

Environmental Report (Fiscal 2017 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.

> **Environmental Management**

> **Results Versus the Medium-term Plan**

> **Climate Change Initiatives**

> **Use of Water**

> **Preserving Water and Air Quality**

> **Reducing Chemical Substance Emissions**

> **Reducing Waste**

> **Preserving Biodiversity**

> **Environmental Accounting**

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 2017 results are included in the scope of reporting (members of the MGC Group Environment and Safety Council*)

Eiwa Chemical Industry Co., Ltd.

Toyo Kagaku Co., Ltd.

MGC Advanced Chemical Inc.

Japan Pionics Co., Ltd.

MGC Ageless Co., Ltd.

Japan Finechem Co., Inc.

MGC Electrotechno Co., Ltd.

Japan U-PiCA Co., Ltd.

MGC Filsheet Co., Ltd.

Fudow Co., Ltd.

JSP Corporation

Yonezawa Dia Electronics Co., Inc

Shin Sanso Kagaku Co.

Through fiscal 2017, Domestic MGC Group includes data from Japan Pionics Co., Ltd.

Overseas MGC Group companies whose 2017 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 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	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 (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
2012	1	13	12	49	8	8	21	70
2013	1	13	12	50	12	14	25	77
2014	1	13	12	53	14	16	27	82
2015	1	13	12	53	14	16	27	82
2016	1	13	12	53	14	16	27	82
2017	1	13	13	55	14	16	28	84

**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).

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 Alone and Domestic MGC Group)

Primary production-related inputs and outputs for MGC alone and the MGC domestic group in fiscal 2017 are as follows:

Input		Output	
Raw materials	970,000t	Product	1.68Mt
Energy (as crude oil equivalent)	572ML	CO ₂ emissions	1.22Mt -CO ₂
Water intake	35Mm ³	Wastewater	32Mm ³
		External waste discharge	21,000t
		Recycling	43,000t

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 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 2017, MGC replaced mercury lamps with LED bulbs in lighting used in its buildings and along roads on their premises, upgraded air conditioning equipment, and installed auxiliary devices on natural gas compressors. These steps had the effect of reducing electric power consumption by about 270,000 kWh/year on a pro forma basis.

Results Versus the Medium-term Plan



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.

RC Medium-term Plan (2015-2017) Environmental Conservation Targets (MGC Alone)

1. Reduce the energy intensity to 85% or lower compared with fiscal 1990 level (implementation of energy-saving measures and decrease of facility trouble).
2. Reduce greenhouse gas emissions intensity to 72% or lower compared with fiscal 1990 level.
3. Reduce emissions of PRTR substances by 10% compared with fiscal 2014.
4. Maintain zero emissions of wastes (zero emissions at MGC: 0.3% or less final disposal of generated wastes, by weight).
5. Reduce generated waste volume by 10% compared with fiscal 2014.
6. Promote initiatives related to the conservation of biodiversity.
7. Formulate methods for evaluating environment-friendly products.

RC Medium-term Plan (2015-2107) Three-year Activity Results (MGC Alone)

1 & 2. As a result of efforts to reduce energy consumption and greenhouse gas emissions in the plant manufacturing division, reduced energy consumption by 3% and greenhouse gas emissions by 12% over three years. The energy intensity was 83% compared to the fiscal 1990 level, an improvement of 12% over three years, and the greenhouse gas emissions intensity was 66% compared to the fiscal 1990 level, an improvement of 19% over three years, achieving the targets. In energy-saving measures, steps taken included deployment of a new-model co-generation system, an improvement of purification process, strengthened heat recovery, a review and a change in fuels used, effective use of by-product fuel and conversion of lighting to LED.

> Climate Change Initiatives

3. Results in fiscal 2017 for emissions of substances subject to the Pollutant Release and Transfer Register (PRTR) Act were 228 tons, approximately 23% lower than the fiscal 2014 level and meeting the medium-term target.

> Reducing Chemical Substance Emissions

4. The zero emissions rate for fiscal 2017 was 0.57%, 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.

> Reducing Waste

5. The amount of waste generated in fiscal 2017 was approximately 82,100 tons, which is about 1% higher than the fiscal 2014 level and which did not meet the medium-term target. The increase was due to an increase in production volume.

6. Carried out such activities as tree planting at sites and participation in cleanup activities in surrounding areas.

> Preserving Biodiversity

7. Established the MGC Group Environmental Contribution Product Certification Criteria in November 2016. As the first MGC Group Environmentally Contributing Products, selected seven products and projects of the MGC Group that contribute to reducing environmental impact. And announced them on websites and in the CSR report. MGC continues to select and announce such products and projects.

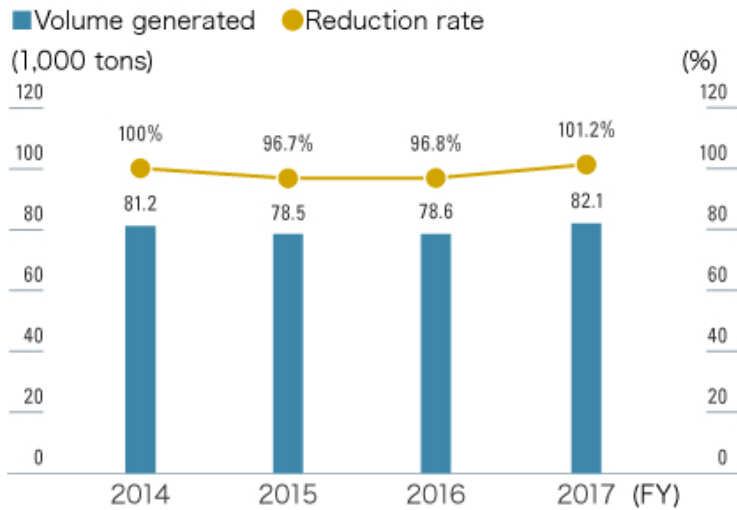
> Spotlight on Eco-Friendly Products

5. Waste Reduction Target for MGC Alone (2015-2017)

Target: Reduce generated waste volume by 10% compared with fiscal 2014.

Result: An increase of about 1% in fiscal 2017 compared with fiscal 2014, due to an increase in production volume.

Volume of waste generated and reduction rate (MGC alone)

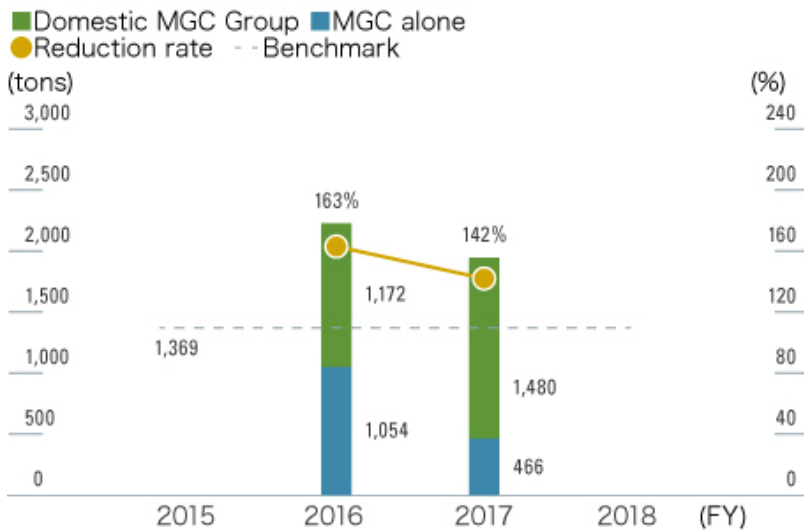


MGC Group Environment and Safety Council Waste Reduction Target (2016-2018)

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 benchmark has not been reached due to the effect of ongoing temporary generation of waste and waste catalyst in conjunction with a business reorganization.

