
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.

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 

Biodiversity Conservation 

Scope of This Report

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

Designation	Scope (energy usage, GHG emissions)	Scope (other than items to the left)
MGC (Non-consolidated)	Mitsubishi Gas Chemical Company, Inc.	Mitsubishi Gas Chemical Company, Inc.
Consolidated subsidiaries	Main companies engaged primarily in manufacturing among consolidated subsidiaries	-
Domestic MGC Group	-	Those domestic subsidiaries which are members of the MGC Group Environment and Safety Council*
Overseas MGC Group	-	Those key overseas subsidiaries which are primarily involved in manufacturing
MGC Group	MGC (non-consolidated) and consolidated subsidiaries	Non-consolidated MGC, along with domestic and overseas MGC Group companies as noted above

Domestic MGC Group companies whose fiscal 2022 results are included in the scope of reporting (members of the MGC Group Environment and Safety Council*)

Eiwa Chemical Industry Co., Ltd.

Fudow Co., Ltd.

Japan Finechem Co., Inc.

Japan U-PiCA Co., Ltd.

JSP Corporation

MGC Advance Co.,Ltd.

MGC Ageless Co., Ltd.

MGC Electrotechno Co., Ltd.

MGC Farmix Co.,Ltd.

MGC Filsheet Co., Ltd.

MGC Terminal Company, Inc.
MGC Woodchem Corporation
Shin Sanso Kagaku Co.
TOHO EARTHTECH,INC.
Toyo Kagaku Co., Ltd.
Yonezawa Dia Electronics Co., Inc

Overseas MGC Group companies whose 2022 results are included in the scope:

AGELESS (Thailand) Co., Ltd.
Brunei Methanol Co. Sdn. Bhd.
Korea Engineering Plastics Co., Ltd.
MGC Advanced Polymers, Inc.
MGC Electrotechno (Thailand) Co., Ltd.
MGC Pure Chemicals America, Inc.
MGC Pure Chemicals Singapore Pte. Ltd.
MGC Pure Chemicals Taiwan, Inc.
Mitsubishi Gas Chemical Engineering-Plastics (Shanghai) Co., Ltd.
PT Peroksida Indonesia Pratama
SamYoung Pure Chemicals Co., Ltd.
TAIXING MGC LINGSU Co., Ltd.
Thai Polyacetal Co., Ltd.
Thai Polycarbonate Co., Ltd.

***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 MGC 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 (energy usage, GHG emissions)	Scope (other than items to the left)
MGC (Non- consolidated)	April – Following March (expressed as fiscal year)	April–following March (expressed as fiscal year)
Consolidated subsidiaries	For Japan, April to the following March; for overseas, January to December	-
Domestic MGC Group	-	April– following March (expressed as fiscal year)
Overseas MGC Group	-	January – December**

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

Number of Companies and Locations Tabulated for This Report (Only Items Other Than Energy Usage and GHG emissions)

The number of companies and locations for which environmental data is tabulated (for subject to tabulation on energy usage and GHG emissions, refer to the Sustainability Data Book.)

Fiscal year ***	MGC (Non-consolidated)		Domestic MGC Group		Overseas MGC Group		Total (MGC Group)	
	Number of Companies	Number of Locations	Number of Companies	Number of Locations	Number of Companies	Number of Locations	Number of Companies	Number of Locations
2017	1	10	13	36	14	16	28	62
2018	1	10	12	34	14	16	27	60
2019	1	11	12	34	14	18	27	63
2020	1	11	13	37	14	18	28	66
2021	1	11	16	45	14	18	31	74
2022	1	11	16	45	14	18	31	74

*** Overseas MGC Group tabulated by calendar year.

**** The number of locations tabulated was reviewed and errors were corrected.

Environmental Management

Environmental Management System (ISO14001) (Non-consolidated)

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

Plant Registered	Registration Number	ISO14001 Registration Date	
		(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 2022 were as follows:

Input			Output	
Raw materials	9.6Mt	➔	Product	1.05Mt
Energy (as crude oil equivalent)	441ML		GHG emissions	913,000t -CO ₂
Water intake	36Mm ³		Wastewater	31Mm ³
			External waste discharge	28,000t
			Recycling	37,000t

Environmental Preservation Investments (Non-consolidated)

In fiscal 2015, MGC began undertaking environmental preservation investments. These investments include investment items that, although they may be very effective in reducing environmental loads, 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.

For example, by replacing mercury lamps and fluorescent lights with LED bulbs, it is possible to both save energy and reduce mercury-containing equipment. Replacing air conditioning equipment with energy-saving models has the dual effect of conserving energy and reducing CFCs (thus preventing destruction of the ozone layer). Further, replacing the equipment with air conditioners that do not use freon as a refrigerant can obtain the additional effect of reducing greenhouse gases.

In fiscal 2022, MGC installed solar power generating facilities on the new R&D building, saved energy and reduced mercury usage by replacing mercury lamps with LEDs, and took other measures. These steps had the effect of reducing GHGs by about 118 t-CO₂/year on a pro forma basis.

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 2022 was approximately 2.9 billion yen. The main investments were R&D investment relating to circular carbon methanol (CCM) production and updating compressors at the Yokkaichi Plant.

