frequency (RCP2 6) (times/year): 0 to 0.00049
Annual impact (yen): 0 to 11,823,262

AQUEDUCT:
Recurrence interval of 100 years
Annual impact (yen): 0 to 395,050,540

[Storm Surge]
Using AQUEDUCT, the estimated minimum, maximum, and average damage for 2030, 2050, and 2080 years, respectively, was calculated from property and sales, assuming a recurrence period of 100 years and 1000 years.

AQUEDUCT:
Recurrence interval of 100 years
Annual impact (yen): 0 to 2,738,180

Cost of response to risk
4000000

Description of response and explanation of cost calculation
[Situation]
AGC Corporation's bases are engaged in glass manufacturing and chemical manufacturing and are operating near coastal areas. Stakeholders are concerned that there

are acute physical risks such as floods and storm surges. Considering these circumstances, we determined that it was necessary to calculate the amount of damage caused by floods and storm surges, and to consider necessary measures. For both floods and storm surges, the amount of damage was calculated using the Cabinet Office Disaster Prevention Economy Consortium, a reference index tool for the impact of natural disasters on businesses (flood damage version), and AQUEDUCT.

[Task]
As a result of the calculation of the amount of damage, it was found that if flooding occurs in the rivers near each site, such as Tsurumi River, Yoro River, and Kako River, the maximum inundation depth is up to 60 cm. However, the probability of occurrence was found to be 0.00128 times / year at most in RCP8.5, which is extremely low. We also found that storm surges that leads to inundation and the impact on assets at the time of occurrence are both extremely low.

[Action]
Based on the results of the damage amount calculation, it was determined that the risk of flood inundation that should be prepared at this time is about 10 cm. In the event of a flood, sandbags are installed to protect assets.

[Result]
As of the end of 2021, a sufficient amount of sandbags have already been prepared at the bases where the risk of inundation was recognized, and the risk response cost was calculated to be 10,000,000-yen x 4 bases, which is the maintenance cost for them, at 4,000,000 yen.

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 resulting from increased demand for products and services

Company-specific description
HFC has been used as a refrigerant (gas) for cooling and warming the air, but there has been a problem that it has a very large impact on global warming. Therefore, it was internationally agreed to switch to "green refrigerants" (natural refrigerants such as HFOs and CO2) that reduce the use of HFCs step by step and significantly reduce the impact on global warming.

To address this new challenge, AGC succeeded in developing green refrigerants (structuring and proprietary manufacturing methods) by utilizing molecular design and organic synthesis technologies nurtured in the chemicals business. AGC is one of the world's leading companies with two of the seven green refrigerants currently sold worldwide (1234yf 1224yd) and is the only company in Japan that produces and sells green refrigerants. In addition to this position in the market, we promote our products through exhibitions and appeal to the market through lobbying through industry associations, which leads to an increase in sales.

Time horizon
Medium-term

Likelihood
More likely than not

Magnitude of impact
Medium

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

Potential financial impact figure (currency)
680000000000

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

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

Explanation of financial impact figure
We expect our Chemicals segment sales to increase approximately 8% in 2023 compared to 2021. Accordingly, we expect sales of our chemicals business, including our green refrigerant AMOLEA(R), to increase from 630.8 billion yen in 2021 to 680 billion yen in 2023. This includes the gas (including AMOLEA(R) and solvents business, the chlor-alkali business, the fluorochemicals business, the urethane business, and the life sciences business.

Cost to realize opportunity
9231000000

Strategy to realize opportunity and explanation of cost calculation

[Situation]
Strengthening controls on refrigerants as an impact on global warming is an opportunity for us to expand our business. This is due to our long-standing research and development of refrigerants (hydrochloric olefins (HFO) with low GWP). On the other hand, in order to expand the market for new refrigerants, it is also necessary to make the developed refrigerants a de facto standard in the market.

[Task]
In addition to being low GWP, new refrigerants are required to have other physical properties that are not inferior to conventional refrigerants. In order to become the de facto standard, we also need to work with industry associations and government agencies around the world to raise awareness.

[Action]
Utilizing the material design technology that we have accumulated over many years, we have developed AMOLEA(R) 1224yd for low-pressure refrigerants such as turbo-freezers, organic rankine cycles, heat pumps, and urethane-foamed refrigerants, which have a GWP of 1 or less.

AMOLEA(R) 1224yd has been exhibited and promoted at CHILLVENTTA, a global exhibition of refrigerant technologies held in Europe since 2016. We also participate in HVAC&R and promote it in the Japanese market.

Furthermore, we have joined EPEE, an organization related to air conditioners in the European Union, and EHPA, an organization related to heat pumps in the European Union, to lobby air conditioners and heat pumps. In Japan, we also have joined the Japan Refrigeration and Air Conditioning Industry Association and the Japan Society of Refrigeration and Air Conditioning Engineers for lobbying.

[Results]
AGC is one of the world's leading companies in two of the seven green refrigerants (HFOs, CO2 and other natural refrigerants) currently sold worldwide. AGC is the only Japanese manufacturer to produce and sell green refrigerants. In addition to this position in the market, the company continued to promote its products through exhibitions and lobbying through industry associations. As a result, in 2021, 1224yd was adopted in Japan and abroad, and increased by 800% (ton-based quantity) compared to 2020.

Cost calculation to realize the opportunity
Research and development expenses in the Chemicals Division were 9.231 billion yen, and we estimated this value as the opportunity realization cost, which includes the gas (including AMOLEA(R)) and solvents business, the chlor-alkali business, the fluorochemicals business, the urethane business, and the life sciences business.

Comment

Identifier
Opp2

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 resulting from increased demand for products and services

Company-specific description
The CO2 (carbon dioxide) problem, which is the cause of global warming, is becoming more and more serious year by year, and in response to this, the governments of each country are embarking on further fuel efficiency regulations for automobiles. Air conditioners are one of the causes of poor fuel economy. In particular, EV (electric vehicle) air conditioners consume a large amount of electricity, and therefore it is crucial to improve the heat shielding and heat insulation effect of automobile glass.

In order to respond to these issues, we have succeeded in developing technology to improve the heat insulation and heat insulation of windows by utilizing the glass material technology, organic and inorganic materials and glass coating technology cultivated in the glass business.

We were the first in the world to develop a coating technology with a function to absorb UV (ultraviolet) and infrared rays in tempered glass (single-pane glass), and to develop a door-reinforced glass UV Verre Premium Cool-on with heat shielding performance that could only be realized with laminated glass until now, followed by the development of a UV Verre Premium Privashield, which realizes high UV cut performance and heat shielding performance in all windows of automobiles.

In recent years, with the development of special low-E coat technology for automobiles, the panoramic sunroof, which is expected to be widely adopted in EVs, has achieved unprecedented heat shielding and heat insulation performance, which can greatly suppress the heat in summer and the cold in winter.

Time horizon
Medium-term

Likelihood
About as likely as not

Magnitude of impact
High

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

Potential financial impact figure (currency)
820000000000

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

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

Explanation of financial impact figure
We expect sales in the glass business to increase by approximately 12% in 2023 compared to 2021. Accordingly, we expect sales of glass operations, including 99% UV-

cut glass for the entire anniversary, to increase from 734.3 billion yen (2021) to 820 billion yen (2023), which consist of the sales of 99% all-around UV cut glass, anti-cloud glass, and light-controlled glass.

Cost to realize opportunity
8782000000

Strategy to realize opportunity and explanation of cost calculation
[Situation]
In recent years, gasoline-powered vehicles, which use fossil-fuel and emit CO2 when they are in operation and contribute to global warming, which results in the shift to EVs, but a new problem presents since air conditioning in EVs also consume a large amount of electricity.

[Task]
It is necessary to improve the heat-shielding and heat-insulating properties of automobile windowpanes and reduce the air-conditioning load. In addition, EVs use panoramic roof glass to capture light and create an open interior space. However, it is easily affected by solar heat and outside air, and to keep the inside of the car comfortable, it is necessary to use an air conditioner or a sunshade which leads to an increase in the weight of the car.

[Action]
Wind shield is the largest area of window glass in automobiles. We first started to improve the heat-shielding property of WS, and developed Cool Verre, which is a laminated glass using a highly heat-shielding interlayer film and two sheets of glass, but it left the problem of reducing the weight of glass that would lead to improved fuel efficiency in cars. To address this issue, we next worked to improve heat insulation by using reinforced glass, which is normally used as a door glass for automobiles.

As a result, we have succeeded in developing the world's first coating technology that imparts the function of absorbing ultraviolet rays and infrared rays to this tempered glass, and launched the UV Verre Premium Cool-on, a door-tempered glass with both UV-cut performance and heat-shielding performance that could only be achieved with laminated glass so far.

Subsequently, we developed UV Verre Premium Privashield and succeeded in providing high UV cut performance and heat shielding performance to all car windows by improving the absorption performance of ultraviolet rays and infrared rays compared to the conventional privacy glass.

Furthermore, we have developed a special Low-E coating technology for automotive applications, enabling us to achieve unprecedented head shielding and insulation performance.

[Result]
Since the start of sales of glass UV Premium Privashields demand for windows with heat shielding performance has increased, and since 2017, we have achieved growth of more than 10% per year on a volume basis.

Cost calculation to realize the opportunity
The R&D cost of the glass unit was 8,782 million yen, which includes the 99% all around UV cut glass, anti-fog glass, and dimming glass all around .

Comment

C3. Business Strategy

C3.1

(C3.1) Does your organization’s strategy include a transition plan that aligns with a 1.5°C world?

Row 1

Transition plan
Yes, we have a transition plan which aligns with a 1.5°C world

Publicly available transition plan
Yes

Mechanism by which feedback is collected from shareholders on your transition plan
We have a different feedback mechanism in place

Description of feedback mechanism
Since 2021, the AGC Group has held annual ESG briefings on sustainability management and specific initiatives for ESG once a year, with the aim of deepening understanding of the environmental, social, and governance aspects of the AGC Group's management and business activities and helping with dialogue from a medium-to long-term perspective for institutional investors and analysts. During the ESG briefing, we explained our 2050 Carbon-Net-Zero efforts and received feedback from participants

Frequency of feedback collection
Annually

Attach any relevant documents which detail your transition plan (optional)
2021_0910eesg.pdf
2021_0910esg.pdf

Explain why your organization does not have a transition plan that aligns with a 1.5°C world and any plans to develop one in the future
<Not Applicable>

Explain why climate-related risks and opportunities have not influenced your strategy
<Not Applicable>

