MITSUBISHI GAS CHEMICAL

MGC

Environmental Reports (Fiscal 2018 Results)

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.

Scope of This Report

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

Designation	Scope
MGC Alone	Mitsubishi Gas Chemical Company, Inc.
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 alone, along with domestic and overseas MGC Group companies as noted above

Domestic MGC Group companies whose fiscal 2018 results are included in the scope of reporting (members of the MGC Group Environment and Safety Council*)
Eiwa Chemical Industry Co., Ltd.
MGC Advanced Chemical Inc.
MGC Ageless Co., Ltd.
MGC Electrotechno Co., Ltd.
MGC Filsheet Co., Ltd.
JSP Corporation
Shin Sanso Kagaku Co.
Toyo Kagaku Co., Ltd.
Japan Pionics Co., Ltd.
Japan Finechem Co., Inc.
Japan U-PiCA Co., Ltd.
Fudow Co., Ltd.
Yonezawa Dia Electronics Co., Inc

Overseas MGC Group companies whose 2018 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.
Thai Polyacetal Co., Ltd.
Thai Polycarbonate Co., Ltd.
Suzhou MGC Suhua Peroxide Co., Ltd.

* **MGC Group Environment and Safety Council**:
MGC Group companies in Japan that manufacture and process chemical substances and resins as raw materials 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	Tabulation Period
MGC Alone	April–following March (listed as fiscal year)
Domestic MGC Group	April– following March (listed 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

The number of companies and locations tabulated for this report is as follows:

Fiscal year***	MGC Alone		Domestic MGC Group		Overseas MGC Group		Total (MG
	Number of Companies	Number of Locations	Number of Companies	Number of Locations	Number of Companies	Number of Locations	Number of Companies
2013	1	13	12	50	12	14	25
2014	1	13	12	53	14	16	27
2015	1	13	12	53	14	16	27
2016	1	13	12	53	14	16	27
2017	1	13	13	55	14	16	28
2018	1	13	12	53	14	16	27

*** Overseas MGC Group tabulated by calendar year.

Environmental Management

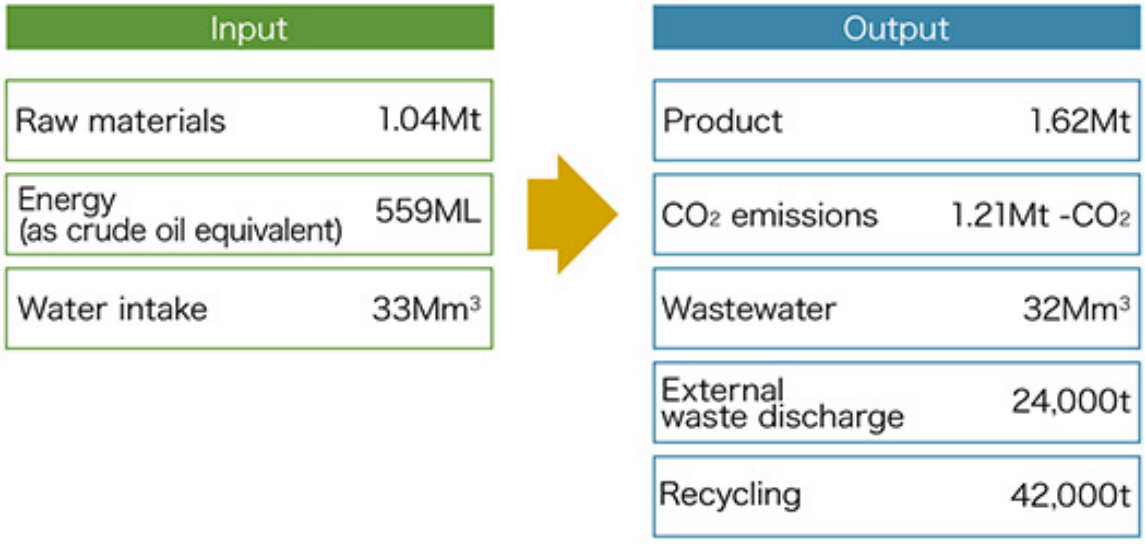
Environmental Management System (ISO14001) (MGC Alone)

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 Alone and Domestic MGC Group)

Primary production-related inputs and outputs for MGC alone and the MGC domestic group in fiscal 2018 are as follows:



Environmental Preservation Investments (MGC Alone)

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 like 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 2018, MGC replaced mercury lamps with LED bulbs in lighting used in its buildings and along roads on their premises, upgraded air conditioning equipment, implemented odor control measures on wastewater processing facility, and took other measures. These steps had the effect of reducing GHGs by about 239 t-CO_2/year on a pro forma basis.

In addition, solar power generating facilities are being installed on the new Niigata Science-Engineering-Quality (N-SEQ) Building constructed at the Niigata Research Laboratory using fiscal 2018 environment preservation investment (installation is scheduled to be completed in 2020).
MGC will continue to promote the use of renewable energy in the future.

Medium-term Plan (Targets for a Quantitative Reduction in Environmental Impact)

In its RC Medium-term Plan, MGC has established targets for a quantitative reduction in environmental impact and is striving to achieve them.
Under the MGC Group Environment and Safety Council, MGC and other member companies are engaged in activities conforming to Responsible Care, establishing targets for a quantitative reduction in environmental impact and striving to achieve them.

Quantitative Environmental Conservation Targets through Fiscal 2020 (RC Medium-term Plan 2020: 2018–2020)

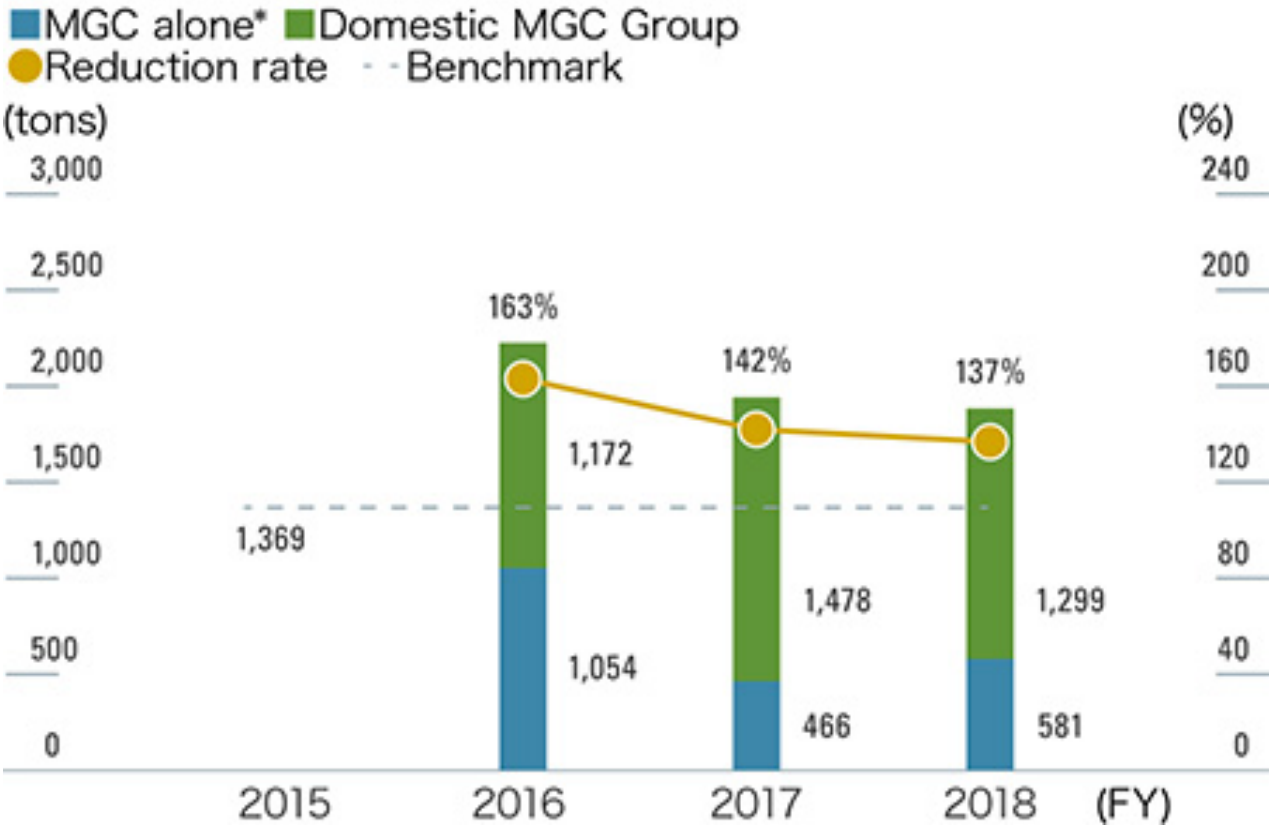
1. Reduce the energy intensity to 89% or lower compared with fiscal 1990 level.
2. Reduce GHG emissions intensity to 66% or lower compared with fiscal1990 level (90% or lower compared with fiscal 2016 level).
Reduce GHG emissions volume by at least 320,000 tons (CO_2 equivalent) compared to fiscal 1990 (reduce by at least 100,000 tons compared to fiscal 2016).
3. Zero emissions of wastes: 0.3% or less final disposal of generated wastes, by weight).
4. Reduce emissions of PRTR substances by 10% compared with fiscal 2017.

MGC Group Environment and Safety Council Waste Reduction Target (2016-2018)

Target: Reduce the volume of waste disposed of in landfills by 10% by fiscal 2018 compared to fiscal 2015 volume excluding temporary increases.

Current status: This target has not been reached due to the effect of temporary generation of waste and waste catalyst in conjunction with a business reorganization and a change to landfill disposal for waste activated sludge, resulting in an increase in final disposal volume above the benchmark. The MCG Group will continue its efforts to reduce waste.

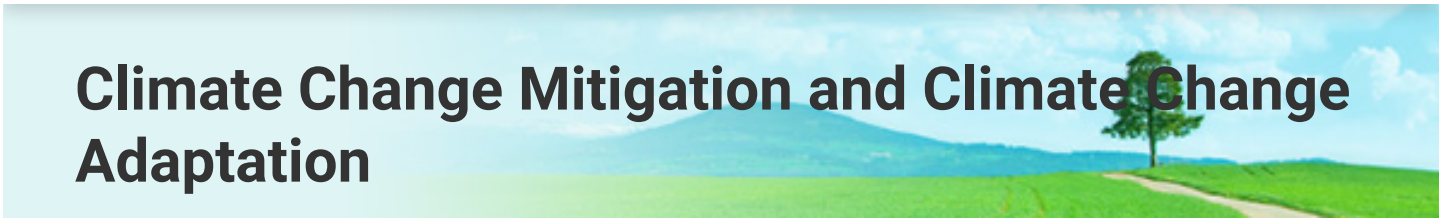
Volume of waste disposed of in landfills and reduction rate (MGC alone + Domestic MGC Group)



* Mitsubishi Gas Chemical unconsolidated: 586 tons (594 tons -8 tons), the estimated amount of the portion of the increase from waste catalyst processing in conjunction with the shutdown of NF ammonia equipment, which was a temporary increase, was deducted from the 700 ton result in FY 2015.