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



Climate Change Initiatives



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 fiscal 2020
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-CO₂ compared to fiscal 1990 by fiscal 2020 (reduce by 100,000 t-CO₂ 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

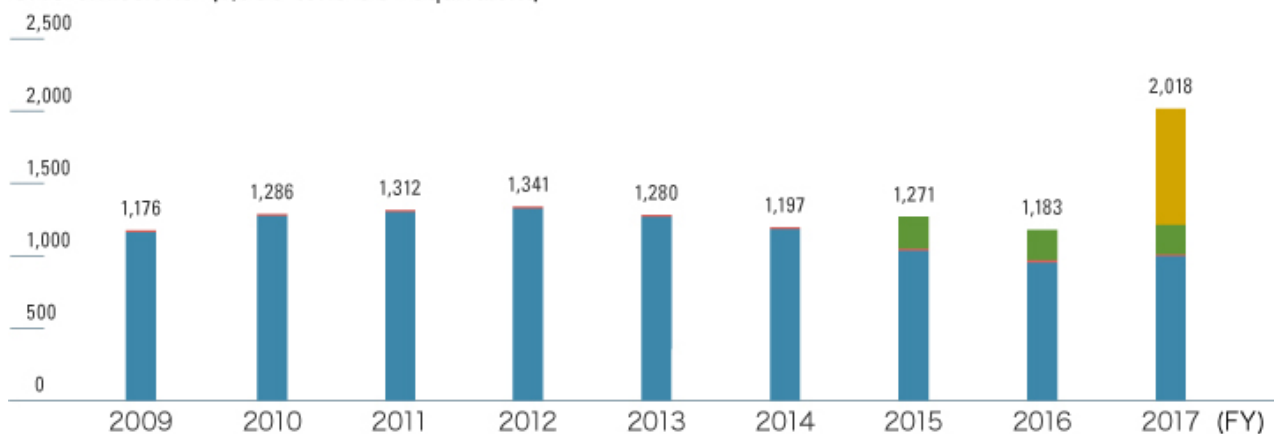
GHG Emissions in fiscal 2017 (Scope 1 + 2)

		Energy consumption (ML crude oil equivalent)	Greenhouse gas emissions (1,000 tons CO ₂ equivalent)
MGC Alone	Plant Manufacturing Division	474.0	998.3
	Office Area	5.9	11.2
Domestic MGC Group		90.3	207.0
Overseas MGC Group		374.2	801.7
MGC Group		944.4	2018.3

Scope 1 + 2 Emissions (MGC Group)

■ MGC Manufacturing Division
 ■ MGC Office Area
 ■ Domestic MGC Group
 ■ Overseas MGC Group

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.

Scope 3 Emissions (fiscal 2017 MGC Alone)

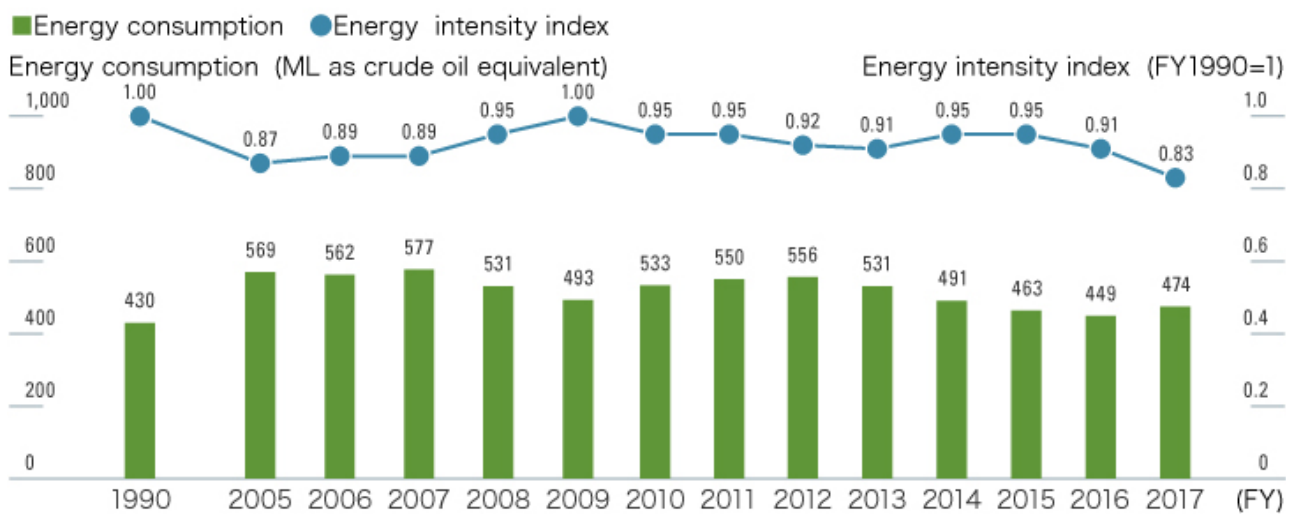
Category		Emissions (1,000 tons CO ₂ equivalent)
Cat.1	Purchased goods and services	5,329
Cat.2	Capital goods	39
Cat.3	Fuel- and energy-related activities not included in Scope 1 or Scope 2	90
Cat.4	Upstream transportation and distribution	723
Cat.5	Waste generated in operations	4
Cat.6	Business travel	4
Cat.7	Employee commuting	1
Cat.8	Upstream leased assets	8
Cat.9	Downstream transportation and distribution	177
Cat.10	Processing of sold products	–
Cat.11	Use of sold products	–
Cat.12	End-of-life treatment of sold products	1,760
Cat.13	Downstream leased assets	13
Cat.14	Franchises	0
Cat.15	Investments	589
Total		8,720

Emission Reduction Initiatives (MGC Alone)

