

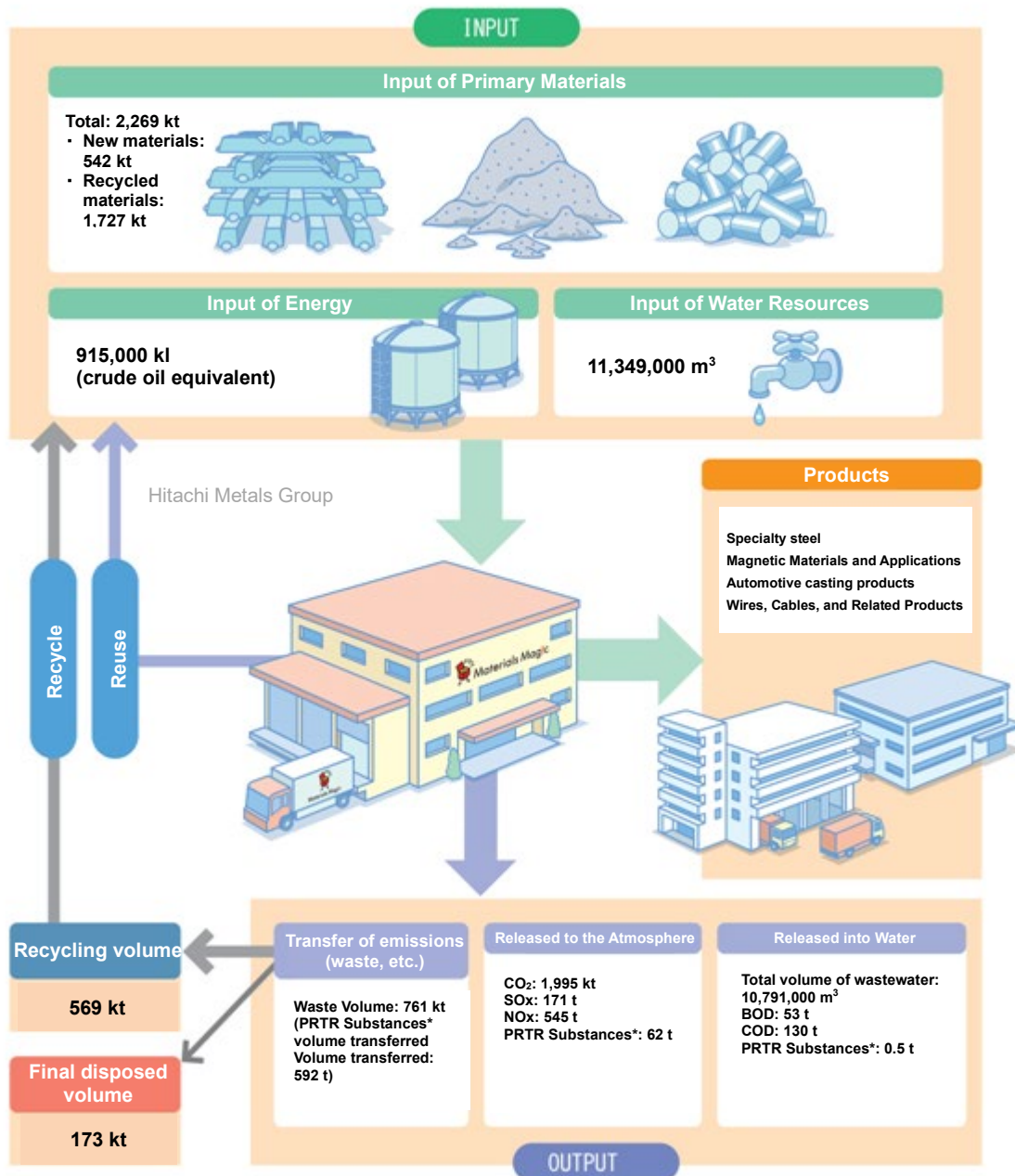
3. Environmental Consideration in Manufacturing

This is a graphical representation of the balance of materials in manufacturing processes at the Hitachi Metals Group for fiscal 2020.

The Hitachi Metals Group is promoting the reduction of the environmental burden in two directions: reducing the volume of input through the efficient use of resources and energy, and reducing the volume of output by controlling atmospheric releases and wastewater discharges, reducing and recycling waste, and so on.

