Environment

Climate change and other global-scale environmental issues have gained much attention in recent years.
The MGC Group recognizes that not only do its business activities place a burden on the environment, but that environmental problems have a significant impact on its business activities, and is engaged in a variety of initiatives to address them.

The MGC Group Declaration on Environmental Sustainability

Environment Information at Glance

Environmental Management

Response to Climate Change

(Disclosure Based on the TCFD Recommendations)

Greenhouse Gas Emission Reduction

Response to Natural Capital

(Disclosure Based on the TNFD Recommendations)

Biodiversity Conservation
Water Resource Conservation
Waste Reduction and Resource Recycling
Reduction of Plastic Waste
Chemical Emission Reduction
Prevention of Air and Water Pollution

Scope of This Report

The scope of information tabulated in this report is classified as follows.

Designation	Scope
MGC (Non-consolidated)	Mitsubishi Gas Chemical Company, Inc.
Consolidated subsidiaries	Main companies engaged primarily in manufacturing among consolidated subsidiaries
Domestic MGC Group	Consolidated subsidiaries located in Japan
Overseas MGC Group	Consolidated subsidiaries located overseas
MGC Group	MGC (non-consolidated) and consolidated subsidiaries

For environmental items other than energy consumption and GHG emissions, the scope of data collection up to and including fiscal year 2023 performance is as follows.

Domestic MGC Group:members of the MGC Group Environment and Safety Council*1

Overseas MGC Group:Companies subject to environmental and safety audits

*1 **MGC Group Environment and Safety Council**:
MGC Group companies in Japan that manufacture and process chemical substances and resins as raw materials, those that engage in the business of transporting or storing chemical substances, and MCG undertake environmental and safety activities in accordance with Responsible Care through the MGC Group Environment and Safety Council.
The Council holds the MGC Group Environment and Safety Council Meeting twice each year to raise the levels of environmental and safety measures by developing annual plans for the environmental and safety activities of each company, conducting PDCA on the results, and reporting on and exchanging information concerning the status of accidents and disaster and other topics.

Tabulation Period for this Report

The tabulation periods for this report are as follows.

Designation	Scope
MGC (Non-consolidated)	April – Following March (expressed as fiscal year)
Consolidated subsidiaries	For Japan, April to the following March; for overseas, January to December

** In the stacked bar chart, figures tabulated by calendar year are accumulated directly on the fiscal year graph.

Environment Information at Glance

Summary of MGC and the MGC Group's environmental and social activities in fiscal 2024

Environment

Environment

Environmental Performance (Environmental Preservation Performance Metrics)

Greenhouse gas (GHG) emissions

1,206
kt CO_{2e}
2023:1,396kt CO_{2e}
GHG emissions (Scopes 1+2) (consolidated)

10,631
kt CO_{2e}
2023:9,607kt CO_{2e}
GHG emissions (Scope 3) (consolidated)

Intensity control metrics

0.0015
kt-CO_{2e}/million yen
2023:0.0017kt-CO_{2e}/million yen
GHG emissions/unit of sales (non-consolidated)

0.00075
MLOE/million yen
2023: 0.00080MLOE/million yen
Energy consumption/unit of sales (non-consolidated)

Pollution prevention

160
t

2023:233t

Emissions of substances subject to PRTR Act reporting
(non-consolidated)

Water resources

27,492,000
m^3

2023:28,477,000 m^3

Water withdrawal
(non-consolidated)

2,796,000
m^3

2023:3,347,000 m^3

Water consumption
(non-consolidated)

Resource recycling

118
t

2023:113t

Final disposal volume
(non-consolidated)

0.14

2023:0.13

Zero waste emission rate: waste disposed of at final disposal sites/total waste generated
(non-consolidated)

Environmental accounting

¥1,172
million

2023:¥1,604 million

Environmental protection costs
(investments)

¥11,046
million

2023:¥4,597 million

Environmental protection costs
(expenses)

Related links

- Environmental and Safety Philosophy, Principle, Declaration, and Basic Policy
- Environmental Safety Action Plan
- Environmental Management
- Response to Climate Change (Disclosure Based on the TCFD Recommendations)
- Greenhouse Gas Emission Reduction
- Water Resource Conservation
- Waste Reduction and Resource Recycling
- Chemical Emission Reduction
- Pollution prevention

ISO 14001 certification status

MGC has obtained certification of compliance with the ISO 14001 environmental management system standard at all of its domestic plants and endeavors to continuously improve its environmental performance.

Environmental risk management

For environmental risk management, MGC requires safety assessments to be performed before installation, replacement, expansion or major modification of facilities. At existing facilities, MGC pursues prevention or early detection of abnormalities through routine inspections and maintenance and conducts emergency response drills as an added precaution against accidents. It has a wide range of insurance coverage, including fire insurance, business interruption insurance, oil pollution insurance and liability insurance.

Water risk management

MGC monitors its actual water consumption and uses water efficiently by measuring water withdrawal, water discharge, water usage and water recycling. In drawing from water sources, MGC restricts its intake to permitted quantities in accord with applicable laws or agreements with municipalities. Additionally, MGC discharges wastewater into rivers, the sea or other public water bodies in compliance with effluent standards after treating it to filter out identified pollutants.

Internal carbon pricing

In April 2021, MGC adopted an internal carbon pricing scheme to quantify climate-change risks. When planning capital expenditures that would result in increased or reduced CO_2 emissions, MGC factors into its investment decisions a cost or benefit based on an internal carbon price (¥10,000/Mt Co_{2e}). By doing so, it promotes reduction of CO_2 emissions and development of technologies and products that contribute to building a low-carbon society.

Biodiversity conservation

MGC endeavors to reliably manage chemicals based on Responsible Care®, mitigate climate change by improving energy efficiency and reducing GHG emissions and maintain a richly biodiverse natural environment. MGC also contributes to sustainable development by creating environmentally beneficial technologies and products and promoting their widespread adoption.

Renewable energy use

- MGC has been involved in geothermal power generation since 1990. A joint venture co-owned by MGC constructed the Wasabizawa Geothermal Power Plant and has been operating it since April 2019. In August 2019, a second joint venture co-owned by MGC commenced construction on another geothermal power plant in Appi, Iwate Prefecture, scheduled to be commissioned into operation in April 2024.
- Additionally, MGC's QOL Innovation Center Shirakawa (Fukushima Prefecture) and Niigata Research Laboratory (Niigata Prefecture) are equipped with photovoltaic systems that generate power for on-site consumption.

Related links

→ Environmental Management

→ Response to Climate Change (Disclosure Based on the TCFD Recommendations)

→ Biodiversity Conservation

Environmental Management

Environmental Management System (ISO14001) (Non-consolidated)

All MGC plants have obtained Environmental Management System registration (ISO14001).

		ISO14001 Registration Date	
Plant Registered	Registration Number	(1996 version)	(2015 version)
Niigata Plant	1162-1998-AE-KOB-RvA	June 1998	November 2017
Mizushima Plant	JCQA-E-0145	May 2000	May 2018
Yokkaichi Plant Naniwa Plant Saga Plant	JQA-EM0502	August 1998 (As the Yokkaichi Plant)	August 2017
Kashima Plant	JQA-EM0345	February 1999	January 2018
Yamakita Plant	JQA-EM0859	May 2000	May 2018

Production-related Input and Output (MGC non-consolidated and domestic MGC Group companies)

Primary production-related inputs and outputs for the non-consolidated MGC and domestic MGC Group in fiscal 2023 were as follows:

Input	
Raw materials	0.71Mt
Energy (as crude oil equivalent)	379ML
Water intake	30Mm^3

Output	
Product	0.79Mt
GHG emissions	783,000t -CO_2
Wastewater	27Mm^3
External waste discharge	31,000t
Recycling	30,000t

Environmental Preservation Investments (Non-consolidated)

MGC began undertaking environmental preservation investments in fiscal 2015, and it has continued these investments for ten years as of fiscal 2024.

These investments include investment items that, although they may be very effective in reducing environmental load, may be less likely to be adopted due to long payback periods or for other reasons, as well as investment items that lead to preservation of biodiversity, recruited through proposals from the various MGC sites. A secretariat consisting of the Environment, Safety and Quality Assurance Division and the Production Technology Division at corporate headquarters then select the items to implement and secure the required budget, before executing the investment.

The measures taken in the last ten years include the non-use of specified chlorofluorocarbons by replacing refrigeration equipment used in manufacturing, the reduction of power consumption by introducing inverter controlled rotating equipment, power saving by using thermal barrier coatings on buildings and thermal barrier films attached to windows and the improvement of work environments, the replacement of air-conditioning systems with energy-efficient systems, and the replacement of fluorescent lights and mercury lamps with LED lights to avoid the use of mercury and save energy.

With a cumulative investment of approx. 1.3 billion yen over the ten years, a reduction of a total of about 8,400 t-CO2e in greenhouse gas emissions was achieved.
MGC will continue to invest to reduce environmental impact.

Environmental Accounting (Non-consolidated)

Through environmental accounting in accordance with guidelines by the Ministry of the Environment, MGC has quantitatively calculated and released the investment amount and costs of environmental preservation required for the business activities of non-consolidated, as well as the real economic benefits obtained.

- Investment amount
  The total amount of investment related to environmental preservation activities in fiscal 2024 was approximately 1.1 billion yen. The main investments were R&D investment relating to gas barrier materials and circular carbon methanol (CCM) production.
- Expenses
  Total expenses related to environmental conservation activities in fiscal 2024 were approximately 11 billion yen. Of these, the highest expense was about 2.9 billion yen for R&D cost, accounting for around 27% of the total.
- Economic benefits
  The reduction of expenses through energy saving measures and the income from the sale of unneeded items generated in our business activities were recorded as real economic benefit.

Environmental Preservation Cost (Investments and Costs Classified According to Business Activity)

Breakdown			Main areas of activity	FY2023 (millions of yen)		FY2024 (millions of yen)	
				Investment	Expenses	Investment	Expenses
Onsite cost	Pollution prevention cost	Air pollution prevention	Exhaust gas treatment expenses, costs related to exhaust gas analysis	16.1	553.7	12.5	961.1
		Water pollution prevention	Updating of aging facilities, updating of wastewater treatment facility	108.9	1,293.4	55.7	1,533.5
		Soil, Noise	Costs related to ground subsidence	0.6	46.5	0.0	3.2

Breakdown		Main areas of activity	FY2023 (millions of yen)		FY2024 (millions of yen)	
			Investment	Expenses	Investment	Expenses
Onsite cost	Global environmental preservation cost	Costs for upgrading to energy-efficient equipment and on-site power generation	263.1	1,432.7	292.6	1,775.9
	Resource recycling cost	Liquid waste treatment costs and waste 3R promotion costs	13.7	763.8	0.0	1,991.2
Up or down stream cost		Environmental label maintenance costs	14.3	5.9	0.0	1040.1
Management activity cost		Environmental legal and regulatory compliance costs, and EMS operating costs	0.5	398.5	3.3	698.5
R&D cost		Research and development of energy-saving technologies and eco-friendly products	1,187.1	28.4	808.2	2986.7
Social contribution cost		Membership dues of nature conservation organizations	0.0	16.0	0.0	43.9
Environmental damage cost		Pollution impacts levy	0.0	57.9	0.0	30.7
Total			1,604.3	4,596.8	1,172.3	11,064.7

Economic benefit

Title	Item	FY2023 (millions of yen)	FY2024 (millions of yen)
Income	Profit on sale of valuable waste, etc.	22.2	28.2
Reduction of expenses	Effects due to energy saving	225.2	867.0

Compliance with the Ministry of the Environment's Environmental Accounting Guidelines 2005
Period:From April 1, 2024 to March 31, 2025
Scope:Non-consolidated
Methods:Investments were apportioned according to the ratio of the approved or enforced amount of capital expenditure to environmental preservation.
Expenses were apportioned according to the ratio of expenses related to environmental preservation and include depreciation allowance.