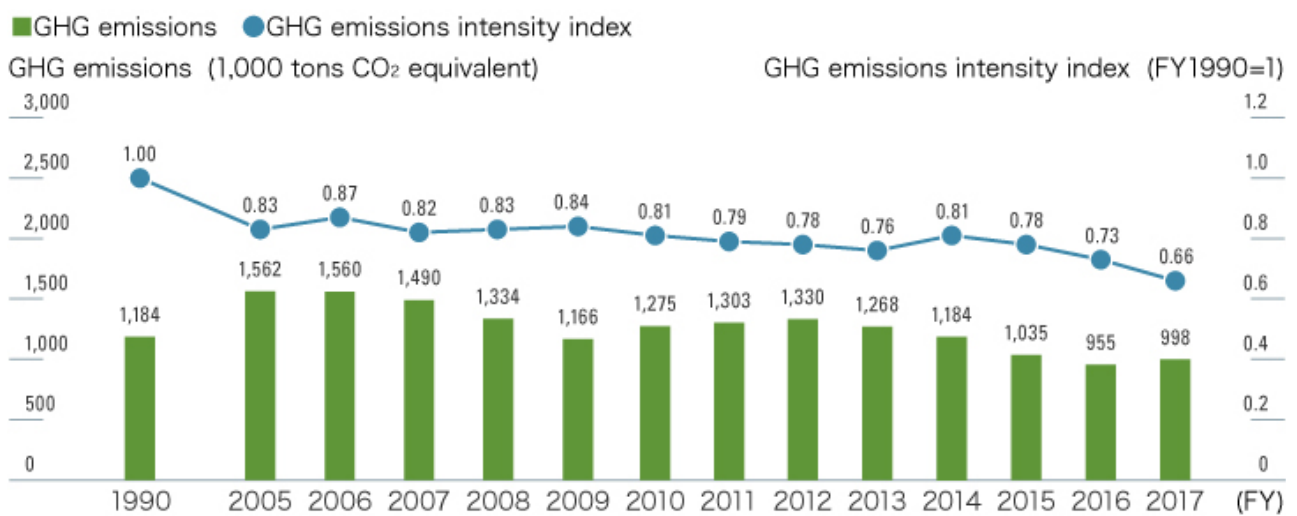
In fiscal 2017, MGC undertook about 50 measures to reduce energy consumption and GHG emissions. These included deployment of an upgraded co-generation system, consolidation of operations on high-efficiency co-generation systems, strengthened heat recovery, improvement of purification process, and deployment of high-efficiency equipment. These steps helped conserve 11ML of energy (crude oil equivalent), and reduced GHG emissions by 27,000 tons (CO₂ equivalent).

Future plans call for further strengthening of heat recovery, and improvement of co-generation system operational methods and manufacturing processes.

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 2018.

[Scope of Accounting and Verification]

Mitsubishi Gas Chemical Company, Inc., CO₂ emissions, Scope 1 + 2

[Targeted Period]

April 1, 2017 – March 31, 2018

[Accounting and Verification Standards]

ISO 14064: 2006

[Verification Statement]

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VERIFICATION STATEMENT OF GREENHOUSE GAS ASSERTIONS

Statement No.: E0003-2018-GHG-KDB-DNVGL Page 1 of 2
initiate reporting of

Verification of Mitsubishi Gas Chemical GHG Monitoring Report (2017)

< Scope of Verification >
DNV GL Business Assurance Japan K.K. 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. (2017) (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 ISO14064-1:2006. The verification of the reported GHG inventory was performed in accordance with ISO 14064-3:2006 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 "Mitsubishi Gas Chemical GHG Monitoring Report" of Mitsubishi Gas Chemical Company Inc. (2017) dated 7 March 2019 do not accurately reflect Mitsubishi Gas Chemical's GHG emission of 2017 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 fulfillment of stated criteria.

The verification has been performed under the supervision of: Independent Validation Verification Body: DNV GL Business Assurance Japan K.K.

Akira Sekine
GHG Verifier
March 2019

Naoki Maeda
Managing Director
25 March 2019

This verification Opinion is based on the information made available to us and the engagement conditions detailed above. Hence, DNV GL cannot guarantee the accuracy or completeness of the information. DNV GL cannot be held liable by any party relying or acting upon this verification Opinion. DNV GL Business Assurance Japan K.K., Sarinomya Chuo Bldg 9th Floor, 4-2-25, Sakurabashi, Chuo-ku, Tokyo 100-8587

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VERIFICATION STATEMENT OF GREENHOUSE GAS ASSERTIONS

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< Quantification of Greenhouse Gas Emission >
The Supply "GHG Report" covers the period from 1 April 2017 to 31 March 2018. 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 2017 based on "Act on the Rational Use of Energy", Article 15 and 19 (2) regarding Chain Business Operators

< GHGs Verified >
 CO₂ CH₄ N₂O HFCs PFCs SF₆ NF₃

Total Direct Emissions (Scope 1)	786,376 tonnes CO₂e
Total Energy Indirect Emissions (Scope 2: Market based)	231,382 tonnes CO₂e
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 Opinion is based on the information made available to us and the engagement conditions detailed above. Hence, DNV GL cannot guarantee the accuracy or completeness of the information. DNV GL cannot be held liable by any party relying or acting upon this verification Opinion. DNV GL Business Assurance Japan K.K., Sarinomya Chuo Bldg 9th Floor, 4-2-25, Sakurabashi, Chuo-ku, Tokyo 100-8587

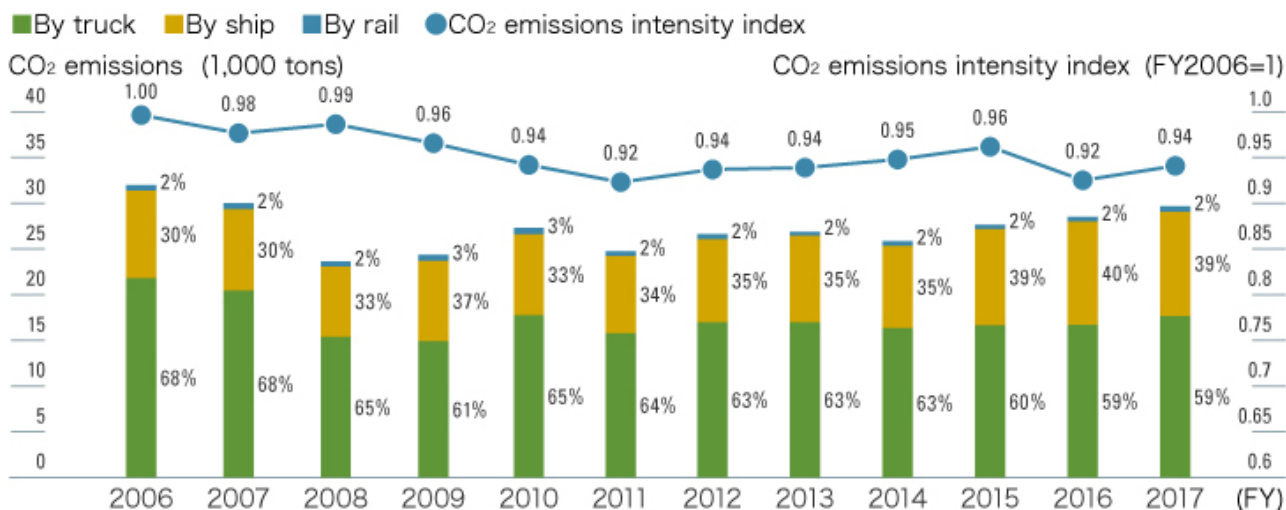
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Initiatives in the Transportation Sector (MGC Alone)

Energy-saving measures in the Transportation Sector primarily involved scaling up the volume of each load transported, and a move to modal shift, a more environmentally friendly transportation method.