C3.2

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

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios: IEA B2DS	Company-wide	<Not Applicable>	It is shown in the IEA's Energy Technology Perspective (ETP) report, which is a scenario in which the temperature rise can be suppressed to less than 1.75 ° C with a probability of at least 50% in 2100. [Parameter] Population: Population increased from 7.3 billion in 2014 to 8.5 billion in 2030 and 10.2 billion in 2060 Economy: Global average GDP growth of 2.9% between 2014-2060 CO2 emissions: Decreased to 8,975 Mt in 2060 (0.26 times compared to 2014, which is 34.254 Mt) [Assumptions] Low carbonization / decarbonization will be actively tackled in the world, which will affect OEM strategies and actions. Regulations on sectors with high carbon emissions will be tightened more and more. [Analytical choice] An intermediate scenario between a 1.5°C target and a target well below 2°C
Transition scenarios: IEA SDS	Company-wide	<Not Applicable>	This is a new scenario created based on the 450 scenarios (up to WEO2016) presented by the IEA in the WEO as a scenario for keeping temperature rises below 2°C in 2100 years compared to pre-Industrial Revolution. The 450 scenarios (as a basis of SDS), which assumes the acceptable threshold for greenhouse gas concentrations to keep temperature increases below 2°C is 450 ppm. [Parameter] Population: The world population will grow from 7.4 billion in 2016 to 9.1 billion in 2040 at an annual rate of 0.9% Economy: Assumes annual average global GDP growth of 3.4% through 2040 CO2 emissions: CO2 emissions in SDS decrease to 17,647 Mt in 2040 [Assumptions] Low carbonization / decarbonization will progress, affecting OEM strategies and actions. Tighter regulations on sectors with high carbon emissions. [Analytical choice] The momentum for achieving the objective well below 2°C is rising worldwide.
Transition scenarios: IEA STEPS (previously IEA NPS)	Company-wide	<Not Applicable>	This is called the NPS (New Policy Scenario) and is currently referred to as the "Central Scenario" in WEO. In addition to the current policy, consideration is also given to policies that have been announced to date. [Parameter] Population: The world population will grow from 7.4 billion in 2016 to 9.1 billion in 2040 at an annual rate of 0.9% Economy: Assumes annual average global GDP growth of 3.4% through 2040 CO2 emissions: CO2 emissions in NPS will rise to 35,881Mt in 2040 (1.1 times compared to 2016, which is 32.053Mt) [Analytical choice] For analysis based on conservative thinking based on trends in each country's governments
Transition scenarios: IEA CPS	Company-wide	<Not Applicable>	This is a scenario that shows what happens if countries around the world continue their current path without changing any of their current policies. [Parameter] Energy demand will increase by 1.3% annually until 2040. Assuming that energy-related CO2 emissions will continue to grow, albeit significantly below the 2.3% growth in 2018. [Assumptions] Low carbonization / decarbonization stagnates and extreme weather conditions disrupting supply chain Automotive sales increase and demand for automotive glass expands. [Analytical choice] In order to assume that the physical risks associated with climate change become increasingly severe
Physical climate scenarios: RCP 2.6	Company-wide	<Not Applicable>	One of Representative Concentration Pathway (RCP) scenarios presented in a report by the Intergovernmental Panel on Climate Change (IPCC), which limits the gap in radiative forcing between pre-industrial and end-21st century to no more than 2.6W/m2. This is a low-level stabilization scenario back-calculated to achieve a future temperature rise of 2°C or less. [Parameter] CO2 Emissions: Cumulative CO2 emissions from human sources need to be limited to about 1 000GtC, or about 1, 210GtC or less (Considering the impact of non-GHGs, about 790GtC, or about 820GtC or less). It is said that 515 GtC of CO2 has already been emitted by 2011. [Assumptions] Occurrence of floods and storm surges [Analytical choice] We chose to analyze the acute physical risk in detail.

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Physical climate scenarios: RCP 8.5	Company-wide	<Not Applicable>	This is one of Representative Concentration Pathway (RCP) scenarios presented in the report of the Intergovernmental Panel on Climate Change (IPCC). CO2 emissions are 5.19 to 7.00 (trillion tons CO2) over the period from 2012 to 2100, with the aim of keeping the gap of radiative forcing between the pre-industrial revolution and the end of the 21st century to no more than 8.5W/m2. [Parameter] The average global temperature at the end of the 21st century (2081-2100) increased by 3.2°C to 5.4°C compared to before industrialization. [Assumptions] Occurrence of floods and storm surges [Analytical choice] We chose to analyze the acute physical risk in detail.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

The current focal question is on the impact of carbon pricing in countries where high-GHG emissions sites are located. Reducing scope 1 and scope 2 GHG emissions subject to carbon pricing is a way of minimizing the impact of carbon pricing and is a key point of our efforts.

To achieve this, the technical department is taking the lead in cold repair of glass melting furnaces and fuel conversion projects to reduce Scope 1, and the Material Logistics Department is considering the implementation of renewable energy with certificates and the procurement of carbon credits to reduce Scope 2.

For sites with high physical risks, we are taking various inundation measures in preparation for disasters in the event of abnormal weather from the perspective of BCP.

Results of the climate-related scenario analysis with respect to the focal questions

Given that the AGC Group is expanding its business globally, we use the International Energy Agency (IEA) 2°C Scenario (B2DS), IEA Sustainable Development Scenario, IEA NPS (New Policies Scenario), IEA CPS (Current Policies Scenario), and contributions determined at the national level (NDCs) are used as scenario analysis.

Opportunities and risk levels were also identified based on a multi-dimensional matrix of assessed likelihood and quantitative and qualitative impacts in the categories of procurement, markets, customers, governments, investors and social to extract events with a high expected impact if they actually occur.

In the 2°C scenario, among our group companies, we found that cost increases associated with the implementation of policies related to the transition of carbon pricing and other measures in Japan, Indonesia, and the EU, both of which have relatively high GHG emissions with glass manufacturing processes and salt electrolysis processes, as well as carbon taxes and emissions trading schemes. In the 4°C scenario, we found that identifying and countermeasures for possible impacts on manufacturing sites and suppliers in the event of intensified physical impacts, such as flooding, storm surges, and sea level increases due to climate change, is an issue for the AGC Group .

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	We believe that the accelerating trend toward carbon decarbonization and low carbon globally will increase demand for products that help mitigate and adapt to climate change. For example, increasing demand for more resilient buildings and automobiles may require us to improve the durability of glass. Based on this recognition, over the medium term, we are working to expand the development and sales of products such as eco-glass, CFC substitutes with low global warming potential, and ion exchange membranes for salt electrolysis. Over the long term, we are also shifting our business portfolio from existing businesses with high GHG emissions to strategic businesses with low GHG emissions and high market growth potential (e.g., life sciences and electronics). In 2021, we completed the transfer of our North American Architectural Glass business, which generates a large amount of GHG emissions. We are steadily transforming our business portfolio into an optimal one. In the life science business, which is positioned as a strategic business, in 2021 we decided to strengthen the manufacturing capacity of synthetic pharmaceutical and agrochemical CDMO at our Japanese base and acquired a genetic therapeutics plant in the United States. In addition, operating income from strategic businesses has steadily increased, from 44.4 billion yen in 2020 to 53.8 billion yen in 2021.
Supply chain and/or value chain	Yes	By identifying the significant impact on raw material procurement and product logistics brought about by climate change in the AGC Group's value chain, we are aware of the importance of raising awareness of sustainability issues through the supply chain and working to improve responses. In January 2020, we revised our Basic Purchasing Policy, requiring the efforts of suppliers involved in the environment and society, including the prevention of global warming. In the future, we will conduct surveys of suppliers based on this policy to ascertain the current status of our initiatives. In addition, by collaborating with suppliers, we are promoting measures that are more effective with less environmental impact, such as improving transportation lots and modal shift of transportation methods.
Investment in R&D	Yes	In product development, we are proceeding with the development of new refrigerants for air conditioners, which will significantly reduce the impact on global warming, as well as further strengthening our research activities on highly energy-efficient car dimmer glass and other products. To reduce GHG emissions in our business activities, we are also developing technologies related to environmentally friendly glass melting processes. In 2021, we were commissioned in the development project, "Development of Combustion Technologies for Fuel Ammonia in Industrial Furnaces," by Energy and Industrial Technology Development Organization (NEDO)
Operations	Yes	Climate change issues have a major impact on our efforts to reduce GHG emissions at each of our production sites. Our strategy is to set a milestone of reducing GHG emissions by 30% (Scope 1 and 2) in 2030 compared to 2019. At each production site, we are promoting the conversion to lower-carbon fuels and energy, the implementation of the latest high-efficiency equipment, and the rationalization of production processes. Examples include upgrading efficiency by maintaining and upgrading electrolysis plant facilities at domestic and overseas chemical factories, switching to LNG for combustion fuel at domestic and overseas glass factories, and expanding the use of surplus renewable energy at electrolytic plants in Japan's chemical factories (Chiba). As a result of these efforts, we will reduce GHG emissions of our group in the 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	Direct costs Indirect costs Capital expenditures Capital allocation Acquisitions and divestments Access to capital Assets Liabilities	[Capital Expenditure/Capital Allocation Case Study] In the medium term, we believe that it is inevitable that energy prices will rise due to the conversion of coal and heavy oil to low-carbon fuels such as LNG and the conversion of renewable energy. In addition, the IEA-scenario estimates carbon prices in developed economies at 100 USD per t-CO2 in 2030 and 140 USD per t-CO2 in 2040. In addition, carbon price-related measures are being introduced in China, South Korea, and other countries around the world. The Group emits approximately 11.6 million tons (Scope 1 + Scope 2) of GHG annually (2021 results). In the long term, if a burden of 10,000 yen / t-CO2 is required, the group will incur an annual burden of approximately 116 billion yen. Therefore, as a milestone in 2030, we set a goal of reducing GHG emissions by 30% compared to 2019 and working on to reduce it. Developing our capital expenditure plans in achieving this goal requires increased capital expenditures, and climate change has a significant impact on our capital expenditure/allocation plans. Over the long term, we are shifting our business portfolio from existing businesses with high GHG emissions to strategic businesses with low GHG emissions and high market growth potential (e.g., life sciences and electronics-related businesses). The investment ratio in strategic businesses under the Medium-Term Management Plan (2021-2023) is 33% (total investment limit of 600 billion), which is an increase compared to 25% (total investment limit of 666 billion) during the previous Medium-Term Management Plan (2018-2020). Furthermore, in the future, it will be essential to develop new manufacturing methods in order to reduce GHG emissions while maintaining growth over the medium to long term. Accordingly, over the medium to long term, we plan to prioritize the allocation of management resources toward the development of new manufacturing methods. [Acquisitions and/or Divestment] There is a possibility that the period of the current medium-term management plan (2021 to 2023) will be affected. At this time, we have not made acquisitions or divestments to reduce our GHG emissions; however, we may consider acquisitions aimed at acquiring technologies that can reduce our GHG emissions and divestments from exiting low carbon productivity operations in the future in order to reduce our GHG (Scope 1 and Scope 2) by 30% by 2030 and to achieve carbon net zero by 2050. [Access to capital] There is a possibility that the period of the current medium-term management plan (2021 to 2023) will be affected. In the medium term, there is a possibility that profits will decrease due to the strengthening of carbon pricing-related measures by governments in each country, and that equity capital will decrease due to an increase in R&D expenses. As a result, the capital adequacy ratio may decline, our financial rating may decline, and ultimately our funding capacity may be affected. [Property] The period of the current medium-term management plan (2021 to 2023) may be affected. Over the medium term, we may experience negative assessments from external stakeholders of low carbon productivity products and manufacturing facilities within our business portfolio, resulting in losses. [Liabilities] The period of the current medium-term management plan (2021 to 2023) may be affected. Over the medium term, our debt ratio could increase because of a decrease in our equity capital as a result of lower earnings from enhanced carbon pricing-related measures by governments and higher research and development costs.

C3.5

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's transition to a 1.5°C world?
No, but we plan to in the next two years

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?
Absolute target
Intensity 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
2021

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Market-based

Scope 3 category(ies)
<Not Applicable>

Base year
2019

Base year Scope 1 emissions covered by target (metric tons CO2e)
6164579

Base year Scope 2 emissions covered by target (metric tons CO2e)
5271336

Base year Scope 3 emissions covered by target (metric tons CO2e)
<Not Applicable>

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
11435915

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
100

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
<Not Applicable>

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2030

Targeted reduction from base year (%)
30

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
8005140.5

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
6986198

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
4621187

Scope 3 emissions in reporting year covered by target (metric tons CO2e)

<Not Applicable>

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
11607385

% of target achieved relative to base year [auto-calculated]
-4.99799680800939

Target status in reporting year
Underway

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition
Well-below 2°C aligned

Please explain target coverage and identify any exclusions
We are promoting initiatives to reduce emissions as a common GHG emission reduction target for the entire AGC Group.
The environmental performance data scope does not cover small-scale sites that are evaluated as having a remarkably low impact based on environmental impact assessments as stipulated in the common group practice, "AGC Group Regulations for Environmental Activities." Nevertheless, these small-scale sites' overall impact is less than 1%.