* FY 2015 results are the benchmark.

Climate Change Mitigation and Climate Change Adaptation



Tackling climate change is a major challenge that calls for initiatives on a global scale for the realization of a sustainable society. In order to reduce greenhouse gas emissions and lessen the environmental burden, the MGC Group actively promotes initiatives by utilizing the technological and development capabilities that have been developed so far.

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).

Initiatives for Climate Change

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.

Greenhouse Gas Reduction Targets (MGC Alone)

The Plant Manufacturing Division accounts for 97% of MGC greenhouse gas (GHG) emissions and is engaged in initiatives to reduce these emissions. It has set the following targets.

Total energy intensity*1: Reduce to 89% or lower compared to fiscal 1990 levels by fiscal2020
GHG emissions intensity*2: Reduce to 66% or lower compared to fiscal 1990 levels by fiscal 2020 (90% or lower compared with fiscal 2016 levels)
GHG emissions volume: Reduce by 320,000 t-CO_2 compared to fiscal 1990 by fiscal 2020 (reduce by 100,000 t-CO_2 compared to fiscal 2016)

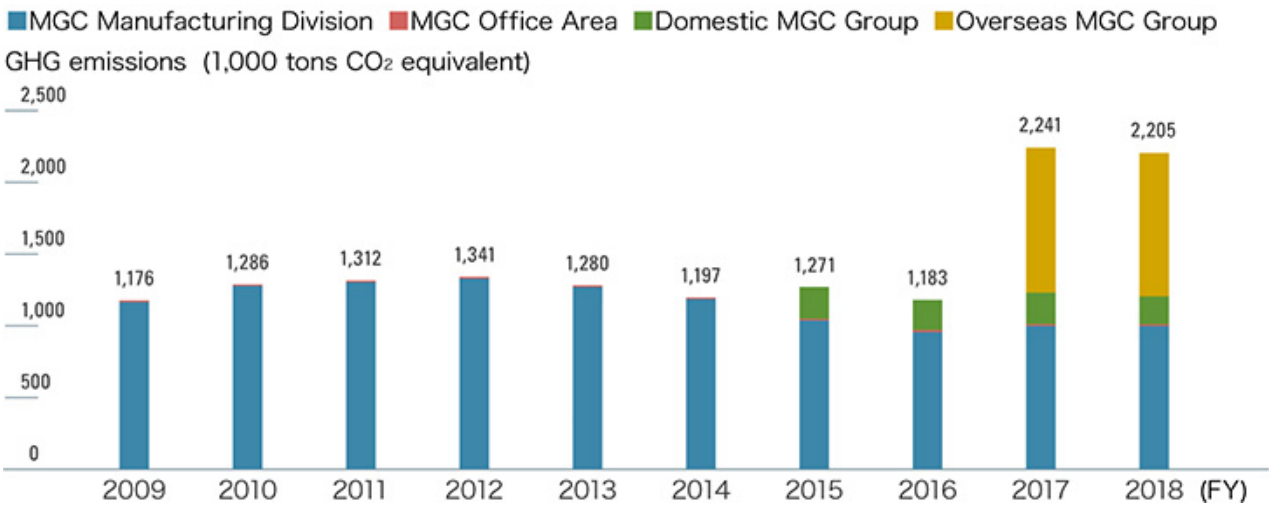
*1 Total energy intensity: The amount of energy consumption per unit of production volume
*2 Greenhouse gas emissions intensity: The amount of GHG emissions per unit of production volume

GHG Emissions

GHG Emissions in fiscal 2018 (Scope 1 + 2)

		Energy consumption (ML crude oil equivalent)	Greenhouse gas emissions (1,000 tons CO_2 equivalent)
MGC Alone	Plant Manufacturing Division	464.4	994.7
	Office Area	5.8	10.8
Domestic MGC Group		89.2	199.2
Overseas MGC Group		484.1	999.9
MGC Group		1043.4	2204.5

Scope 1 + 2 Emissions (MGC Group)



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.

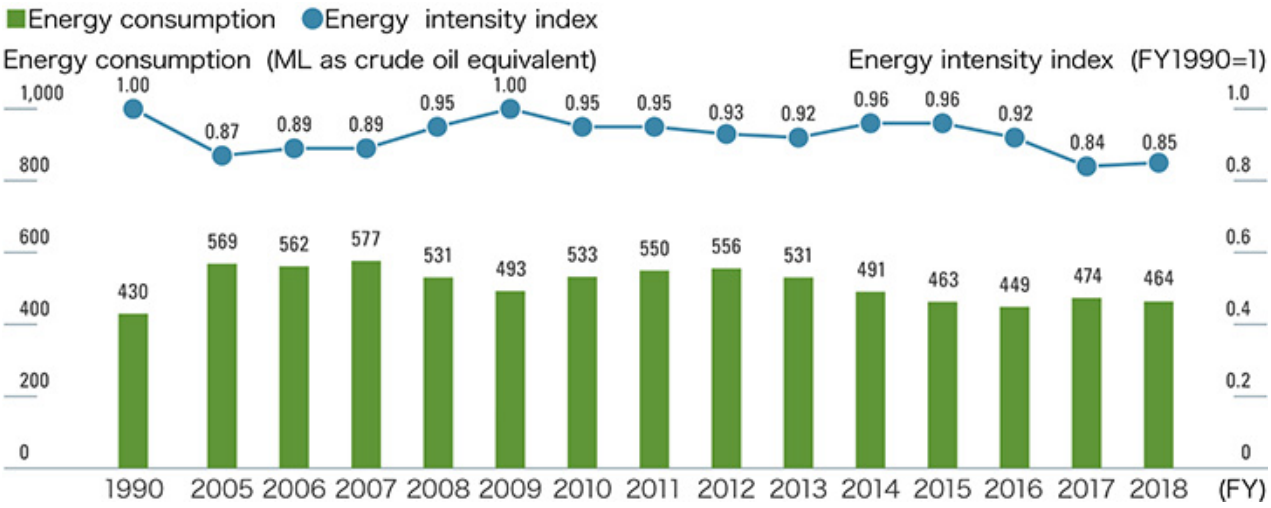
Scope 3 Emissions

Category		Emissions (1,000 tons CO_2 equivalent)	
		MGC Alone (fiscal 2018)	MGC Group (fiscal 2017)
Cat.1	Purchased goods and services	5,129	6,915
Cat.2	Capital goods	53	97
Cat.3	Fuel- and energy-related activities not included in Scope 1 or Scope 2	84	180
Cat.4	Upstream transportation and distribution	715	938
Cat.5	Waste generated in operations	4	9
Cat.6	Business travel	4	9
Cat.7	Employee commuting	1	2
Cat.8	Upstream leased assets	8	16
Cat.9	Downstream transportation and distribution	109	238
Cat.10	Processing of sold products	—	—
Cat.11	Use of sold products	—	—
Cat.12	End-of-life treatment of sold products	1,312	1,965
Cat.13	Downstream leased assets	14	13
Cat.14	Franchises	0	0
Cat.15	Investments	513	205
Total		8,940	10,587

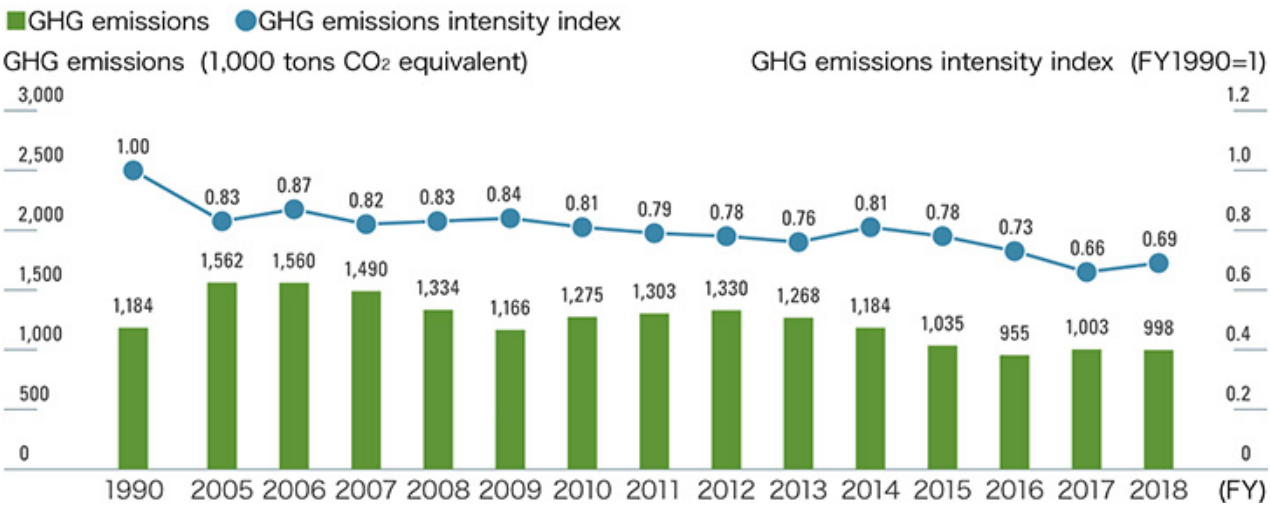
Emission Reduction Initiatives (MGC Alone)

MGC is taking measures to reduce energy consumption and GHG emissions. In fiscal 2018, such measures included reinforcing thermal recovery, reviewing reactor and co-generation system operating methods, and installing high-efficiency equipment. These efforts helped conserve 3ML of energy (crude oil equivalent) and reduced GHG emissions by 6,000 tons (CO_2 equivalent). Future plans call for additional installation of high-efficiency equipment, review of refining and reaction conditions, and other measures.

MGC Production Division energy consumption and energy intensity index



MGC Production Division GHG emissions and GHG emissions intensity index



Third-Party Verification of Greenhouse Gas Emissions (MGC Alone)

Beginning with the FY2016 report, a third-party organization has verified the GHG emission data reports disclosed by MGC to enhance reliability and transparency.