Response to Climate Change(Disclosure Based on the TCFD Recommendations)

In May of 2019, MGC declared its support for the recommendations of the Task Force on Climate-related Financial Disclosures (the "TCFD").

Tackling climate change is a major challenge that calls for initiatives on a global scale if we are to achieve a sustainable society. MGC recognizes that solving energy and climate change problems is an important issue, and is working to solve these issues in terms of both mitigating and adapting to climate change.

Specifically, MGC has formulated targets for reducing Scope 1 and 2*1 greenhouse gas (GHG) emissions and is working toward their steady reduction. At the same time, MGC is proactively disclosing information on Scope 3*2 GHG emissions and is taking action to reduce them in collaboration with its suppliers. MGC is working to improve energy efficiency and the carbon cycle of raw materials, and to promote energy transition toward the goal of achieving a zero-carbon society by 2050. MGC will also contribute to solving energy and climate change problems through business operations by deploying innovative process technologies and factoring whole-lifecycle GHG emissions into its design and development processes.

In March 2021, MGC announced a new objective for achieving carbon neutrality by 2050 with the goal of limiting the increase in average temperature to below two degrees Celsius. MGC encourages the building of energy systems to achieve carbon neutrality, and aims to expand the range of products conducive to carbon neutrality.

*1 Scope 1 emissions are GHG emissions directly generated by MGC. Scope 2 emissions are indirect GHG emissions associated with the use of energy (mainly electric power) purchased from external suppliers.
*2 Scope 3 emissions are indirect GHG emissions generated in supply chains through organizational activities such as raw material sourcing, manufacturing, distribution, sales and waste disposal.

1. Governance

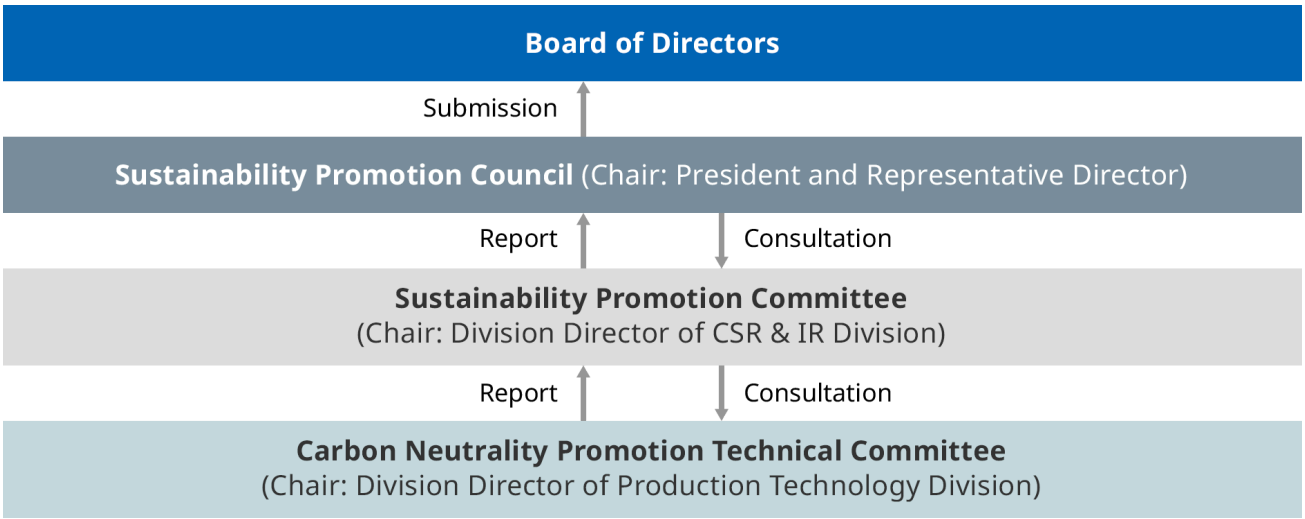
The Sustainability Promotion Council, chaired by the President and composed of members of the Board of Directors and executive officers at the level of Senior Managing Executive Officer or higher, deliberates and makes decisions on addressing climate change risk and other key Sustainability issues (materiality). Important matters to be deliberated at the Sustainability Promotion Council is resolved by the Board of Directors.

The participation of corporate sector heads on the Sustainability Promotion Committee, an advisory body to the Sustainability Promotion Council, ensures key Sustainability issues are adequately deliberated.

To develop a response to climate change, MGC has established the Carbon Neutrality Promotion Technical Committee, a Sustainability Promotion Expert Committee that advises the Sustainability Promotion Committee. As the administrative office for dealing with TCFD and CDP requirements, the Climate change Action Technical committee promotes cross-business initiatives.

Long-term objectives for reducing GHG emissions have been incorporated in the Medium-Term Management Plan, with management taking a leading role in their implementation.

Climate Change Governance Structure



2. Strategy: Responding to Climate Change Risks and Opportunities

Assumptions behind the Analysis and Assessment of Transition Risks and Business Opportunities

- Assessment years: 2030, 2050
- Scenario
  Main external information referred to in the decarbonation scenario

  -IEA WEO2021 SDS

  -IEA WEO2022 APS

  -SSP1

  Main external information referred to in the business-as-usual scenario

  -IEA WEO2021 STEPS

  -IEA WEO2022 STEPS

  -SSP2
- Analysis subjects
  Specialty Chemicals Business Sector (hydrogen peroxide, electronic chemicals, optical materials, polycarbonate, oxygen absorbers, electronic materials)
  Green Energy & Chemicals (GEC) Business Sector (MXDA, MX Nylon)
- Quantitatively assess the impacts of risks and opportunities on the existing business portfolio and formulate response measures

Results of Transition Risks and Opportunities in the Decarbonization Scenario

Specialty:Specialty Chemicals Business Sector　GEC:Green Energy & Chemicals Business Sector　If applicable: ★

Factor	□ Risk ○ Opportunity	Specialty	GEC	Impact on business	Main response measures
Policies and regulations	□○	★	★	More stringent regulatory measures, such as carbon taxes	・Increased efficiency in energy usage ・Development of decarbonization processes ・Decarbonization of raw materials and fuels ・Promotion of GHG emission reduction in production processes (including logistics)
	□○		★	Rapid proliferation of renewable energy	
	○	★		Increase in infrastructure demand associated with electricity transmission infrastructure development	
Technology	□○	★	★	Rapid progress in technological innovation	・Expansion of research and development ・Implementation of cross-value innovation ・Expansion of high-value-added product grades ・Expansion of low-power-consumption product grades
	○	★		Increased functionality of electronic devices	
	○	★		Technological innovation driven by demand for more efficient electricity consumption	

Factor	□ Risk ○ Opportunity	Specialty	GEC	Impact on business	Main response measures
Markets	○	★	★	Increase in demand for high-value-added products driven by high economic growth	・Expansion of high-value-added product grades ・Development of new products to meet the needs of decarbonized societies ・Decarbonization of raw materials and fuels
	○	★	★	Decline in fossil fuel prices due to shift away from dependence on fossil fuels	
	○	★	★	Increased recognition of environmental value driven by shift toward a circular, decarbonized economy	
	□○	★		Increase in semiconductor content driven by expansion of battery electric vehicles	

Results of Transition Risks and Opportunities in the Business-as-Usual Scenario

Factor	□ Risk ○ Opportunity	Specialty	GEC	Impact on business	Main response measures
Environment	□	★	★	Impact on plant operations due to increased severity of natural disasters	・Enhancement of BCP
	□	★	★	Supply chain disruption	
Technology	□○	★	★	Delayed technology development due to lack of international cooperation	・Implementation of cross-value innovation
Markets	○	★	★	Marked increase in population compared with decarbonization scenario	
	□○	★	★	Sluggish economic growth compared with decarbonization scenario	
	□○	★	★	Increase in fossil fuel prices	

Assumptions behind scenario analysis for physical risks fiscal 2025

- Evaluation period: July to December 2024
- Evaluation point: 2030, 2050
- Scenario: Global warming
  Main external information referenced in the 2°C scenario

  -SSP1-2.6 (RCP2.6): A world where global decarbonization progresses, and the average global temperature increase by 2100 is limited to 1.5-1.8°C above pre-industrial revolution average.

  Main external information referenced in the 4°C scenario

  -SSP5-8.5: A world where the global community fails to implement climate measures, and CO2 emissions double by 2050, resulting in a 4.4°C increase in average global temperature by 2100 above pre-industrial revolution average.
- Analysis subjects: 52 sites of the Mitsubishi Gas Chemical Group in Japan and overseas
- The increased risk of weather disaster due to climate change is evaluated as the potential for damage to the Company's business sites based on published hazard information and material provided by external experts.
- Weather disasters subject to evaluation: river flooding and storm surges
- Main information used in screening evaluation to ascertain the potential for damage to business sites: Ministry of Land, Infrastructure, Transport and Tourism's "Web-Based Flood Simulation Search System at an Arbitrary Point " and Fathom Global Flood Map
- Change from the FY2021 physical risk analysis: Changed from the highest hazard level (flood depth 2m: our own criteria) to the second highest level (flood depth 0.5m: Ministry of Land, Infrastructure, Transport and Tourism criteria). The scope was changed from a people-centric evaluation to one that also considers buildings and facilities.
- Main information used for quantitative evaluation of companywide financial impact amount of climate change for business sites evaluated to have a high level of hazard under the screening results: evaluating organization's flood damage calculation model and the Ministry of Land, Infrastructure, Transport and Tourism's "Manual for Economic Evaluation of Flood Control Investment (Draft) "

Impact of Increasing Weather Disasters Due to Global Warming on the Company's Business Sites

Type of weather disaster	Number of business sites evaluated as highly hazardous※1				
	Under current climate (Baseline)	2°C scenario		4°C scenario	
		2030	2050	2030	2050
River flooding	12	12	12	12	13
Storm surge	2	3	3	3	3
	Economic impact amount (Millions of yen)※2				
River flooding	-	10	130	30	300
Storm surge	-	10	60	10	70

※1:Determination standard=Ministry of Land, Infrastructure, Transport and Tourism standard grade B and above

※2:Economic impact amount=Cumulative value of the sum of physical damage amount and opportunity loss amount from 2024 to the time of evaluation

3. Risk Management

MGC has identified key issues (materiality) related to the environment, society and governance, and manages risk through cross-company materiality management. One material issue that has been identified as extremely important from the perspective of stakeholders and MGC itself is a proactive response to environmental problems. MGC intends to take the initiative on this issue, a requirement for continuing our business operations and activities.

Under this scenario analysis, the result showed that the financial impact of climate change on the MGC Group is limited. Analyzing this result, we found that the reason is that the Group's business sites are generally not subject to high hazard risk due to the characteristics of their locations. However, we will conduct a more detailed analysis on the sites evaluated as highly hazardous as necessary going forward, and also strengthen our business continuity planning (BCP), while proceeding with measures such as developing multiple manufacturing sites, optimizing raw material and product inventories throughout the supply chain, and reducing equipment stoppage risk.

To gain a quantitative understanding of climate change risks, in April 2021 MGC introduced an internal carbon pricing system. In capital investment plans involving an increase or decrease in CO_2 emissions, the cost or effect of applying and converting the internal carbon price (10,000 yen/MT-CO_2 equivalent) will be used to help make investment decisions, promote CO_2 emissions reductions, and encourage the creation of technologies and products that contribute to building a low-carbon society.