- Expenses

Total expenses related to environmental conservation activities in fiscal 2022 were approximately 10.2 billion yen. Of these, the highest expense was about 2.8 billion yen for research and development, accounting for around 28% 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	FY2021 (millions of yen)		FY2022 (millions of yen)	
				Investment	Expenses	Investment	Expenses
Onsite cost	Pollution prevention cost	Air pollution prevention	New installation of vent exhaust gas treatment facilities, exhaust gas treatment expenses	71.7	858.8	46.2	922.6
		Water pollution prevention	Updating of aging facilities, updating of automatic shutoff valves	144.0	1,666.8	62.3	1,975.6
		Soil, Noise	Measures to prevent soil penetration	19.5	2.7	9.8	0.1

Breakdown		Main areas of activity	FY2021 (millions of yen)		FY2022 (millions of yen)	
			Investment	Expenses	Investment	Expenses
Onsite cost	Global environmental preservation cost	Updating compressors, updating air conditioning equipment	499.4	2,172.7	631.7	1,818.0
	Resource recycling cost	Implementation of resource recycling measures	0.4	819.3	28.2	1,088.1
Up or down stream cost		Collection and reuse of product containers	3.8	111.7	8.9	0.0
Management activity cost		Introduction of environmental data system, environmental-related analysis	1.3	1,391.1	5.9	1,495.9
R&D cost		Research and development of energy-saving technologies and eco-friendly products	1,188.6	2,826.0	2,062.7	2,840.7
Social contribution cost		Membership dues of nature conservation organizations	0.0	4.7	0.0	4.0
Environmental damage cost		Pollution impacts levy	0.0	75.0	0.0	47.8
Total			1,928.7	9,928.7	2,855.9	10,192.9

Economic benefit

Title	Item	FY2021 (millions of yen)	FY2022 (millions of yen)
Income	Profit on sale of valuable waste, etc.	7.6	60.6
Reduction of expenses	Effects due to energy saving, power savings from solar power generation	74.4	242.4

Compliance with the Ministry of the Environment's Environmental Accounting Guidelines 2005

Period:From April 1, 2022 to March 31, 2023

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

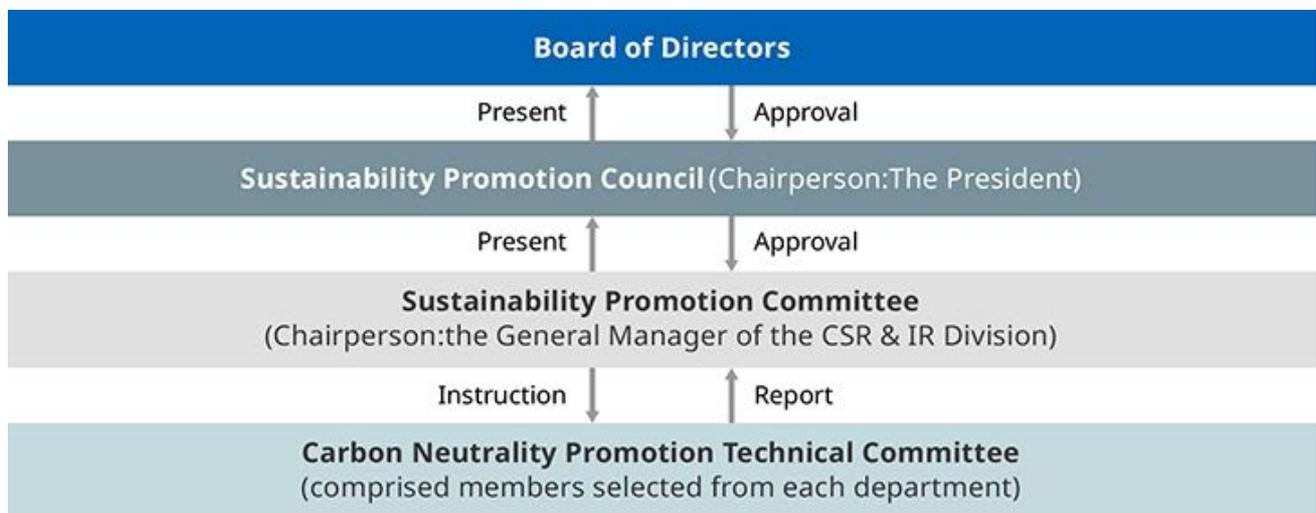
The Sustainability Promotion Council, composed of directors and chaired by the President, deliberates and makes decisions on addressing climate change risk and other key Sustainability issues (materiality). Important matters to be deliberated at the Sustainability Promotion Council is resolved by the 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 Climate change Action 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 scenario analysis for fiscal 2022

- Evaluation points: 2030,2050
- Scenario: Increased temperature
Main external information referred to in decarbonization scenario
 - IEA WEO 2021 SDS (World gradually reducing emissions to keep global increase in average temperature to less than 1.5°C)
 - SSP1 (Rapid development progressing on low-income countries, global economic inequality being resolved, and technological development advancing rapidly)
Main external information referred to in baseline scenario
 - IEA WEO 2021 STEPS (World in which average temperature increases by approximately 2.6°C in around 2100 due to course of emissions according to plans announced by each country at present)
 - SSP2 (Growth anticipated to between that of SSP3 – with little international cooperation, little investment in technological development, and slow economic growth – and that of SSP1 scenario of decarbonization)
- Analysis scope: Optical materials and oxygen absorbers businesses
- Conduct a quantitative assessment of the financial impact of risks and opportunities in the existing business portfolio and draft a response strategy

Evaluation Results

	Risks and Opportunities (<input type="checkbox"/> Risks <input type="checkbox"/> Opportunities)	Main Initiatives
Risks and opportunities in decarbonization scenario	<ul style="list-style-type: none"> <input type="checkbox"/> Increased demand for high-value-added products due to high economic growth compared to the baseline scenario <input type="checkbox"/> Increased functionality of electronic devices <input type="checkbox"/> Changes in food culture such as the use of meat alternatives using plant-based materials <input type="checkbox"/> Strict regulations such as decarbonization 	<ul style="list-style-type: none"> • Expansion of product lineup supporting high-value-added products • Expansion of research and development, and implementation of cross-value innovation • Reduction of weight through development of highly refractive products
Risks and opportunities in baseline scenario	<ul style="list-style-type: none"> <input type="checkbox"/> Significant increase in population compared to the decarbonization scenario <input type="checkbox"/> <input type="checkbox"/> Decrease in agricultural land area and decrease in production due to progress of warming <input type="checkbox"/> Low economic growth compared to the decarbonization scenario due to lack of international cooperation and inhibition of technological development <input type="checkbox"/> Increased fossil fuel prices 	<ul style="list-style-type: none"> • Acceleration of market development in emerging countries • Acceleration of market development in long-term food storage applications • Expansion of research and development, and implementation of cross-value innovation • Reduction of size and weight of products, adoption of environmentally friendly materials

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.