(1) Material Balance

The Hitachi Metals Group's Material Balance for Fiscal 2020 (Global)



* PRTR emission quantities are totals of those released by domestic companies in the Hitachi Metals Group
The final disposal amount includes household waste, hazardous waste, and in-house landfill.

(2) Climate Change Prevention

The Hitachi Metals Group is a materials manufacturer and uses significant amounts of energy in its manufacturing processes. For this reason, the Group positions the prevention of climate change as a management priority. The Group has established medium- to long-term targets and is now working on energy conservation measures to reduce its energy consumption rate and CO₂ emissions.

(a) Vision for Preventing Climate Change

The following presents the targets of the Hitachi Metals Group's three-year plan covering fiscal 2019 to fiscal 2021 and the results of fiscal 2020.

• Targets for Fiscal 2021 in the Medium-Term Environmental Action Plan

Reduction of per unit of CO₂ emitted*¹ in manufacturing processes by 7% from that in FY2010 (global)

*1: (CO₂ emissions) / (amount of activity)*²

*2: A figure representing the scale of business activities such as sales or production weight

• Fiscal 2020 Results

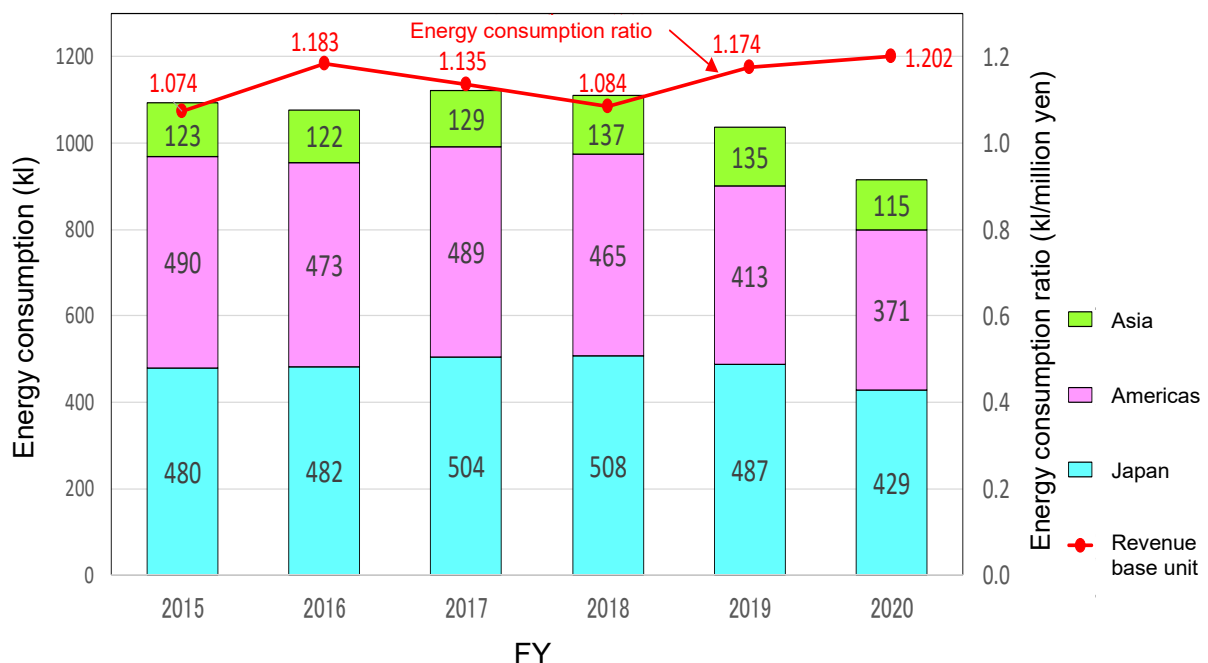
Improvement ratio of CO₂ emissions per unit: -2.3%

(b) Trends in Energy Consumption and Sales Energy Consumption Ratio per Production Unit

The Hitachi Metals Group's global energy consumption in fiscal 2020 was equivalent to 915 thousand kl of crude oil, down 120 thousand kl (11.6%) from fiscal 2019. The decrease was principally related to diminished production, resulting in a year-on-year decrease of 13.6% in revenues, chiefly due to the spread of COVID-19. On the other hand, the basic unit for revenue was 1.202, up about 2.3% from fiscal 2019. Major factors for the increased basic unit were attributable to lower capacity utilization owing to diminished production, and especially heat-treating furnaces and other equipment that is unsuitable for frequent shutdown and thus requires fixed energy.