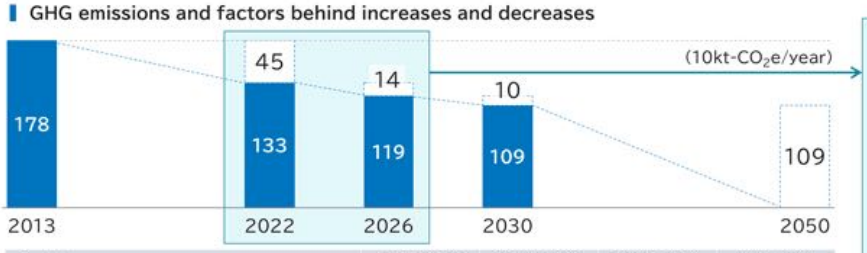
4.Metrics and targets

MGC group has established long-term objectives for reducing GHG emissions as it works toward achieving carbon neutrality by 2050. To achieve these objectives, MGC has established key performance indicators (KPIs) for GHG emissions and GHG emissions intensity. We are moving forward with short, medium and long-term emissions reduction strategies that include promoting energy savings activities, deployment of renewable energy, and Circular Carbon Methanol production.

Long-term GHG Emissions Reduction Targets

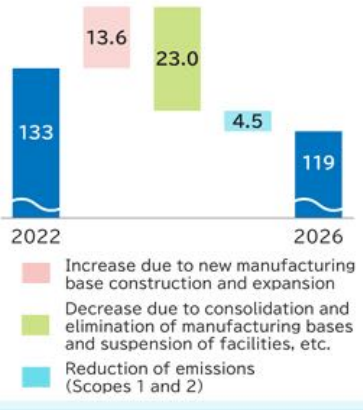
2026 target: 33% reduction from FY2013 baseline	2030 target: 39% reduction from FY2013 baseline	2050 target: carbon neutrality

GHG emissions and factors behind increases and decreases

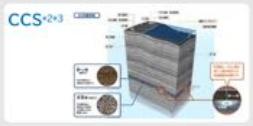


Period		2013-2022	2023-2026	2027-2030	2031-2050
Increase due to new manufacturing base construction and expansion		45.0	(13.6)	2.6	46.9
Decrease due to consolidation and elimination of manufacturing bases and suspension of facilities, etc.			23.0		
Reduction in emissions due to R&D collaboration*1					
Reduction of emissions (Scope 1)	Upgrade to highly efficient facilities, energy savings		1.9	2.6	10.0
	Fuel change		1.1	0.2	
Reduction of emissions (Scope 2)	Introduction of renewables and use of transitional energy		1.5	2.3	30.5
	Collaboration with energy supply companies			2.4	21.6

Changes in emissions due to business portfolio reforms from 2022 to 2026



Businesses and technologies contributing to emissions reduction









*1 Deploy new energy systems/CCUS, etc., *2 Carbon Capture and Storage, *3 Source: Japan CCS Co., Ltd., *4 Provided by Appi Geothermal Energy Corporation

Greenhouse Gas Emission Reduction

MGC considers risks associated with climate change to be an important business issue. It is moving forward with efforts to reduce emissions of greenhouse gas (GHG) and to reduce the negative impact of climate change on its business.
At the same time, new needs in society associated with climate change also represent a business opportunity. MGC recognizes that contributing to the achievement of a sustainable society through its products and technologies is an important issue.

Basic Approach to Climate Change Mitigation

1. Formulate targets for reducing Scope 1 and 2[*1] GHG emissions and steadily reduce them through planning, execution, monitoring and reassessment.
2. Assess, manage, monitor and proactively disclose Scope 3[*2] GHG emissions and take action to reduce them in collaboration with suppliers.
3. Improve energy efficiency and raw materials' carbon cycle and promote energy transition toward realization of a zero-carbon society by 2050.
4. Contribute to solving energy and climate change challenges through business operations by deploying innovative process technologies and factoring whole-lifecycle GHG emissions into design and development processes.
5. Disclose information through climate change initiatives[*3].

*1 Scope 1 emissions are GHG emissions directly generated by MGC. Scope 2 emissions are indirect GHG emissions associated with use of energy (mainly electric power) purchased from external suppliers.
*2 Scope 3 emissions are indirect GHG emissions generated in supply chains through organizational activities such as raw material sourcing, manufacturing, distribution, sales and waste disposal.
*3 MGC proactively participates in various collaborative activities to mitigate climate change (climate change initiatives).

Greenhouse Gas Reduction Targets

MGC has quantitative set targets for reducing GHG emissions (Scope 1 & 2) and is taking action to achieve those targets.

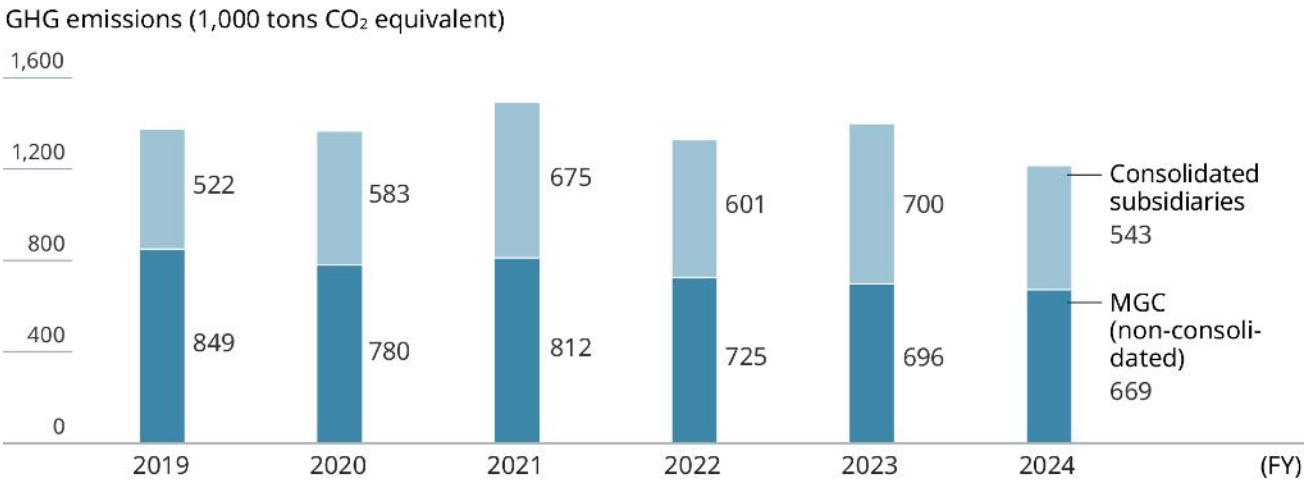
	2026	2030	2050
MGC Group	Reduce by 33% compared to 2013	Reduce by 39% compared to 2013	Achieve carbon neutrality

GHG Emissions

Results of energy consumption/GHG emissions in fiscal 2024

	Energy consumption	Scope 1 emissions	Scope 2 emissions
	(ML crude oil equivalent)	(1,000 tons CO_2 equivalent)	(1,000 tons CO_2 equivalent)
MGC Group	574	626	587
MGC (non-consolidated)	321	529	140
Consolidated subsidiaries	253	97	447

Scope 1 + 2 Emissions



Scope 3 Emissions (MGC Group)

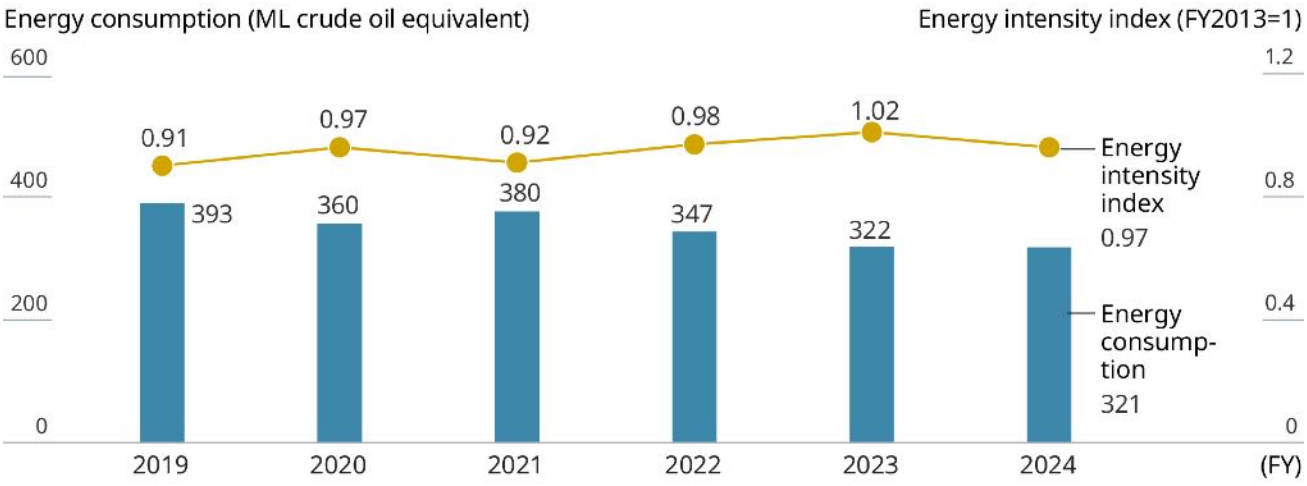
Scope 3 emissions in fiscal 2024

Category		Scope 3 Emissions (1,000 tons CO_2 equivalent)	
		MGC (non-consolidated)	MGC Group
Cat.1	Purchased goods and services	3,368	6,012
Cat.2	Capital goods	267	268
Cat.3	Fuel- and energy-related activities not included in Scope 1 or Scope 2	122	406
Cat.4	Upstream transportation and distribution	280	410
Cat.5	Waste generated in operations	15	40
Cat.6	Business travel	<1	1
Cat.7	Employee commuting	1	1
Cat.8	Upstream leased assets	3	4
Cat.9	Downstream transportation and distribution	148	183
Cat.10	Processing of sold products	–	–
Cat.11	Use of sold products	406	460
Cat.12	End-of-life treatment of sold products	2,956	3,185
Cat.13	Downstream leased assets	11	19
Cat.14	Franchises	0	0
Cat.15	Investments	–	–
Total		7,577	10,989

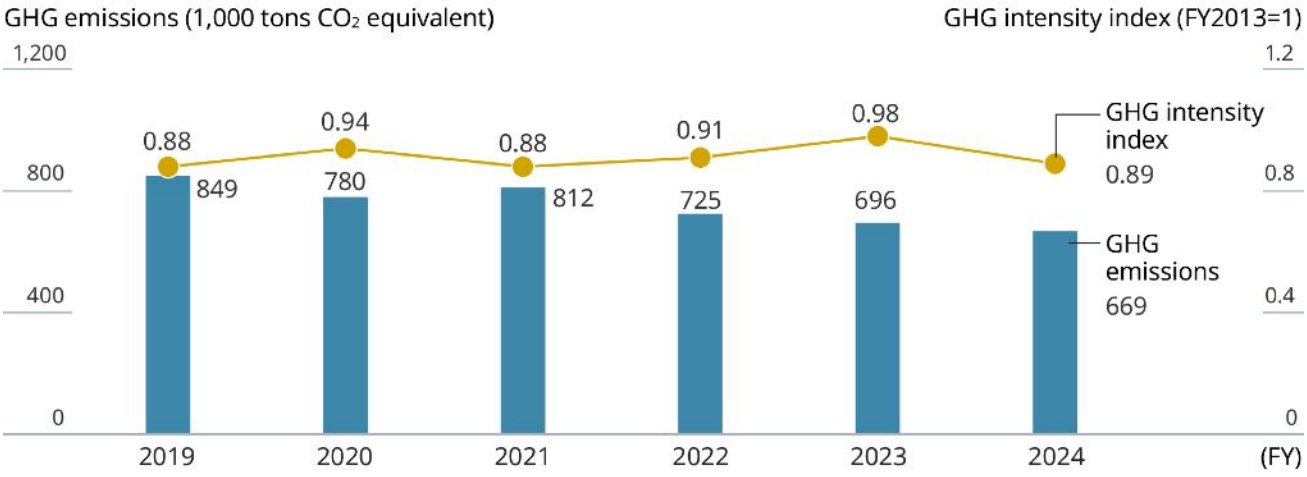
Energy-Saving and GHG Emission Reduction Initiatives (non-consolidated)

MGC is committed to energy conservation and GHG emission reduction. We will contribute to reducing environmental impact in terms of both resource conservation and GHG emissions from energy use by curtailing the use of fossil fuels. In fiscal 2024, we revised our co-generation systems and improved the controllability of distillation columns, among other initiatives. The GHG reduction effects from these measures are equivalent to 30,000 tons of CO2. In addition, we expanded the amount of renewable energy introduced as an energy source for production. The GHG reduction effects from the introduction of renewable energy are equivalent to 43,000 tons of CO2. In the future, we plan to enhance the recovery and utilization of byproduct fuels and implement energy conservation measures through reviewing manufacturing conditions, among other initiatives.