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 CO₂ emissions, the cost or effect of applying and converting the internal carbon price (10,000 yen/MT-CO₂ equivalent) will be used to help make investment decisions, promote CO₂ emissions reductions, and encourage the creation of technologies and products that contribute to building a low-carbon society.

4. Indicators and Objectives

MGC 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

2023 target:
28% reduction from
FY2013 baseline

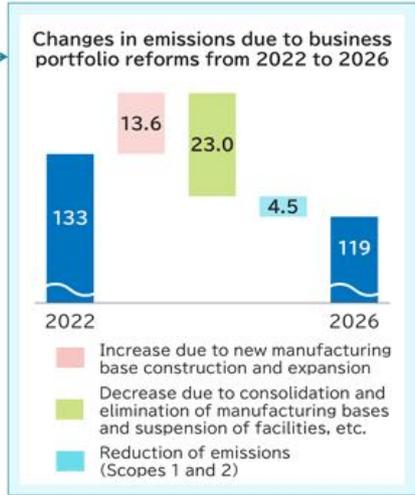
2030 target:
36% reduction from
FY2013 baseline

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		(13.6)		
Decrease due to consolidation and elimination of manufacturing bases and suspension of facilities, etc.		23.0	2.6	46.9
Reduction in emissions due to R&D collaboration ^{#1}				
Reduction of emissions (Scope 1)	45.0	1.9	2.6	10.0
Fuel change		1.1	0.2	
Introduction of renewables and use of transitional energy		1.5	2.3	30.5
Reduction of emissions (Scope 2)			2.4	21.6



Businesses and technologies contributing to emissions reduction

CCS-2+3

Appi Geothermal Power Plant^{#4}

Circular carbon methanol

Eco-friendly products

^{#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

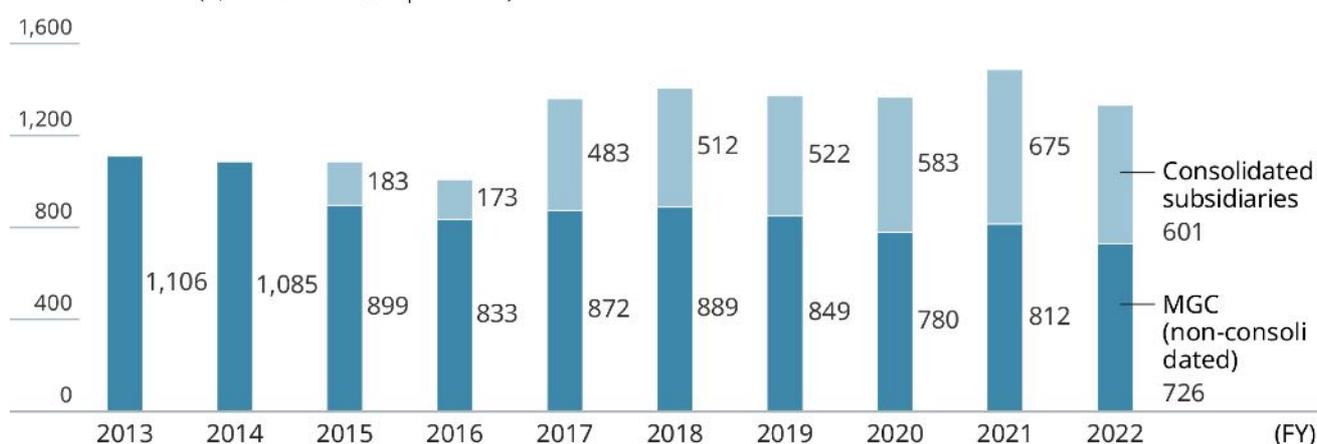
GHG Emissions

Results of energy consumption/GHG emissions in fiscal 2023

	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	640	715	682
MGC (non-consolidated)	322	545	151
Consolidated subsidiaries	318	170	521

Scope 1 + 2 Emissions

GHG emissions (1,000 tons CO₂ equivalent)



Note: Domestic MGC Group GHG emissions noted only for fiscal 2015 and later.

Note: Overseas MGC Group GHG emissions noted only for 2017 and later.

Scope 3 Emissions (MGC Group)

Scope 3 emissions in fiscal 2023

Category		Scope 3 Emissions (1,000 tons CO ₂ equivalent)	
		MGC (non-consolidated)	MGC Group
Cat.1	Purchased goods and services	3,500	5,300
Cat.2	Capital goods	230	230
Cat.3	Fuel- and energy-related activities not included in Scope 1 or Scope 2	120	280
Cat.4	Upstream transportation and distribution	270	340
Cat.5	Waste generated in operations	8	8
Cat.6	Business travel	<1	1
Cat.7	Employee commuting	1	1

Category		Scope 3 Emissions (1,000 tons CO ₂ equivalent)	
		MGC (non-consolidated)	MGC Group
Cat.8	Upstream leased assets	3	3
Cat.9	Downstream transportation and distribution	140	150
Cat.10	Processing of sold products	–	–
Cat.11	Use of sold products	240	280
Cat.12	End-of-life treatment of sold products	2,600	2,600
Cat.13	Downstream leased assets	12	2
Cat.14	Franchises	0	0
Cat.15	Investments	–	–
Total		7,200	9,300