MGC GHG emissions (Scope 1+2) have undergone third-party verification and have obtained a verification statement in fiscal 2019.

[Scope of Accounting and Verification]

Mitsubishi Gas Chemical Company, Inc., CO_2 emissions, Scope 1 + 2

[Targeted Period]

April 1, 2018 – March 31, 2019

[Accounting and Verification Standards]

ISO 14064: 2006

[Verification Statement]

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VERIFICATION STATEMENT OF GREENHOUSE GAS ASSERTIONS

Statement No.: BD003-2019-GHG-KOB-DNVGL Page 1 of 2

Initiate reporting of

Verification of Mitsubishi Gas Chemical GHG Monitoring Report (2018)

< Scope of Verification>
DNV GL Business Assurance Japan KK has been commissioned by Mitsubishi Gas Chemical Company Inc. to perform a verification of the greenhouse gas assertion of "Mitsubishi Gas Chemical GHG Monitoring Report" of Mitsubishi Gas Chemical Company Inc. (2018) (hereafter the "GHG Report") with respect to the following area:

Mitsubishi Gas Chemical Company Inc., Scope 1 & 2

< Verification criteria and GHG Programme>
The identification, calculation, monitoring and reporting of the GHG emissions were based on ISO 14064-1:2006 (JIS Q 14064-1:2010). The verification of the reported GHG inventory was performed in accordance with ISO 14064-3:2006 (JIS Q 14064-1:2011)as well as criteria given, including the requirement from Mitsubishi Gas Chemical's GHG Monitoring and Reporting Procedure to provide for consistent GHG emission identification, calculation, monitoring and reporting.

< Verification Statement>
It is DNV GL's opinion that with limited assurance level nothing has come to our attention which causes us to believe that the greenhouse gas assertions of the "GHG Report" of Mitsubishi Gas Chemical Company Inc. (2018) dated 14 February 2020 do not accurately reflect Mitsubishi Gas Chemical's GHG emission of 2018 in accordance with the verification criteria identified as stated above.

< Process and Methodology>
The reviews of the Inventory Reports and the relevant documents, and the subsequent follow-up interviews have provided DNV GL with sufficient evidence to determine the fulfilment of stated criteria.

The verification has been performed under the supervision of:

Akira Sekine
GHG Verifier
March 2020

Independent Validation Verification Body:
DNV GL Business Assurance Japan KK

Naoki Maeda
Management Representative
17 March 2020

This Verification Opinions is based on the information made available to us and the engagement conditions detailed above. Hence, DNV GL cannot guarantee the accuracy or correctness of the information. DNV GL cannot be held liable to any party relaying or acting upon this Verification Opinion.
DNV GL Business Assurance Japan KK Sannomiya Chuo Bldg 8th Floor, 4-2-20, Goko-dori, Chuo-ku, Kobe 651-0087

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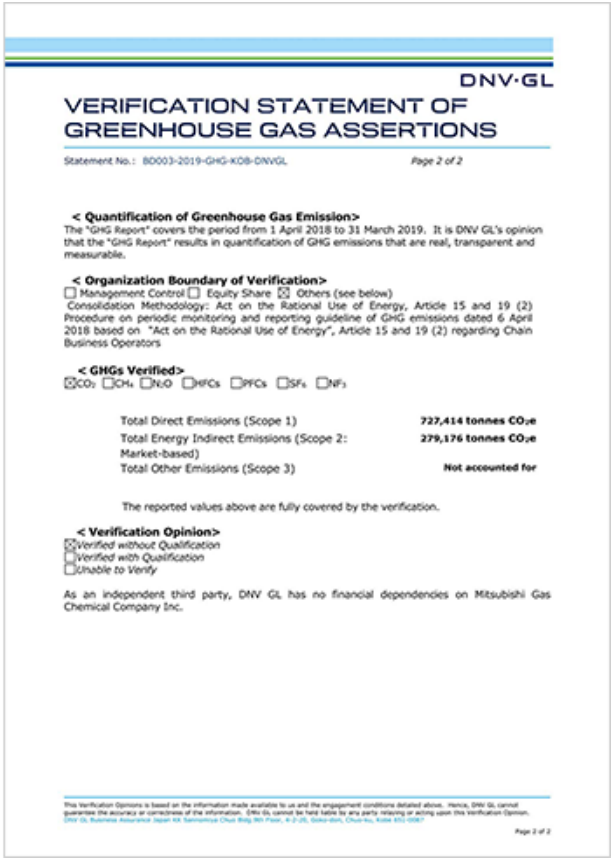

DNV·GL

VERIFICATION STATEMENT OF GREENHOUSE GAS ASSERTIONS

Statement No.: BD003-2019-GHG-KOB-DNVGL Page 2 of 2

< Quantification of Greenhouse Gas Emission>
The "GHG Report" covers the period from 1 April 2018 to 31 March 2019. It is DNV GL's opinion that the "GHG Report" results in quantification of GHG emissions that are real, transparent and measurable.

< Organization Boundary of Verification>
☐ Management Control ☐ Equity Share ☒ Others (see below)
Consolidation Methodology: Act on the Rational Use of Energy, Article 15 and 19 (2) Procedure on periodic monitoring and reporting guideline of GHG emissions dated 6 April 2018 based on "Act on the Rational Use of Energy", Article 15 and 19 (2) regarding Chain Business Operators

< GHGs Verified>
☒CO_2 ☐CH_4 ☐N_2O ☐HFCs ☐PFCs ☐SF_6 ☐NF_3

Total Direct Emissions (Scope 1)	**727,414 tonnes CO_2e**
Total Energy Indirect Emissions (Scope 2: Market-based)	**279,176 tonnes CO_2e**
Total Other Emissions (Scope 3)	**Not accounted for**

The reported values above are fully covered by the verification.

< Verification Opinion>
☒*Verified without Qualification*
☐*Verified with Qualification*
☐*Unable to Verify*

As an independent third party, DNV GL has no financial dependencies on Mitsubishi Gas Chemical Company Inc.

This Verification Opinions is based on the information made available to us and the engagement conditions detailed above. Hence, DNV GL cannot guarantee the accuracy or correctness of the information. DNV GL cannot be held liable to any party relaying or acting upon this Verification Opinion.
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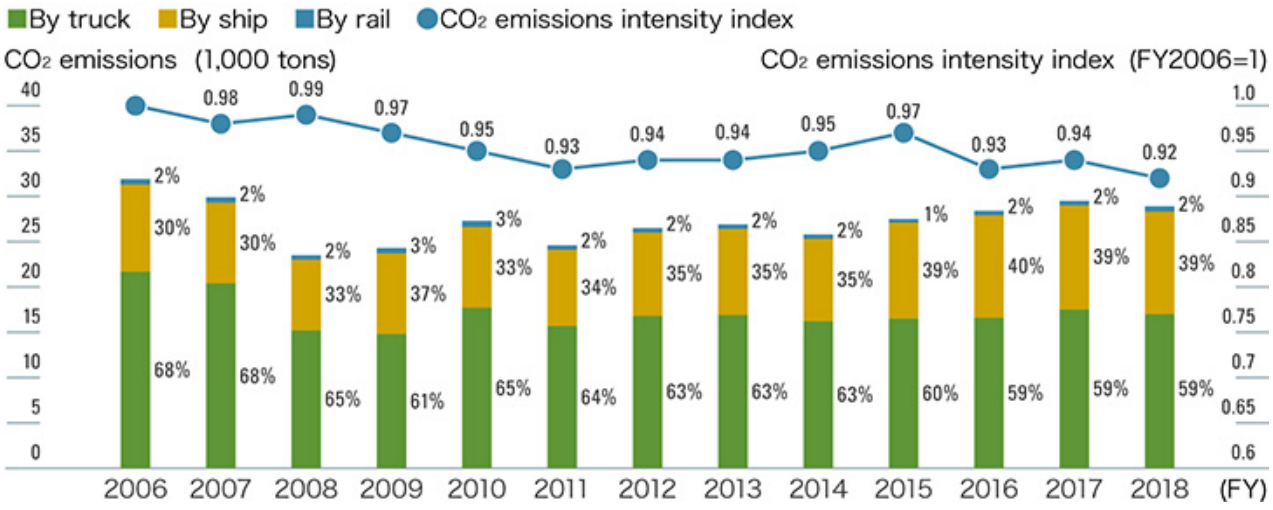
Initiatives in the Transportation Sector (MGC Alone)

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.
As a result of measures undertaken in fiscal 2018, energy consumption was reduced by 2%.

MGC transportation sector CO_2 emissions



Disclosure Through CDP

Through CDP, an international NGO engaged in disclosing information on climate change, water security and other issues, MGC discloses its activities regarding climate change. Under the CDP 2019 Climate Change Survey, MGC received a B- rating.

Wasabizawa Geothermal Power Plant Commences Operations

The Wasabizawa Geothermal Power Plant (Yuzawa City, Akita Prefecture), a joint venture of Electric Power Development Co., Ltd., Mitsubishi Materials Corporation, and MGC, began commercial operations in May 2019. It is the first large-scale geothermal power plant constructed in Japan in 23 years. Geothermal power plants generate electricity using subterranean steam, making geothermal power a renewable form of energy that produces virtually no CO_2 during generation.
In September 2019, construction started on the Appi Geothermal Power Plant (Hachimantai City, Iwate Prefecture), also a joint venture with Electric Power Development and Mitsubishi Materials.
Through these geothermal power projects, MCG is contributing to the increased use of renewable energy.

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.

Water Resource Risk Management

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 of chemical products and for various other purposes, including steam-heating and cooling in chemical manufacturing processes, product refining and cleaning containers.

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 effluent standards after treating it to filter out identified pollutants. Data on these water-related environmental impacts are published in the Sustainability Data Book.

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

From a business continuity standpoint, MGC has identified production downtime due to drought or flooding of production facilities as a water-related risk, formulated the business continuity plan (BCP) that addresses this risk and implemented measures to

mitigate it. None of 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.

Meanwhile, MGC sees opportunities in businesses that provide solutions for issues surrounding the coolant water of air conditioning equipment and cooling systems. Such solutions include water treatment agents that maintain healthy coolant water quality by killing disease-causing legionella bacteria and a comprehensive water treatment system service offered through affiliate Dia Aqua Solutions Co., Inc.