Plan for achieving target, and progress made to the end of the reporting year
We are reducing energy consumption through further energy-saving measures and switching from fossil-derived energy to non-fossil-derived energy.
For the glass melting process, which is already carbon emission efficiency, we are working on to introduce oxygen combustion method with even higher energy efficiency, introduce electric booster for melting that reduces fuel consumption, accelerate the electrification of the melting heat source, and verify test the ammonia combustion.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

Target reference number
Abs 2

Year target was set
2022

Target coverage
Company-wide

Scope(s)
Scope 3

Scope 2 accounting method
<Not Applicable>

Scope 3 category(ies)
Category 1: Purchased goods and services
Category 10: Processing of sold products
Category 11: Use of sold products
Category 12: End-of-life treatment of sold products

Base year
2019

Base year Scope 1 emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 2 emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3 emissions covered by target (metric tons CO2e)
9593262

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
9593262

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
<Not Applicable>

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
<Not Applicable>

Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
72.8

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
100

Target year
2030

Targeted reduction from base year (%)
30

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
6715283.4

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3 emissions in reporting year covered by target (metric tons CO2e)
7064625

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
7064625

% of target achieved relative to base year [auto-calculated]
87.861563668333

Target status in reporting year
New

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition
Well-below 2°C aligned

Please explain target coverage and identify any exclusions
Of all 15 categories of the Scope 3 GHG emissions, Category 1, Category 10, Category 11, and Category 12 are targeted for reduction. The GHG emissions of these four categories, which are the targets of reduction targets, are the same as the total value of the AGC groups in each category, and no exclusion items have been set.

Plan for achieving target, and progress made to the end of the reporting year
We are working on to achieve the Scope 3 target by focusing on the promotion of the next-generation refrigerant / solvent AMOLEA(R) series, which has an extremely low global warming potential, and by strengthening supplier engagement activities.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number
Int 1

Year target was set
2021

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2

Scope 2 accounting method
Market-based

Scope 3 category(ies)
<Not Applicable>

Intensity metric
Metric tons CO2e per unit revenue

Base year
2019

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)
0.406

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)
0.347

Intensity figure in base year for Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)
0.753

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure
100

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure
100

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this Scope 3 intensity figure
<Not Applicable>

% of total base year emissions in all selected Scopes covered by this intensity figure
100

Target year
2030

Targeted reduction from base year (%)
50

Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]
0.3765

% change anticipated in absolute Scope 1+2 emissions
-30

% change anticipated in absolute Scope 3 emissions
0

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)
0.41

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)
0.27

Intensity figure in reporting year for Scope 3 (metric tons CO2e per unit of activity)
<Not Applicable>

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)
0.68

% of target achieved relative to base year [auto-calculated]
19.3891102257636

Target status in reporting year
Underway

Is this a science-based target?
Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition
Well-below 2°C aligned

Please explain target coverage and identify any exclusions
Our Scope 1 and Scope 2 GHG emissions, which are subject to reduction targets, are the same as the total value of each AGC group, and no exclusion items have been set.

Plan for achieving target, and progress made to the end of the reporting year
We will expand strategic businesses with high carbon efficiency and asset efficiency while working to improve carbon efficiency and asset efficiency in our core businesses.

To reduce the amount of CO2 emitted during the glass manufacturing process, we have been steadily switching the fuels for glass furnaces from heavy oil to natural gas.

In addition to these initiatives, as a leading company in the industry, we are developing and introducing world-class level energy-saving glass manufacturing technologies. In addition, we are promoting the implementation of cutting-edge production technologies, such as carbon-free ammonia combustion.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?
Net-zero target(s)
Other climate-related target(s)

C4.2b

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number
Oth 1

Year target was set
2021

Target coverage
Company-wide

Target type: absolute or intensity
Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Engagement with suppliers	Percentage of suppliers (by emissions) with a science-based target

Target denominator (intensity targets only)
<Not Applicable>

Base year
2019

Figure or percentage in base year
0

Target year
2030

Figure or percentage in target year
50

Figure or percentage in reporting year
0

% of target achieved relative to base year [auto-calculated]
0

Target status in reporting year
Underway

Is this target part of an emissions target?
This goal is a supplier engagement goal and is therefore not part of the emissions reduction goal.

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

Please explain target coverage and identify any exclusions
Our goal is to encourage our raw materials and energy suppliers that account for 50% of our Scope 3 Category 1 and 3 emissions to set GHG reduction targets in line with SBT standards. 100% of Category 1 and 3 emissions are set as the denominator of the reduction target, and there are no items excluded.

Plan for achieving target, and progress made to the end of the reporting year
We participate in the CDP Supply Chain Program and communicate with our suppliers through annual questionnaires and request responses, which encourages the suppliers to set a science-based target.

List the actions which contributed most to achieving this target
<Not Applicable>

C4.2c

(C4.2c) Provide details of your net-zero target(s).

Target reference number
NZ1

Target coverage
Company-wide

Absolute/intensity emission target(s) linked to this net-zero target
Abs1
Int1

Target year for achieving net zero
2050

Is this a science-based target?
No, but we anticipate setting one in the next 2 years

Please explain target coverage and identify any exclusions
We are aiming to achieve carbon net zero by 2050, with our Scope 1 and 2 emissions. For both Scope 1 and 2 emissions, we have not set any emission sources that are excluded from this target, and we are targeting to decrease emissions of the entire group.

Do you intend to neutralize any unabated emissions with permanent carbon removals at the target year?
Unsure

Planned milestones and/or near-term investments for neutralization at target year
<Not Applicable>

Planned actions to mitigate emissions beyond your value chain (optional)
As the need for environmentally friendly products is expected to grow more than ever, AGC is developing several environmentally friendly products, including vacuum-insulated glass, solar cells with integrated building materials, and next-generation refrigerants and solvents, AMOLEA(R). We intend to further expand these products in the future. For example, insulation glass for construction is estimated to reduce emissions ten times the amount of CO2 emissions during production. Demand for electrolyzed polymers for fuel cells is also accelerating due to the widespread use of fuel cell vehicles to realize a hydrogen society. AGC has secured an overwhelming No.1 position by achieving both high power generation performance and high durability, and we will continue to contribute to the spread of fuel-cell vehicles.

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*	0	0
Implementation commenced*	0	0
Implemented*	3	37000
Not to be implemented	0	0

C4.3b

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

Initiative category & Initiative type

Energy efficiency in production processes	Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)
15000

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
1000000000

Investment required (unit currency – as specified in C0.4)
7000000000

Payback period
4-10 years

Estimated lifetime of the initiative
21-30 years

Comment
Conversion of electrolytic cells at Kashima Plant, a factory for chemicals business

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Initiative category & Initiative type

Energy efficiency in production processes	Fuel switch

Estimated annual CO2e savings (metric tonnes CO2e)
2000

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
3000000

Investment required (unit currency – as specified in C0.4)
50000000

Payback period
1-3 years

Estimated lifetime of the initiative
21-30 years

Comment
LNG consumption was reduced by increasing the amount of hydrogen combustion.

Initiative category & Initiative type

Energy efficiency in production processes	Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)
20000

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1
Scope 2 (location-based)

Voluntary/Mandatory
Voluntary

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

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

Payback period
Please select

Estimated lifetime of the initiative
16-20 years

Comment
By performing full maintenance of the glass melting furnaces on a regular basis, we reduced GHG emissions from burning fossil fuels in the glass melting furnaces.

C4.3c

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

Method	Comment
Compliance with regulatory requirements/standards	Regarding regulations and standards related to climate change, our basic policy is to comply with all applicable climate change responses and other environmental laws and regulations at each site. In addition, we have established an environmental management system to identify laws and regulations applicable to each site and assess their compliance. In the event of nonconformity, management reports it and promptly takes corrective action.
Dedicated budget for energy efficiency	The Act on the Rational Use of Energy (commonly known the Energy Conservation Act) applies to many manufacturing sites in Japan, which requires that the energy consumption per unit of production be reduced by at least 1% every year. To meet this requirement, we formulate measures for energy conservation every year. In addition, under the Energy Conservation Law, subsidies are applied according to the reduction results. In the architectural glass business and chemicals business segment, we are implementing energy conservation throughout the business divisions in order to actively utilize this system. In 2021, we established a research system on capital investment and subsidies that match it. In addition to the initiatives in business sectors, we established and launched "AGC Group GHG Emissions Reduction System" in 2022 as a cross-departmental GHG reduction system, a mechanism to share subsidy information throughout the group and we are currently designing the system so that it can be deployed globally. In addition, the Sustainability Promotion Department has assigned a person in charge for the Ministry of Economy, Trade and Industry, which is the main body controlling the subsidy system. We have also decided to assign a person in charge of GHG emissions surveys in AGC China, the regional headquarters, and we have begun to establish a system for conducting surveys on subsidies in China region.
Internal price on carbon	In our group's glass operations in Europe, we introduced internal carbon pricing (ICP) in 2005 and have evaluated profitability based on future carbon costs for large-scale capital investment projects and made investment decisions. In order to incorporate carbon costs into investment decisions for carbon pricing, which is expected to be introduced in each country in the future, we designed an ICP system to be introduced throughout the AGC Group in 2021. As a result, we have established two types of ICPs: The first is ICP for business investment, such as plant construction, M&A, and capital investment for reducing GHGs. The price we set is 6,500 (yen / t-CO2). In addition, ICP for investment in technology development to reduce GHG is set higher than the above price because it is a relative long-term approach. During the ICP system design phase of 2021, we applied ICP in a number of investment projects on a trial basis. In our manufacturing equipment investment projects in China, we applied ICP primarily for stress testing purposes and determined that we would be able to ensure profitability over the long term. In the renewable energy self-generation capital investment project in Taiwan, after considering the ICP, the NPV turned positive, and the decision was made to execute the investment after considering other factors.
Partnering with governments on technology development	In December 2021, we were selected to carry out the " Fuel ammonia utilization and production technology development / Development of Fuel Ammonia Combustion Technologies in Industrial Furnaces" project by Industrial Technology Development Organization (NEDO). In the future, we will promote technological development in collaboration with other companies and universities with the aim of contributing to carbon decarbonization in the industrial field. After establishing the technology, we plan to consider introducing this technology as a technology that contributes to energy conservation, taking into account our own ICPs.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation

Group of products or services

Taxonomy used to classify product(s) or service(s) as low-carbon

Climate Bonds Taxonomy

Type of product(s) or service(s)

Buildings construction and renovation	Building orientation: Thermal performance

Description of product(s) or service(s)

We manufacture and sell insulation glass for windows (Low-E glazing) made from glass with special coatings that reflect near-infrared rays while transmitting visible light. It can improve the heat insulation of windows for houses and buildings, reduce the use of heating and cooling, and reduce CO2 emissions. Since visible light can still be transmitted through, it is a well-balanced glass for windows.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)

Yes

Methodology used to calculate avoided emissions

Other, please specify (ISO 10292:1994, and JIS R 3107:2019)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)

Use stage

Functional unit used

Glazing Annual thermal energy balance per m2

Reference product/service or baseline scenario used

Single glazing for windows, using glass without special coatings

Life cycle stage(s) covered for the reference product/service or baseline scenario

Use stage

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario

0.091

Explain your calculation of avoided emissions, including any assumptions
The thermal energy balance was obtained by calculating the amount of heat energy lost through the window (Heat Loss) and the amount of heat energy gained by sunlight (Solar Gain) from the thermal transmittance (U-value), which is an index of thermal insulation performance of glass, and the solar heat gain, which is an index related to optical properties of glass.
Single glazing with a standard U-value of 5.8 W/m2K was calculated to have a negative heat energy balance, requiring the addition of heat energy equivalent to 84 kg-CO2 emissions per square meter of glass per year. On the other hand, Low-E double glazing with a U-value of 1.0 W/m2K was calculated to have a positive thermal energy balance and to save thermal energy equivalent to 91 kg-CO2 emissions per m2 of glass per year compared to the reference glass.