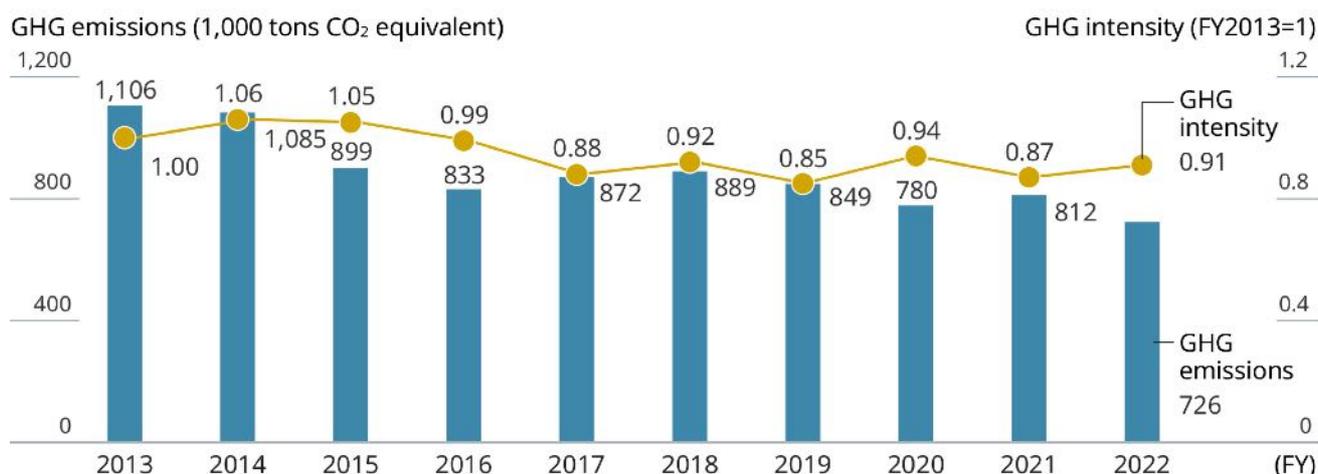
Energy-Saving and GHG Emission Reduction Initiatives (non-consolidated)

MGC is committed to energy conservation and reduction of GHG emissions. We will curtail the use of fossil fuels to contribute to reducing environment impact in terms of both reduced resource use and reduced GHG emissions from the use of energy. In fiscal 2023, we updated large equipment such as chillers and improved the efficiency of waste heat recovery. The GHG reduction effects from these measures are equivalent to 9,800 tons of CO₂. In addition, we expanded the use of renewable energy as the source of energy used in production on a large scale. The GHG reduction effects from the introduction of renewable energy are equivalent to 26,000 tons of CO₂. In the future, we plan to review co-generation systems, increase the amount of byproduct fuel recovered and used, and take of the measures.

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 FY2022 April 1, 2022 - March 31, 2023

GHG emissions in FY2023 April 1, 2023 - March 31, 2024

— [Accounting and Verification Standards]

GHG Protocol Corporate Accounting and Reporting Standard (reviced edition)

ISO14064-3:2019

— [Verification Statement]

Verification Statement Scope1,2,3 emissions in FY2022



Verification Statement Scope1,2 emissions in FY2023



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 CO₂ 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 CO₂ 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](#) →

Water Resource Conservation

MGC 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.

Going forward, MGC aims to achieve qualitative and quantitative targets for efficient water usage established in the RC Medium-term Plan 2023 (2021–2023), to more effectively preserve water resources.

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

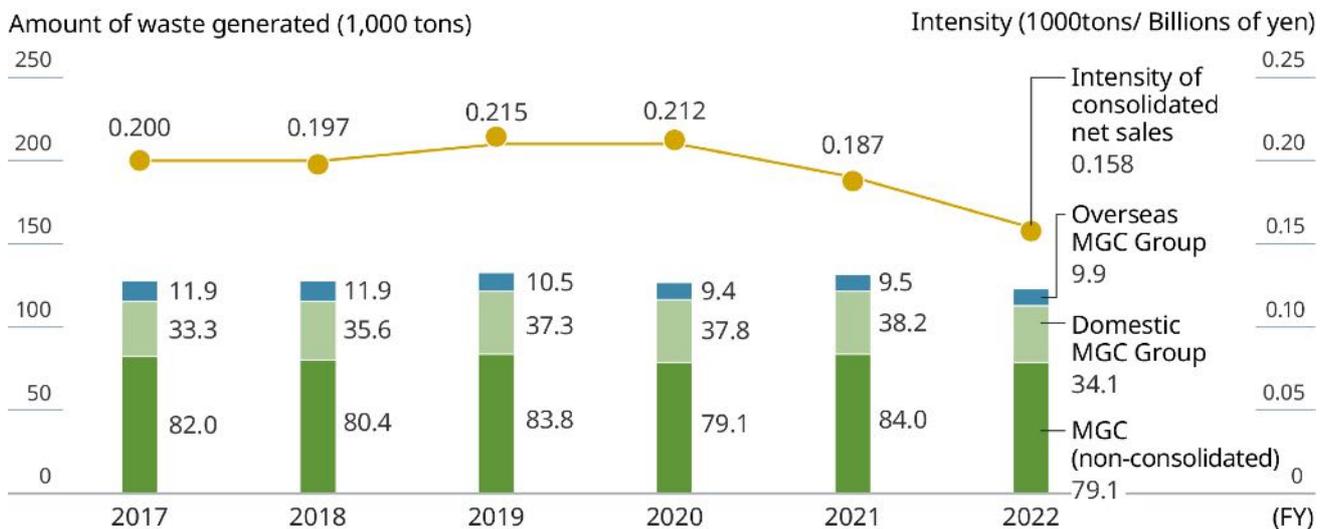
Each MGC Group company is striving to reduce waste by promoting the 3Rs of waste (Reduce, Reuse, Recycle), and to undertake the proper disposal of waste in accordance with law.

Basic Approach to Resource Use

The MGC Group promotes efficient utilization of fuel and other resources (including product raw materials) and development of innovative process technologies at its domestic and overseas production sites and contributes to reduction in GHG emissions.

