


Environment

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Production-related Inputs and Outputs (Non-consolidated)

Input			Output	
Raw materials	0.77Mt		Production volume	1.01Mt
Energy (as crude oil equivalent)	376ML		GHG emissions	0.81Mt-CO ₂ -e
Water withdrawal	35Mm ³		Water discharge	31Mm ³
			External waste discharge	11kt
			Recycling	19kt

Raw Materials / Production Volume (Non-consolidated)

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Raw material input	kt	798	764	704	770
Production volume	kt	1,416	1,373	1,144	1,011

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 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.

*3 MGC proactively participates in various collaborative activities to mitigate climate change (climate change initiatives)

Greenhouse Gas (GHG) Emissions

Scope1+2

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
		Non-consolidated	Non-consolidated	Consolidated	Consolidated
CO ₂ emissions from non-energy use	t-CO ₂ -e	805,250	768,469	1,282,951	1,374,979
CO ₂ emissions from non-energy use	t-CO ₂ -e	78,097	78,246	74,596	101,546
CH ₄	t-CO ₂ -e	753	841	3,688	3,553
N ₂ O	t-CO ₂ -e	513	562	685	693
HFCs	t-CO ₂ -e	4,257	1,212	875	1,197
PFCs	t-CO ₂ -e	0	0	0	0
SF ₆	t-CO ₂ -e	0	0	23	23
NF ₃	t-CO ₂ -e	0	0	0	0
Total*1	t-CO ₂ -e	888,869	849,331	1,362,817	1,481,991
Scope1	t-CO ₂ -e	599,243	602,661	653,428	768,905
Scope2 (market based)	t-CO ₂ -e	289,626	246,670	709,389	713,086
GHG emissions intensity ratio per unit to sales	t-CO ₂ -e / million yen	2.4	2.4	2.3	2.1

*1 Due to rounding off figures, there are places where the sums for each item do not match the total.

*Data for prior fiscal years were revised to reflect changes in the Group's composition and revision of calculation standards.

*For the above table's reporting boundaries, see MGC Group's Consolidated Subsidiaries on page 40.

Scope 3

Category	Unit	FY2018	FY2019	FY2020	FY2021
		Non-consolidated	Non-consolidated	Consolidated	Consolidated
Purchased goods and services	kt CO ₂ -e	5,129	5,010	6,110	7,780
Capital goods	kt CO ₂ -e	53	45	109	185
Activities related to fuels and energy not includable in Scopes 1 and 2	kt CO ₂ -e	84	101	235	266
Transportation and distribution (upstream)	kt CO ₂ -e	715	626	642	703
Waste generated in operations	kt CO ₂ -e	<4	<4	6	5
Business travel	kt CO ₂ -e	<4	<4	1	1
Employee commuting	kt CO ₂ -e	<1	<1	1	1
Leased assets (upstream)	kt CO ₂ -e	<8	<8	7	7
Transportation and distribution (downstream)	kt CO ₂ -e	109	158	212	150
Processing of sold products	kt CO ₂ -e	—	—	—	—
Use of sold products	kt CO ₂ -e	—	—	—	—
End-of-life treatment of sold products	kt CO ₂ -e	1,312	2,026	1,824	2,207
Leased assets (downstream)	kt CO ₂ -e	14	34	26	28
Franchises	kt CO ₂ -e	0	0	0	0
Investments	kt CO ₂ -e	513	586	361	175
Total	kt CO ₂ -e	7,947	8,604	9,533	11,508

*Due to rounding off figures, there are places where the sums for each item do not match the total.

*Data for prior fiscal years were revised to reflect changes in the Group's composition and revision of calculation standards.

*For the above table's reporting boundaries, see MGC Group's Consolidated Subsidiaries on page 40.

GHG Emissions/ Intensity of Calculated Value-added GHG Emissions

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
GHG emissions	kt CO ₂ -e	889	849	780	807
Intensity of calculated value added for GHG emissions	kt CO ₂ -e /100 million yen	0.92	0.92	0.83	0.69

*Calculated value added: The estimated amount of added value calculated based on MGC Alone net sales of MGC multiplied by the value added rate for the chemical industry published by the Ministry of Economy, Trade and Industry.

GHG Emissions in Transportation Sector

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
By rail	kt CO ₂ -e	0.59	0.58	0.57	0.60
By ship	kt CO ₂ -e	11.3	10.8	9.9	11.5
By truck	kt CO ₂ -e	17.0	16.2	16.2	16.9

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.