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
20

Level of aggregation
Group of products or services

Taxonomy used to classify product(s) or service(s) as low-carbon
Low-Carbon Investment (LCI) Registry Taxonomy

Type of product(s) or service(s)

Other	Other, please specify (Environmentally friendly next-generation low-GWP refrigerant)

Description of product(s) or service(s)
AMOLEA® refrigerant series are environmentally friendly next-generation low-GWP refrigerants. It is a hydrofluoro-olefin (HFO) refrigerant with an ozone depletion potential (ODP) of zero or virtually zero and a global warming potential (GWP) of less than one, which means it has a very low impact on the global environment. AMOLEA®1224yd is a safe (non-flammable, low toxicity) refrigerant that has been approved by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Guidelines for Assessing the Contribution of Products to Avoided Greenhouse Gas Emissions (ILCA)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
End-of-life stage

Functional unit used
GHG emissions per ton of refrigerant at disposal

Reference product/service or baseline scenario used
HFC refrigerant R-245fa

Life cycle stage(s) covered for the reference product/service or baseline scenario
End-of-life stage

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
590.5

Explain your calculation of avoided emissions, including any assumptions
Refrigerant is used in refrigeration and air-conditioning equipment, and leaks occur when the equipment is filled with refrigerant and when the equipment is used. The amount of refrigerant remaining at the time of equipment disposal was obtained by subtracting the amount of refrigerant leaked. The amount of refrigerant recovered at the time of equipment disposal was subtracted from the amount of refrigerant remaining to be disposed of. The GHG emissions at the time of each refrigerant disposal were calculated by multiplying each GWP value by the amount of refrigerant disposed of, and the difference between the two was used to calculate the amount of reduction contribution.
The leakage rates of R-245fa and AMOLEA®1224yd were used for the refrigerants used in commercial refrigeration and air-conditioning equipment. The refrigerant recovery rate published by the Ministry of Economy, Trade and Industry*3 was used to calculate the amount of recovered refrigerant.
*1 List of Calculation Methods and Emission Factors for Greenhouse Gas Emissions Calculation, Reporting, and Publication System (Ministry of the Environment 2020.)
*2Review of Emission Factors for Refrigeration and Air-Conditioning Equipment in Use (Ministry of Economy, Trade and Industry, March 2009)
*3 Recovery rate of CFCs at the time of disposal of commercial refrigeration and air-conditioning equipment (Ministry of Economy, Trade and Industry 2020. 12.)

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
5

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?
No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?
No

Name of organization(s) acquired, divested from, or merged with
<Not Applicable>

Details of structural change(s), including completion dates
<Not Applicable>

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	Yes, a change in methodology	In 2021, the GHG coefficient set used in the calculation of Scope 3 GHG emissions was changed from CFP to IDEA. Accordingly, Scope 3 GHG emissions in 2019 and 2020 were retroactively calculated.

C5.1c

(C5.1c) Have your organization's base year emissions been recalculated as result of the changes or errors reported in C5.1a and C5.1b?

	Base year recalculation	Base year emissions recalculation policy, including significance threshold
Row 1	Yes	As specified in the GHG Protocol, we have a base year emissions recalculation policy to retroactively recalculate emissions when certain conditions necessitate such recalculation. As for the criteria for recalculation, we define significance threshold as a cumulative change of 5% or more in base year total emissions (tCO2e), as defined by the SBTi.

C5.2

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

Scope 1

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
6164579

Comment
Scope 1 emissions are calculated in accordance with the GHG Protocol.

Scope 2 (location-based)

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
5365839

Comment
Location-based Scope 2 emissions calculations are consistent with the GHG Protocol. Emission factors are based on IEA published values for each country and region.

Scope 2 (market-based)

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
5271336

Comment
Market-based Scope 2 emissions calculations are based on the GHG Protocol. If a specific emission factor is provided by each energy supplier, that factor is used. If an energy supplier does not provide a specific emission factor, the calculation is based on published values from IPCC, IEA, etc.

Scope 3 category 1: Purchased goods and services

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
2941524

Comment
Scope 3 Category 1 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 2: Capital goods

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
389455

Comment
Scope 3 Category 2 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
1776397

Comment
Scope 3 Category 3 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 4: Upstream transportation and distribution

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
1197336

Comment
Scope 3 Category 4 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 5: Waste generated in operations

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
11859

Comment
Scope 3 Category 5 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 6: Business travel

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
18769

Comment
Scope 3 Category 6 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 7: Employee commuting

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
21406

Comment
Scope 3 Category 7 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 8: Upstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 9: Downstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 10: Processing of sold products

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
281954

Comment
Scope 3 Category 10 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 11: Use of sold products

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
2398421

Comment
Scope 3 Category 11 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 12: End of life treatment of sold products

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
3971363

Comment
Scope 3 Category 12 calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 13: Downstream leased assets

Base year start
January 1 2019

Base year end
December 31 2019

Base year emissions (metric tons CO2e)
167009

Comment
Scope 3 Category 1 3calculations follow the calculation method specified by the GHG Protocol.

Scope 3 category 14: Franchises

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 15: Investments

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

Act on the Rational Use of Energy
China Corporate Energy Conservation and GHG Management Programme
IEA CO2 Emissions from Fuel Combustion
IPCC Guidelines for National Greenhouse Gas Inventories, 2006
ISO 14064-1
Japan Ministry of the Environment, Law Concerning the Promotion of the Measures to Cope with Global Warming, Superceded by Revision of the Act on Promotion of Global Warming Countermeasures (2005 Amendment)
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)
6986198

Start date
<Not Applicable>

End date
<Not Applicable>

Comment

C6.2

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

Row 1

Scope 2, location-based
We are reporting a Scope 2, location-based figure

Scope 2, market-based
We are reporting a Scope 2, market-based figure

Comment

C6.3

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

Reporting year

Scope 2, location-based
4696203

Scope 2, market-based (if applicable)
4621187

Start date
<Not Applicable>

End date
<Not Applicable>

Comment

C6.4

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

C6.4a

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

Source
"AGC Group Environmental Management Working Rules", a set of common rules for the Group, defines whether or not environmental performance data, including GHG emission sources, must be reported. The internal criteria include a three-level evaluation of the nature of the site's activities, the number of employees, and the presence or absence of environmental impacts, and are based on the following three criteria: the site does not perform even light work such as assembly or processing and is used as a simple office; the number of employees is less than 50; and the environmental impact assessment results identify no environmental impacts. Small-scale facilities that meet all three of these conditions are excluded from the scope of calculation as a source of Scope 1 and 2 emissions, and are not required to report environmental performance data. Other sites are required to report environmental performance data, and all energy consumption is calculated as Scope 1 and 2.

Relevance of Scope 1 emissions from this source
Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source
Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)
Emissions are not relevant

Explain why this source is excluded
We estimate that the total GHG emissions of small establishments that do not report environmental performance data according to the definition above are less than 1% of the total (less than 11,600 t-CO2, 2021), an impact that is outside the threshold of significance answered in C5.1c.

Estimated percentage of total Scope 1+2 emissions this excluded source represents
1

Explain how you estimated the percentage of emissions this excluded source represents
Scope 1 and 2 were calculated using as a model those business sites that are the same size as relatively large business sites among small-scale business sites that are required to report environmental performance data on a voluntary basis, and that voluntarily report environmental performance data. Since the number of small-scale business sites that are required to voluntarily report environmental performance data is less than 232 (11,600t-CO2 / 50t-CO2), the total GHG emissions of these small-scale business sites are considered to be less than 1% of the total.

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

Emissions in reporting year (metric tons CO2e)
3406412

Emissions calculation methodology
Average data method
Spend-based method

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

Please explain
Calculation method
The emission factors are based on the Inventory Database for LCA named IDEA, published by Sustainable Management Promotion Organization called SuMPO, Japan.
- Upstream emissions from purchased products (main raw materials):
Σ((weight of each product procured from outside the Group companies) x (unit emissions per product in physical quantity))
- Upstream emissions from purchased products and services (indirect procurement):
∑ ((Procurement amount by account from outside the Group companies) x (unit requirement by product, based on value))

Exclusions:.
The small-scale business offices described in C6.4 do not fall under direct procurement in Category 1 because they exist for administrative functions such as sales offices and offices. However, since the amount of activity related to indirect procurement in Category 1 is quoted from our Financial Reports, the relevant category emissions related to small-scale business offices are also included in the scope of calculation.

Capital goods

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
684617

Emissions calculation methodology
Average data method
Spend-based method

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

Please explain
Calculation Methodology:
The emission factors are based on the Japanese Ministry of Environment database.
Σ((capital investment) x (capital formation sectoral intensity))

Exclusions:
Since the amount of capital investment disclosed in our Financial Reports is calculated as the amount of activity in Category 2, the emissions in this category related to small-scale establishments are also included in the scope of calculation.

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

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
2265872

Emissions calculation methodology
Average data method
Fuel-based method

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

Please explain
Calculation method
The emission factors are based on the Inventory Database for LCA named IDEA published by Sustainable Management Promotion Organization (SuMPO), Japan.
Σ ((Fuel, electricity, and steam consumption) x (emissions intensity by type))

Exclusions:.
As explained in C6.4, energy consumption at small-scale business sites is less than 1% of the total group volume, which is less than the materiality threshold of 5%, and is therefore excluded from the calculation for Category 3.

Upstream transportation and distribution

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
1293478

Emissions calculation methodology
Average data method
Distance-based method

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

Please explain
Calculation method
The emission factors are based on the Inventory Database for LCA named IDEA published by Sustainable Management Promotion Organization (SuMPO), Japan.
Specific shipper's portion: Ton-kilometer value under the Act on the Rational Use of Energy x (emission factor by means of transportation)
Procurement and transportation: Σ{(procurement weight) × (transportation distance) × (intensity by means of delivery)}
Overseas export: Σ {(transported weight) x {(transported distance) x (specific consumption per means of transport)} (Ocean containers, product Air, domestic transport by overseas sites)

Exclusions:.
Since the small business offices described in C6.4 exist for administrative functions such as sales offices and offices, and do not directly transport shipments, they are determined to be excluded from the calculation of Category 4.

Waste generated in operations

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
13722

Emissions calculation methodology
Average data method
Waste-type-specific method

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

Please explain
Calculation Methodology
The emission factors are based on the Inventory Database for LCA named IDEA published by Sustainable Management Promotion Organization (SuMPO) and the DB of the Ministry of the Environment in Japan.
Σ {(Volume of waste by type and treatment method) x (Unit emissions by type and treatment method)}

Exclusions:.
The amount of waste generated at small sites, as described in C6.4, is less than 1% of the total group volume, which is less than 5% of the materiality threshold, and is therefore considered to be excluded from the calculation for Category 5.

Business travel

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
17819

Emissions calculation methodology
Average data method
Spend-based method

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

Please explain
Calculation Methodology:
The emission factors refer to the Ministry of Environment DB in Japan.
Σ{(transportation cost by means of transportation x (emission intensity by means of transportation)}

Exclusions: Category 6
Since Category 6 calculates travel expenses of all employees as an activity, emissions in this category related to small-scale business offices are also included in the calculation target, and there are no exclusions.