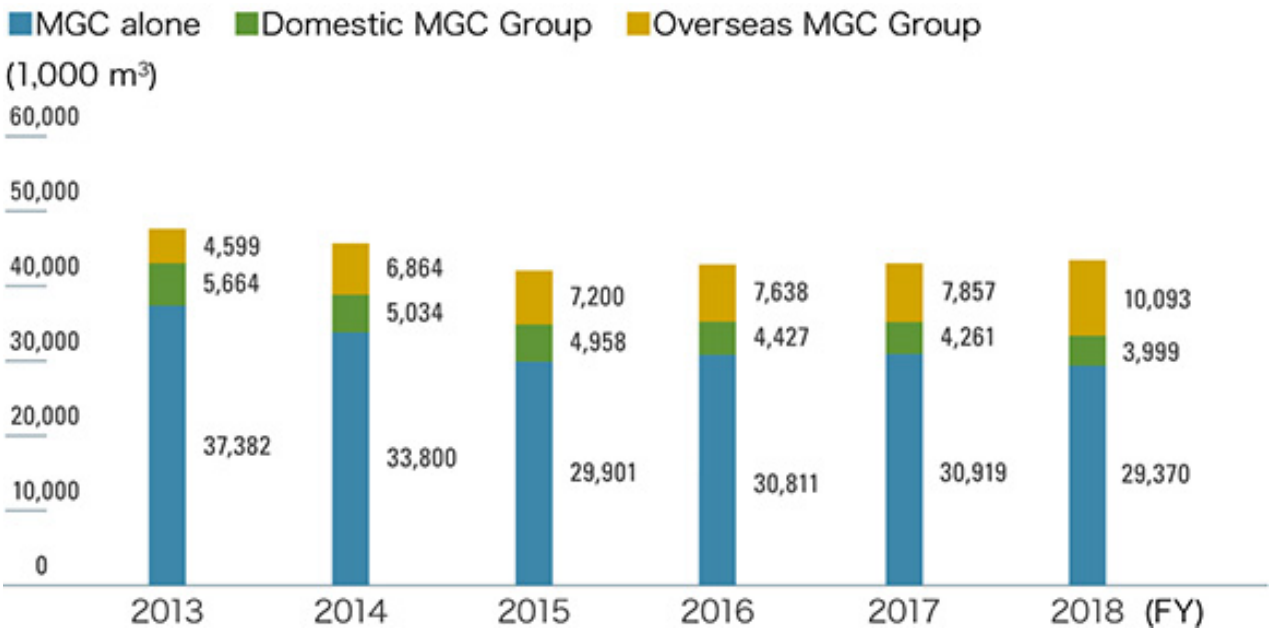
Going forward, MGC will set qualitative and quantitative targets for efficient water usage to more effectively preserve water resources.

Use of Water

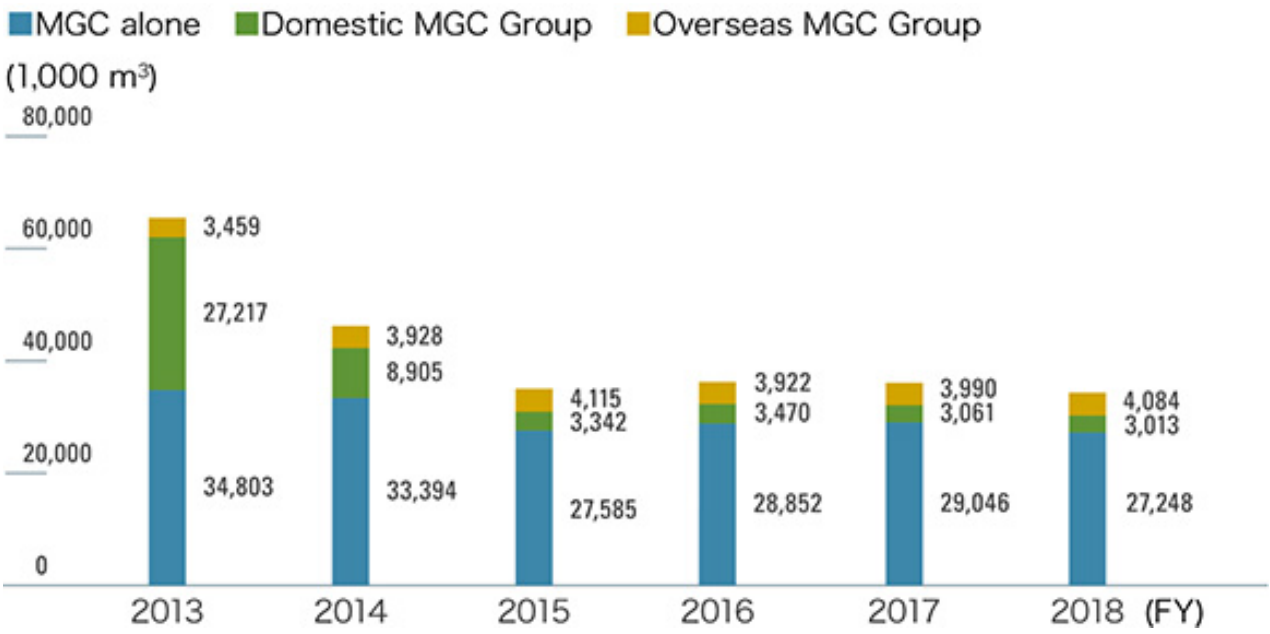
To use the water resources so vital to the Earth sustainably, MCG Group companies monitor water intake and wastewater volumes to ensure the efficient use of this resource.

Water Intake / Wastewater Volume (MGC Group)

Water intake

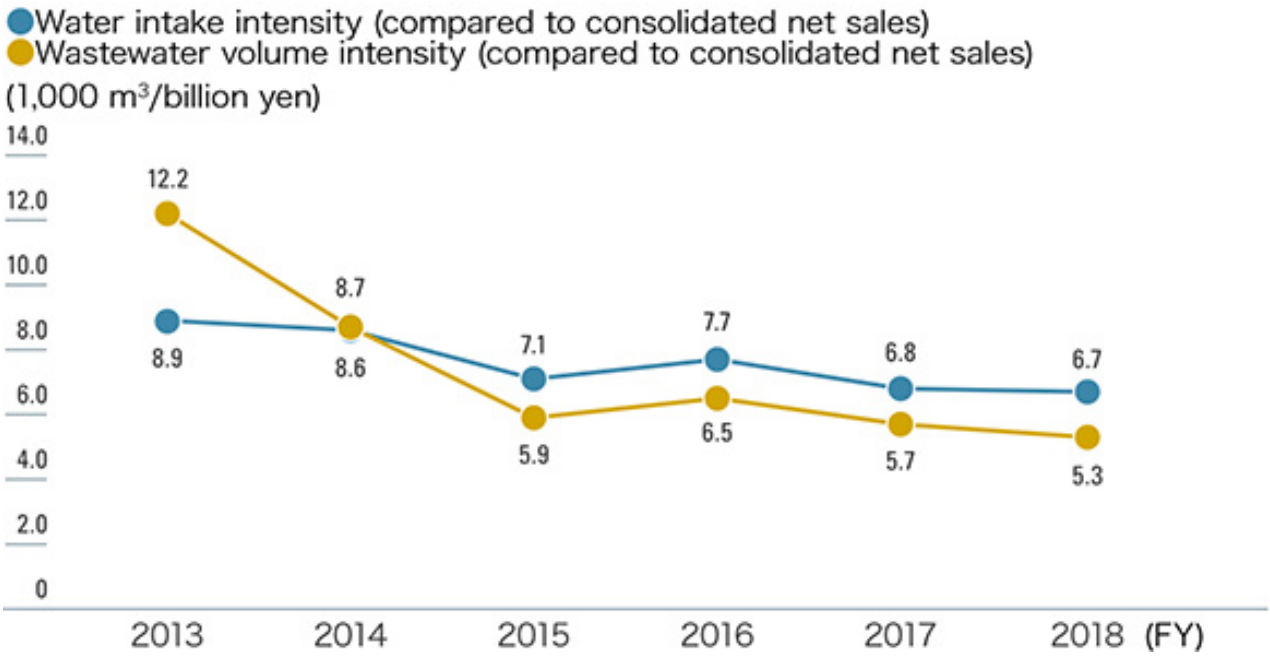


Wastewater



The increase in wastewater generated by the Group in Japan in fiscal 2013 was a temporary upturn due to intensive processing of wastewater that have been stored in tanks in conjunction with the shutdown of facilities.

Global water intake / wastewater volume intensity compared to consolidated net sales



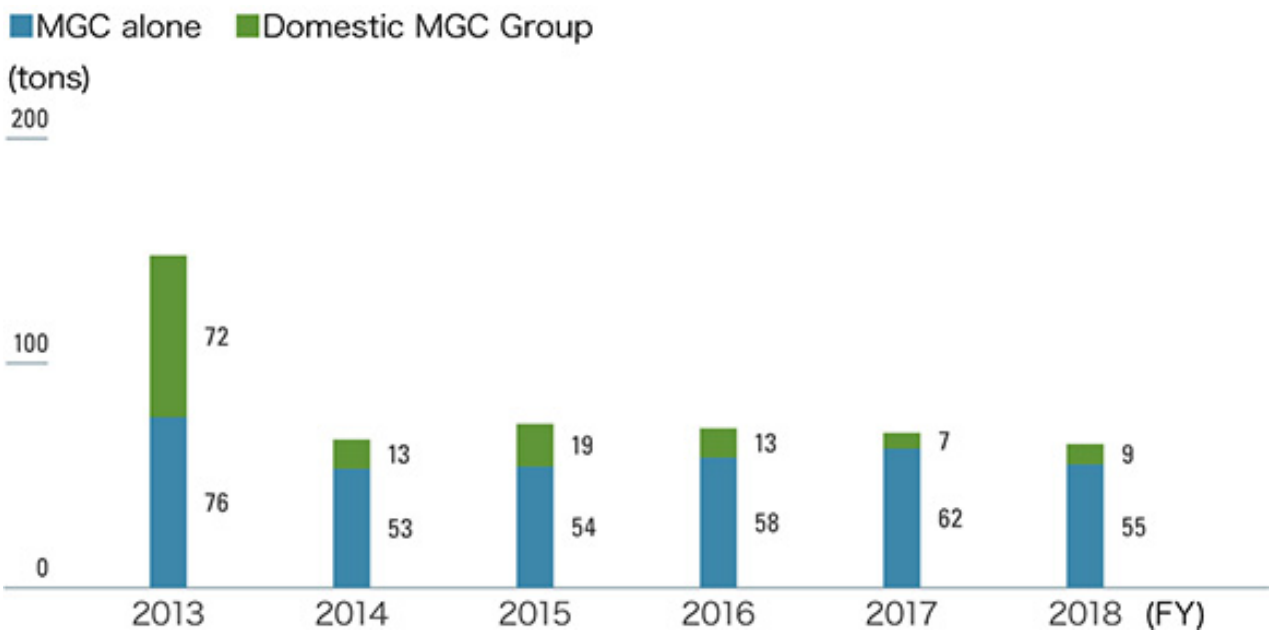
* 2017 data has been reviewed and corrected.