Energy Management (Non-consolidated)

Energy Use (Ratio of grid power, renewable energy and self-generated energy)

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Total energy use*	MWH	3,424,987	3,482,864	3,200,855	3,448,040
Ratio of grid power	—	11.3%	9.8%	9.7%	9.4%
Ratio of renewable energy	—	0.0%	0.0%	0.0%	0.0%
Total self-generated energy	MWH	205,432	272,094	243,556	260,992

*Calculated based on SASB standards

Energy Use (Ratio of renewable/non-renewable energy)

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Nonrenewable fuels purchased and consumed (A) (nuclear power, coal, oil, natural gas, etc.)	MWH	2,675,134	2,831,478	2,608,631	2,801,072
Nonrenewable Electricity purchased (B)	MWH-purchased electricity	388,671	340,631	309,240	322,395
Steam, heat, cooling and other nonrenewable energy purchased (C)	MWH	418,329	377,594	345,762	392,181
Renewable energy purchased or generated. (D) (wind, energy solar, biomass, hydroelectric, geothermal etc.)	MWH	0	0	10	12
Non-renewable energy sold (E) (electricity, heating, cooling)	MWH	57,146	66,839	62,778	67,608
Total non-renewable energy consumed (A+B+C-E)	MWH	3,424,987	3,482,864	3,200,855	3,448,040

Energy Use (crude oil equivalent)

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Production and research divisions, Corporate Sector	ML-crude oil equivalent	396	393	359	376
Logistics division	ML-crude oil equivalent	11	10	10	10
Energy intensity	KL/million-ton kilo	19	19	20	20

Energy Use/ Intensity of Calculated Value-added Energy

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Energy use	ML-crude oil equivalent	396	393	359	376
Intensity of calculated value added for energy consumption	ML-crude oil equivalent /100 million yen	0.41	0.43	0.38	0.32

*Calculated value added: The estimated amount of added value calculated based on MGC Alone net sales of MGC multiplied by the value-added rate for the chemical industry published by the Ministry of Economy, Trade and Industry.

Water Resources (Non-consolidated)

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 presented in detail below.

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 a business continuity plan (BCPs) 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 Día 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 Resources

Indicator		Unit	FY2018	FY2019	FY2020	FY2021
Water withdrawal	Tap water (Third party water source)	1000m ³	1,585	1,490	1,521	1,613
	Surface water (fresh water such as lakes, rivers, etc.)	1000m ³	27,394	29,231	30,980	33,296
	Ground water	1000m ³	391	368	392	387
	Total	1000m ³	29,370	31,089	32,893	35,296
Water discharge	Sewage system	1000m ³	2,189	2,047	2,035	2,233
	Ocean/sea	1000M ³	7,962	9,050	8,540	9,455
	River/lake(freshwater)	1000m ³	17,182	17,819	18,264	19,585
	Other	1000m ³	0	0	0	0
	Total	1000m ³	27,332	28,915	28,839	31,274
Water consumption*1		1000m ³	2,038	2,174	4,054	4,022
Percentage of water recycled for use*2		1000m ³	23,532	460,025	422,047	511,862
Ratio of water recycled for use		%	45	94	93	94

*1 Water withdrawal — Water discharge

*2 Value for FY2018 is small due to a narrow survey scope

※ We have reviewed past data and revised figures.

Water Withdrawal/ Intensity of Calculated Value-added Water Withdrawal

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Water withdrawal	1000m ³	29,370	31,089	32,893	35,296
Intensity of calculated value added for water withdrawal	1000m ³ / 100 million yen	30.2	33.6	35.1	30.2

*Calculated value added: The estimated amount of added value calculated based on MGC Alone net sales of MGC multiplied by the value-added rate for the chemical industry published by the Ministry of Economy, Trade and Industry.

※ We have reviewed past data and revised figures.

Water Consumption/Calculated Value-added Water Consumption Intensity

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Water consumption	1000m ³	2,038	2,174	4,054	4,022
Intensity of calculated value added for water consumption	1000m ³ / 100 million yen/	2.2	2.4	4.5	3.4

*Calculated value added: The estimated amount of added value calculated based on MGC Alone net sales of MGC multiplied by the value-added rate for the chemical industry published by the Ministry of Economy, Trade and Industry.