Employee commuting

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
20163

Emissions calculation methodology
Average data method
Spend-based method

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

Please explain
Calculation Methodology:
The emission factors refer to the DB of the Ministry of the Environment in Japan.
Σ{(commuting cost by means of transportation) x (emission intensity by means of transportation)}

Exclusions: Category 7 is calculated as the commuting cost for all employees.
Since Category 7 calculates the commuting cost of all employees as an activity, the emissions in this category related to small-scale establishments are also included in the calculation target, and there are no exclusions.

Upstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons 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
Since we own the leased assets but have control over their operation, we are responsible for our own emissions from the leased assets and all are included in Scope 1 and 2. Therefore, we have determined that this category is not relevant.

Downstream transportation and distribution

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons 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
Since we produce intermediate products such as parts and materials, our logistics mainly transportation by other companies from our company to the processing plants of our sales destinations are subject to calculation under Category 9. However, we have determined that this category is not relevant because all shipments from our company are included in the scope of calculation for Category 4 under the GHG Protocol, since we are the specified shipper and have control over them.

Processing of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
261426

Emissions calculation methodology
Average data method
Average product method

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

Please explain
Calculation Method:.
For products that directly emit GHGs when used by purchasers, emissions are calculated by multiplying the emission intensity of each product based on assumed usage conditions.
Emission intensity is based on the Inventory Database for LCA named IDEA published by Sustainable Management Promotion Organization (SuMPO), Japan.
- (Fluorinated gas sales weight) x GWP x (leakage coefficient during equipment use or inspection)
- (Weight of fluorinated solvents sold) x GWP
- (Weight of sodium bicarbonate sold) x (Weight of CO2 produced by pyrolysis (per unit weight of sodium bicarbonate; from reaction equation))"

Exclusions:.
The category in question uses the volume of product sales as the activity volume, which is not relevant to the activity volume of small-scale sites.

Use of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
1680847

Emissions calculation methodology
Average data method
Average product method

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

Please explain
Calculation Method:.
For products that directly emit GHGs when used by purchasers, emissions are calculated by multiplying the emission intensity of each product based on assumed usage conditions.
Emission intensity is based on the Inventory Database for LCA named IDEA published by Sustainable Management Promotion Organization (SuMPO), Japan.
- (Fluorinated gas sales weight) x GWP x (leakage coefficient during equipment use or inspection)
- (Weight of fluorinated solvents sold) x GWP
- (Weight of sodium bicarbonate sold) x (Weight of CO2 produced by pyrolysis (per unit weight of sodium bicarbonate; from reaction equation))"

Excluded items:.
The category in question uses the volume of product sales as the activity volume, which is not relevant to the activity volume of small-scale sites.

End of life treatment of sold products

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
1715940

Emissions calculation methodology
Average data method
Average product method

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

Please explain
Calculation method: The amount of waste generated in the manufacturing process is subtracted from the amount of input resources.
The amount of waste generated in the manufacturing process is subtracted from the amount of input resources, and this amount is multiplied by the emissions intensity of each waste treatment method to calculate the amount of emissions.
The emissions intensity is based on the Inventory Database for LCA named IDEA published by Sustainable Management Promotion Organization (SuMPO), Japan.
- Σ{(weight of products shipped) x (emissions intensity by waste type)}
- (Weight of fluorinated gases sold - Leakage amount when equipment is sealed and used) x (100% - Domestic refrigerant recovery rate) x GWP
- SF6 sales weight x GWP x leakage rate at disposal

Exclusions:.
The category considers the amount of product sales as the amount of activity and has no relevance to the amount of activity of small-scale business sites.

Downstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons 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
We do not hold any assets that qualify as downstream leases and this category is not relevant.

Franchises

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons 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
Since the AGC Group has no franchise, this category is not considered relevant.

Investments

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons 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 AGC Group, the existence of an equity method affiliate is not for investment purposes, and the AGC Group's influence is small in terms of "influence," which is the criterion for determining relevance under the GHG Protocol, and is therefore not considered to be relevant.

Other (upstream)

Evaluation status
Please select

Emissions in reporting year (metric tons 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

Other (downstream)

Evaluation status

Emissions in reporting year (metric tons 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

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
684

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
11607385

Metric denominator
unit total revenue

Metric denominator: Unit total
16974

Scope 2 figure used
Market-based

% change from previous year
13

Direction of change
Decreased

Reason for change
As described in C4.3b, as a Scope 1 emissions reduction measure, we are actively converting fuels used in our glass melting kilns to low-carbon energy sources. Some of the converted energy is electricity derived from renewable energy sources, and the Scope 2 emissions intensity has been low, resulting in an overall improvement in GHG emissions per unit of sales.

C7. Emissions breakdowns

C7.1

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

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	6420615	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	34827	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	1454	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	403574	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	44397	IPCC Fourth Assessment Report (AR4 - 100 year)
PFCs	81331	IPCC Fourth Assessment Report (AR4 - 100 year)

C7.2

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

Country/Region	Scope 1 emissions (metric tons CO2e)
Japan	1387215
China	415159
Indonesia	2378134
Singapore	2785
Republic of Korea	83353
Taiwan, China	108826
Thailand	313303
Viet Nam	27065
Belgium	480933
Czechia	308926
France	288357
Germany	145810
Hungary	1301
Italy	120333
Netherlands	30
Poland	362
Russian Federation	433544
Slovakia	41
Spain	116796
United Kingdom of Great Britain and Northern Ireland	33682
Brazil	243114
Canada	141
Mexico	59
United States of America	95872
Denmark	1057

C7.3

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

By business division

By activity

C7.3a

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

Business division	Scope 1 emissions (metric ton CO2e)
Architectural Glass Asia Pacific	629314
Architectural Glass Europe & Americas	2128690
Automotive	620356
Electronics	623194
Chemicals	2961103
Others	23540

C7.3c

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

Activity	Scope 1 emissions (metric tons CO2e)
CO2 emissions originated from fuel combustion	5315661
CO2 emissions originated from processing raw materials	1048078
GHG generation associated with emission of methane and fluorine-based gases into the air other than CO2	565583
Process emissions of CO2 other than above	56875

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

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

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	2961103	<Not Applicable>	
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.5

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

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Japan	1472082	1225942
China	531340	571117
Indonesia	541605	597287
Singapore	2994	2994
Republic of Korea	177889	177299
Taiwan, China	322675	291336
Thailand	1130424	1099454
Viet Nam	18354	22629
Belgium	38941	96630
Czechia	122000	122650
France	6031	45173
Germany	18484	22929
Hungary	18077	40617
Italy	19268	34230
Morocco	26712	18850
Netherlands	481	568
Poland	30463	23485
Russian Federation	85828	99878
Slovakia	64	105
Spain	7221	10504
United Kingdom of Great Britain and Northern Ireland	5885	5885
Brazil	8704	0
Canada	135	135
Mexico	4038	4982
United States of America	106034	106034
Denmark	472	472

C7.6

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

By business division

By activity

C7.6a

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

Business division	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Architectural Glass Asia Pacific	140710	130118
Architectural Glass Europe & Americas	214109	306130
Automotive Glass	758407	789987
Electronics	1084967	1022302
Chemicals	2420117	2279141
Others	77893	93510

C7.6c

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

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Grid power consumption	4400214	4325198
Purchased steam	295759	295759
Hot water / Cold water	230	230

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

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

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	2420117	2279141	
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C-CH7.8

(C-CH7.8) Disclose the percentage of your organization's Scope 3, Category 1 emissions by purchased chemical feedstock.

Purchased feedstock	Percentage of Scope 3, Category 1 tCO2e from purchased feedstock	Explain calculation methodology
Ammonia	0.02	Scope 3 Category 1 emissions: 3,406,412 t-CO2eq Category 1 emissions from ammonia: 635 t-CO2eq 635/3,406,412 = 0.02%
Propylene (FCC)	5.5	Scope 3 Category 1 emissions: 3,406,412 t-CO2eq Scope 3 Category 1 emissions from propylene: 187,375 t-CO2eq 187,375/3,406,412=5.5%
Soda ash	8.02	Scope 3 Category 1 emissions: 3,406,412 t-CO2eq Category 1 emissions from soda ash: 273,085 t-CO2eq 273,085/3,406,412=8.02%
Other base chemicals	29.77	Scope 3 Category 1 emissions: 3,406,412 t-CO2eq Category 1 emissions from ethylene: 1,014,107 t-CO2eq 1,014,107/3,406,412=29.77%
Polymers	3.13	Scope 3 Category 1 emissions: 3,406,412 t-CO2eq Category 1 emissions from PVB: 106,642 t-CO2eq 106,642/3,406,412=3.13%
Specialty chemicals	0.06	Scope 3 Category 1 emissions: 3,406,412 t-CO2eq Category 1 emissions from PTFE: 1,949 t-CO2eq 1,949/3,406,412=0.06%

C-CH7.8a

(C-CH7.8a) Disclose sales of products that are greenhouse gases.

	Sales, metric tons	Comment
Carbon dioxide (CO2)	0	
Methane (CH4)	0	
Nitrous oxide (N2O)	0	
Hydrofluorocarbons (HFC)	0	Non-disclosable
Perfluorocarbons (PFC)	0	Non-disclosable
Sulphur hexafluoride (SF6)	0	Non-disclosable
Nitrogen trifluoride (NF3)	0	

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	69616	Decreased	0.6	Scope 1+2 emissions in 2020 were 11,064,000 t-CO2. Since the GHG emissions reduction due to increased renewable energy consumption was 69,616 tons, we calculated 69,616/11,064,000 = 0.6% Due to the active introduction of renewable energy at our global sites and the improved accuracy of our renewable energy reporting, we identified 173,613 MWh of energy from renewable energy sources in 2021. Since the energy from renewable energy sources identified for 2020 was 15,753 MWh, the difference, 157,860 MWh, was converted to additional renewable energy use using 0.441 kg-CO2/kWh.
Other emissions reduction activities	4227	Decreased	0.038	Scope 1+2 emissions in 2020 were 11,064,000 t-CO2. Since GHG emissions reductions through various emissions reduction activities amounted to 4,227 tons, we calculated 4,227/11,064,000 = 0.038%. Energy-saving measures at each of our global sites, such as the use of LED lighting, replacement of aging equipment, and process improvements, resulted in a reduction of 9,584,797 kWh. This was converted using 0.441 kg-CO2/kWh.
Divestment	0	Please select		
Acquisitions	0	Please select		
Mergers	0	Please select		
Change in output	470441	Increased	20	The answer here is based on sales, not production. Compared to 14,123(100M-JPY) in sales in 2020, sales in 2021 were 16,974(100M-JPY), an increase of 20%. Although production increased in line with sales growth, GHG emissions increased by 5% from 11,604k t-CO2 to 11,608k t-CO2. The increase is net of reductions from energy conservation and renewable energy sources.
Change in methodology	0	Please select		
Change in boundary	0	Please select		
Change in physical operating conditions	0	Please select		
Unidentified		<Not Applicable>		
Other		<Not Applicable>		

C7.9b

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

Market-based

C8. Energy

C8.1

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

More than 20% but less than or equal to 25%

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	Yes
Consumption of purchased or acquired cooling	Yes
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

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

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	14978	24420029	24435007
Consumption of purchased or acquired electricity	<Not Applicable>	152432	8762098	8914530
Consumption of purchased or acquired heat	<Not Applicable>	0	21	21
Consumption of purchased or acquired steam	<Not Applicable>	0	1007217	1007217
Consumption of purchased or acquired cooling	<Not Applicable>	0	1100	1100
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	21181	<Not Applicable>	21181
Total energy consumption	<Not Applicable>	188591	34190464	34379055

C-CH8.2a

(C-CH8.2a) Report your organization's energy consumption totals (excluding feedstocks) for chemical production activities in MWh.