To reduce energy consumption even further, we will continue to pursue energy-saving activities linked to *monozukuri* (manufacturing). The emphasis is on omitting excess processes, improving efficiency, boosting yield rate, curtailing fixed energy, installing energy-saving equipment, fuel conversion and introducing renewable energy.

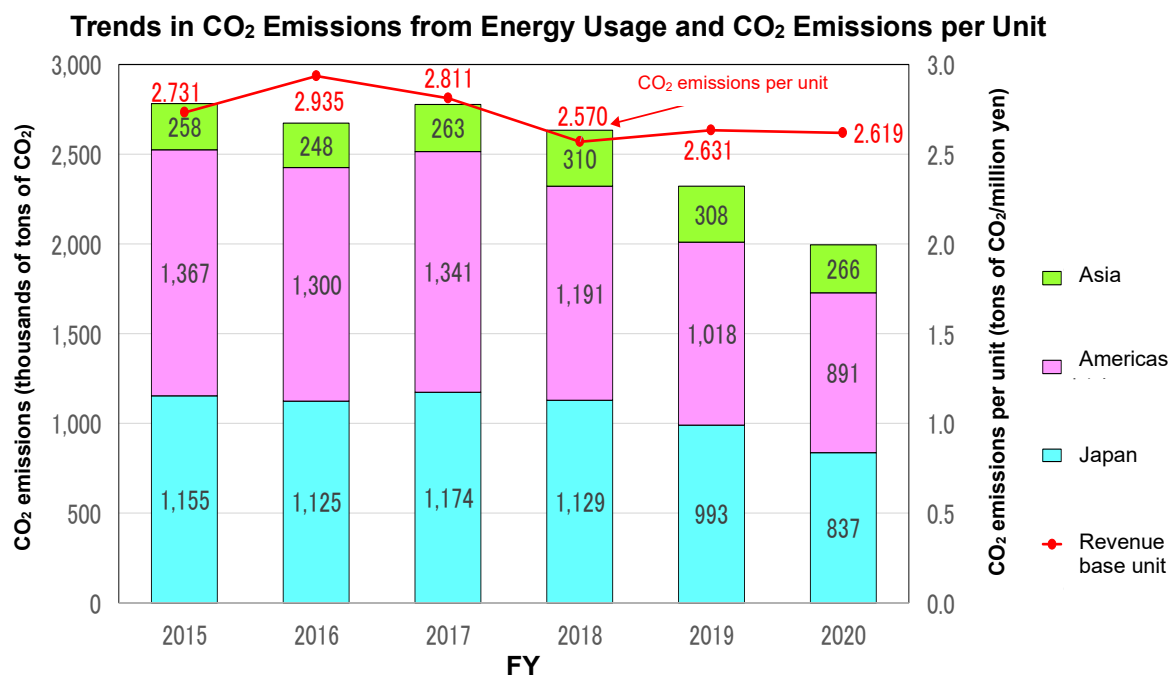
Trends in Energy Consumption and Sales Energy Consumption Ratio



(c) Trends in CO₂ Emissions from Energy Usage and CO₂ Emissions per Unit

In fiscal 2020, CO₂ emissions from the Hitachi Metals Group's business activities decreased by 324 thousand tons (14.0%) from fiscal 2019, to 1,995 thousand tons. The above significant decrease in CO₂ emissions was principally related to diminished production, resulting in a year-on-year decrease of 13.6% in revenues, chiefly due to the spread of COVID-19. On the other hand, the basic unit for revenue was 2.619, down about 0.4% from fiscal 2019. The decreased basic unit was owing to fuel conversion and a switch to a power company that offers lower CO₂ emissions coefficients, which offset a lower capacity utilization due to diminished production.

Going forward, we will step up our efforts to reduce CO₂ emissions, setting medium- to long-term targets aimed at achieving carbon neutrality in 2050.



Note: At 62%, electricity accounts for the majority of the Hitachi Metals Group's CO₂ emissions, followed by coke and city gas, in that order.