As an example of a change to modal shift implemented in fiscal 2017, a change from truck to rail transport successfully reduced energy consumption by 0.7%.

MGC transportation sector CO₂ emissions



Disclosure Through CDP (MGC Alone)

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 2017 Climate Change Survey, MGC received an A- rating for the second year in a row.

Use of Solar Power Generation Facility

Solar power generation facility has been installed at the QOL Innovation Center Shirakawa, a new MGC Group manufacturing site opened in fiscal 2017. Power generated is used on the premises, and contributes to reducing GHG emissions.



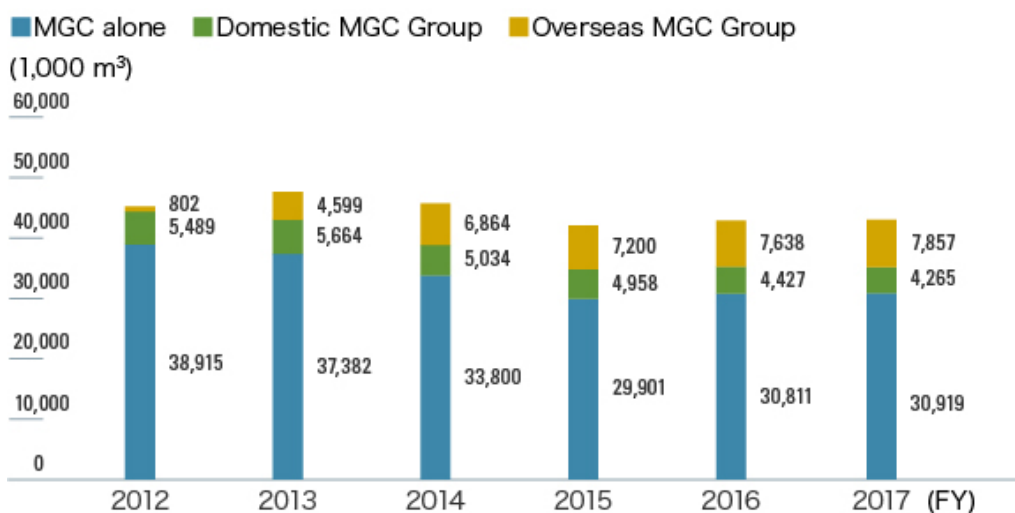
Use of Water



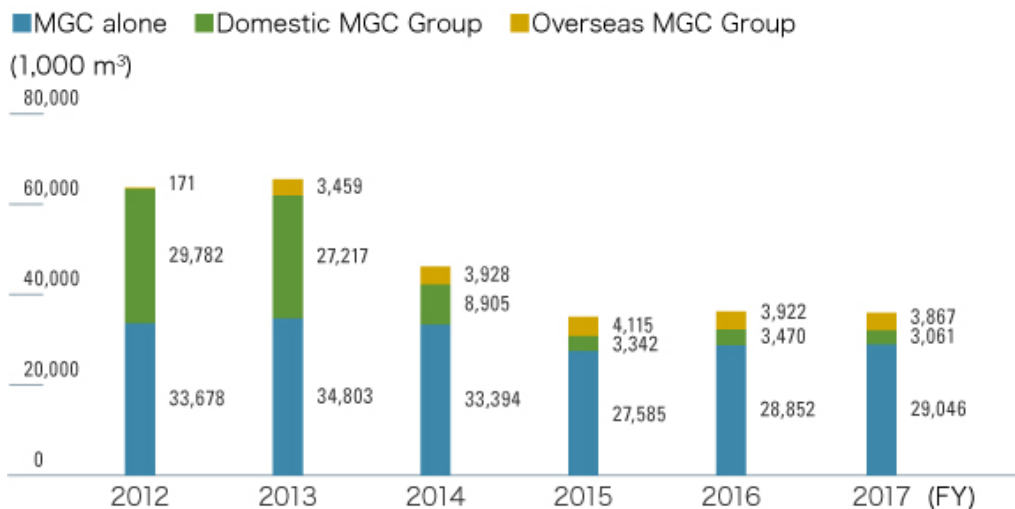
To use the water resources so vital to the Earth sustainably, MGC Group companies monitor water intake and wastewater volumes to ensure the efficient use of this resource.

Water Intake / Wastewater Volume (MGC Group)

Water intake

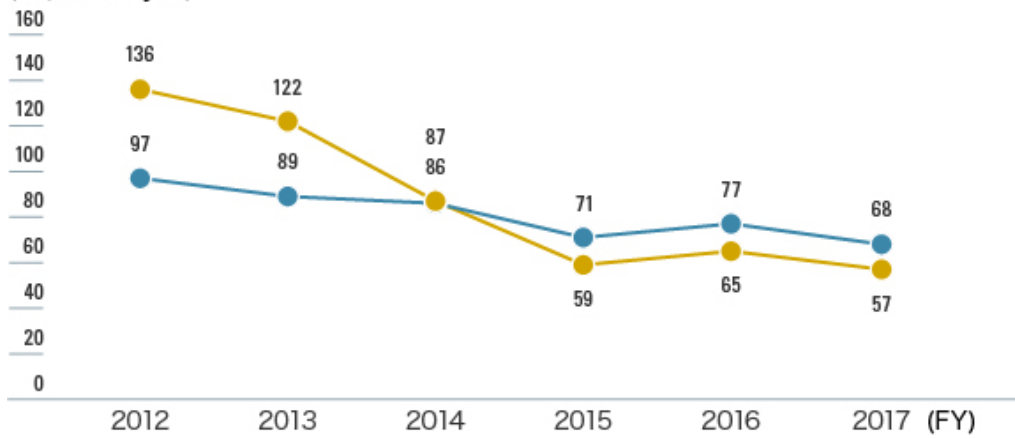


Wastewater



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

● Water intake intensity (compared to consolidated net sales)
● Wastewater volume intensity (compared to consolidated net sales)
(m³/million yen)