Consumption of fuel (excluding feedstocks)

Heating value
HHV (higher heating value)

MWh consumed from renewable sources inside chemical sector boundary
14978

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
8804697

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
8819675

Consumption of purchased or acquired electricity

Heating value
<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary
29619

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
4158946

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
4188565

Consumption of purchased or acquired heat

Heating value
<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary
0

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
0

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
0

Consumption of purchased or acquired steam

Heating value
<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary
0

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
960868

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
960868

Consumption of purchased or acquired cooling

Heating value
<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary
0

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
0

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
0

Consumption of self-generated non-fuel renewable energy

Heating value
<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary
18

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
0

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
18

Total energy consumption

Heating value
<Not Applicable>

MWh consumed from renewable sources inside chemical sector boundary
44614

MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)
13924512

MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary
0

Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary
13969126

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	Yes
Consumption of fuel for the generation of heat	No
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

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

Sustainable biomass

Heating value
Please select

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

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

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

Comment

Other biomass

Heating value
Please select

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

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

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

Comment

Other renewable fuels (e.g. renewable hydrogen)

Heating value
HHV

Total fuel MWh consumed by the organization
14978

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

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

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

Comment

Coal

Heating value
HHV

Total fuel MWh consumed by the organization
5448891

MWh fuel consumed for self-generation of electricity
5357389

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

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

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

Comment

Oil

Heating value
HHV

Total fuel MWh consumed by the organization
1534239

MWh fuel consumed for self-generation of electricity
16001

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

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

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

Comment

Gas

Heating value
HHV

Total fuel MWh consumed by the organization
14567400

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

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

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

Comment

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value
HHV

Total fuel MWh consumed by the organization
2869499

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

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

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

Comment

Total fuel

Heating value
HHV

Total fuel MWh consumed by the organization
24435007

MWh fuel consumed for self-generation of electricity
5373390

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
0

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

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

Comment

C8.2d

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

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	1716527	1693476	44232	21181
Heat	0	0	0	0
Steam	19718	0	0	0
Cooling	0	0	0	0

C-CH8.2d

(C-CH8.2d) Provide details on electricity, heat, steam, and cooling your organization has generated and consumed for chemical production activities.

Electricity

Total gross generation inside chemicals sector boundary (MWh)
1670339

Generation that is consumed inside chemicals sector boundary (MWh)
1669076

Generation from renewable sources inside chemical sector boundary (MWh)
1281

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)
0

Heat

Total gross generation inside chemicals sector boundary (MWh)
0

Generation that is consumed inside chemicals sector boundary (MWh)
0

Generation from renewable sources inside chemical sector boundary (MWh)
0

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)
0

Steam

Total gross generation inside chemicals sector boundary (MWh)
19718

Generation that is consumed inside chemicals sector boundary (MWh)
0

Generation from renewable sources inside chemical sector boundary (MWh)
0

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)
0

Cooling

Total gross generation inside chemicals sector boundary (MWh)
0

Generation that is consumed inside chemicals sector boundary (MWh)
0

Generation from renewable sources inside chemical sector boundary (MWh)
0

Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)
0

C8.2e

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

Sourcing method
Green electricity products from an energy supplier (e.g. green tariffs)

Energy carrier
Electricity

Low-carbon technology type
Hydropower (capacity unknown)

Country/area of low-carbon energy consumption
Brazil

Tracking instrument used
Contract

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
83375

Country/area of origin (generation) of the low-carbon energy or energy attribute
Brazil

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)
2013

Comment
CTG BRASIL

China Three Gorges Corporation has chosen Brazil as a priority country in its international growth strategy. Since it arrived in the country, in 2013, it made strategic alliances with recognized companies in the industry and with strong local presence.

To grow sustainably, CTG Brazil has increased its investments to become a clean energy company increasingly relevant. It currently is the second largest power generator in the country with private capital.

The company relies on the dedication of its local talents team and is guided by its commitment to make joint efforts to contribute to the Brazilian energy matrix in the long run, with social responsibility and respect for the environment.

Sourcing method
Green electricity products from an energy supplier (e.g. green tariffs)

Energy carrier
Electricity

Low-carbon technology type
Renewable energy mix, please specify (Solar, wind)

Country/area of low-carbon energy consumption
Spain

Tracking instrument used
Contract

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
12224

Country/area of origin (generation) of the low-carbon energy or energy attribute
Spain

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

Comment

Sourcing method
Green electricity products from an energy supplier (e.g. green tariffs)

Energy carrier
Electricity

Low-carbon technology type
Hydropower (capacity unknown)

Country/area of low-carbon energy consumption
Japan

Tracking instrument used
NFC – Renewable

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
1110

Country/area of origin (generation) of the low-carbon energy or energy attribute
Japan

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)
2017

Comment
We use electricity from a menu called Aqua Premium, which uses hydroelectric power provided by Tokyo Electric Power Company. TEPCO began offering this plan in 2017.

C8.2g

(C8.2g) Provide a breakdown of your non-fuel energy consumption by country.

Country/area
Japan

Consumption of electricity (MWh)
3004156

Consumption of heat, steam, and cooling (MWh)
574999

Total non-fuel energy consumption (MWh) [Auto-calculated]
3579155

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Indonesia

Consumption of electricity (MWh)

2152737

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
2152737

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Singapore

Consumption of electricity (MWh)
7746

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
7746

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Thailand

Consumption of electricity (MWh)
2055986

Consumption of heat, steam, and cooling (MWh)
403324

Total non-fuel energy consumption (MWh) [Auto-calculated]
2459310

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Viet Nam

Consumption of electricity (MWh)
28155

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
28155

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
China

Consumption of electricity (MWh)
843687

Consumption of heat, steam, and cooling (MWh)
8699

Total non-fuel energy consumption (MWh) [Auto-calculated]
852386

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Taiwan, China

Consumption of electricity (MWh)
580352

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
580352

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area

Republic of Korea

Consumption of electricity (MWh)
343880

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
343880

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
United Kingdom of Great Britain and Northern Ireland

Consumption of electricity (MWh)
28346

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
28346

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Italy

Consumption of electricity (MWh)
76104

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
76104

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Netherlands

Consumption of electricity (MWh)
1365

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
1365

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Spain

Consumption of electricity (MWh)
37493

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
37493

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Slovakia

Consumption of electricity (MWh)
252

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
252

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Czechia

Consumption of electricity (MWh)
269972

Consumption of heat, steam, and cooling (MWh)
11710

Total non-fuel energy consumption (MWh) [Auto-calculated]
281682

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Denmark

Consumption of electricity (MWh)
3907

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
3907

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Germany

Consumption of electricity (MWh)
55489

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
55489

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Hungary

Consumption of electricity (MWh)
82354

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
82354

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
France

Consumption of electricity (MWh)
105998

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
105998

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Belgium

Consumption of electricity (MWh)
246505

Consumption of heat, steam, and cooling (MWh)
1030

Total non-fuel energy consumption (MWh) [Auto-calculated]
247535

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Poland

Consumption of electricity (MWh)
48523

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
48523

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Morocco

Consumption of electricity (MWh)
38220

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
38220

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Russian Federation

Consumption of electricity (MWh)
223866

Consumption of heat, steam, and cooling (MWh)
8575

Total non-fuel energy consumption (MWh) [Auto-calculated]
232441

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
United States of America

Consumption of electricity (MWh)
278378

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
278378

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Canada

Consumption of electricity (MWh)
1004

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
1004

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Brazil

Consumption of electricity (MWh)
83375

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
83375

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

Country/area
Mexico

Consumption of electricity (MWh)
10154

Consumption of heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
10154

Is this consumption excluded from your RE100 commitment?
<Not Applicable>

C-CH8.3

(C-CH8.3) Does your organization consume fuels as feedstocks for chemical production activities?
Yes

C-CH8.3a

(C-CH8.3a) Disclose details on your organization's consumption of fuels as feedstocks for chemical production activities.

Fuels used as feedstocks
Other, please specify (Propylene)

Total consumption
115942

Total consumption unit
metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit
3.14

Heating value of feedstock, MWh per consumption unit
0

Heating value
Unable to confirm heating value

Comment
The propylene used in this question is for use as a raw material for chemical products.

Fuels used as feedstocks
Other, please specify (Ethylene)

Total consumption
627824

Total consumption unit
metric tons

Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit
3.14

Heating value of feedstock, MWh per consumption unit
0

Heating value
Unable to confirm heating value

Comment
The ethylene used in this question is for use as a raw material for chemical products.

C-CH8.3b

(C-CH8.3b) State the percentage, by mass, of primary resource from which your chemical feedstocks derive.

	Percentage of total chemical feedstock (%)
Oil	
Natural Gas	
Coal	
Biomass	
Waste (non-biomass)	
Fossil fuel (where coal, gas, oil cannot be distinguished)	
Unknown source or unable to disaggregate	

C9. Additional metrics

C9.1

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

C-CH9.3a

(C-CH9.3a) Provide details on your organization's chemical products.

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-CH9.6a

(C-CH9.6a) Provide details of your organization's investments in low-carbon R&D for chemical production activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Carbon capture and storage (CCS)	Applied research and development	≤20%		

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	Third-party verification or assurance process in place

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/ section reference
Page 1

Relevant standard
ISO14064-3

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 market-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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/ section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category
Scope 3: Purchased goods and services

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category

Scope 3: Capital goods

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
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Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Upstream transportation and distribution

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Waste generated in operations

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Business travel

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
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Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Employee commuting

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Processing of sold products

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Use of sold products

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: End-of-life treatment of sold products

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
GHG検証報告書 AGC様 2021年度分_英文_20220614.pdf

Page/section reference
Page 1

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Downstream leased assets

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
GHG検証報告書 AGC様 2021年度分_和文_20220614.pdf
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Page/section reference
Page 1

Relevant standard
ISO14064-3

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?
Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C5. Emissions performance	Energy consumption	ISO14064-3	In the verification process for Scope 1 and Scope 2 GHG emissions, energy consumption, which is the basis for the calculation, is verified.
C4. Targets and performance	Product footprint verification	EPD (Environmental Product Declaration)	We received third-party certification for our insulating glass, disclosing information on the environmental impact of our products over their life cycle.
C4. Targets and performance	Product footprint verification	Eco Leaf Type III Environmental Declaration	The water-based fluoropolymer paint "Bonflon" has acquired this environmental label. https://ecoleaf-label.jp/pdf_view.php?uuid=6e51c825-ddff-4d8b-96ac-a48c4e79e350.pdf&filename=JR-AB-18002E.pdf

C11. Carbon pricing

C11.1

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

Yes

C11.1a

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

EU ETS

France carbon tax

Japan carbon tax

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

EU ETS

% of Scope 1 emissions covered by the ETS

20.1

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1 2021

Period end date

December 31 2021

Allowances allocated

1033371

Allowances purchased

0

Verified Scope 1 emissions in metric tons CO2e

6986197

Verified Scope 2 emissions in metric tons CO2e

0

Details of ownership

Facilities we own and operate

Comment

C11.1c

(C11.1c) Complete the following table for each of the tax systems you are regulated by.

France carbon tax

Period start date
January 1 2021

Period end date
December 31 2021

% of total Scope 1 emissions covered by tax
0

Total cost of tax paid
0

Comment
Our manufacturing sites in France are exempt from the carbon tax because it is an EU-ETS site.

Japan carbon tax

Period start date
January 1 2021

Period end date
December 31 2021

% of total Scope 1 emissions covered by tax
9.1

Total cost of tax paid
188392976

Comment

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

We are working on Scope1 GHG emissions reductions to reduce the impact of the carbon tax in Japan and EU-ETS. In order to reduce Scope 1 GHG emissions mainly through the realization of production process innovation, we have set the following reduction items: introduction of energy-efficient oxygen combustion in glass melting furnaces, introduction of electric boosters for melting to reduce fuel consumption, and accelerated electrification of melting heat sources.