Preserving Air and Water Quality

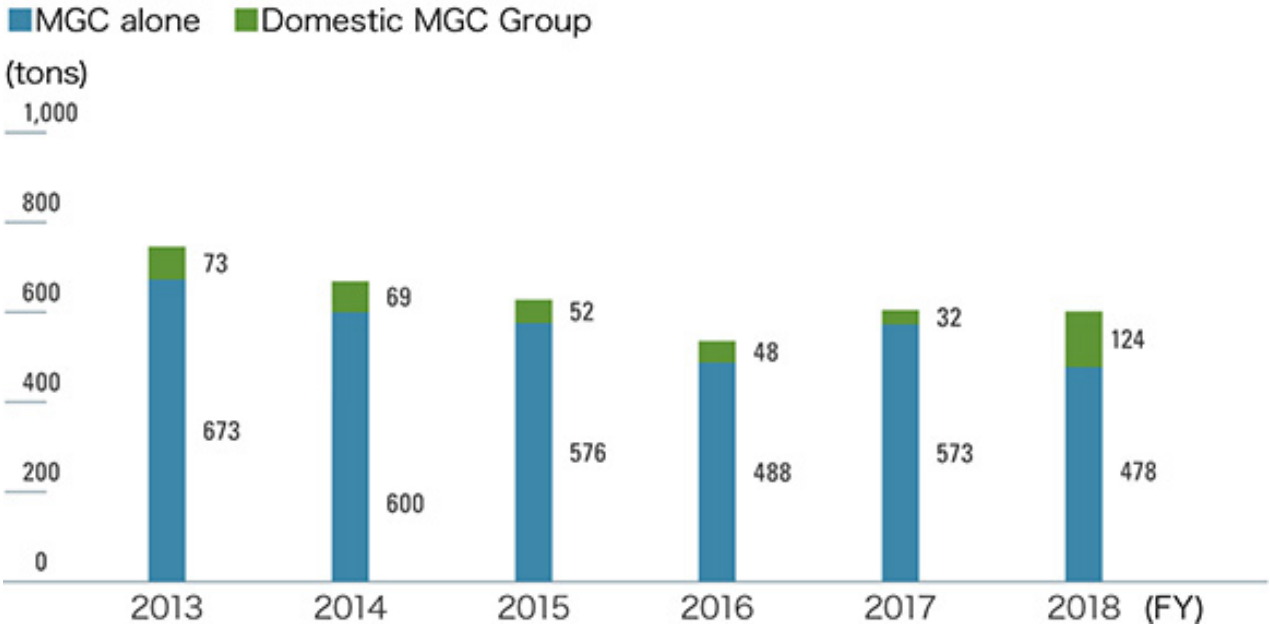
To prevent pollution and to maintain sound habitats for living things, MGC Group companies monitor the volume of environmentally hazardous substances in wastewater and waste gas and work to reduce discharge volumes.

Preserving Air Quality (MGC Alone and Domestic MGC Group)

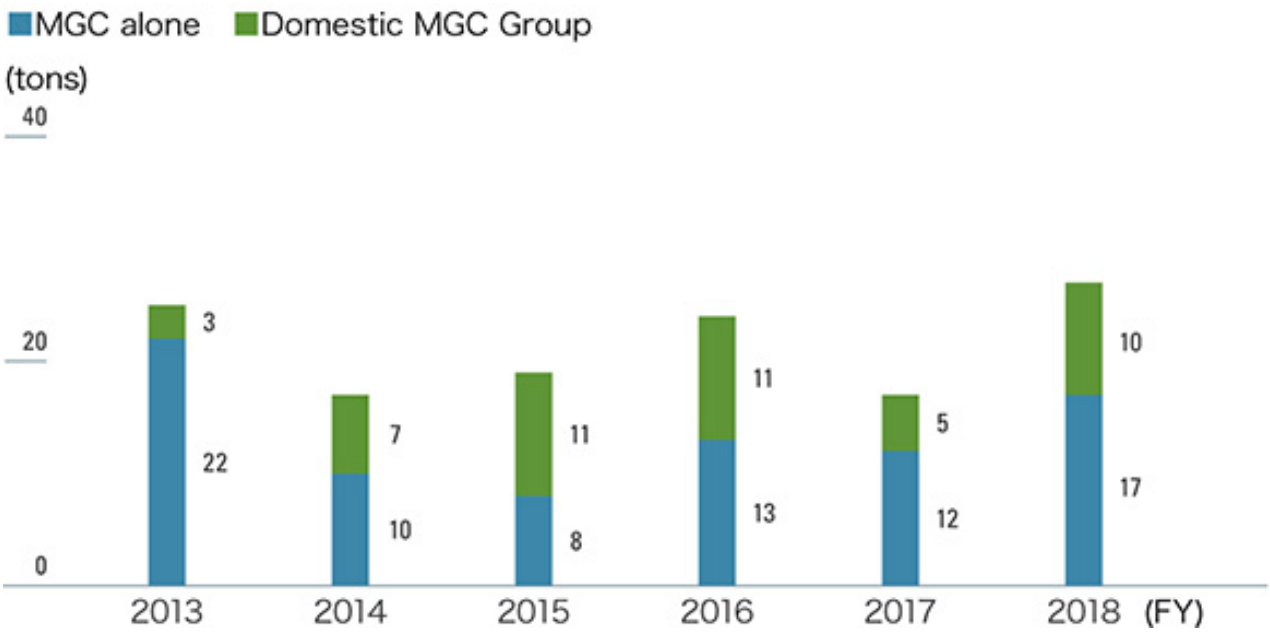
Emission of SOx



Emission of NOx



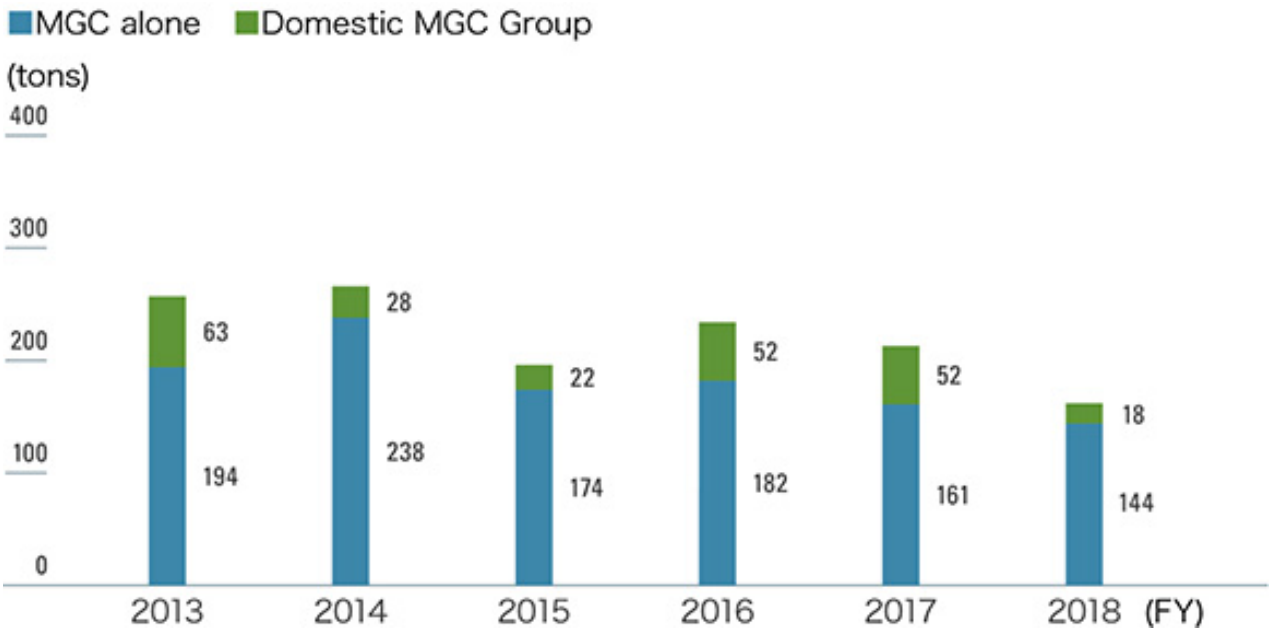
Emission of soot and dust



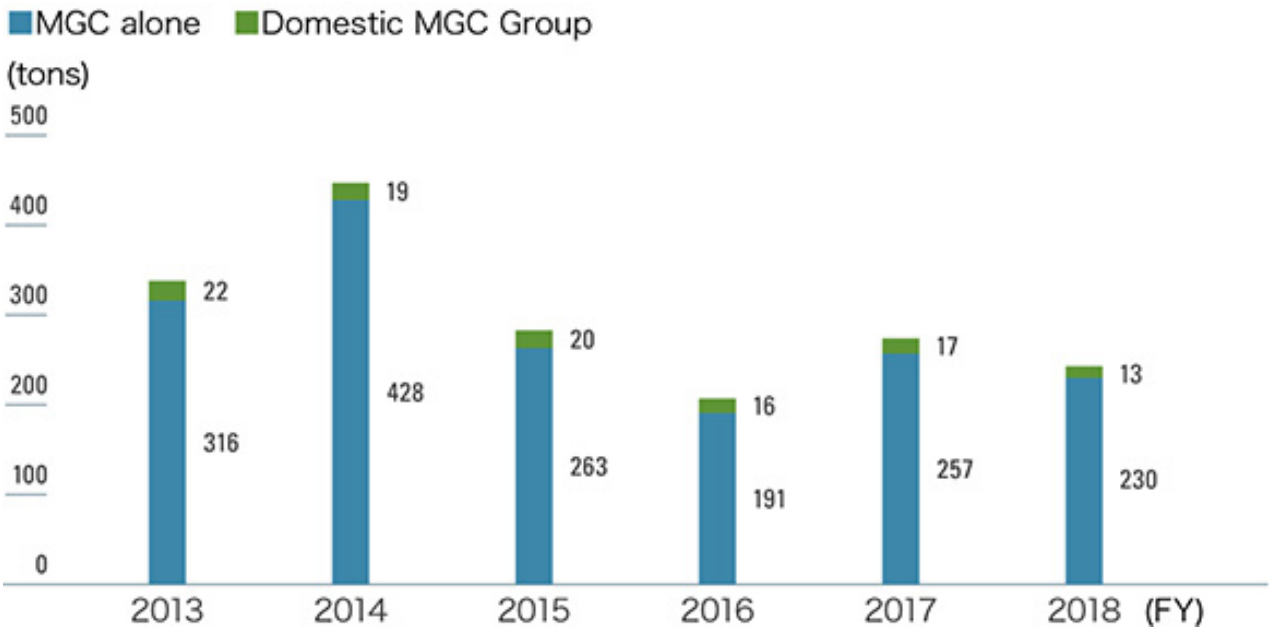
* Past data has been reviewed and corrected.