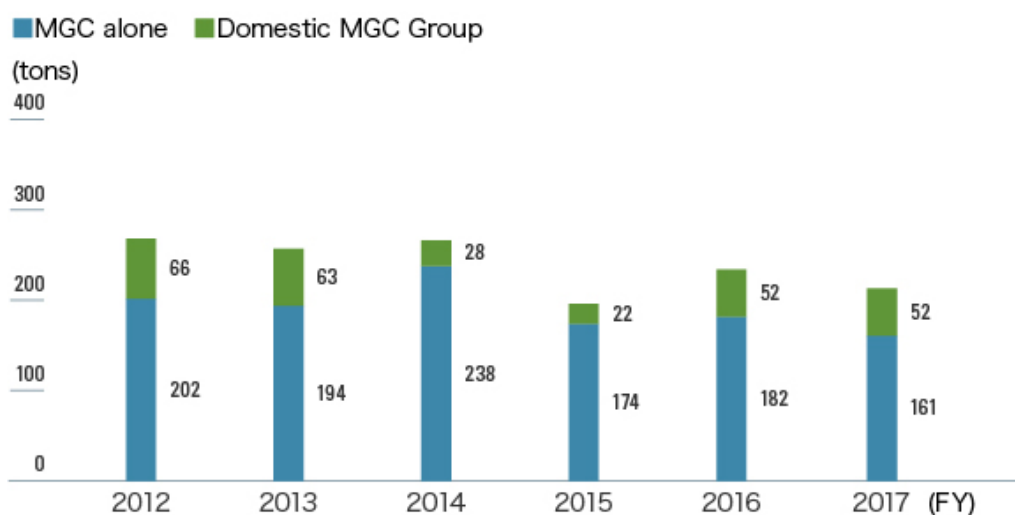
Preserving Water and Air Quality



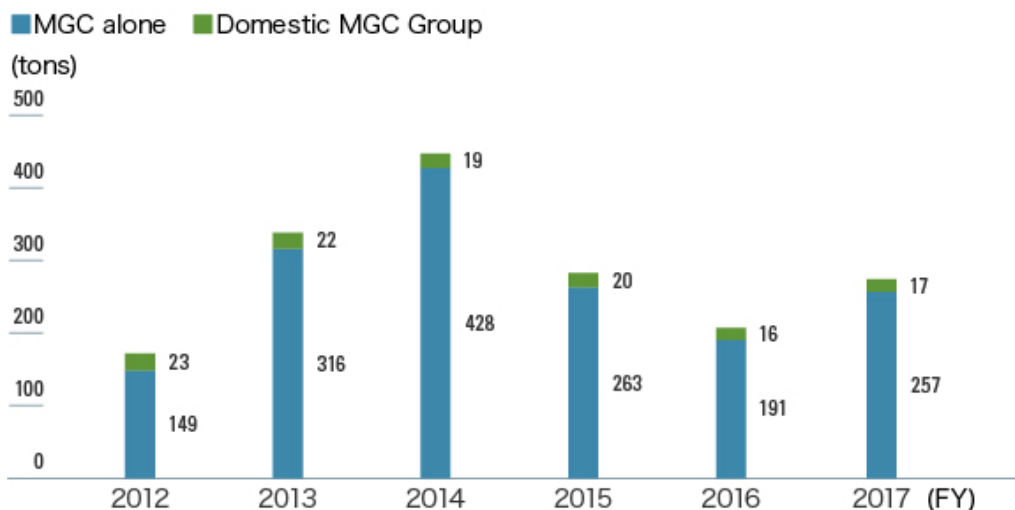
To prevent pollution and to maintain sound habitats for living things, MGC Group companies monitor the volume of environmentally hazardous substances in wastewater and waste gas and work to reduce discharge volumes.

Preserving Water Quality (MGC Alone and Domestic MGC Group)

Emission of COD

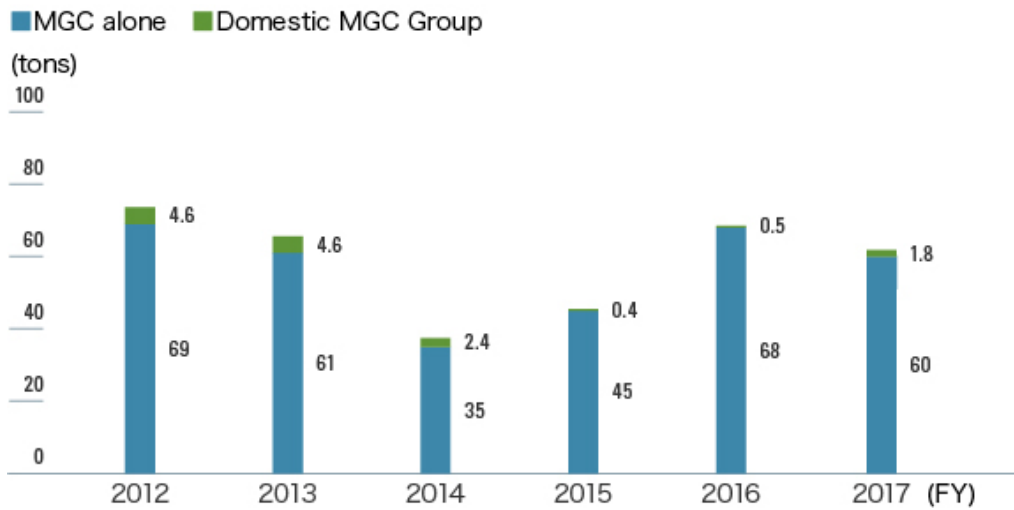


Emission of total nitrogen



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.

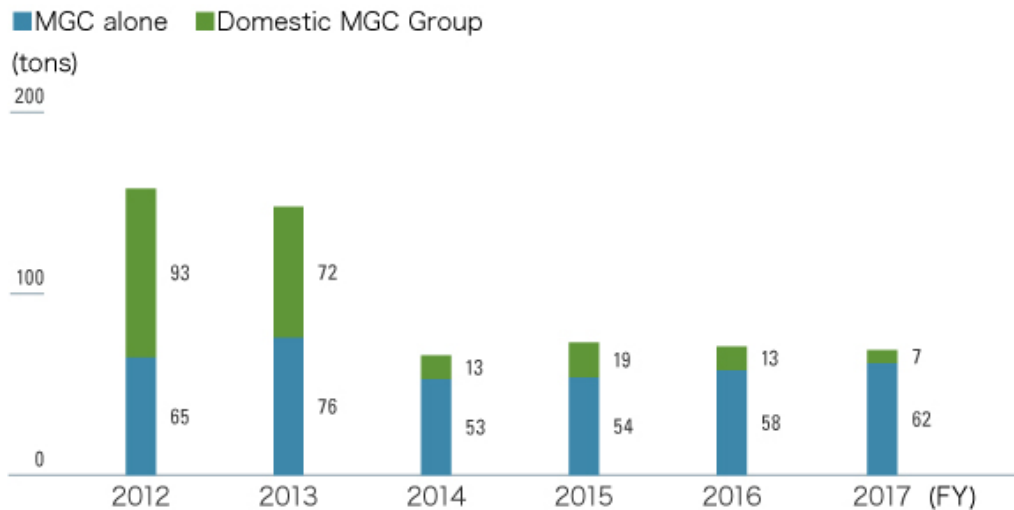
Emission of total phosphorous



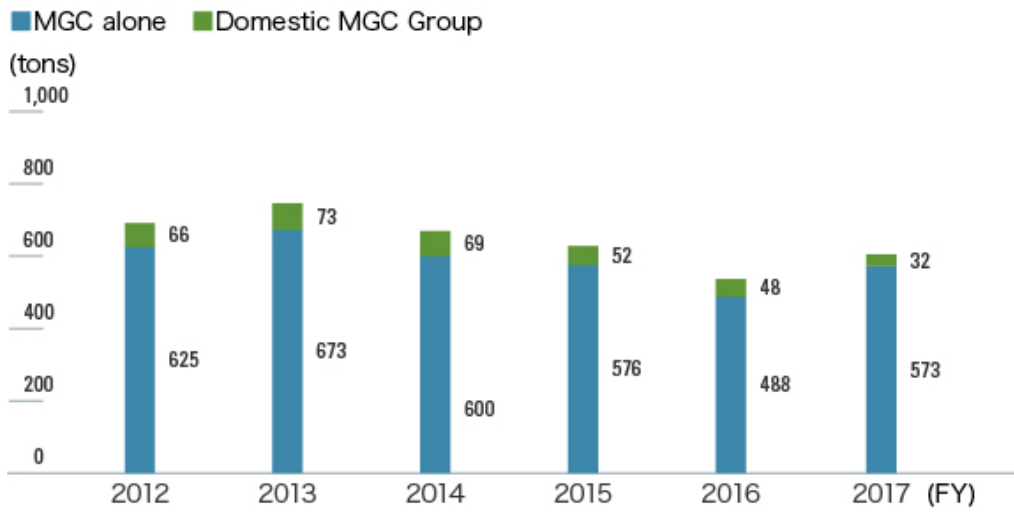
* Past data has been reviewed and corrected.