Energy consumption and energy intensity index of MGC (non-consolidated)



MGC non-consolidated GHG emissions and GHG intensity index



Third-Party Verification of Greenhouse Gas Emissions

A third-party organization has verified the GHG emission data reports disclosed by MGC to enhance reliability and transparency.

MGC GHG emissions (Scope1,2,3) have undergone third-party verification and have obtained a verification statement.

[Scope of Accounting and Verification]

Mitsubishi Gas Chemical Company, Inc., Scope1,2,3

[Targeted Period]

GHG emissions in FY2024 April 1, 2024 - March 31, 2025

[Accounting and Verification Standards]

GHG Protocol Corporate Accounting and Reporting Standard (reviced edition)
JIS Q 14064-3:2023 (ISO14064-3:2019)

[Verification Statement]

Verification Statement　Scope1,2,3 emissions in FY2024

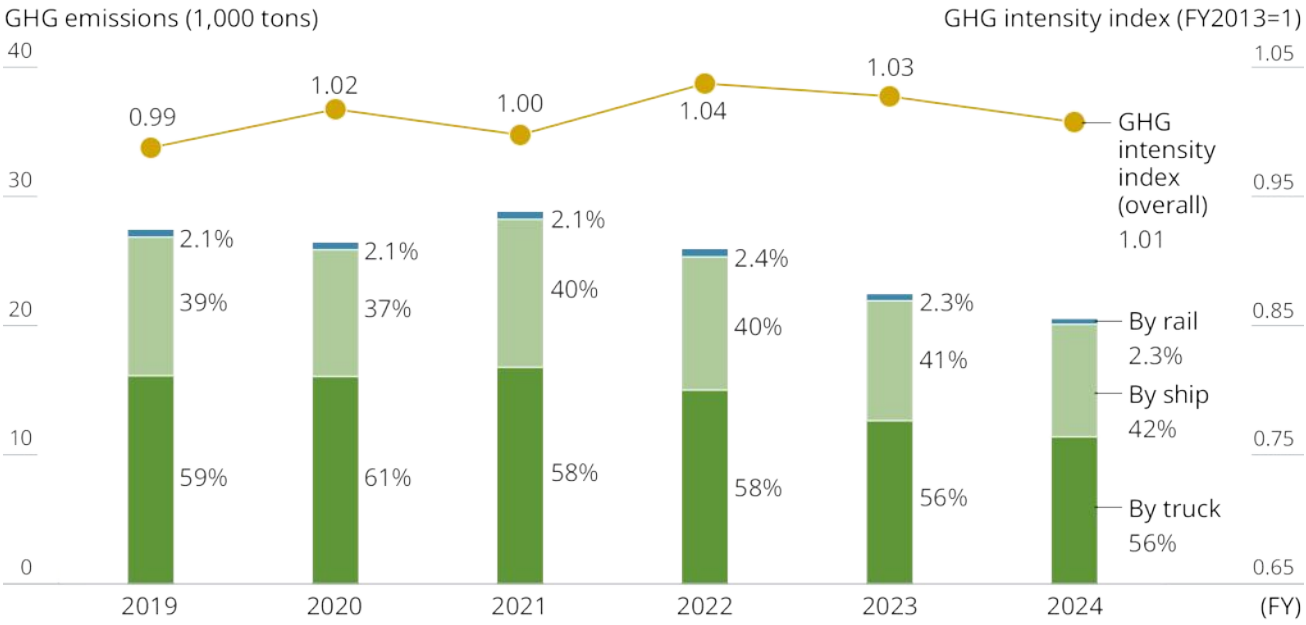


Independent Verification Report

Initiatives in the Transportation Sector (non-consolidated)

In the Transportation Sector, MGC is implementing measures with a focus on modal shifts to more environmentally-friendly transportation methods to reduce energy consumption and GHG emissions. GHG intensity improved by 1.5% in fiscal 2021.

MGC transportation sector CO_2 emissions



MGC Group products that contribute to reducing GHG emissions and that help lessen society's impact on the environment are featured on the Spotlight on Eco-Friendly Products page.

Spotlight on Eco-Friendly Products →

The Mitsubishi Gas Chemical Group is aiming to achieve carbon neutrality by 2050, and is advancing its challenge to reduce CO_2 emissions to net-zero using its unique technologies.

MGC's Vision of Carbon-Neutral World Circa 2050 →

Various environmental data including GHG data is reported in the Sustainability Data Book. In addition to this page, refer to the Sustainability Data Book.

Sustainability Data Book →

Response to Natural Capital (Disclosure Based on the TNFD Recommendations)

In July 2025, MGC endorsed the recommendations of the Taskforce on Nature-related Financial Disclosures (TNFD)*1 and registered as a "TNFD Adopter"*2.

In December 2022, at the 15th Conference of the Parties to the United Nations Convention on Biological Diversity (CBD COP15), the Kunming-Montreal Global Biodiversity Framework was adopted, setting the goal to “take urgent action to halt and reverse biodiversity loss to put nature on a path to recovery” (i.e., Nature Positive) as the mission up to 2030. Furthermore, in September 2023, the TNFD published its final recommendations with the aim of supporting nature-positive outcomes.

MGC recognizes that our business activities depend on various benefits derived from natural capital and biodiversity, and that they also have an impact on them. For example, while water and natural gas are essential resources for our business activities, excessive use of these resources may have a negative impact on the natural capital that is their source. Therefore, we believe that reducing negative impacts on natural capital and biodiversity, and promoting positive impacts, are important for our business activities and the sustainable development of society.

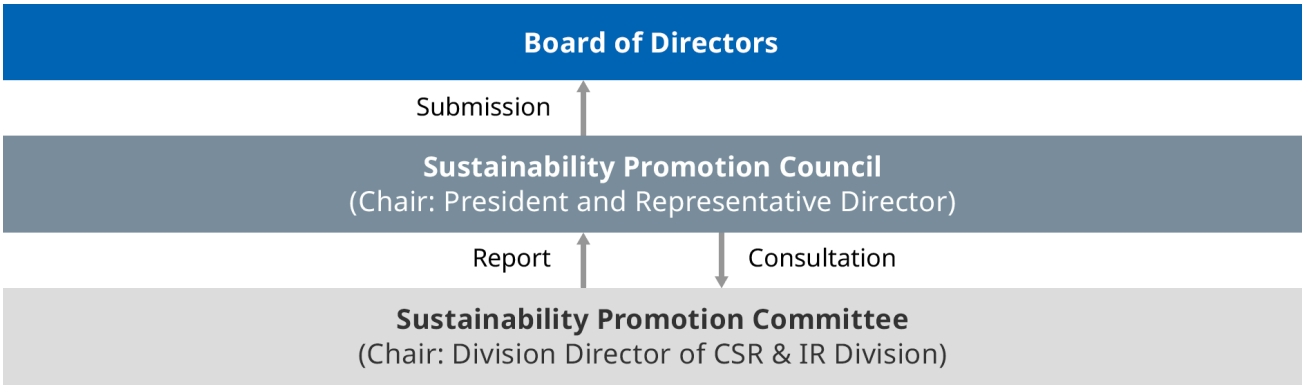
Against such as backdrop, MGC is promoting and disclosing nature-related issues (dependencies, impacts, risks, and opportunities) in line with the TNFD recommendations, with the aim of realizing a nature-positive society. In fiscal year 2024, MGC evaluated nature-related issues for direct operations, including product manufacturing in the Specialty Chemicals Business Sector and Green Energy & Chemicals Business Sector and for major businesses in which we are involved.

*1 An international initiative established to develop a framework for nature-related risk management and information disclosure by companies and organizations.
*2 A company or organization that has expressed the intention to disclose information in accordance with the TNFD recommendations.

1. Governance

MGC deliberates and makes decisions on addressing nature-related risks and other key sustainability issues in the Sustainability Promotion Council, chaired by the President and composed of members of the Board of Directors and executive officers at the level of Senior Managing Executive Officer or higher. Important matters deliberated upon in the Sustainability Promotion Council are decided by the Board of Directors.
The participation of corporate sector heads in the Sustainability Promotion Committee, an advisory body to the Sustainability Promotion Council, ensures key sustainability issues are adequately deliberated, and escalated to the Sustainability Promotion Council.

Governance Structure



In October 2023, MGC established the "Mitsubishi Gas Chemical Group Human Rights Principle" to fulfill its responsibility to respect the human rights of various individuals impacted by MGC's business activities. If nature-related human rights risks are identified within MGC's value chain, the company will take appropriate actions to respect human rights. Furthermore, MGC aims to be a company trusted and supported by society by creating opportunities for communication with various stakeholders and fulfilling its responsibilities toward them.

2. Strategy

Dependencies and Impacts

MGC organized the dependencies and impacts of its business activities on nature, based on the results of ENCORE*3 and its operational characteristics. The heatmap visualizing the findings is as follows.
Based on the heatmap, it was considered that all business sectors have significant impacts on nature, including land-use change, water use, natural resource use, and soil pollution. Additionally, MGC's dependency on ecosystem services for the supply of resources such as water and natural gas was evaluated as significant.
Water resources are essential as MGC uses freshwater in its chemical manufacturing processes, and access to an adequate quantity of high-quality freshwater is considered essential for our business operations.

*3 A tool for assessing the extent to which business activities are dependent on and impacting nature.

Organized Results: Importance of Impacts on Nature

	Product manufacturing in the Specialty Chemicals Business Sector and the Green Energy & Chemicals Business Sector	Natural gas field development	Natural gas power Generation and Geothermal power generation
Land-use change	H	VH	VH
Freshwater-use change	VL	VH	VL
Ocean-use change	VL	VH	VL
Water use	VH	VH	VH
Other resource use (including mining)	H	VH	VH
Non-GHG air pollution	M	H	M
Water pollution	H	H	M
Soil pollution	VH	H	H
Waste	H	H	VL
Disturbances	L	H	VL

Organized Results: Importance of Dependencies on Nature

	Product manufacturing in the Specialty Chemicals Business Sector and the Green Energy & Chemicals Business Sector	Natural gas field development	Natural gas power Generation and Geothermal power generation
Water supply	VH	VH	VH
Genetic material	VL	VL	VL
Biomass provisioning	L	VL	VL
Other provisioning services (including natural gas)	H	VH	VH
Pollination	VL	VL	VL
Soil and sediment retention	L	L	M
Water flow regulation	M	M	M
Solid waste remediation	VL	VL	VL
Water purification	H	H	M
Flood mitigation	M	M	M
Air filtration	L	M	L
Soil quality regulation	VL	VL	VL
Nursery population and habitat maintenance	VL	VL	VL
Local climate regulation	L	VL	VL
Biological control	VL	VL	VL
Rainfall pattern regulation	VL	VL	VL
Storm mitigation	M	M	M
Noise attenuation	L	H	VL

Legend

VH	Very high materiality rating
H	High materiality rating
M	Medium materiality rating
L	Low materiality rating
VL	Very low materiality rating

Analysis of Priority Locations

MGC has identified regions (Priority Locations) that have significant dependencies and impacts on nature and require prioritized analysis and responses. This identification was conducted for 102 locations, including consolidated subsidiaries, based on two perspectives: Material Locations*4 and Sensitive Locations*5.
Material Locations were identified based on the previously mentioned heatmap, considering the presence or absence of business activities with significant dependencies and impacts on nature, as well as their impact on management.
Sensitive Locations were identified based on TNFD's published materials, using five perspectives: "Areas of high ecosystem integrity," "Areas of rapid decline in ecosystem integrity," "Areas important for biodiversity," " Areas of high physical water risks," and " Areas of importance for ecosystem service provision."