Converting to a glass melting furnace in accordance with the timing of its cold repair is effective in terms of operation, and these technologies are being introduced to glass melting furnaces that have reached the timing of their cold repair. The cold repair cycle of a glass melting furnace is 15 to 20 years, and this initiative will be implemented over the long term from 2019, when the net zero carbon target was set, to 2050, the year in which the target will be achieved.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?
No

C11.3

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

C11.3a

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

Objective for implementing an internal carbon price
Navigate GHG regulations
Change internal behavior
Drive energy efficiency
Drive low-carbon investment
Stress test investments

GHG Scope
Scope 1
Scope 2

Application
We use internal carbon pricing to incentivize investment in GHG emissions reduction capital expenditures and GHG emissions reduction technology development, as well as stress testing (carbon risk management) in the decision-making process for business investments such as plant construction and M&A.

Actual price(s) used (Currency /metric ton)
6500

Variance of price(s) used
The AGC Group has set two types of ICPs: one is for business investments such as plant construction and M&A, and the other is for capital investments for GHG emissions reduction, with a price of 6,500 (JPY/t-CO2). This price was set with reference to the average European emissions trading price in 2021 and prices set by other companies. The results of the sensitivity analysis are determined based on regional circumstances. For investment projects outside of Western and Central Europe, calculations are also made based on regional circumstances and at a lower price than the above price.
We also set ICP prices for investments in technology development to reduce GHG emissions higher than the above prices because these investments are relatively more long-term in nature.

Type of internal carbon price
Shadow price

Impact & implication
The AGC Group's European region has long introduced Internal Carbon Pricing (ICP) to evaluate the profitability of large capital investment projects based on future carbon costs and to make investment decisions. In 2021, we designed an ICP framework to be introduced throughout the AGC Group in order to incorporate carbon costs into investment decisions for carbon pricing that is expected to be introduced in the future in various countries. In the case of a glass manufacturing facility investment in China, the ICP was applied mainly for the purpose of stress testing, and it was judged to be profitable in the long term. In the case of an investment in a renewable energy in-house power generation facility in Taiwan, the NPV turned positive as a result of ICP application, and we made the decision to execute the investment after considering other factors as well.

C12. Engagement

C12.1

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

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
50

% total procurement spend (direct and indirect)

% of supplier-related Scope 3 emissions as reported in C6.5
49.2

Rationale for the coverage of your engagement
Categories 1 and 3 GHG emissions of Scope 3 which are related to suppliers account for 49.2% of the AGC Group's total Scope 3 emissions in 2021. They also account for about 25% of total GHG emissions including Scope 1 and 2. To reduce these GHG emissions, AGC recognizes that engagement with its suppliers is essential.
In response, AGC surveyed its suppliers for the first time in 2021 regarding their GHG emissions reduction measures, targeting those suppliers with the largest percentage of GHG emissions among those associated with 2020 Scope 3 Categories 1 and 3. Suppliers that accounted for approximately 55% of total Category 1 and 3 emissions, and approximately 90% of Category 1 emissions, were included in the survey.

Impact of engagement, including measures of success
The questionnaire we requested suppliers to answer in 2021 included the following questions;
- Whether or not feel the need to address climate change such as by reducing CO2 emissions
- Whether or not have an understanding of your company's CO2 emissions under SCOPE 1+2
- Whether or not have an organization or project to reduce CO2 emissions
- Whether or not have a CO2 reduction target
- To provide specific examples of reduction rate
- The base year and the target year of GHG emissions reduction
- The details of reducing CO2 emissions excluding the introduction of renewable energy if any.
- Whether or not tracking Scope3 GHG emissions
- Whether or not have calculated CO2 emissions of the products supplying to AGC?
- Whether or not the target certified SBT
- If you plan to obtain SBT certification in the future, please indicate the year in which you plan to obtain it.
- Whether or not adopt renewable energy?
- Whether or not set a renewable energy target?

Approximately 85% of the suppliers subject to the questionnaire responded in 2021 cycle, and we found that approximately 70% of the suppliers who had responded were aware of their Scope 1 and 2, which is equivalent to approximately 30% of all respondents were aware of Scope 3, and approximately half of them had set GHG emissions reduction targets. We found that about half of them have set GHG emissions reduction targets. In addition, about 15% of the suppliers who responded have obtained SBT certification.

In 2022, we will continue to monitor the suppliers' efforts by requesting suppliers to answer to our questionnaire as we did in 2021, with the aim of increasing the percentage of the suppliers who are aware of all Scope 1, 2, and 3 GHG emissions and have reduction targets from about 15% in 2021 to 40% by 2030. We plan to strengthen engagement with suppliers to increase the percentage of suppliers with SBT certification to 40% by 2030. Similarly, the percentage of suppliers with SBT certification is currently about 15% and will increase to 30% by 2030. To this end, we will add a statement encouraging suppliers to be certified SBT starting with the supplier survey to be conducted in 2022. In addition, we have joined the CDP Supply Chain Program from 2022 and are conducting a detailed survey of 27 suppliers to further strengthen engagement.

Comment

C12.1d

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

Employee Engagement

In order for the AGC Group to realize and exercise the climate action it has set for itself and that is expected of it by all stakeholders, the awareness, understanding, actions, and internal and external involvement of AGC Group employees involved in all business activities are the keys to success. Based on this idea, we launched a new environmental education program, "Earthcue TV," in 2020, mainly targeting employees engaged in operations that have not been strongly associated with environmental issues and climate action. “Earthcue" is a coined word meaning "rescue the Earth”. Although targeted at employees, the program aims to encourage employees to act in an environmentally conscious manner in their lives outside of the company.

“Earthcue TV" is a series of animated educational videos, each about two minutes long, that aim to educate all AGC Group employees about climate change and other environmental issues, the AGC Group's impact on these issues, and the numerical targets set by the AGC Group. The videos are produced in a series of animated educational videos of about two minutes per episode. The main medium is the company's intranet, which is maintained by the head office. For sites in countries with limited access to the intranet, the same "Earthcue TV" video files are shared and distributed to employees via their respective available devices, the intranet, and the Internet. The video is also available in Japanese, English, Chinese, Indonesian, and Thai versions to maximize the number of employees whose native language is spoken.

To date, the video has aired in Japan, Asia, and Europe, and can be viewed by approximately 40,000 employees. In order to receive feedback on this "Earthcue TV," the intranet set up by AGC's headquarters allows users to indicate their "Like" intentions. Each release has received numerous "likes" and positive feedback from employees in Europe and China who have found the educational video to be very informative.

Artificial Silica Sand

The AGC Group's glass operations generate glass waste, known as cullet, from the manufacturing process. Cullet is mainly recycled as a raw material for asphalt, but the AGC Takasago Plant contributes to the restoration of artificial tidal flats by turning glass cullet into artificial silica sand. Tidal flats are home to a wide variety of organisms, including reeds and other salt-water plants, as well as microscopic algae in seawater and on the ground surface, which absorb carbon dioxide through photosynthesis. In addition, tidal flats contribute to GHG reduction by accumulating plant and animal remains on the seafloor and storing carbon as blue carbon. This activity is being promoted as a technology to be demonstrated in the Environmental Technology Demonstration Project sponsored by the Ministry of the Environment.

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization’s purchasing process?

Yes, suppliers have to meet climate-related requirements, but they are not included in our supplier contracts

C12.2a

(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization’s purchasing process and the compliance mechanisms in place.

Climate-related requirement

Climate-related disclosure through a non-public platform

Description of this climate related requirement

In 2021, Category 1 and 3 GHG emissions accounted for approximately 25% of the AGC Group's total Scope 3 GHG emissions. Therefore, we recognize that the cooperation of our suppliers is essential to our Scope 3 GHG emissions reduction measures. In order to ensure smooth supplier engagement activities, we have established transaction requirements for "timely and accurate disclosure of information in response to surveys on environmentally hazardous substances designated by the AGC Group" and "desire to cooperate with the AGC Group's environmental activities".
The supplier questionnaire, which has been conducted since FY2021, is based on these requirements, and approximately 85% of the companies sent the questionnaire have responded.

% suppliers by procurement spend that have to comply with this climate-related requirement

100

% suppliers by procurement spend in compliance with this climate-related requirement

100

Mechanisms for monitoring compliance with this climate-related requirement

Supplier self-assessment

Response to supplier non-compliance with this climate-related requirement

Retain and engage

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

Direct or indirect engagement that could influence policy, law, or regulation that may impact the climate

Yes, we engage directly with policy makers
Yes, we engage indirectly through trade associations
Yes, we engage indirectly by funding other organizations whose activities may influence policy, law, or regulation that may significantly impact the climate

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?

Yes

Attach commitment or position statement(s)

Medium-Term Management Plan Presentation Materials
2021_0205e_2.pdf
2021_0205_2.pdf

Describe the process(es) your organization has in place to ensure that your engagement activities are consistent with your overall climate change strategy

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

C12.3a

(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?

Focus of policy, law, or regulation that may impact the climate

Other, please specify (Development of technologies to reduce GHG emissions)

Specify the policy, law, or regulation on which your organization is engaging with policy makers

Our group aims to achieve net zero carbon by 2050. To achieve this goal, it is extremely important to reduce GHG emissions in the glass business, which is the major source of GHG emissions of the entire AGC Group. For this reason, we are collaborating with policy makers on reducing GHG emissions in glass manufacturing.

Policy, law, or regulation geographic coverage

National

Country/region the policy, law, or regulation applies to

Japan

Your organization's position on the policy, law, or regulation

Support with no exceptions

Description of engagement with policy makers

In 2021, we met directly with policy makers to introduce our GHG reduction efforts in glass manufacturing and to gain their understanding. Specifically, we explained our plans in three ways: 1) deployment of existing technologies, 2) consideration of improved technologies, and 3) deployment of new technologies.
The policy maker commented that there are support programs for GHG reduction measures through the use of existing technologies and improved technologies, and that if there is a possibility of utilizing these programs, we should consult with the department in charge of the project before proceeding.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

<Not Applicable>

Have you evaluated whether your organization's engagement is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

C12.3b

(C12.3b) Provide details of the trade associations your organization engages with which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association
Other, please specify (Flat Glass Manufactures Association of Japan)

Is your organization's position on climate change consistent with theirs?
Consistent

Has your organization influenced, or is your organization attempting to influence their position?
We have already influenced them to change their position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)
Both the Flat Glass Manufactures Association of Japan and our company are actively promoting the spread and expansion of high-performance glass, including Low-E double glazing glass, which contributes to energy conservation in buildings such as homes, offices, and commercial buildings and meets social needs. The two associations also share the same position in actively addressing environmental issues, such as aiming to reduce CO2 emissions from the raw fuel melting process used in flat glass production.

In 2021, Flat Glass Manufactures Association of Japan has submitted public comments on the draft guidelines for the Implementation of Business Adaptation in the Flat Glass Industry (Business Sector-specific Implementation Guidelines).

Aligning, we attempted to influence the trade association on the following two points
1) Widespread use of high-performance glass such as "Low-E double-glazing glass" will contribute to energy conservation in buildings such as residences, offices, and commercial buildings. Currently, it is recognized that while penetration is steady in the newly built detached housing sector, it is insufficient in the non-residential sector. In addition, the high thermal insulation of existing buildings, especially existing houses, is considered to be effective in reducing CO2 emissions. MHI lobbied industry associations to establish regulations, subsidies, and other support programs to encourage greater use of this technology. In response, the industry association lobbied the government.

2) In 2022, the Flat Glass Industry's Vision 2022 for Carbon Neutrality in 2050, issued by the Flat Glass Manufactures Association of Japan, stated that the industry would continue its efforts through technological innovation and establishment of technologies to achieve the goal. In 2021, we played a leading role in the formulation of the vision by leading the discussion.