Preserving Air Quality (MGC Alone and Domestic MGC Group)

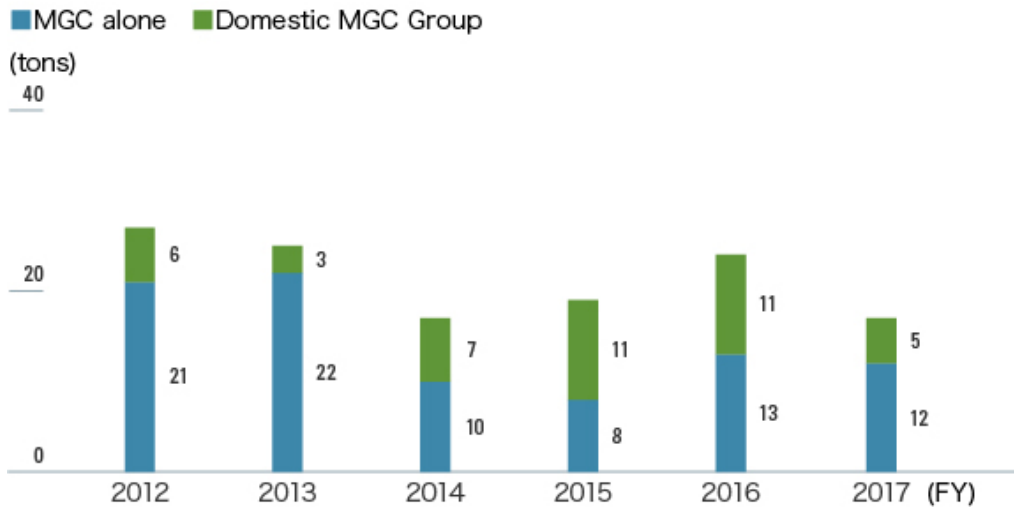
Emission of SOx



Emission of NOx



Emission of soot and dust



* Past data has been reviewed and corrected.

Reducing Chemical Substance Emissions

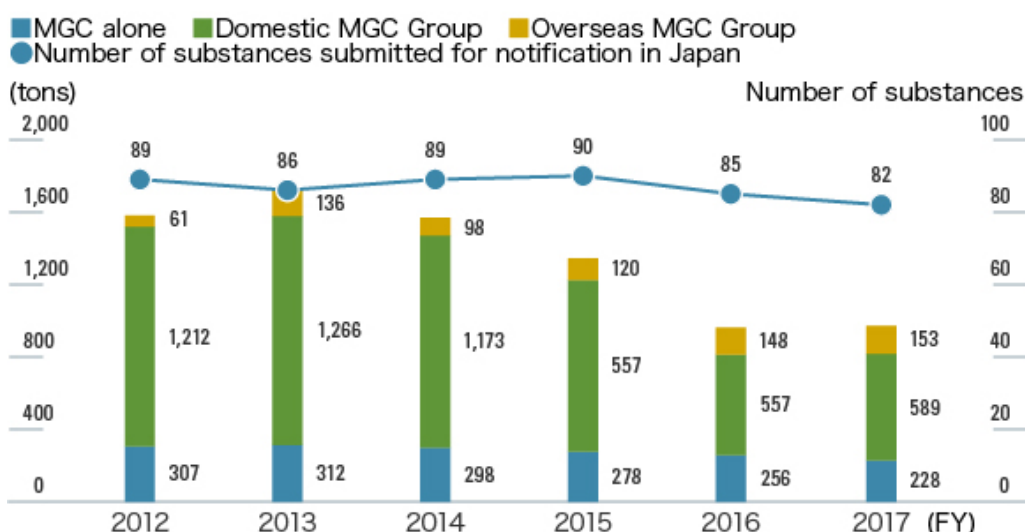


Each MGC Group company assesses and submits notifications on substances subject to the chemical substance emission notification system of the country in which it is based (PRTR in Japan), while working to reduce the amounts released and transferred.

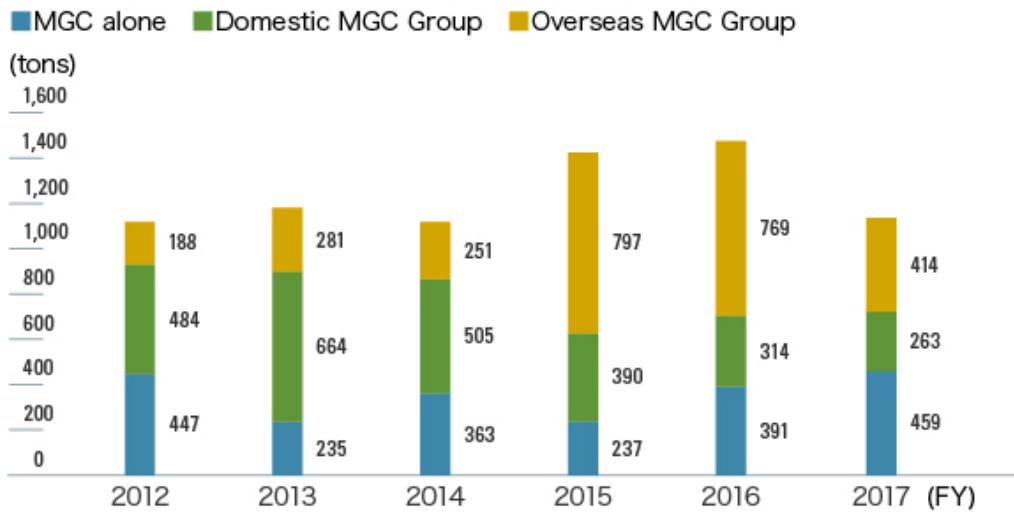
Substances Subject to Notification under the PRTR Law (MGC Group)

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.