Preserving Water Quality (MGC Alone and Domestic MGC Group)

Emission of COD

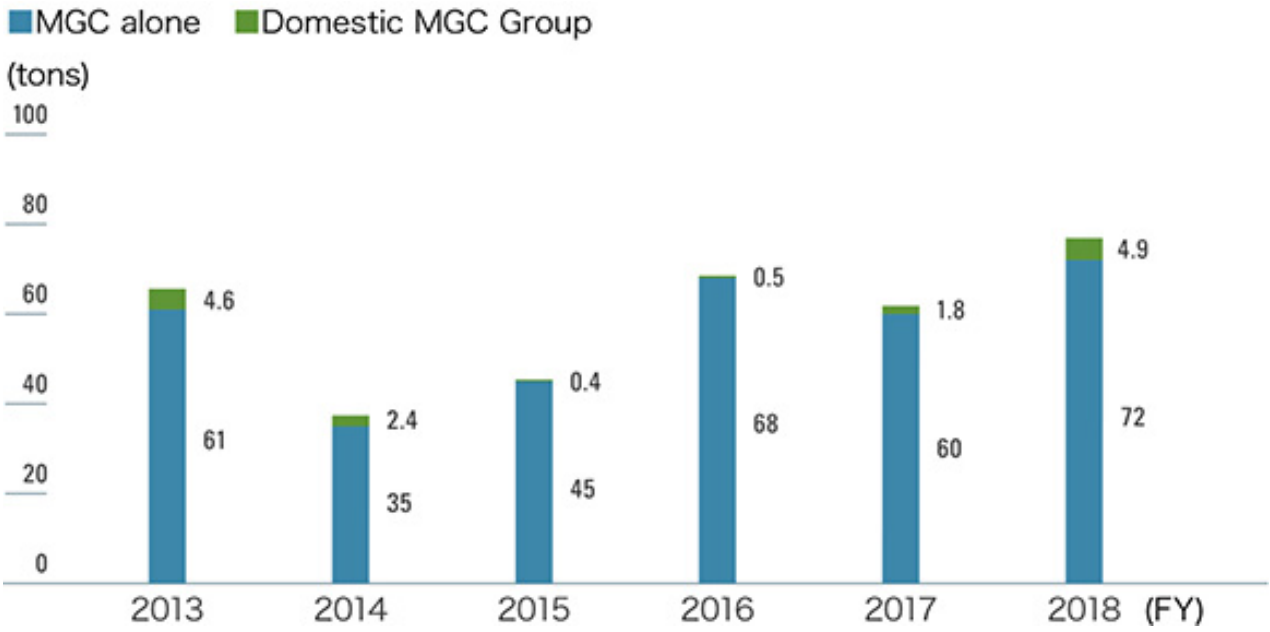


Emission of total nitrogen



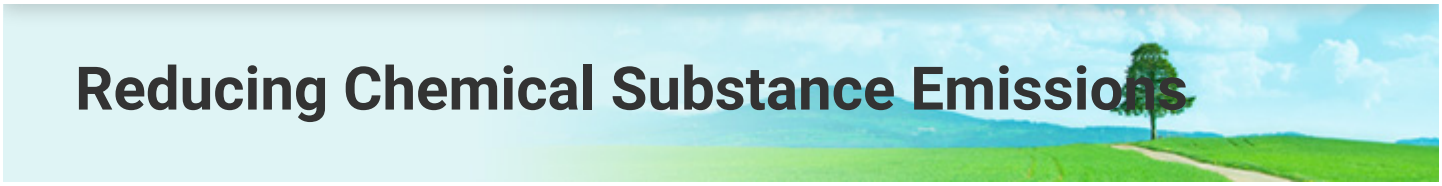
The increase in nitrogen seen during fiscal 2013 and fiscal 2014 was a temporary increase due to processing of wastewater associated with the decommissioning of facilities.

Emission of total phosphorous



* The increase in total phosphorous emissions since fiscal 2016 is the result of increases in the use of phosphorous compounds in conjunction with higher production.

Reducing Chemical Substance Emissions

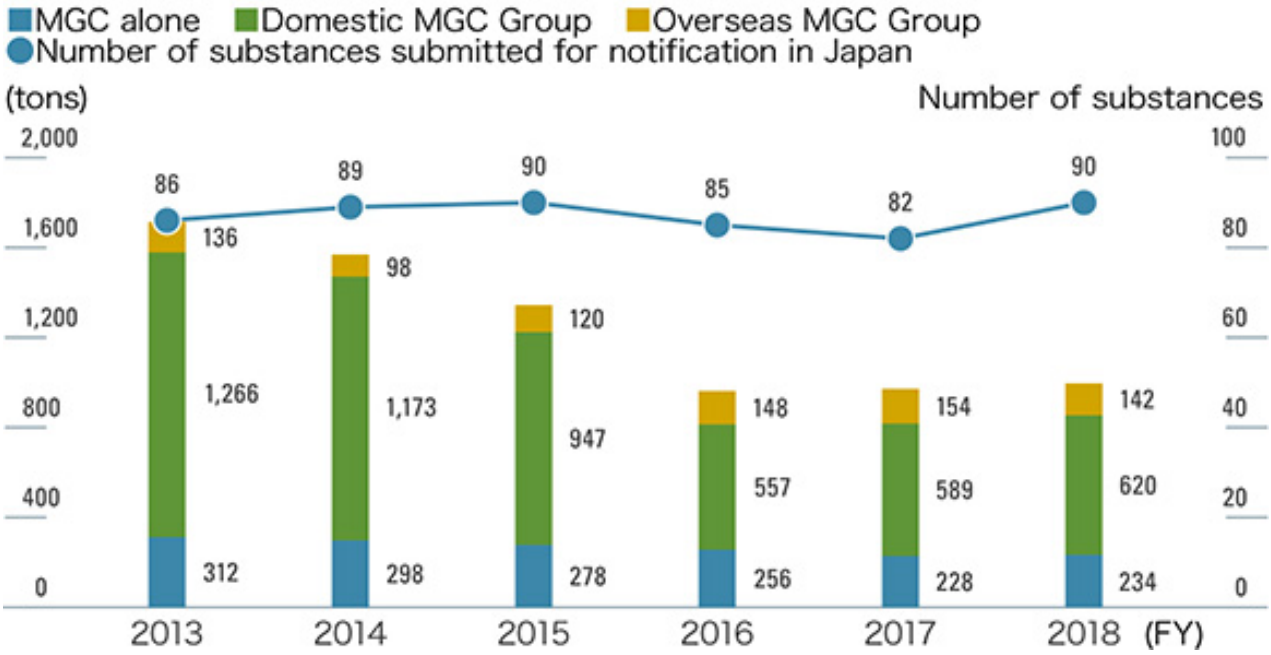


Each MGC Group company assesses and submits notifications on substances subject to the chemical substance emission notification system of the country in which it is based (PRTR in Japan), while working to reduce the amounts released and transferred.

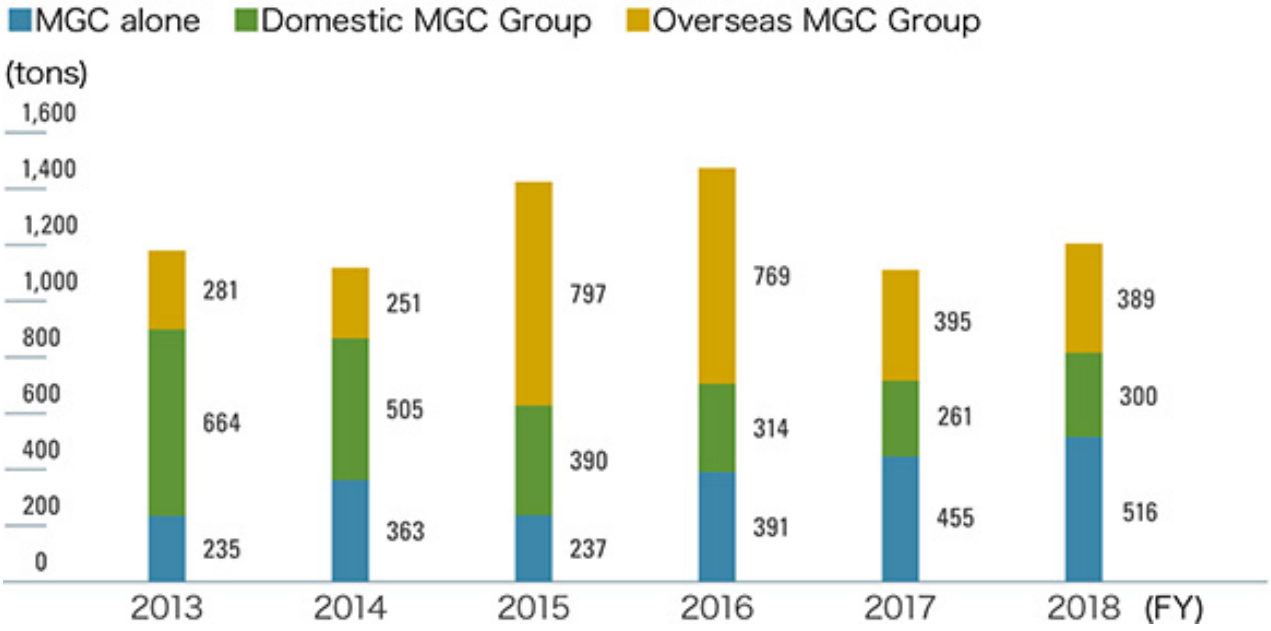
Substances Subject to Notification under the PRTR Law (MGC Group)

Many countries have systems that require notifications regarding chemical substance emission in a similar way to Japan's PRTR Law (TRI in the US, etc.). In its tabulation, MGC has aggregated substance emissions reported by MGC alone and by domestic MGC Group companies based on the PRTR Law, and emissions reported by overseas group companies under the laws of their respective countries and regions for substances listed under Japan’s PRTR system or for which there is a CAS number.