Reducing Waste (MGC Group companies)

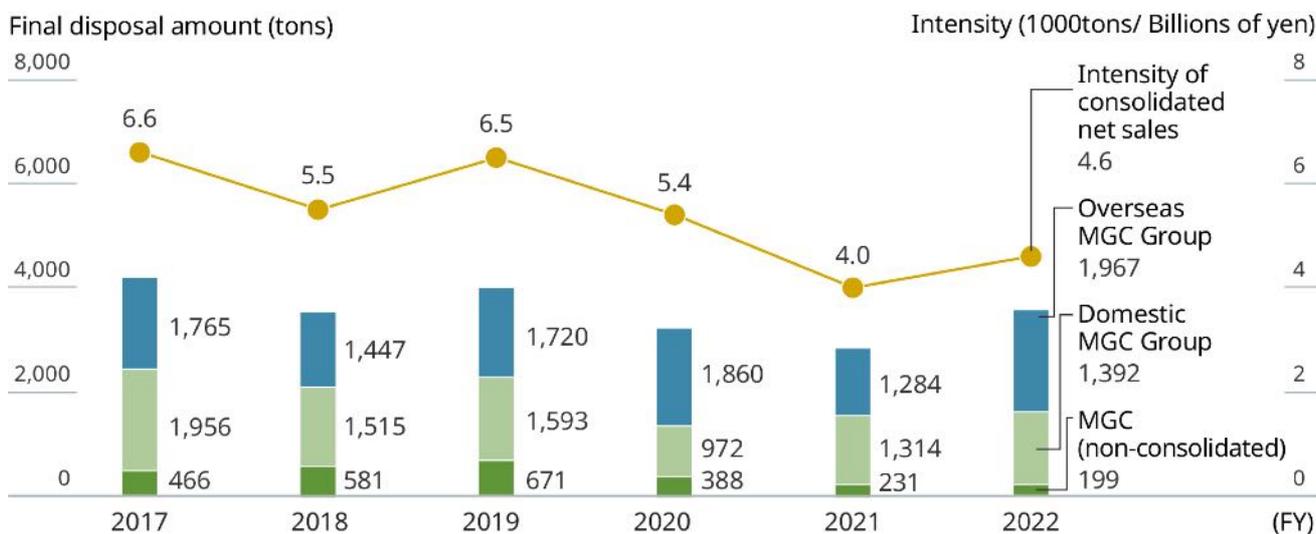
Amount of waste generated/ Intensity of consolidated net sales



Recycled amount/ Intensity of consolidated net sales



Final disposal amount/ Intensity of consolidated net sales



Zero Waste Emissions Rate (Non-consolidated)

MGC (non-consolidated) defines zero waste emissions rate by dividing the final disposal amount by the amount of waste generated and is working to reduce the rate.

The zero emissions rate is positioned as a KPI in the "Grow UP 2023" plan, and the target for fiscal 2023 is 0.3% or less.

The zero emissions rate in fiscal 2022 was 0.25%.

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



Chemical Emission Reduction

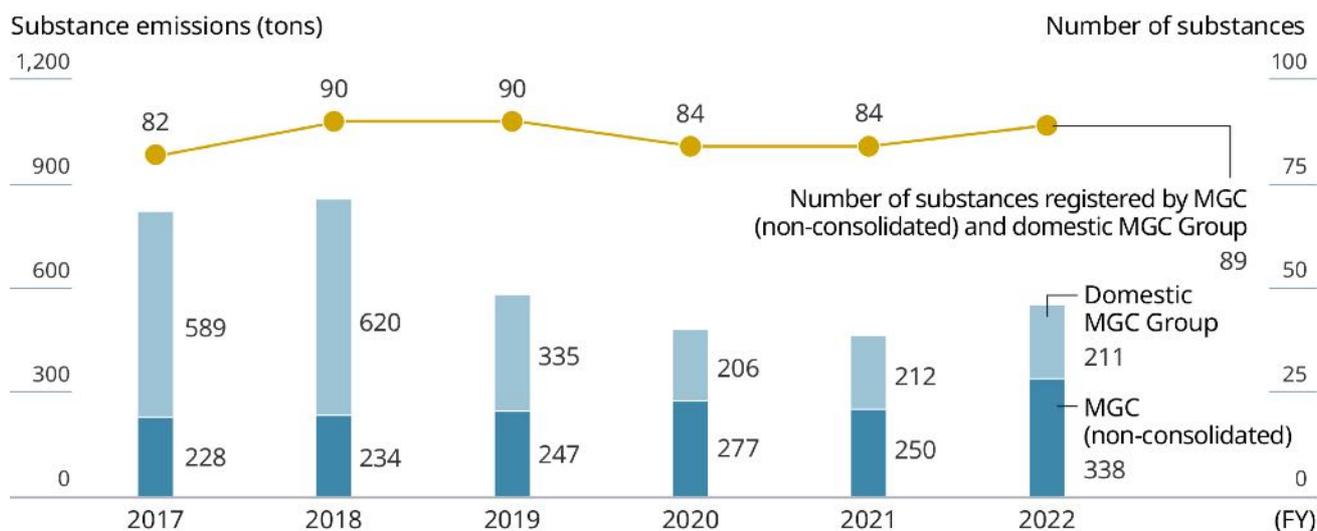
PRTR-Related Matters

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.