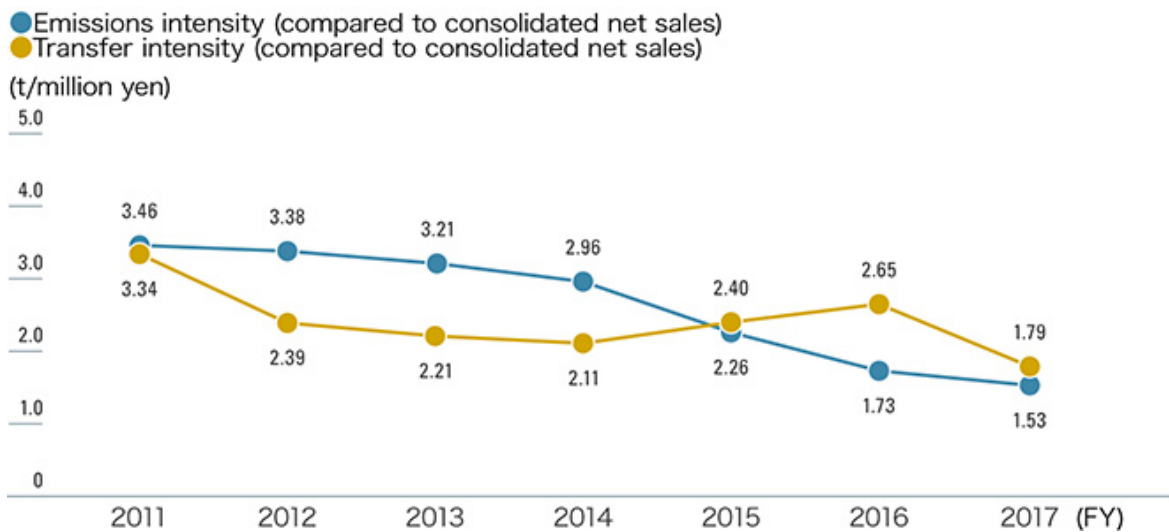
Substance emissions (in accordance with the PRTR Law)



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 2015	FY 2016	FY 2017
128	Chloromethane	923	534	567
296	1,2,4-Trimethylbenzene	176	75	99
186	Dichloromethane	25	58	78
80	Xylene	20	18	24
300	Toluene	14	13	14

* 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 2017 totaled 72 substances and 312 tons, a decrease of about 7% from 336 tons in the previous fiscal year.

Reducing Waste

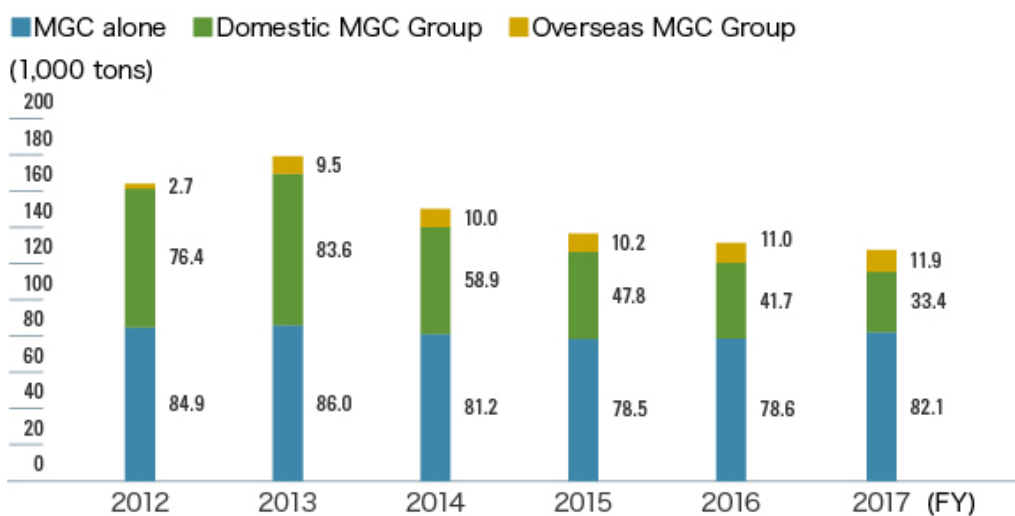


Each MGC Group company is striving to reduce waste by promoting the 3Rs of waste (Reduce, Reuse, Recycle), and to undertake the proper disposal of waste in accordance with law.

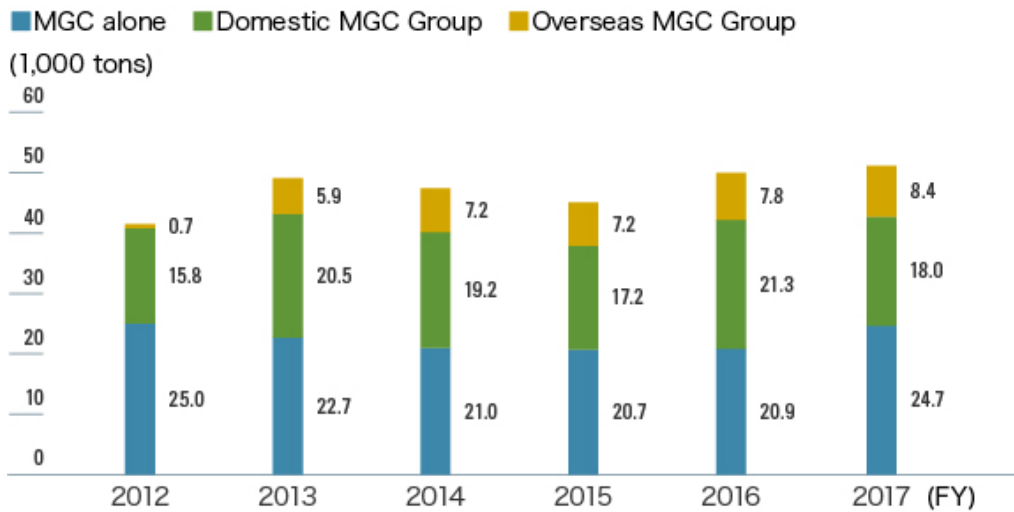
Reducing Waste (MGC Group)

Fiscal 2017 waste amounts totaled about 127,400 tons Group-wide, a decrease of about 3,900 tons, or about 3%, from the previous year. Final disposal for the Group totaled 4,189 tons, an increase of about 390 tons from the previous year.