Investigation Details for Extracting Sensitive Locations

Survey Items for Extracting Sensitive Locations	Main Investigation Details
Areas of high ecosystem integrity	• Understanding ErII (Ecoregion Intactness Index) at Each Site
Areas of rapid decline in ecosystem integrity	• Understanding ErII (Ecoregion Intactness Index) at Each Site
Areas important for biodiversity	• Understanding STAR (Species Threat Abatement and Restoration) Indicator Values at Each Site • Understanding KBA (Key Biodiversity Area) at Each Site
Areas of high physical water risks	• Using the WRI Aqueduct Water Risk Atlas to Understand Indicator Values for Physical Risk Quantity and Physical Risk Quality at Each Site
Areas of importance for ecosystem service provision	• Using Critical Natural Asset Layers to Understand NCP (Nature’s Contributions to People) Indicator Values at Each Site

As a result, in fiscal year 2024, three priority areas were identified: the "Niigata Plant of Mitsubishi Gas Chemical Co., Inc. (Japan)", the "Arizona Plant of MGC Pure Chemicals America, Inc. (USA)", and "PT Peroksida Indonesia Pratama (Indonesia)". Moving forward, we plan to investigate the current state of environmental impact and the condition of nature in these priority areas. We also plan to disclose the evaluation results related to dependencies and impacts.

*4 Locations identified that have nature-related issues material to the company.
*5 Locations where business activities are in contact with areas where nature is important.

3. Risk and Impact Management

MGC is conducting analysis and evaluation of nature-related issues based on the LEAP approach*6. Specifically, MGC organizes the dependencies and impacts related to nature by utilizing ENCORE results and considering the characteristics of our business operations. Based on the organized results and publicly available information, we identify regions with high priority for analysis and response (Priority Locations).
Moving forward, MGC plans to evaluate dependencies and impacts at the identified Priority Locations based on site-specific information, and to organize and evaluate countermeasures. Furthermore, using the organized results of dependencies and impacts along with diagnostic findings for Priority Locations, MGC will identify risks and opportunities, conduct a qualitative assessment of their financial impacts, and evaluate response strategies.

Additionally, MGC manages dependencies and impacts on nature, such as wastewater and waste management, at each plant, as identified and evaluated above. Nature-related risks and opportunities are identified, assessed, and response strategies are formulated by the Sustainability Promotion Department within its CSR & IR Division. The results of these evaluations and considerations are deliberated by the Sustainability Promotion Committee and then submitted to the Sustainability Promotion Council for further discussion.

*6 An integrated approach for evaluating nature-related issues, including identifying points of connection with nature, diagnosing dependencies and impacts on nature, and assessing risks and opportunities.
(LEAP:Locate, Evaluate, Assess, Prepare)

4. Metrics and Targets

MGC monitors and measures water usage by tracking intake volumes, discharge volumes, water consumption, and recycled water volumes to gain a comprehensive understanding of its water usage practices and promote efficient utilization. In addition, MGC compiles environmental data annually, including the volume of industrial waste generated, final disposal amounts, emissions of non-GHG air pollutants such as SOx and NOx, and the release of water pollutants such as BOD and COD. These environmental impact data are published each year in the Sustainability Data Book.

MGC has established targets in its medium-term management plan to reduce the Zero Waste Emission Rate (amount of final disposal/total industrial waste generated) to 1.2% by fiscal year 2026 and further to 1.0% by fiscal year 2030. These targets apply to MGC's non-consolidated operations and domestic consolidated subsidiaries.
In fiscal year 2024, MGC achieved a zero-emission waste disposal rate of 1.1%. Additionally, under the Responsible Care Medium-Term Plan, MGC aims to reduce plastic waste emissions by 10% compared to fiscal year 2023 by fiscal year 2026 and to achieve a water reuse rate of over 95% (non-consolidated). In fiscal year 2024, MGC successfully reduced plastic waste emissions by 10.6% compared to fiscal year 2023 and achieved a water reuse rate of 94%. Looking ahead, MGC will consider establishing indicators and targets aligned with TNFD disclosure metrics.

Water Resource Conservation

MGC group companies recognizes that water, a blessing of nature, is essential for business activities, and that it is important to enable sustainable use of water without compromising on water quality, and is working on a variety of relevant initiatives.

Water Resource Risk Management

MGC uses large quantities of water, both as a raw material for manufacturing chemical products and for various other purposes, including steam-heating and cooling in chemical manufacturing processes, and as water for product refining and for cleaning product containers. In this way, MGC recognizes that it is essential to provide sufficiently high-quality water in continuing its business.

To sustainably use water resources essential to manufacturing chemicals, MGC manages a variety of risks. Specifically, MGC monitors its actual water consumption and uses water efficiently by measuring water withdrawal, water discharge, water usage and water recycling. In drawing from water sources, MGC restricts its intake to permitted quantities in accord with applicable laws or agreements with municipalities. Additionally, MGC discharges wastewater into rivers, the sea or other public water bodies in compliance with required effluent standards after treating it to filter out identified pollutants. Data on these water-related environmental impacts are published in "Pollution Prevention" page and "Sustainability Data Book".

Additionally, MGC maintains a sanitary water-use environment at all its sites to provide MGC employees and the employees of our partners with access to properly functioning, safely managed sanitary facilities (wash service).

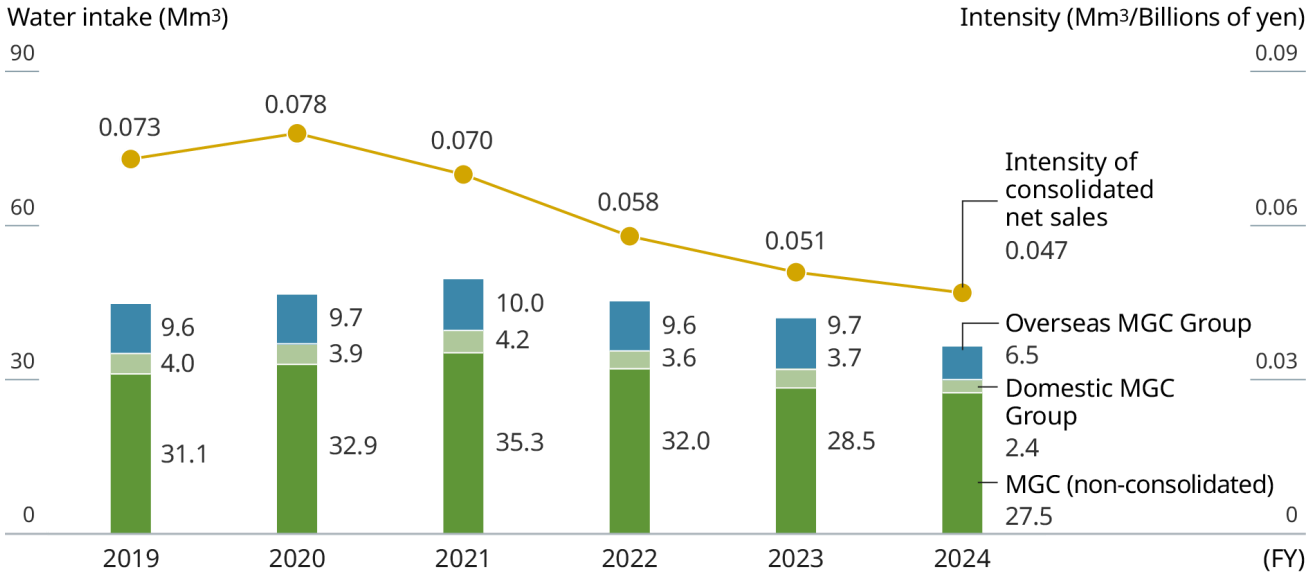
From a business continuity standpoint, production downtime due to drought or flooding of production facilities have been identified as a water-related risk at each production site.

Each production site has formulated the business continuity plan (BCP) that addresses this risk and implemented measures to mitigate it. None of the river-basins in the areas in which MGC's plants are located has experienced either adverse impacts on production activities due to water stress or conflicts with stakeholders regarding use of water resources.

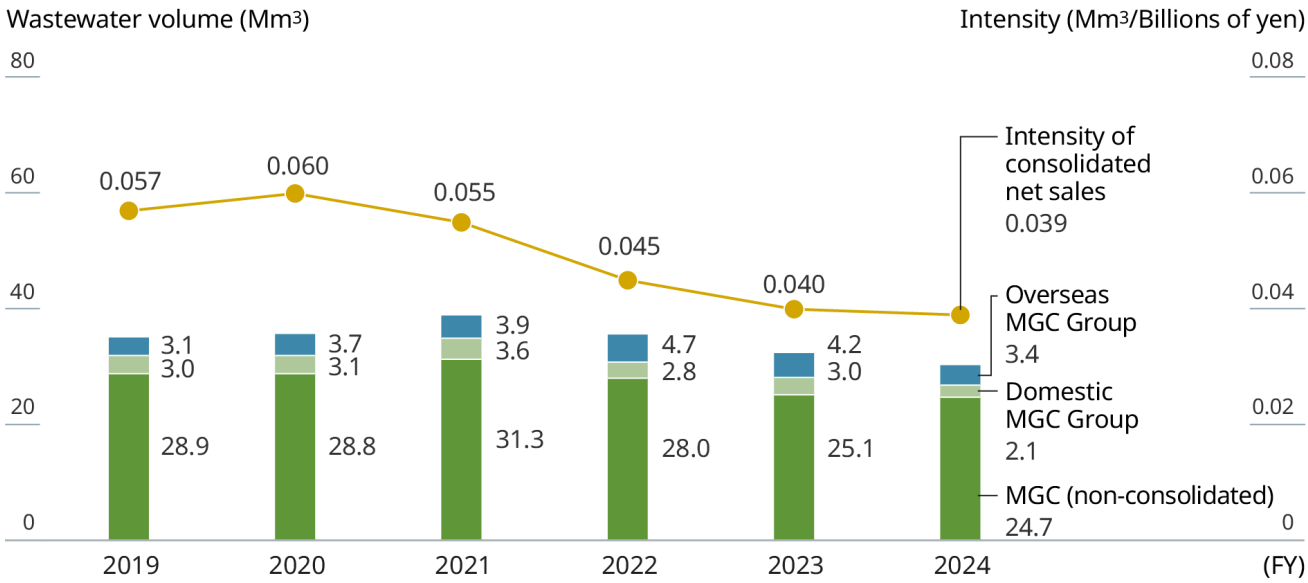
As for water-related opportunities, businesses developed by MGC and its Group companies include businesses that provide solutions for issues surrounding the coolant water of air conditioning equipment and cooling systems. We provide solutions to water issues, such as water treatment agents that have the effect of sterilizing disease-causing legionella bacteria and that maintain healthy coolant water quality, and a comprehensive water treatment system service offered through affiliate Dia Aqua Solutions Co., Inc.

Water Intake / Wastewater Volume (MGC Group companies)

Water intake/ Intensity of consolidated net sales



Wastewater volume/ Intensity of consolidated net sales



*For the data for the overseas MGC Group, the total value for the calendar year is added as is in the fiscal year value.