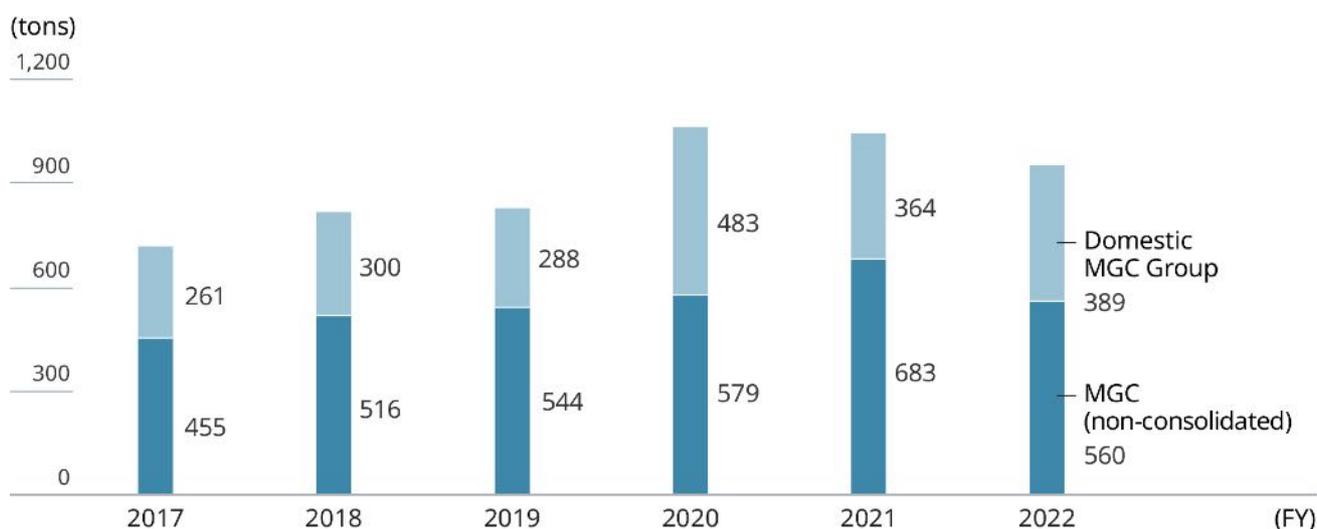
Substances Subject to Notification under the PRTR Scheme (MGC non-consolidated and domestic MGC Group companies)

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)

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)					
		FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
296	1,2,4-Trimethylbenzene	99	113	162	162	121	216
128	Chloromethane	567	590	308	187	188	188
186	Dichloromethane	78	87	74	78	69	56
80	Xylene	24	17	20	11	29	32
300	Toluene	14	12	14	14	15	13

Japan Chemical Industry Association PRTR-targeted Substances (Non-consolidated)

The Japan Chemical Industry Association (JCIA), of which MGC is a member, has specified 328 Class I Designated Chemical Substances stipulated by the PRTR Law, and a JCIA-specified 90 substances plus 1 substance group as voluntary PRTR-targeted substances considered volatile organic compounds (VOCs). The JCIA tabulates the emissions of member companies, and the entire chemical industry is working toward reducing emissions of these PRTR substances.

The amount of said substances emitted by MGC in fiscal 2022 totaled 68 substances and 395 tons, a decrease of around 25% from the 315 tons of emissions in fiscal 2021. The main cause was an increase in atmospheric releases of 1,2,4-trimethylbenzene caused by defective refrigeration equipment at the Kashima Plant.

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

At the business sites of MGC non-consolidated and domestic MGC Group companies, which are class I specified product managers under the Act on Rational Use and Appropriate Management of Fluorocarbons, simple and periodic inspections of equipment are 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.

Calculated Fluorocarbon Leak Volume (non-consolidated)

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

Calculated Fluorocarbon Leak Volume (non-consolidated)

	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
Calculated Leak Volume(t-CO ₂)	2,231	4,098	1,737	730	2,535	156
Whether subject to leak volume reporting	Subject	Subject	Subject		Subject	

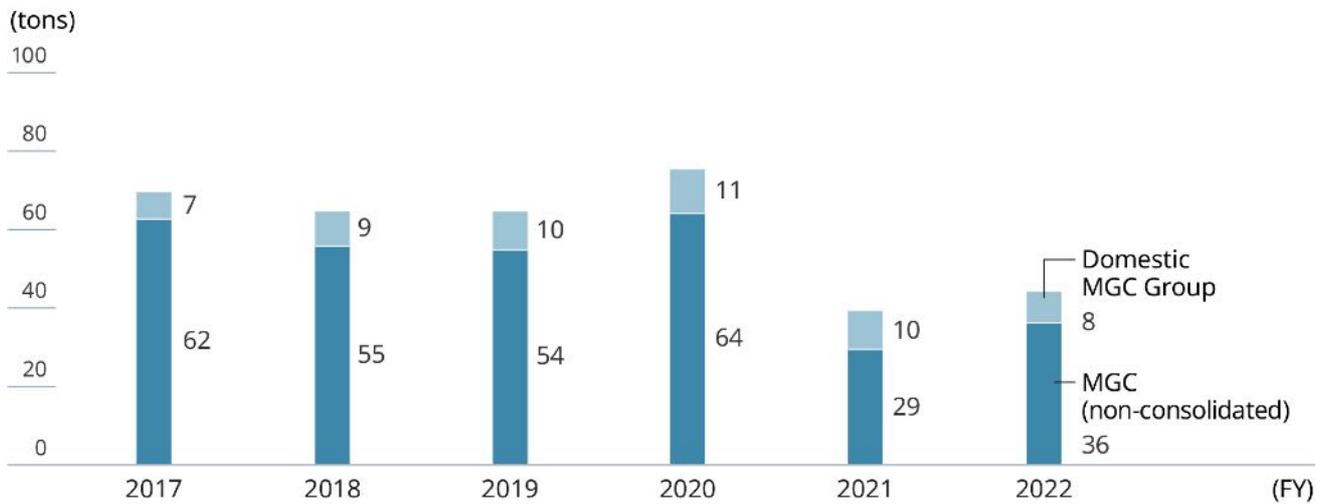
- Since fiscal 2020, the amount of fluorocarbons leaked has decreased in conjunction with the updating of refrigeration equipment at the Kashima Plant.
- The amount of fluorocarbons leaked in fiscal 2021 increased due to problems with facilities at the Kashima Plant.