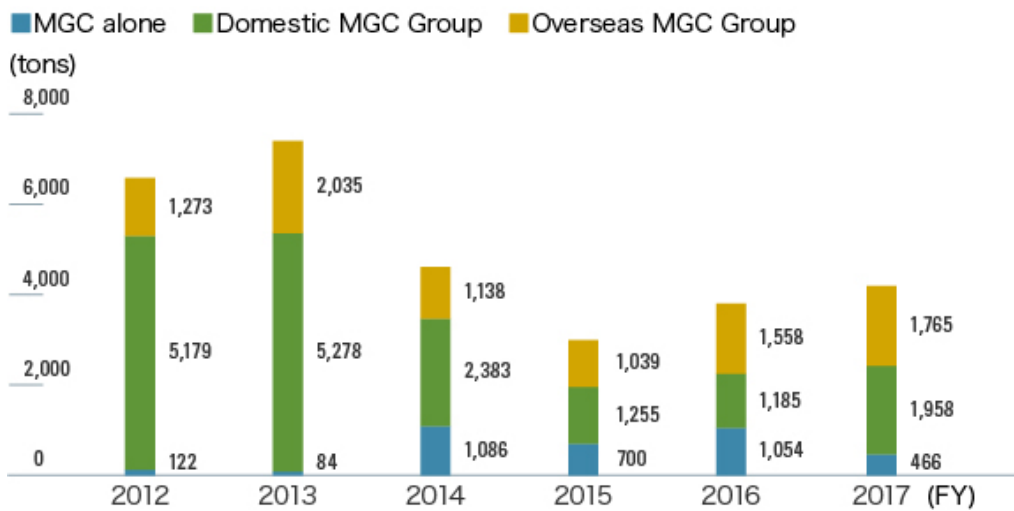
Amount of waste generated



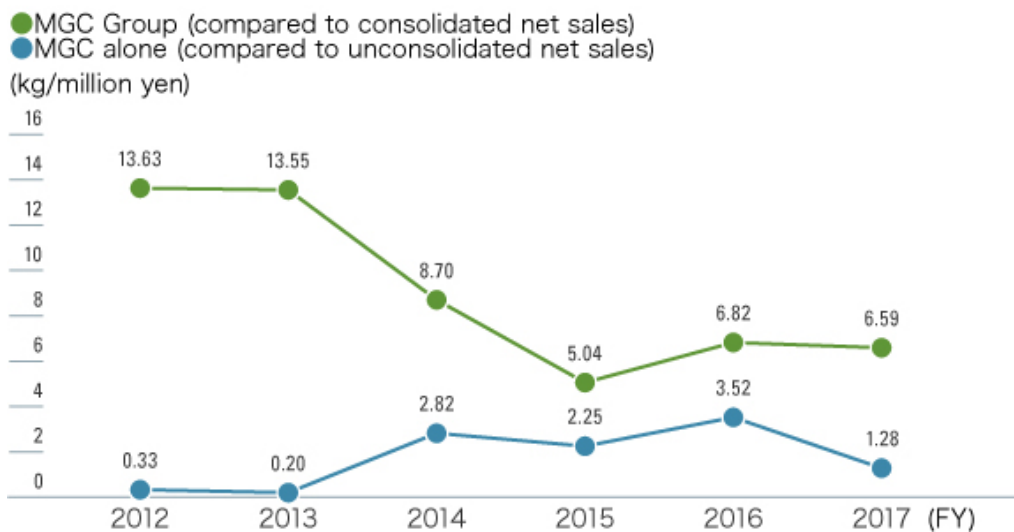
Recycled amount



Final disposal amount



Final disposal intensity compared to net sales



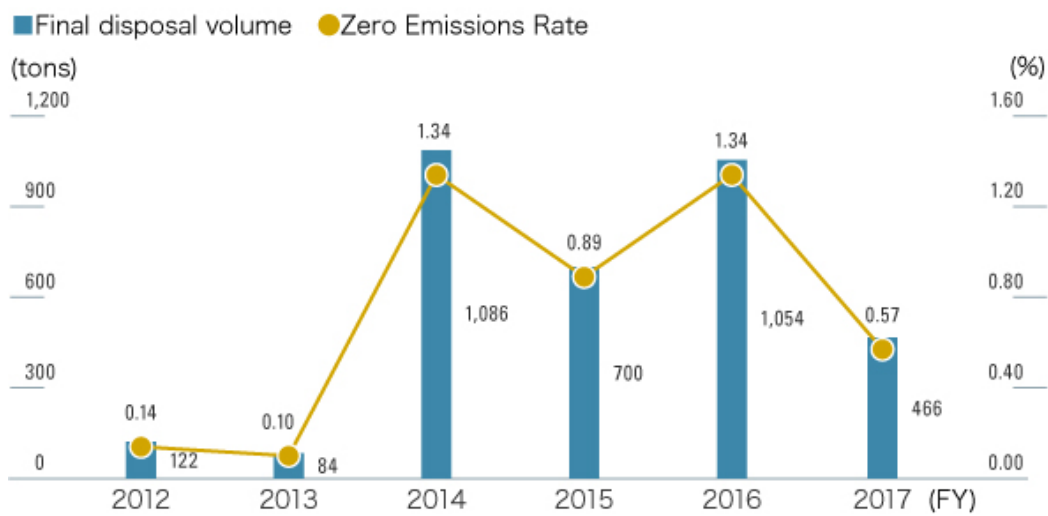
* Past data has been reviewed and corrected.

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 2017 was 0.57%, 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.

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. Among these are many which may have a severe impact on human health and ecosystems if unintentionally released into nature.

Carrying out its business activities with a keen awareness of this, MGC will strive to maintain a rich natural environment and preserve biodiversity by reducing its impact on the global environment through measures such as chemical management founded on responsible care, environmental preservation and conservation of resources and energy. Furthermore, we will contribute to sustainable development through the development of technology that can be assessed as eco-friendly products, and the proliferation of these products.

We are undertaking activities related to biodiversity through close-at-hand activities at each plant, such as flower campaigns within the plants and maintenance of forest preserves in surrounding areas, as well as beautification of rivers and harbors neighboring our sites.

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 2017 was approximately 500 million yen. Major investments included improvements to waste gas treatment facility at the Yamakita Plant.

- Expenses

Total expenses related to environmental conservation activities in fiscal 2017 were 8.4 billion yen. Of these, the highest expense was 2.5 billion yen for research and development, accounting for 30% 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	FY2016 (millions of yen)	FY2017 (millions of yen)
Income	Profit on sale of valuable waste, etc.	25.9	29.5
Reduction of expenses	Effects due to energy saving	355.7	1,064.1

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

Breakdown			Main areas of activity	FY2016 (millions of yen)		FY2017 (millions of yen)	
				Investment	Expenses	Investment	Expenses
Onsite cost	Pollution prevention cost	Air pollution prevention	Upgrade of exhaust gas treatment facilities	212.9	736.1	57.1	771.2
		Water pollution prevention	Upgrade of wastewater treatment facilities and measuring equipment	102.6	1,627.4	55.7	1,602.0
		Soil, Noise	Prevention of soil infiltration	8.4	0.3	16.9	0.0
	Global environmental preservation cost		Replacement of mercury-vapor lamps and other lighting with LED fixtures, upgrade of air conditioning equipment	114.7	1,323.4	90.0	1,928.3
	Resource recycling cost		Material and thermal recycling of waste	7.1	873.5	0.2	931.6
Up or down stream cost			Retrieval and reuse of product containers; yellow card management	0.0	52.3	0.0	55.5
Management activity cost			Maintenance of green spaces and environmental-related analysis	33.9	516.5	24.9	487.8
R&D cost			Research and development of energy-saving technologies and eco-friendly products	283.6	2,899.8	259.2	2,498.4
Social contribution cost			Greening of surrounding areas, communication with local communities	0.0	11.1	0.0	10.1
Environmental damage cost			Pollution impacts levy	0.0	75.4	0.0	77.7
Total				763.1	8,115.9	504.0	8,362.6

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

Period:From April 1, 2017 to March 31, 2018

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.