Waste Reduction and Resource Recycling

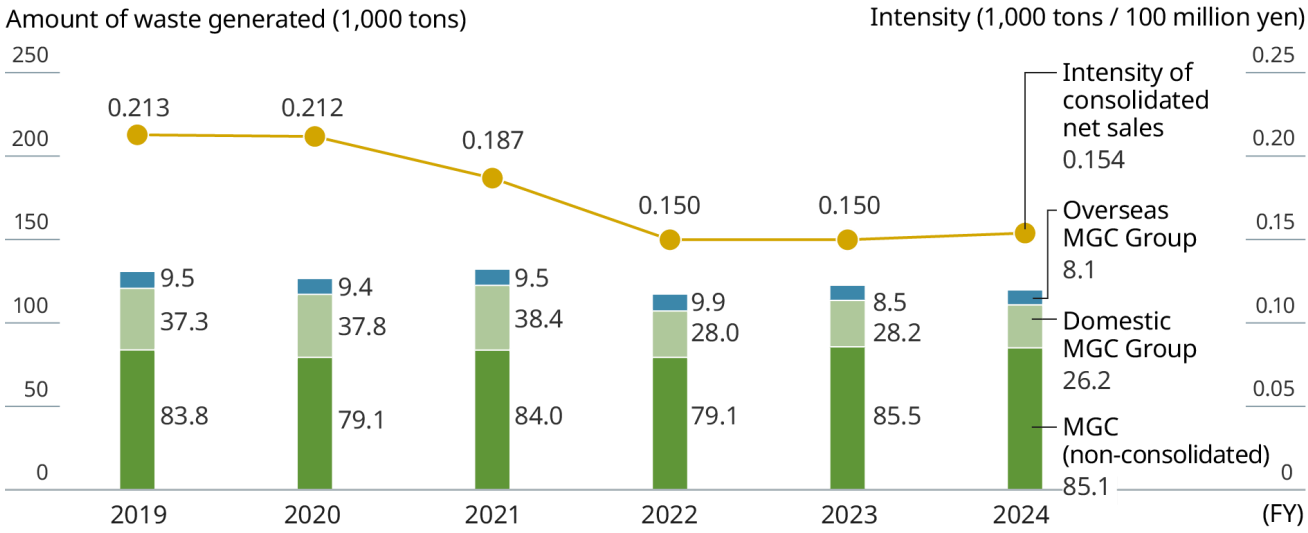
Each MGC Group company is striving to reduce industrial waste by promoting the 3Rs of waste (Reduce, Reuse, Recycle), and to undertake the proper disposal of waste in accordance with law.

Basic Approach to Resource Use

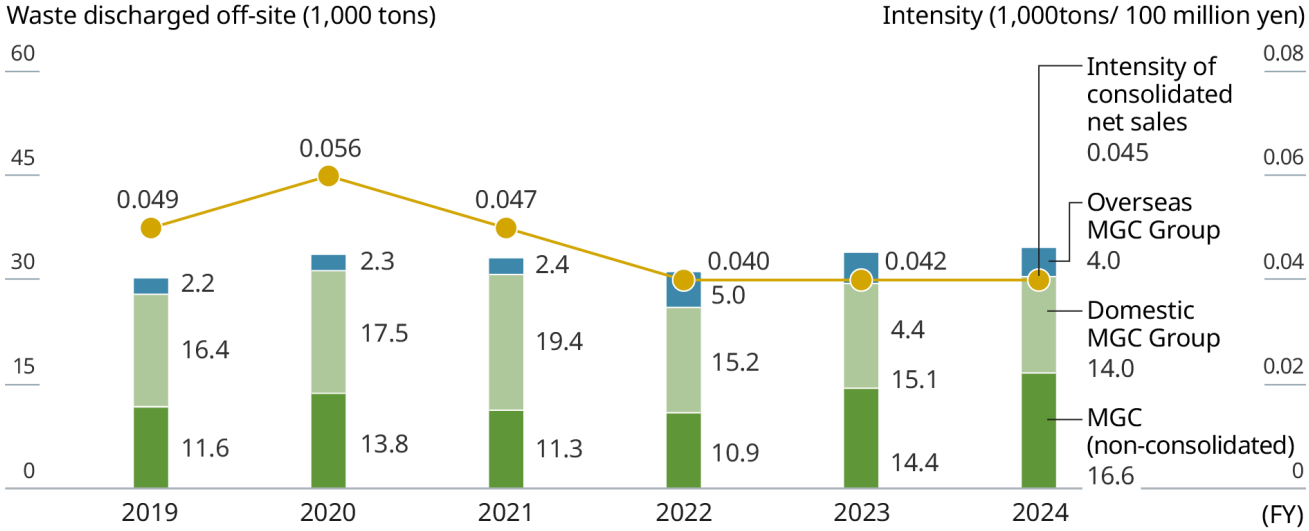
The MGC Group promotes the efficient use of resources (including raw materials, water resources, fuels, and energy) and the development of innovative process technologies at its domestic and overseas production sites, which increases production efficiency and reduces the environmental impact of its production activities. With these initiatives, the MGC Group endeavors to reduce industrial waste emissions and final disposal amount. Further, the waste generated during product manufacturing and the waste disposed of after the use of products lead to Scope 3 GHG emissions. The MGC Group will therefore strive to reduce waste in this regard as well.

Reducing Waste (MGC Group companies)

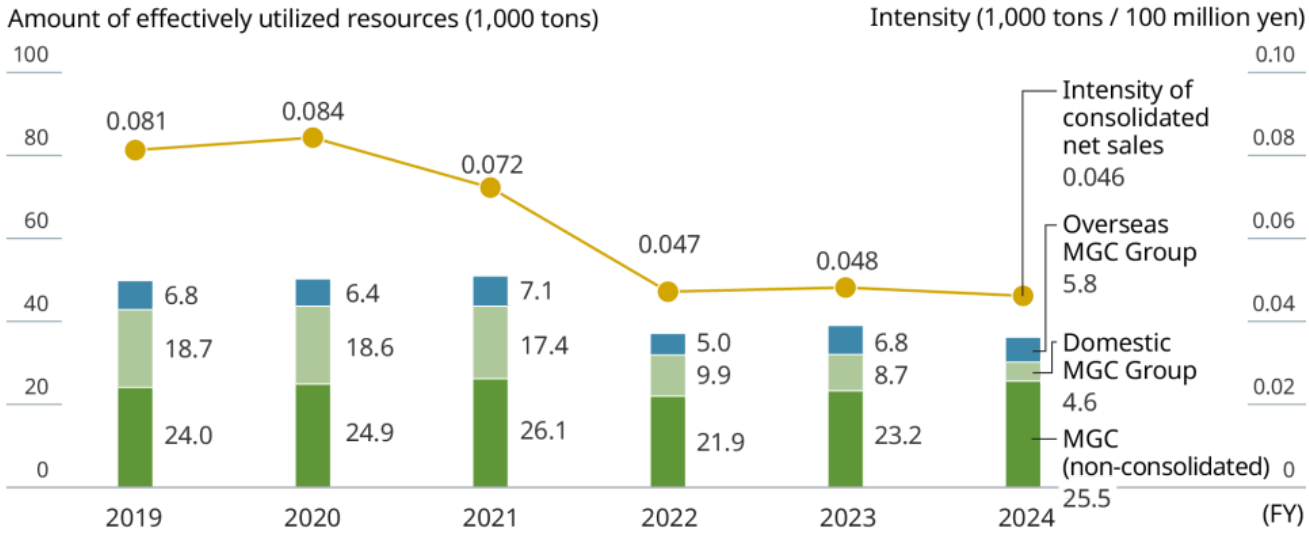
Amount of waste generated/ Intensity of consolidated net sales



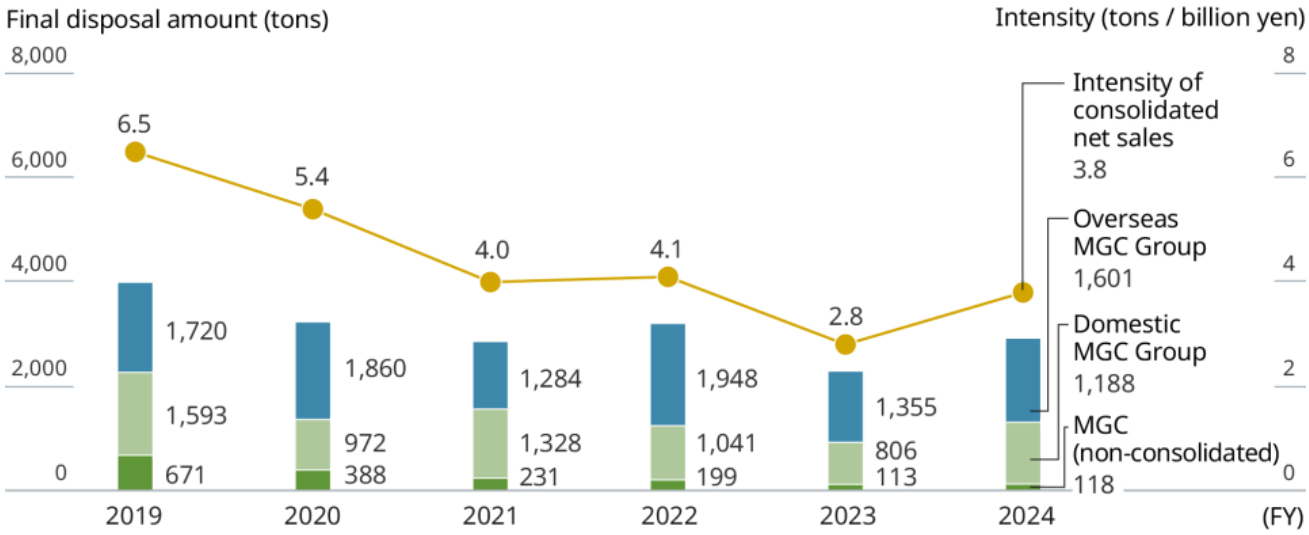
Waste discharged off-site/ Intensity of consolidated net sales



Amount of effectively utilized resources/ Intensity of consolidated net sales



Final disposal amount/ Intensity of consolidated net sales

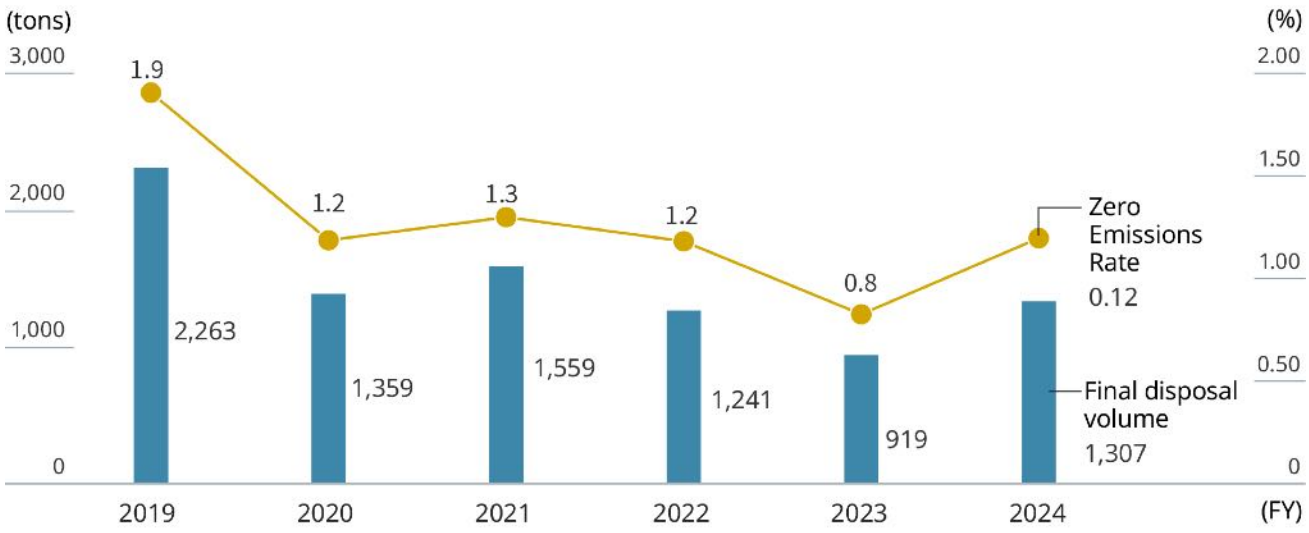


Zero Industrial Waste Emissions Rate (Non-consolidated and Domestic MGC Group)

MGC (non-consolidated) and domestic MGC Group companies have defined the industrial waste emissions rate as the percentage obtained by dividing the final disposal amount of industrial waste by the amount of industrial waste generated. They are working to reduce the rate to zero. The emissions rate is positioned as a KPI in the Grow UP 2026 plan, and the target for fiscal 2026 is 1.2% or lower.