Pollution Prevention

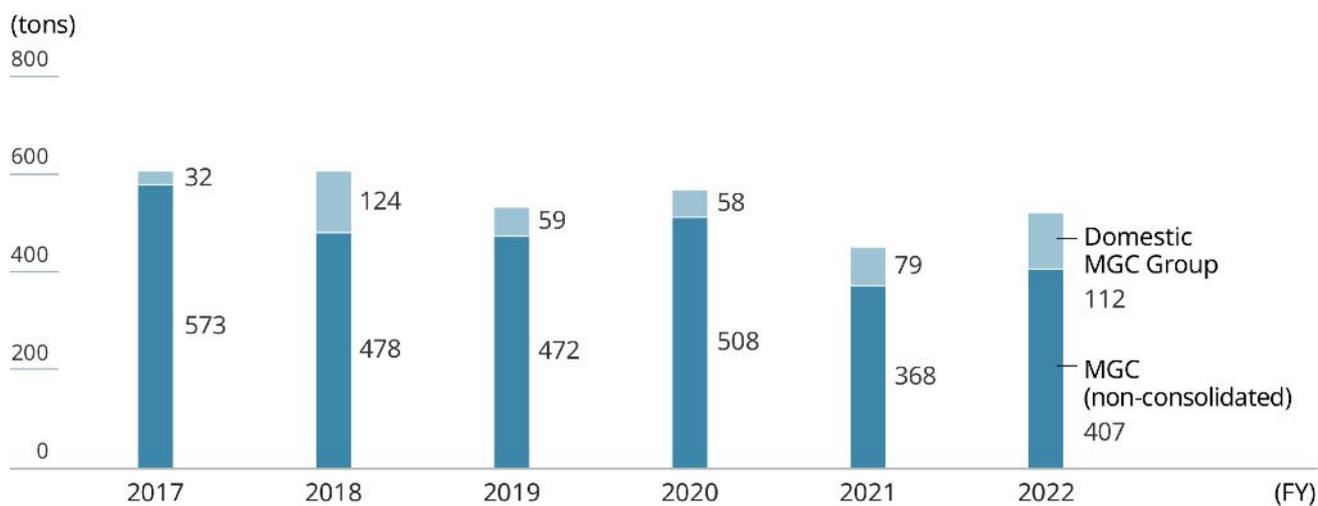
To prevent pollution and to maintain sound habitats for living things, MGC Group companies monitor the volume of environmentally hazardous substances in wastewater and waste gas and work to reduce discharge volumes.