For the CO₂ emission factor of electric power, Japan uses emission factor for each electric power company announced by the Ministry of the Environment, while the Americas and Asian countries use the country-specific conversion factor issued in 2017 by the IEA (International Energy Agency).

■Hitachi Metals Group' long-term targets for carbon neutrality

As countries around the world accelerate their initiatives to address climate change based on the Paris Agreement, the Japanese government announced in October 2020 the policy goal of achieving effectively zero emissions of carbon dioxide (CO₂) and other greenhouse gases by 2050. Primarily for this reason, companies are increasingly being expected to work even more aggressively toward transitioning to a decarbonized society. Recognizing these expectations, the Hitachi Metals Group has set the following targets for CO₂ emissions*¹.

CO₂ emissions*¹ targets

Medium-term target: 38% reduction by 2030 (compared to fiscal 2015*²)

Long-term target: Aim for effectively zero emissions by 2050

*¹: Absolute total value of Scope 1 (direct CO₂ emissions by the Company) and Scope 2 (indirect emissions from the use of electricity, heat, and steam supplied by other companies)

*²: CO₂ emissions in fiscal 2015: 2,779 thousand t-CO₂/year

We are faced by many different issues for promoting initiatives to achieve carbon neutrality. To address such issues, we will implement various measures, such as process improvement particularly through facility investment, fuel conversion for melting and heating furnaces and other equipment, technology development for expanding usage of carbon-free fuels, and introducing renewable energy in addition to continuing with previous energy-conserving activities.

(3) Effective Use of Resources

(a) Vision for Effective Use of Resources

The Hitachi Metals Group is using in-house reuse and recycling by way of intermediate processing to create a resource-efficient society and achieve the “thorough circulation of resources throughout the life cycle of goods and services,” as stated in the 4th Fundamental Plan for Establishing a Sound Material-Cycle Society.

●Targets for Fiscal 2020 in the Medium-Term Environmental Action Plan

- Reduction of waste generation per production unit^{*1} by at least 13% compared to fiscal 2010 (global)
- Waste landfill rate: 13% or less (global)

^{*1}: (Waste and valuables generation) / (amount of activity^{*2})

^{*2}: A figure representing the scale of business activities such as sales or production weight

●Fiscal 2020 Results

Rate of reduction of waste generation per production unit: 15.2%

- Waste landfill rate: 10.9%

We are working to reduce waste/valuables generation (“waste”), which is measured using the indicator of generation of waste per production unit. We are promoting efforts to reduce waste output, focusing on process innovation such as kaizen (improvement) of production processes. Furthermore, due to strict conditions in the final disposal site and requirements to respond to social demands regarding the effective use of resources, we have set a goal since FY2019 of improving the waste landfill rate, working to increase recycling and reduce the final disposal volume.

(b) Results of Waste Management

Total waste generated by the Hitachi Metals Group in fiscal 2020 reached about 761 thousand tons, down 118 thousand tons from 879 thousand tons in the previous fiscal year.

We achieved a 15.2% reduction from the base year in the generation of waste per production unit, a management indicator in our Environmental Action Plan, and exceeded our target. This was attributable to the launch of a sand recycling system at the U.S.-based Waupaca Foundry, Inc.

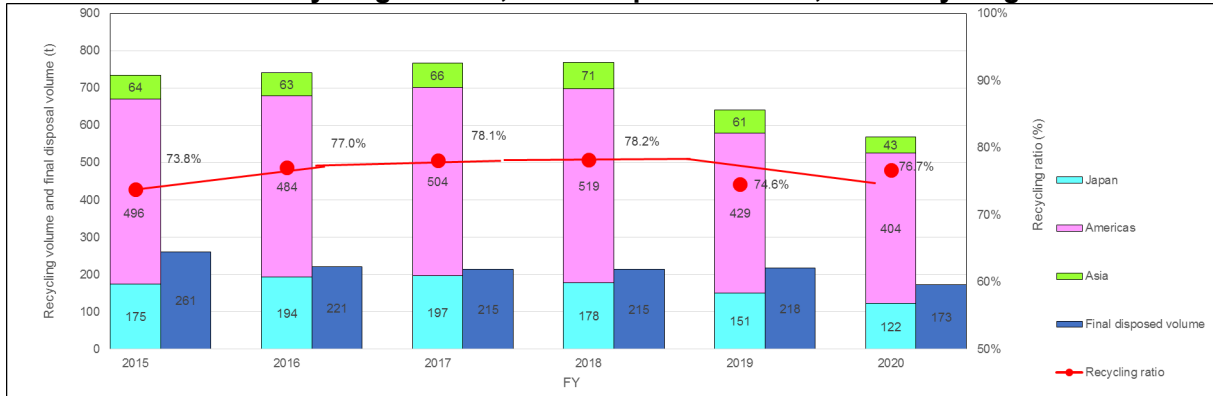
The amount of recycled resources was 122,000 tons in Japan, 404,000 tons in the Americas, and 43,000 tons in Asia (total: 569,000 tons). The final disposal amount was 17,000 tons in Japan, 146,000 tons in the Americas, and 10,000 tons in Asia (total: 173,000 tons). (The final disposal amount includes the amount of household waste, hazardous waste, and waste deposited on our premises.)