The emissions rate in fiscal 2024 was 1.2%.

Final disposal volume and Zero Emissions Rate (Non-consolidated and Domestic MGC Group)



Reduction of Plastic Waste

Our Approach to Plastic Resource Circulation

Our Group includes companies that manufacture plastic products, manufacture resins that are used as raw materials for plastic products, and process plastic parts.

These companies are constantly trying to reduce plastic waste emissions by improving yields in manufacturing and processing and recycling resin by-products and scraps.

Chemical Emission Reduction

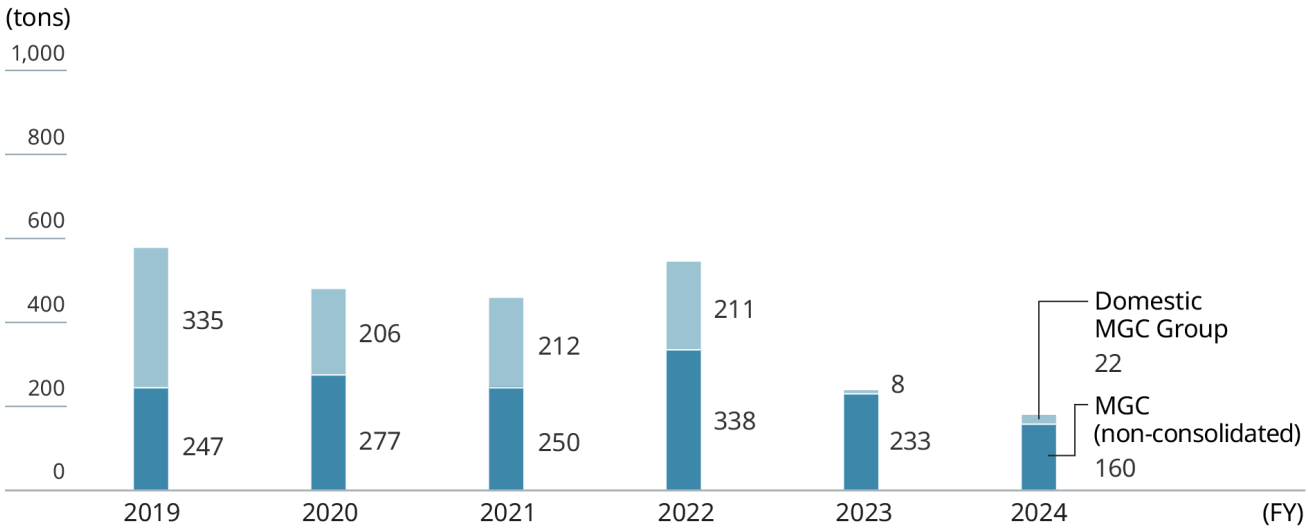
PRTR-Related Matters

MGC non-consolidated and domestic MGC Group companies assess and submit notifications on released and transferred substances subject to the PRTR scheme under the Act on the Assessment of Releases of Specified Chemical Substances in the Environment and the Promotion of Management Improvement (PRTR Act) while working to reduce the amounts released and transferred.

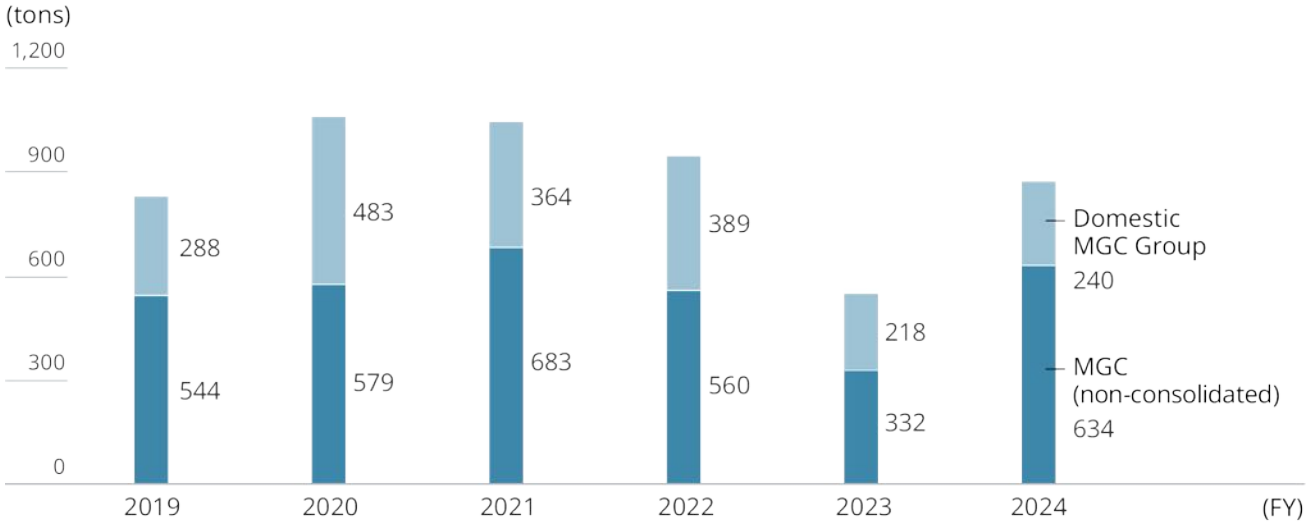
Substances Subject to Notification under the PRTR Scheme (MGC non-consolidated and domestic MGC Group companies)

Quantities of released and transferred substances for which notice was submitted under the PRTR scheme by MGC non-consolidated and domestic MGC Group companies were aggregated.

Substance emissions (substances subject to PRTR)



Substance transfers (substances subject to PRTR)



* Past data has been reviewed and numerical values have been corrected.

High-emission Substances for Which Notice Was Submitted under the PRTR Scheme (MGC non-consolidated and domestic MGC Group companies*1)

Among the substances for which notice was submitted under the PRTR scheme, those listed below were emitted by MGC non-consolidated and domestic MGC Group companies in total in amounts of 10 tons or more.

Government-designated number	Substance	Emissions (tons)					
		FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
691	Trimethylbenzene*2	162	162	121	216	97	97
186	Dichloromethane	74	78	69	56	40	36
731	Heptane	-	-	-	-	9	19
300	Toluene	14	14	15	13	13	17
80	Xylene	20	11	29	32	13	13
65	Epichlorohydrin	-	-	-	-	15	12
213	N,N-Dimethylacetamide	-	-	-	-	27	0

*1: Until FY2022, the emissions represent the data of MGC Group Environment and Safety Council. (Including Equity method affiliate)

*2: Until FY2022, the substance was 1,2,4-Trimethylbenzene (Former government-designated number:296)

No.213 N,N-Dimethylacetamide:Temporary increase in emissions due to leakage

No.65 Epichlorohydrin : Increase due to a revision of the calculation methodology

VOC Emissions (Non-consolidated)

Below are the emissions of the Japan Chemical Industry Association (JCIA) and PRTR-targeted substances at MGC (non-consolidated). These are the atmospheric emissions of substances that are considered volatile organic compounds (VOCs) under the PRTR system plus the atmospheric emissions of the 25 substance groups independently designated by the JCIA as JCIA PRTR-targeted substances.

	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
PRTR-targeted(tons)	269	266	237	327	196	152
JCIA-targeted(tons)	376	339	298	379	247	205

MGC will continue its efforts to reduce emissions of chemical substances occurring in conjunction with the unplanned shutdown and startup of equipment and similar factors, by implementing measures to reduce problems at manufacturing plants and through preventive measures.

Act on Rational Use and Appropriate Management of Fluorocarbons

MGC is conducted and records are retained, the amounts of leaks are calculated in accordance with recovery certificates and filling certificates obtained at the time of equipment maintenance, and appropriate measures are taken when disposing of equipment as class I specified product managers under the Act on Rational Use and Appropriate Management of Fluorocarbons, simple and periodic inspections of equipment .

Calculated Fluorocarbon Leak Volume (non-consolidated)

The calculated volume of leaked fluorocarbons at MGC sites is as follows.

Calculated Fluorocarbon Leak Volume (non-consolidated)

	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024
Calculated Leak Volume(t-CO_2)	1,737	730	2,535	156	650	901
Whether subject to leak volume reporting	Subject		Subject			

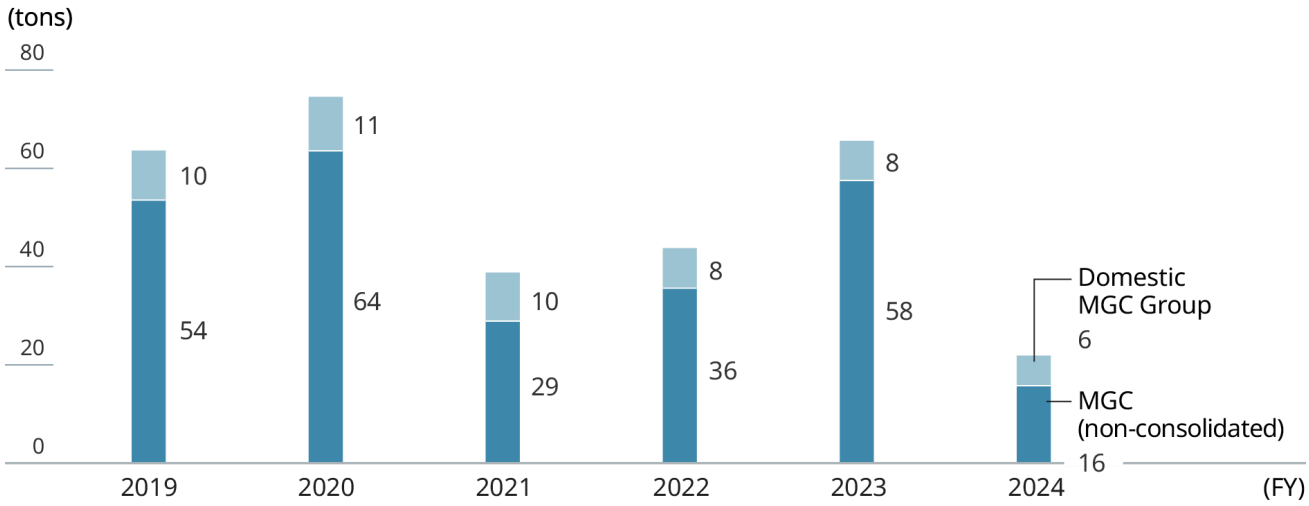
- Since fiscal 2020, the amount of fluorocarbons leaked has decreased in conjunction with the updating of refrigeration equipment at the Kashima Plant.
- The amount of fluorocarbons leaked in fiscal 2021 increased due to problems with facilities at the Kashima Plant
- Fiscal 2023 data was reviewed, and the values were corrected