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)
29000000

Describe the aim of your organization's funding
The funds provided are equivalent to membership dues.

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

C12.3c

(C12.3c) Provide details of the funding you provided to other organizations in the reporting year whose activities could influence policy, law, or regulation that may impact the climate.

Type of organization
Non-Governmental Organization (NGO) or charitable organization

State the organization to which you provided funding
WWF Japan

Funding figure your organization provided to this organization in the reporting year (currency as selected in C0.4)
1000000

Describe the aim of this funding and how it could influence policy, law or regulation that may impact the climate
WWF is currently working to reduce GHG emissions and other substances that cause global warming, with the goal of limiting the increase in average global temperatures to 1.5 degrees Celsius above pre-industrial levels.

Have you evaluated whether this funding is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

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 voluntary communications

Status
Complete

Attach the document
agc_report_en_2021.pdf
agc_report_2022.pdf

Page/Section reference
P13, P73-79

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets

Comment

Publication
In voluntary sustainability report

Status
Underway – previous year attached

Attach the document
agc_sus_en_2021.pdf
agc_sus_jp_2021.pdf

Page/Section reference
P45-54

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Publication
In mainstream reports

Status
Complete

Attach the document
rep2021_4.pdf

Page/Section reference
P21, 23

Content elements
Risks & opportunities

Comment
Short- to medium- and long-term climate change-related risks are disclosed in the "Business and Other Risks" section.
The Financial Report is prepared only in Japanese, and the English version is not attached.

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	Yes, executive management-level responsibility	With the recognition by society and the economy that issues related to natural capital, including biodiversity-related issues, are important issues affecting corporate sustainability, the AGC Group recognizes that its directors have a duty to identify risks and opportunities related to natural capital and to work to mitigate and restore the damage to natural capital. The AGC Group also recognizes that directors have a duty to identify risks and opportunities related to natural capital and to work to mitigate and restore natural capital. The AGC Group recognizes that addressing issues related to natural capital, including biodiversity-related issues, is a materiality (key opportunity/risk) within the AGC Group, which promotes sustainability management and advocates "environmental considerations". Matters related to natural capital issues, including biodiversity-related issues, to be discussed and reported to the Board of Directors are deliberated by the Sustainability Committee, and the implementation standards are stipulated in the "Matters to be discussed by the Sustainability Committee and Reporting Standards for the Sustainability Committee and the Board of Directors.	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have made public commitments and publicly endorsed initiatives related to biodiversity	Commitment to Net Positive Gain	Other, please specify (30 by 30 alliance initiating by MOE Japan)

C15.3

(C15.3) Does your organization assess the impact of its value chain on biodiversity?

	Does your organization assess the impact of its value chain on biodiversity?	Portfolio
Row 1	Yes, we assess impacts on biodiversity in both our upstream and downstream value chain	<Not Applicable>

C15.4

(C15.4) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	No, we are not taking any actions to progress our biodiversity-related commitments, but we plan to within the next two years	<Not Applicable>

C15.5

(C15.5) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	Yes, we use indicators	State and benefit indicators

C15.6

(C15.6) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Content of biodiversity-related policies or commitments Details on biodiversity indicators Biodiversity strategy	- Press Release on "Participation in the 30 by 30 Alliance" (full page) - Sustainability Data Book 2022 (Protected Species Habitat Areas near Business Sites) 20220523.pdf 20220523e.pdf

C16. 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.

Nothing to state.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

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

SC. Supply chain module

SC0.0

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

Noting to state.

SC0.1

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

	Annual Revenue
Row 1	1697400000000

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
Stellantis N.V.

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
2237.5

Uncertainty (±%)
10

Major sources of emissions
natural gas

Verified
Yes

Allocation method
Other, please specify (Based on shared net sales (EUR))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

Requesting member
Stellantis N.V.

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
31272.5

Uncertainty (±%)
10

Major sources of emissions
Electricity and steam

Verified
Yes

Allocation method
Other, please specify (Based on shared net sales (EUR))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Mercedes-Benz Group AG

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
1811.7

Uncertainty (±%)
10

Major sources of emissions
natural gas

Verified
Yes

Allocation method
Other, please specify (Based on shared net sales (EUR))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Mercedes-Benz Group AG

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
25321.1

Uncertainty (±%)
10

Major sources of emissions
Electricity and steam

Verified
Yes

Allocation method
Other, please specify (Based on shared net sales (EUR))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Renault Group

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
318.9

Uncertainty (±%)
10

Major sources of emissions
natural gas

Verified
Yes

Allocation method
Other, please specify (Based on shared net sales (EUR))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Renault Group

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
4456.8

Uncertainty (±%)
10

Major sources of emissions
Electricity and steam

Verified
Yes

Allocation method
Other, please specify (Based on shared net sales (EUR))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Volvo Car Group

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
705.6

Uncertainty (±%)
10

Major sources of emissions
natural gas

Verified
Yes

Allocation method
Other, please specify (Based on shared net sales (EUR))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Volvo Car Group

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
9862.5

Uncertainty (±%)
10

Major sources of emissions
Electricity and steam

Verified
Yes

Allocation method
Other, please specify (Based on shared net sales (EUR))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Ford Motor Company

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
3761.5101

Uncertainty (±%)
10

Major sources of emissions
Natural Gas

Verified
Yes

Allocation method
Other, please specify (% Sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Ford Motor Company

Scope of emissions
Scope 2

Allocation level

Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
5967.4302

Uncertainty (±%)
10

Major sources of emissions
Electricity

Verified
Yes

Allocation method
Other, please specify (% Sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Honda Motor Co., Ltd.

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
38843.2295

Uncertainty (±%)
10

Major sources of emissions
Natural Gas

Verified
Yes

Allocation method
Other, please specify (Based on sales ratio for Honda Japan)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Honda Motor Co., Ltd.

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
25693.779

Uncertainty (±%)
10

Major sources of emissions
Electricity

Verified
Yes

Allocation method
Other, please specify (Based on sales ratio for Honda Japan)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied

Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Honda Motor Co., Ltd.

Scope of emissions
Scope 3

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
64045.5883

Uncertainty (±%)
10

Major sources of emissions
Purchasing products

Verified
Yes

Allocation method
Other, please specify (Based on sales ratio for Honda Japan)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Nissan Motor Co., Ltd.

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
54163.1458

Uncertainty (±%)
10

Major sources of emissions
Natural gas

Verified
Yes

Allocation method
Other, please specify (Based on sales % for Nissan (not including Renault))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Nissan Motor Co., Ltd.

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
35827.5023

Uncertainty (±%)
10

Major sources of emissions

Electricity

Verified
Yes

Allocation method
Other, please specify (Based on sales % for Nissan (not including Renault))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Nissan Motor Co., Ltd.

Scope of emissions
Scope 3

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
26406.3049

Uncertainty (±%)
10

Major sources of emissions
Scope3 Category1

Verified
Yes

Allocation method
Other, please specify (Based on sales % for Nissan (not including Renault))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Nissan Motor Co., Ltd.

Scope of emissions
Scope 3

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
9977.9549

Uncertainty (±%)
10

Major sources of emissions
Scope3 Category4

Verified
Yes

Allocation method
Other, please specify (Based on sales % for Nissan (not including Renault))

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Toyota Motor Corporation

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
458563.1931

Uncertainty (±%)
10

Major sources of emissions
Natural gas

Verified
Yes

Allocation method
Other, please specify (% sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Toyota Motor Corporation

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
303327.5419

Uncertainty (±%)
10

Major sources of emissions
Electricity

Verified
Yes

Allocation method
Other, please specify (% sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Isuzu Motors Limited

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
13706.7081

Uncertainty (±%)
10

Major sources of emissions
Natural gas

Verified
Yes

Allocation method
Other, please specify (% sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
Isuzu Motors Limited

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
9066.6284

Uncertainty (±%)
10

Major sources of emissions
Electricity

Verified
Yes

Allocation method
Other, please specify (% sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
General Motors Company

Scope of emissions
Please select

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
1961.3654

Uncertainty (±%)
10

Major sources of emissions
Natural Gas

Verified
Yes

Allocation method
Other, please specify (% Sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
General Motors Company

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
Automotive company

Emissions in metric tonnes of CO2e
3111.599

Uncertainty (±%)
10

Major sources of emissions
Electricity

Verified
Yes

Allocation method
Other, please specify (% Sales)

Market value or quantity of goods/services supplied to the requesting member

Unit for market value or quantity of goods/services supplied
Please select

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made

---

Requesting member
L'Oréal

Scope of emissions
Scope 1

Allocation level
Business unit (subsidiary company)

Allocation level detail
製品製造拠点

Emissions in metric tonnes of CO2e
5166.7

Uncertainty (±%)
10

Major sources of emissions
都市ガス、軽油、ドライアイス、溶媒など

Verified
No

Allocation method
Allocation not necessary due to type of primary data available

Market value or quantity of goods/services supplied to the requesting member
200000

Unit for market value or quantity of goods/services supplied
Kilograms

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
GHGプロトコルに基づき、弊社で使用している全エネルギー使用量と地球温暖化に係わる化学物質の放出量より算出。

Requesting member
L'Oréal

Scope of emissions
Scope 2

Allocation level
Business unit (subsidiary company)

Allocation level detail
製品製造拠点

Emissions in metric tonnes of CO2e
3546

Uncertainty (±%)
10

Major sources of emissions
購入電力

Verified
No

Allocation method
Allocation not necessary due to type of primary data available

Market value or quantity of goods/services supplied to the requesting member
200000

Unit for market value or quantity of goods/services supplied
Kilograms

Please explain how you have identified the GHG source, including major limitations to this process and assumptions made
GHGプロトコルに基づき、弊社で使用している全エネルギー使用量と地球温暖化に係わる化学物質の放出量より算出。

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
Customer base is too large and diverse to accurately track emissions to the customer level	Linking manufacturing costing to GHG emissions calculation

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.

Under planning

SC2.1

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

Requesting member
L'Oréal

Group type of project
Other, please specify (エネルギー削減プロジェクトの実施)

Type of project
Other, please specify (溶媒転換)

Emissions targeted
Actions that would reduce our own operational emissions (our scope 1 & 2)

Estimated timeframe for carbon reductions to be realized
3-5 years

Estimated lifetime CO2e savings
2500

Estimated payback
Please select

Details of proposal
溶媒転換に伴う温暖化ガス排出量の削減

Requesting member
L'Oréal

Group type of project
Other, please specify (エネルギー削減プロジェクトの実施)

Type of project
Other, please specify (ガス回収率向上)

Emissions targeted
Actions that would reduce our own operational emissions (our scope 1 & 2)

Estimated timeframe for carbon reductions to be realized
Other, please specify (2030年)

Estimated lifetime CO2e savings
600

Estimated payback
Please select

Details of proposal
ガス回収に伴うドライアイス使用量の削減

Requesting member
L'Oréal

Group type of project
Other, please specify (エネルギー削減プロジェクトの実施)

Type of project
Other, please specify (溶媒リサイクル)

Emissions targeted
Actions that would reduce our own operational emissions (our scope 1 & 2)

Estimated timeframe for carbon reductions to be realized
Other, please specify (2030年)

Estimated lifetime CO2e savings
500

Estimated payback
Please select

Details of proposal
溶媒リサイクルの効率化

Requesting member
L'Oréal

Group type of project
Reduce Logistics Emissions

Type of project
Changing transportation mode (switch from air to rail)

Emissions targeted
Actions that would reduce our own supply chain emissions (our own scope 3)

Estimated timeframe for carbon reductions to be realized
1-3 years

Estimated lifetime CO2e savings

Estimated payback
Please select

Details of proposal
Scope3のカテゴリー1,9の輸送手段の変更。精査後に具体的GHG削減目標値を設定予定。

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 understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below
I have read and accept the applicable Terms