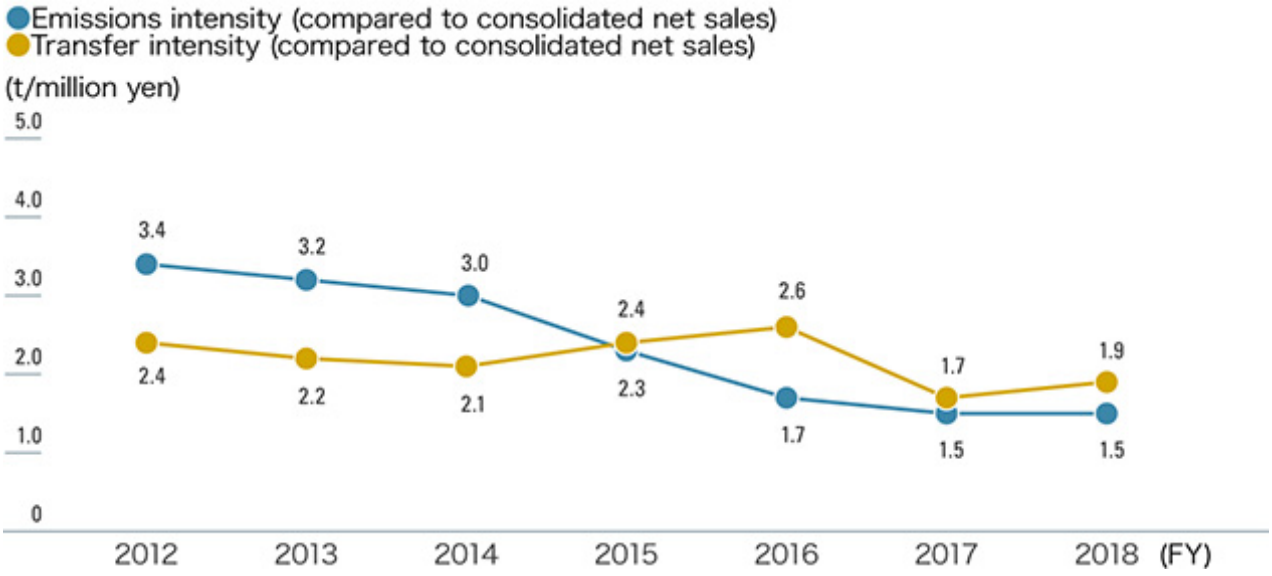
Substance emissions (in accordance with the PRTR Law)



Substance transfers (in accordance with the PRTR Law)



Substance emissions and transfer intensity (in accordance with the PRTR Law) compared to consolidated net sales



* Past data has been reviewed and corrected.

High-emission Substances Notified under the PRTR Law (MGC Alone and Domestic MGC Group)

Among the substances notified under the PRTR Law, those listed below were emitted by MGC alone and the domestic MGC Group in total in amounts of 10 tons or more.

Government-designated number	Substance	Emissions (tons)		
		FY 2016	FY 2017	FY 2018
128	Chloromethane	534	567	590
296	1,2,4-Trimethylbenzene	45	99	113
186	Dichloromethane	58	78	87
80	Xylene	18	24	18
300	Toluene	13	14	13

* Past data has been reviewed and corrected.

Japan Chemical Industry Association PRTR-targeted Substances (MGC Alone)

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 substance 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 2018 totaled 72 substances and 326 tons. The production volumes of some products increased, and as a result, emissions increased slightly from the previous fiscal year. MGC will continue its

efforts to reduce emissions occurring in conjunction with facility shutdowns by implementing measures to reduce problems at plants and taking other action.

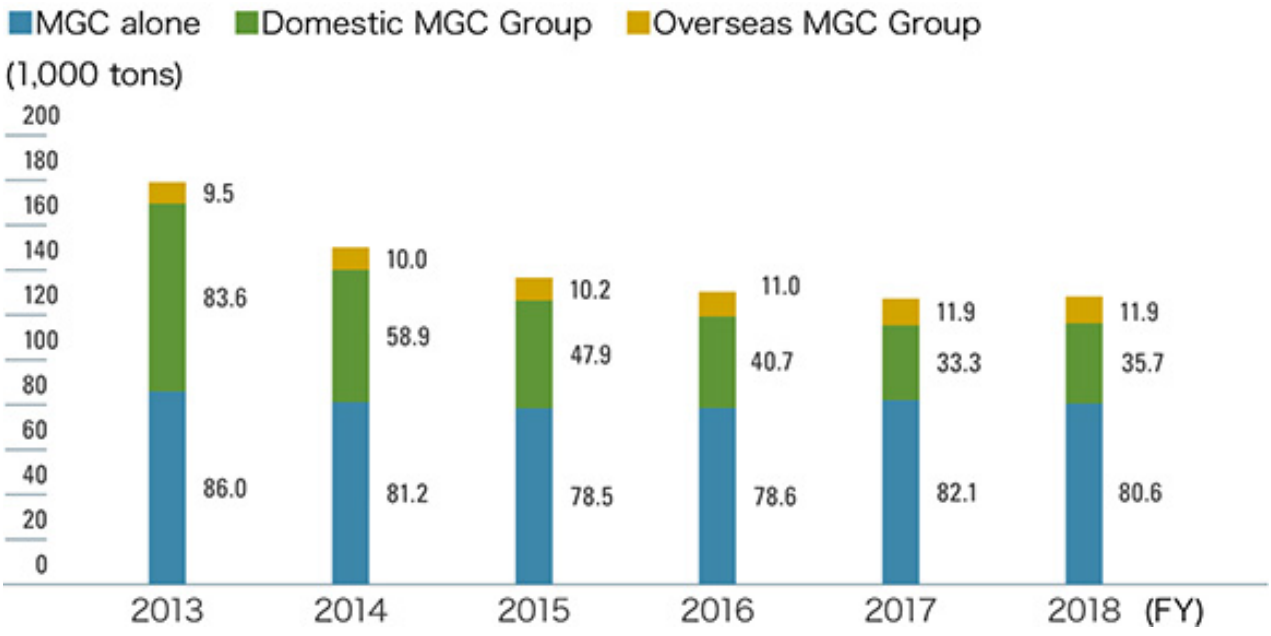
Reducing Waste

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.

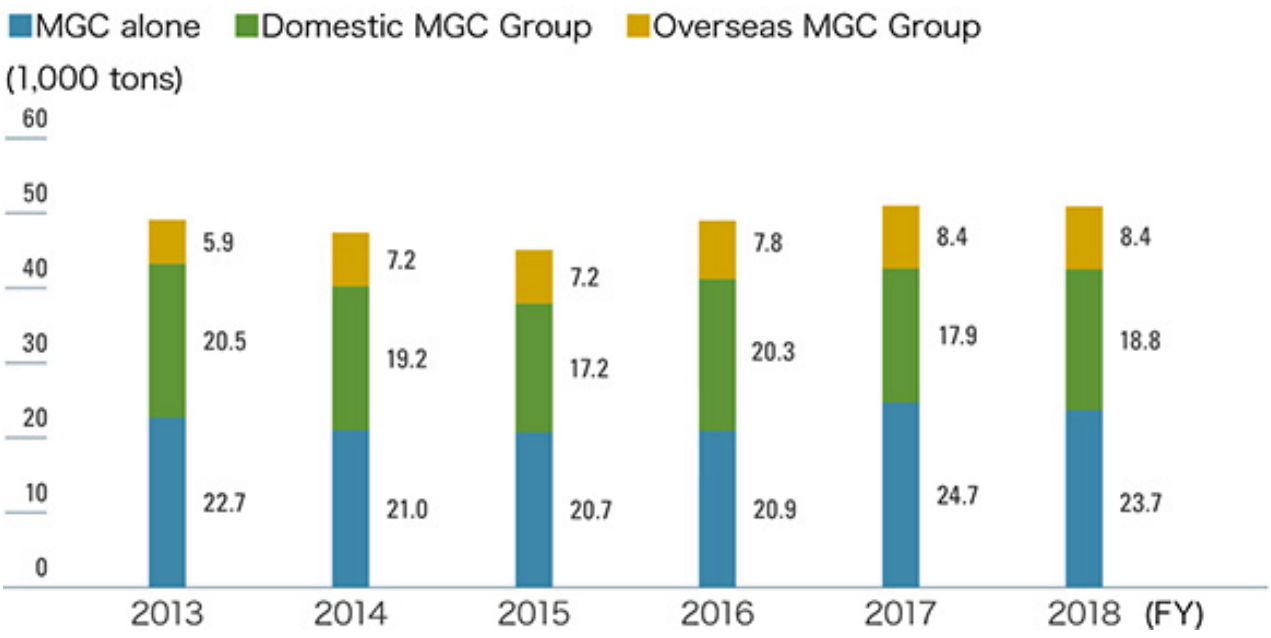
Reducing Waste (MGC Group)

Fiscal 2018 waste amounts totaled about 128,200 tons Group-wide, an increase of about 900 tons, and nearly flat from the previous year. Final disposal for the Group totaled 3,361 tons, a decrease of about 830 tons from the previous year.