※ We have reviewed past data and revised figures.

Water recycling achievement status

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Water recycling rate	%	45	94	93	94
Target: at least 95%	-	×	×	×	×

Resource Recycling (Non-consolidated)

Waste

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Volume of waste generation	Ton	80,415	83,820	79,115	84,157
Recycled volume (Including post-disposal recycling)	Ton	23,561	23,965	24,913	26,238
Final disposal volume	Ton	581	671	388	231
Recycling rate	%	29	29	32	31

※ We have reviewed past data and revised figures.

Zero waste emission rate

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Amount of final disposal/total amount of waste generated	%	0.72	0.80	0.49	0.27
Target: at most 0.3%	-	×	×	×	○

※ We have reviewed past data and revised figures.

PRTR Law Substances (Non-consolidated)

Number of notified substances subject to PRTR Law

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Number of substances	Substances	56	54	55	54

Emissions of PRTR Law Substances

Indicator		Unit	FY2018	FY2019	FY2020	FY2021
Emissions of PRTR Substances	Atmosphere	Ton	227	270	266	239
	Water bodies	Ton	8	10	11	11
	Soil	Ton	0	0	0	0
	Total*	Ton	234	280	277	250

*Due to rounding off figures, there are places where the sums for each item do not match the total.

High-emission Substances Notified under the PRTR Law

Government-designated number	Substance	Unit	FY2018	FY2019	FY2020	FY2021
296	1,2,4-Trimethylbenzene	Ton	99	150	152	111
186	Dichloromethane	Ton	87	74	77	68
300	Toluene	Ton	10	12	12	28
80	Xylene	Ton	16	18	10	13

Reduction of PRTR Chemical Discharges

In its Responsible Care Medium-term Plan 2023, MGC set a target of reducing its plants' discharges of chemicals regulated by Japan's PRTR Law by 10% relative to FY2020.

Pollution Prevention (Non-consolidated)

Air Emissions

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Volatile organic compounds (VOCs)	Ton	318	375	338	298
NO _x	Ton	478	472	508	30
SO _x	Ton	55	54	64	368
Dust	Ton	17	25	31	8

※ We have reviewed past data and revised figures.

Control of Water Discharge

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
BOD	Ton	31	33	47	38
COD	Ton	114	125	121	137
Total oxygen demand (BOD+COD)	Ton	144	157	169	175
Total phosphorus emissions	Ton	72	59	51	309
Total nitrogen emissions	Ton	230	247	193	56

Environmental Accounting (Non-consolidated)

Environmental Accounting

Breakdown			Unit	FY2018		FY2019		FY2020		FY2021	
				Amount invested	Expenses	Amount invested	Expenses	Amount invested	Expenses	Amount invested	Expenses
Onsite cost	Pollution prevention cost	Air pollution	Million yen	10	1,021	6	926	95	878	72	859
		Water pollution	Million yen	83	1,750	106	1,669	178	1,561	144	1,667
		Soil/noise pollution	Million yen	138	12	80	0	354	0	19	3
	Global environmental protection cost	Million yen	115	1,664	139	1,806	192	1,872	499	2,173	
	Resource recycling cost	Million yen	70	1,119	0	837	6	1,143	0	819	
Up or down stream cost			Million yen	0	43	0	35	0	40	4	112
Management activity cost			Million yen	43	471	25	475	41	547	1	1,391
R&D cost			Million yen	222	2,376	337	2,716	442	2,748	1,189	2,826
Social contribution cost			Million yen	0	9	0	8	0	7	0	5
Environmental damage cost			Million yen	0	71	0	74	0	71	0	75
Total*			Million yen	680	8,536	692	8,546	1,308	8,866	1,929	9,929

*Due to rounding off figures, there are places where the sums for each item do not match the total.