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

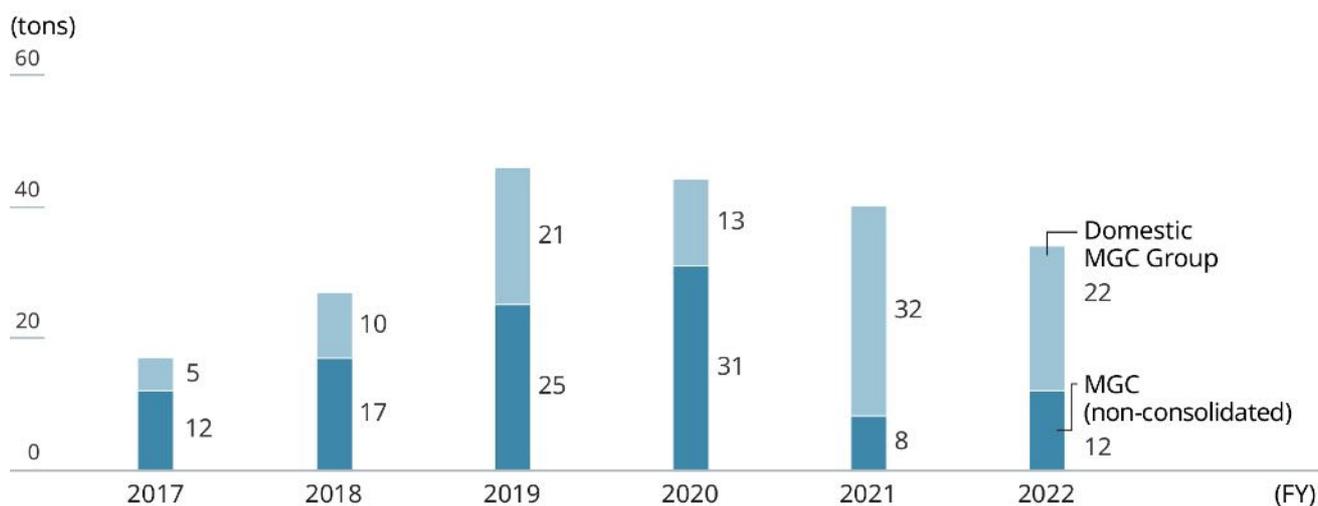
Emission of SOx



Emission of NOx



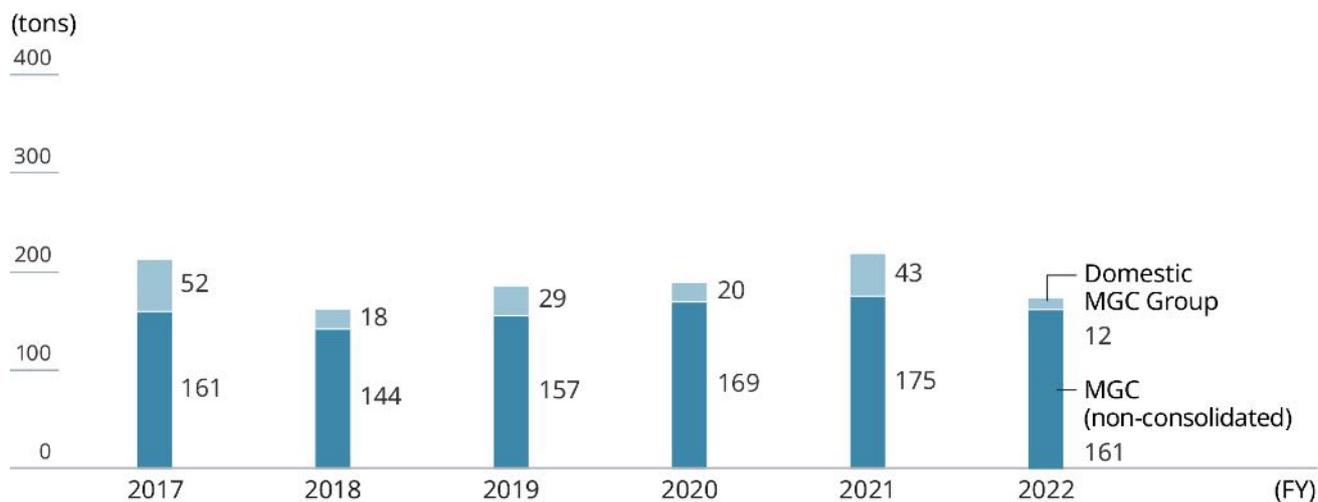
Emission of soot and dust



* Past data has been reviewed and corrected.

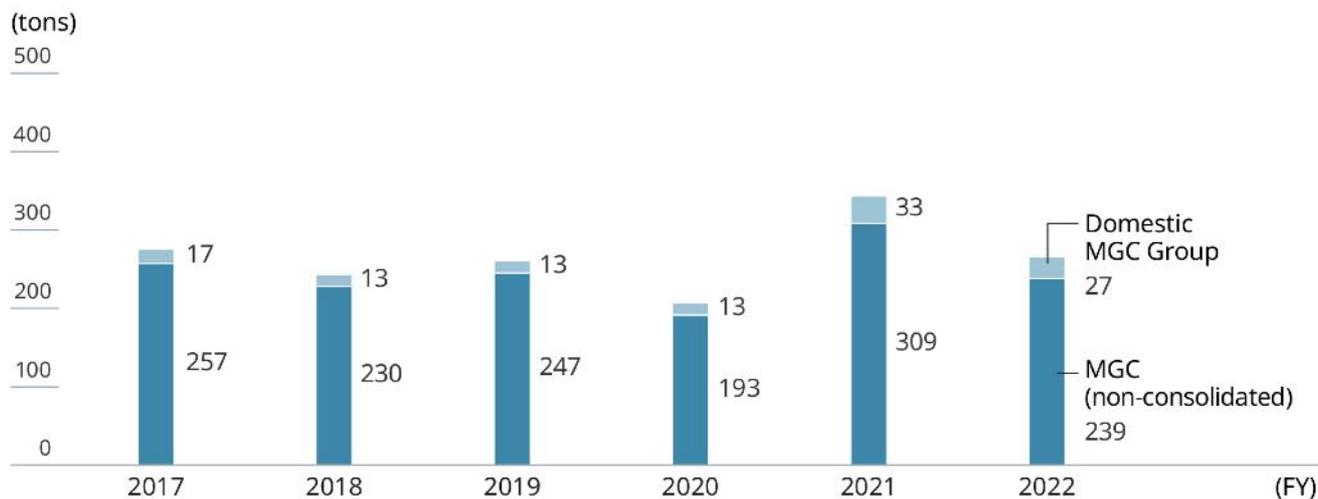
Preserving Water Quality (MGC non-consolidated and domestic MGC Group companies)

Emission of COD



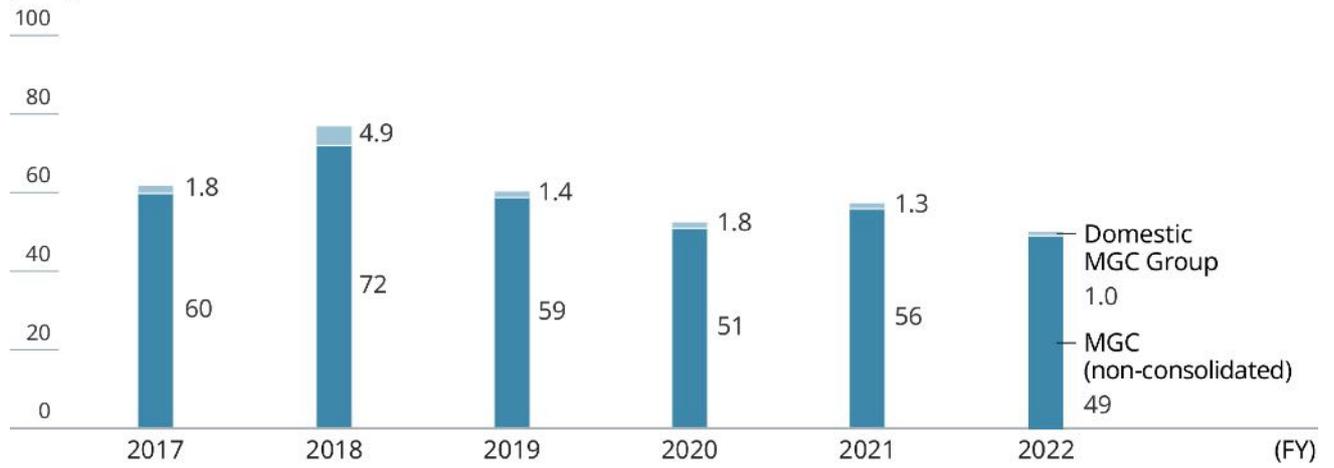
* In cases where only BOD is measured, the measurement data is directly added to COD emissions.

Emission of total nitrogen



Emission of total phosphorous

(tons)



Biodiversity Conservation

Biodiversity Conservation (Non-consolidated)

Endorsing the aims of the Keidanren (Japan Business Federation) Declaration of Biodiversity, 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.