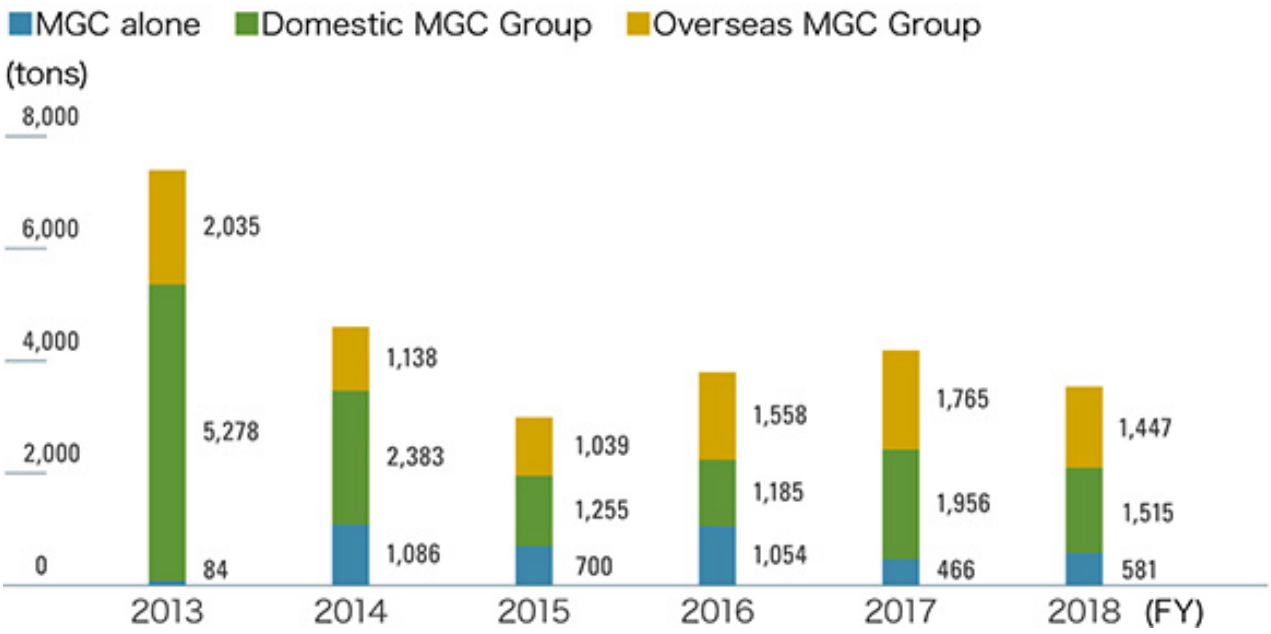
Amount of waste generated



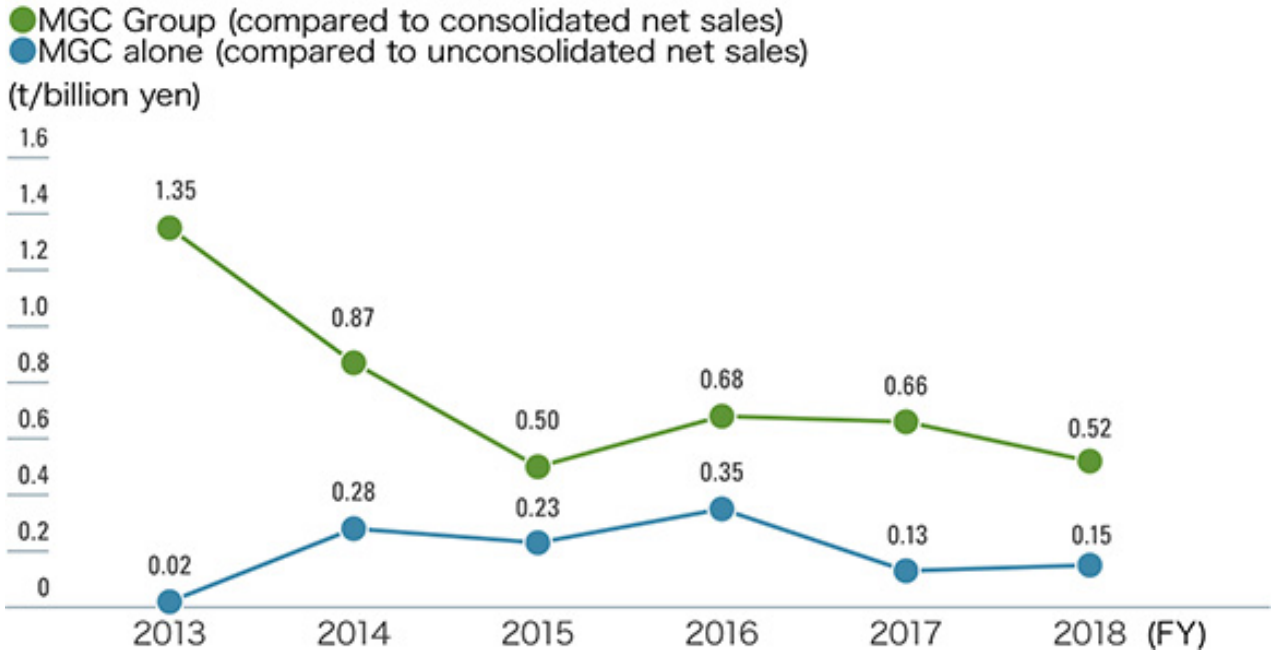
Recycled amount



Final disposal amount



Final disposal intensity compared to net sales

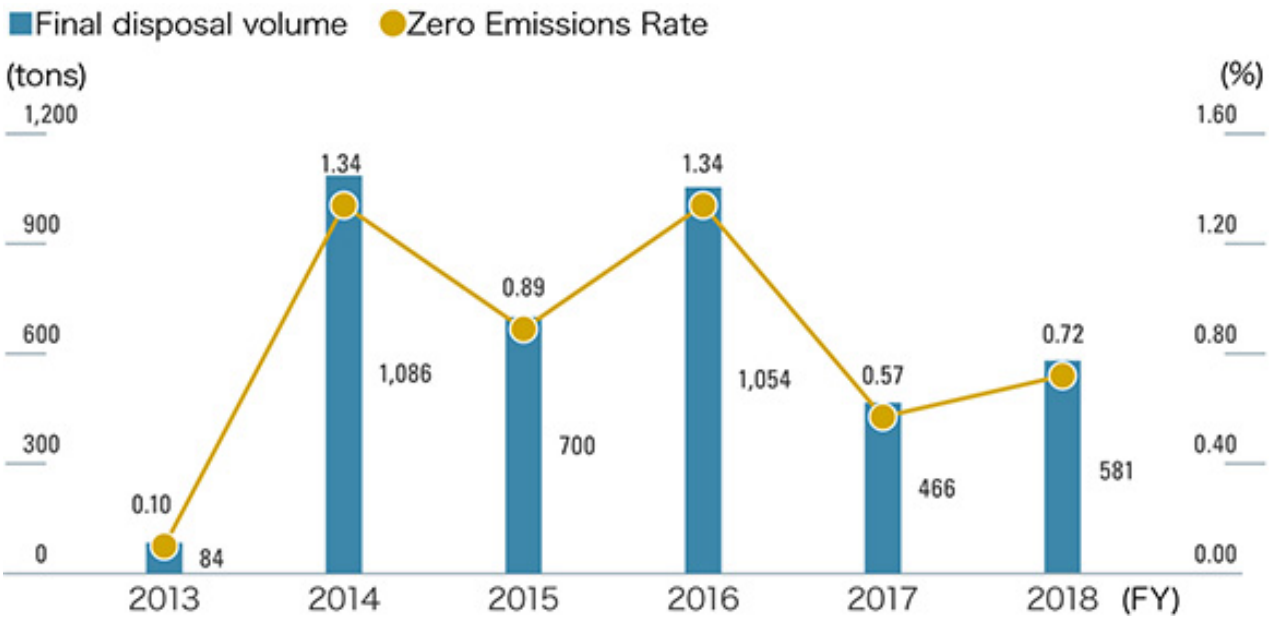


* Past data has been reviewed and corrected.

Zero Emissions (MGC Alone)

MGC alone defines zero emissions as final disposal of waste of 0.3% or less of waste generated, and works to encourage recycling and reduction of final disposal.
The zero emissions rate for fiscal 2018 was 0.72%, and zero emissions have not been achieved since fiscal 2014. Increases in the amount of final disposal since fiscal 2014 have been due to ongoing temporary circumstances, including waste generated in conjunction with a business reorganization, and the occurrence of waste catalyst and surplus soil. In addition, waste activated sludge that previously was sold for value is now disposed of in landfills, contributing to the increase in final disposal volume.

Final disposal volume and Zero Emissions Rate (MGC alone)



Preserving Biodiversity

Preserving Biodiversity (MGC Alone)

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.

Companies that manufacture chemicals handle a large volume and variety of chemical substances. Each Group company takes comprehensive measures and exercises due care to prevent leaks and other incidents that may have an impact on human health and ecosystems.

MGC strives to mitigate climate change by conducting reliable chemical management founded on responsible care, conserving energy, and reducing emissions of GHG and to maintain a rich natural environment and preserve biodiversity.
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.

TOPICS

Collection of Plastic-Related Case Studies that Contribute to the Japan Business Federation SDGs

The Japan Business Federation Website contains a collection of plastic-related case studies from numerous companies in Japan titled “Contributing to the UN SDGs through Measures Addressing Plastic Waste Issues: Efforts toward a positive future for plastics “TORIKUMI”.

› https://www.keidanren.or.jp/en/policy/2018/099.html

The collection includes case studies concerning plastic resource recycling initiatives and measures to address plastic in the oceans by JSP and MCG.

Environmental Accounting

Environmental Preservation Costs and Economic Benefits (MGC Alone)

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 MGC alone, as well as the real economic benefits obtained.

- Investment amount
  The total amount of investment related to environmental preservation activities in fiscal 2018 was approximately 680 million yen. Major investments included improvements to phenol recovery facilities at the Niigata Plant.
- Expenses
  Total expenses related to environmental conservation activities in fiscal 2018 were 8.4 billion yen. Of these, the highest expense was 2.4 billion yen for research and development, accounting for 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.

Economic benefit

Title	Item	FY2017 (millions of yen)	FY2018 (millions of yen)
Income	Profit on sale of valuable waste, etc.	29.5	29.6
Reduction of expenses	Effects due to energy saving	1,064.1	182.6

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

Breakdown			Main areas of activity	FY2017 (millions of yen)		FY2018 (millions of yen)	
				Investment	Expenses	Investment	Expenses
Onsite cost	Pollution prevention cost	Air pollution prevention	Upgrade and updating of exhaust gas treatment facilities	57.1	771.2	10.1	1,021.4
		Water pollution prevention	Upgrade of wastewater treatment facilities and measuring equipment	55.7	1,602.0	82.8	1,750.0
		Soil, Noise	Prevention of soil infiltration, updating of odor sensors	16.9	0.0	138.2	11.7
	Global environmental preservation cost		Replacement of mercury-vapor lamps and other lighting with LED fixtures, upgrade of air conditioning equipment	90.0	1,928.3	114.6	1,664.0
	Resource recycling cost		Measures to extend the lives of catalysts, recycling of waste	0.2	931.6	69.5	1,118.8
Up or down stream cost			Retrieval and reuse of product containers; Container and Packaging Recycling Act	0.0	55.5	0.0	42.7
Management activity cost			Greening of surrounding areas, environmental-related analysis, disclosure of environmental information	24.9	487.8	42.8	470.9
R&D cost			Research and development of energy-saving technologies and eco-friendly products	259.2	2,498.4	222.1	2,376.0
Social contribution cost			Environmental preservation organization membership dues	0.0	10.1	0.0	8.9
Environmental damage cost			Pollution impacts levy	0.0	77.7	0.0	71.1
Total				504.0	8,362.6	679.9	8,535.5

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

Period:From April 1, 2018 to March 31, 2019

Scope:MGC alone

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.