Economic Benefits Associated with Environmental Protection Measures

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Income	Million yen	30	45	48	8
Reduction of expenses	Million yen	183	398	111	74

Water Conservation Expenditure

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Water-related investment (CAPEX)	Million yen	83	106	178	144
Water-related expenses (OPEX)	Million yen	1,750	1,669	1,561	1,667

Biodiversity Conservation Project Expenditures (Non-consolidated)

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Biodiversity conservation project investment (CAPEX)	Million yen	0	0	0	0
Biodiversity conservation project expenses (OPEX)	Million yen	101	113	108	85

Environment-related Accidents / Violations of Environmental Laws and Regulations (Non-consolidated)

Indicator	Unit	FY2018	FY2019	FY2020	FY2021
Violations of environmental laws and regulations	Cases	0	0	1	1
Accidents/pollution with potential to cause environmental problems	Cases	0	1	1	1
Complaints regarding environmental problems	Cases	0	0	0	0
Total environmental fines/penalties	Thousand yen	0	0	0	0

Status of External Certification

Status of External Certification (As End of March 2022)

Japan

Company	Business Sites	ISO 14001	OHSAS 18001	ISO 45001	ISO 9001
MITSUBISHI GAS CHEMICAL COMPANY, INC.	Niigata Plant	●			●
	Mizushima Plant	●			●
	Yokkaichi Plant	●			●
	Kashima Plant	●			●
	Yamakita Plant	●			●
JSP CORPORATION	Hokkaido Plant	●			●
	Kanuma No.1 Plant	●			●
	Kanuma No.2 Plant	●			●
	Kanuma No.3 Plant				
	Mirafoam Plant	●			●
	Kashima Plant	●			●
	Yokkaichi No.1 Plant	●			●
	Yokkaichi No.2 Plant	●			●
	Kansai Plant	●			●
	Kitakyushu Plant				
Kyusyu Plant	●			●	
JAPAN FINECHEM COMPANY, INC.	Sakaide Factory	●			●
	Niigata Factory	●			●
	Hiratsuka Division	●			●
TOHO EARTHTECH, INC.	Factory				●
	Construction Business Headquarters	●			●
MGC Woodchem Corporation	Hiratsuka Factory				
	Shimizu Factory				
	Mizushima Factory				
Japan U-Pica Company Ltd.	Shonan Factory				●
	Mine Factory	●			●

Company	Business Sites	ISO 14001	OHSAS 18001	ISO 45001	ISO 9001
Fudow Company Limited	Fujinomiya Factory	●			●
	Hiratsuka Factory	●			●
	Gamagori Factory				●
	Tokai Office				●
KYODOU KASANKASUISO CORP.	Factory				
MGC Filmsheet Co., Ltd.	Tokorozawa Factory				●
	Osaka Factory				●
	Shirakawa Factory				●
MGC Electrotechno Co.,Ltd.	Factory	●			●
Yonezawa Dia Electronics Co., Inc.	Factory	●			●
MGC AGELESS Co.,Ltd.	Factory				●
EIWA CHEMICAL IND. CO., LTD	Kinuura Factory				●
	Ujitawara Factory				●
TOYO KAGAKU, INC.	Headquarters Factory	●			●
	Mitake Factory	●			●
	Mizushima Factory	●			●

Asia

Company	Business Sites	ISO 14001	OHSAS 18001	ISO 45001	ISO 9001
■ Korea					
Samyoung Pure Chemicals Co., Ltd	Cheonan Plants	●		●	●
	Ulsan Plants	●		●	●
■ Taiwan					
MGC Pure Chemicals Taiwan, Inc.	Plant	●		●	●
■ China					
Taixing Lingsu Specialty Materials Co., Ltd.	Plant	●			●
MITSUBISHI GAS CHEMICAL ENGINEERING-PLASTICS (SHANGHAI) CO., LTD.	Plant	●			●
Suzhou MGC Suhua Peroxide Co., Ltd.	Plant	●			●
■ Singapore					
MGC PURE CHEMICALS SINGAPORE PTE. LTD.	Plant	●		●	●
■ Indonesia					
PT PEROKSIDA INDONESIA PRATAMA	Plant	●		●	●
■ Thailand					
THAI POLYACETAL CO., LTD	Plant	●		●	●
AGELESS (THAILAND) CO., LTD.	Factory			●	●
MGC ELECTROTECHNO (THAILAND) CO., LTD	Factory	●			●

Americas

Company	Business Sites	ISO 14001	OHSAS 18001	ISO 45001	ISO 9001
MGC ADVANCED POLYMERS, INC.	Factory	●			●
MGC PURE CHEMICALS AMERICA, INC	Arizona Facility	●		●	●
	Texas Facility	●		●	●
	Oregon Facility	●		●	●

* Total 40sites (69%) of 57 production sites acquired ISO 14001 certification.

* Total 0sites (0%) of 57 production sites acquired OHSAS 18001 certification.

* Total 10sites (17%) of 57 production sites acquired ISO 45001 certification.