Prevention of Air and Water Pollution

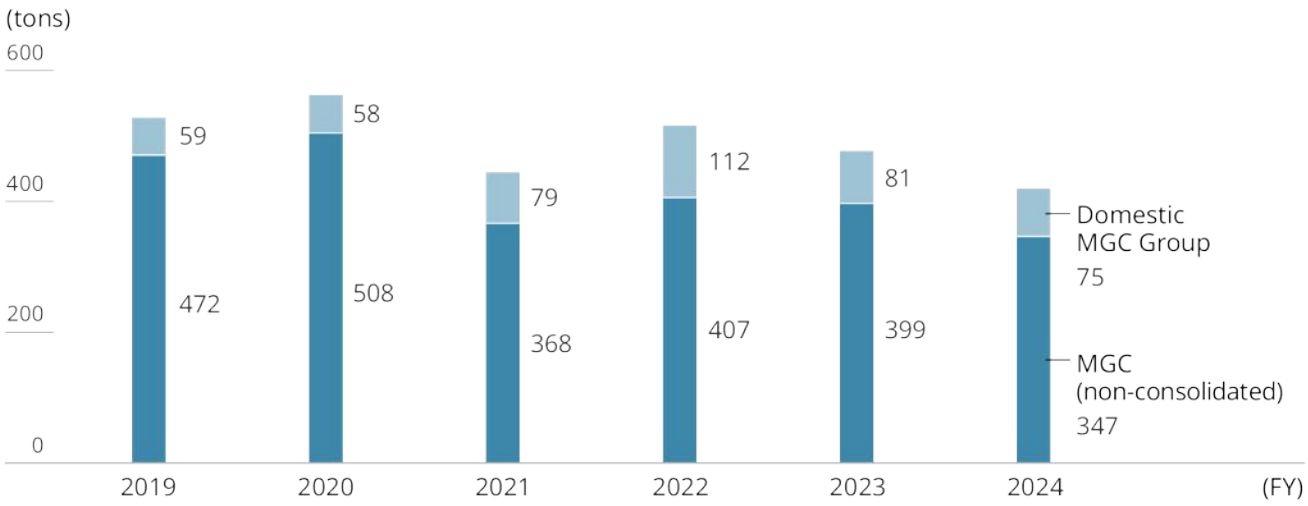
To prevent pollution and to maintain sound habitats for living things, MGC Group companies monitor the volume of environmentally hazardous substances in wastewater and waste gas and work to reduce discharge volumes.

Preserving Air Quality (MGC non-consolidated and domestic MGC Group companies)

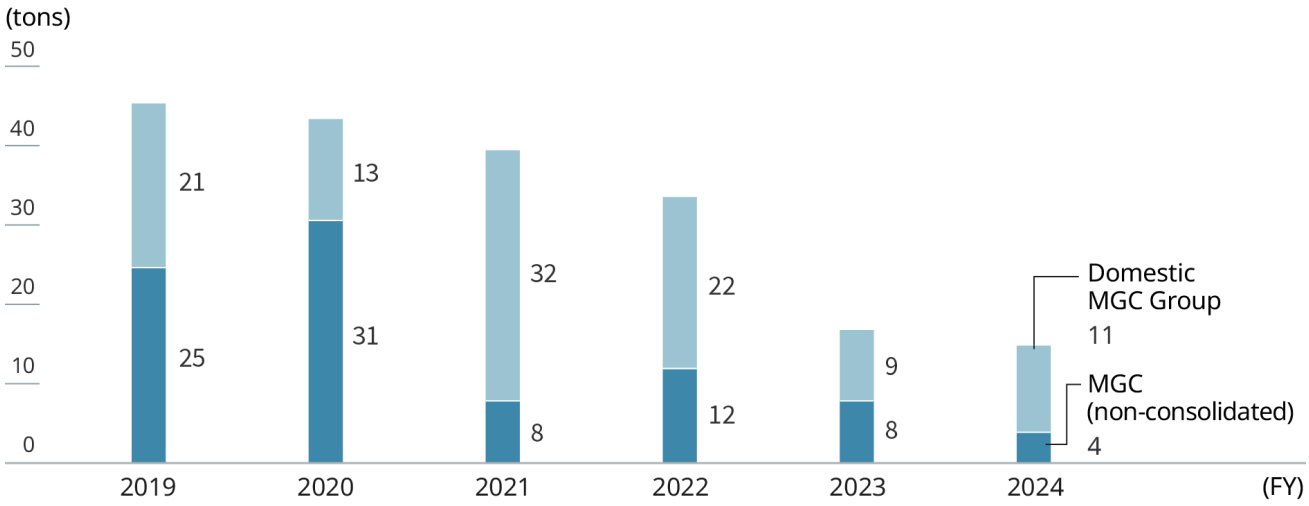
Emission of SOx



Emission of NOx



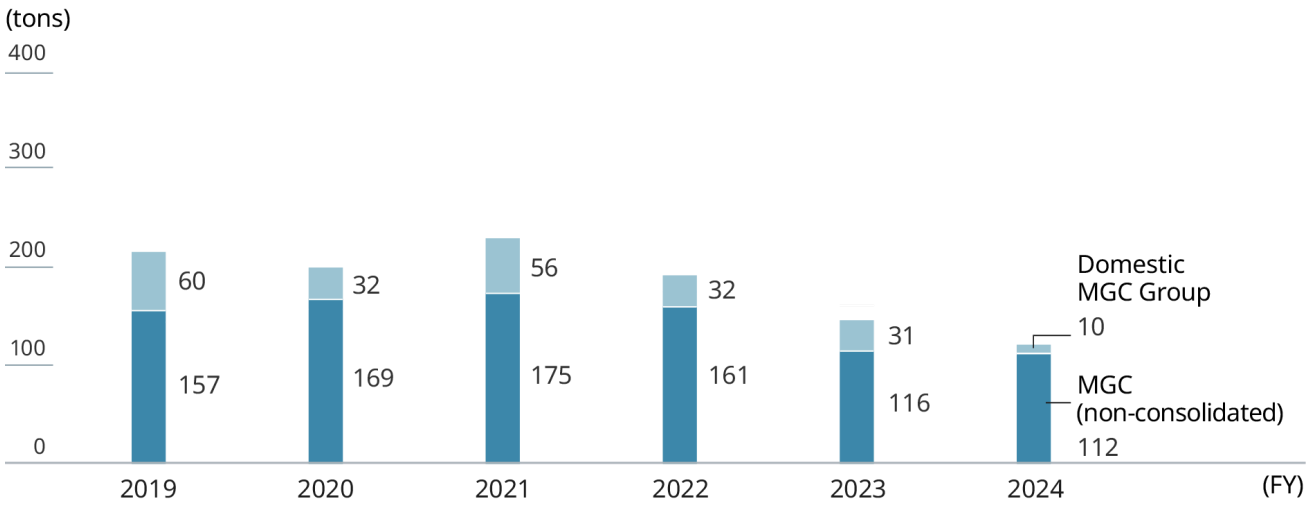
Emission of soot and dust



* Past data has been reviewed and corrected.

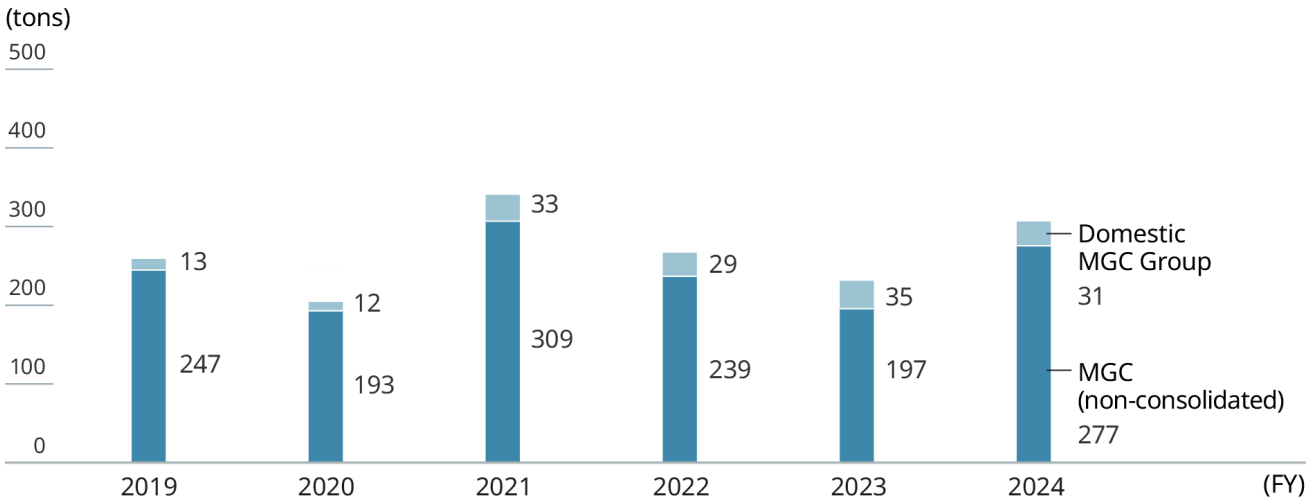
Preserving Water Quality (MGC non-consolidated and domestic MGC Group companies)

Emission of COD

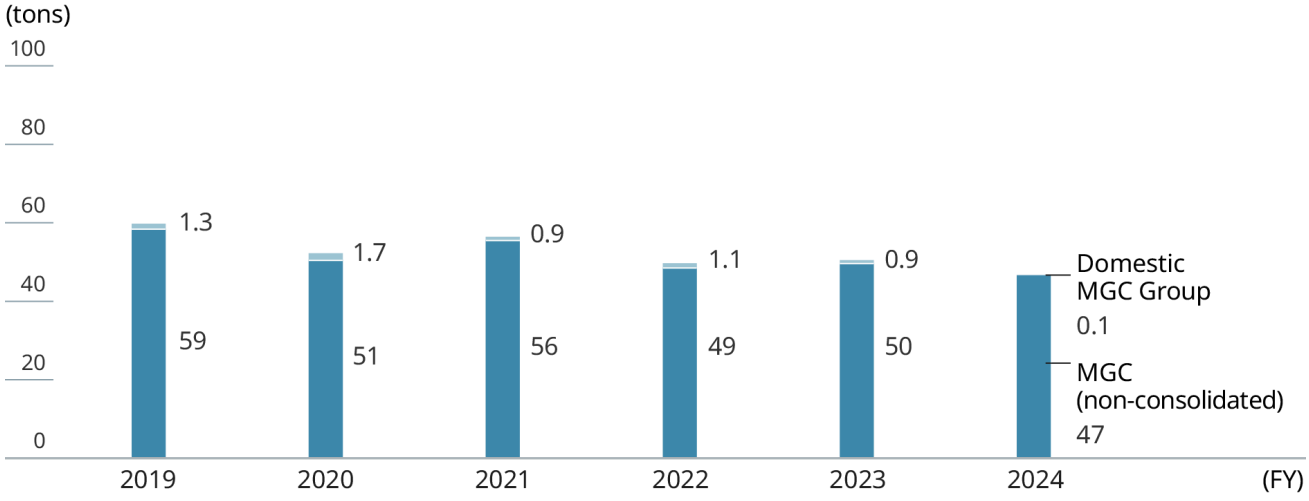


* In cases where only BOD is measured, the measurement data is directly added to COD emissions.

Emission of total nitrogen



Emission of total phosphorous



Biodiversity Conservation

Biodiversity Conservation (Non-consolidated)

Endorsing the aims of the Keidanren (Japan Business Federation) Declaration of Biodiversity and Action Policy, MGC signed on as a promotional partner of the Declaration in 2009.
In 2014, MGC became a member of the Keidanren Nature Conservation Committee with the aim of engaging in activities to protect the natural environment and conserve biodiversity.

MGC reliably manages chemicals based on responsible care and strives to conduct operations while taking all possible measures to prevent effects on human health or the health of ecosystems and works to achieve greenhouse gas emissions reduction targets. Through these efforts, we seek to maintain abundant natural environments where wildlife can thrive and increase biodiversity by sustainably using natural capital.
Furthermore, we contribute to sustainable development through the development of technology that can be assessed as eco-friendly products, and the proliferation of these products.

We undertake activities that support biodiversity through close-at-hand activities at each plant, such as flower-growing campaigns within plant sites and maintenance of forest preserves in surrounding areas, as well as addressing the issues of plastic in the oceans by cleaning up rivers and harbors neighboring our sites.