There were many challenges to recycling waste in Japan, but due to factors such as recycling activities in the Americas, the waste landfill rate in fiscal 2020 was 10.9%, compared to the target value of 13%. Going forward, we plan to raise the bar overall through initiatives at overseas offices, where we believe that many recyclable items remain.

Also of note, we achieved zero emission status^{*1} at 19 business offices.

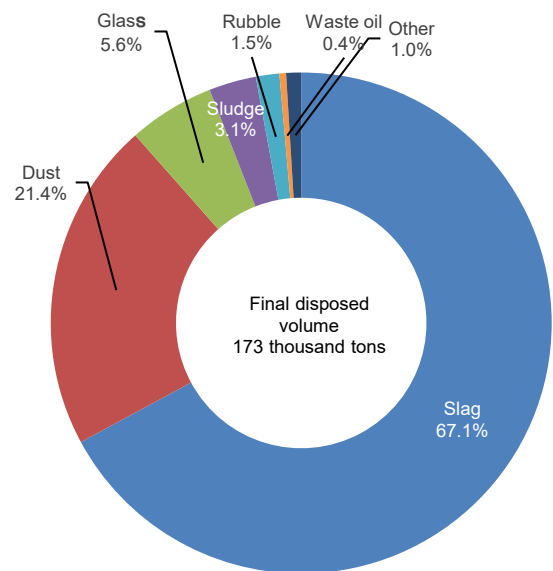
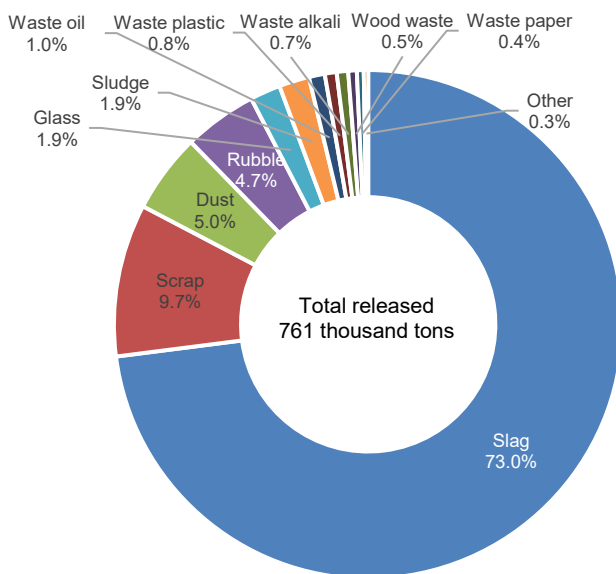
^{*1}: Deemed to be a final disposal volume of less than 0.5% of total emissions since fiscal 2011

Trends in Recycling Volume, Final Disposal Volume, and Recycling Ratio



Breakdown of Waste Volume (Hitachi Metals Group)

Breakdown of Final Disposal Volume (Hitachi Metals Group)



Note: The final disposal amount includes household waste, hazardous waste, and in-house landfill.

(c) Reduction of Water Usage

●Targets for Fiscal 2020 in the Medium-Term Environmental Action Plan

- Reduction of water usage per production unit*¹ by at least 24% compared to fiscal 2010 (global)

*1. (Water usage) / (amount of activity*²)

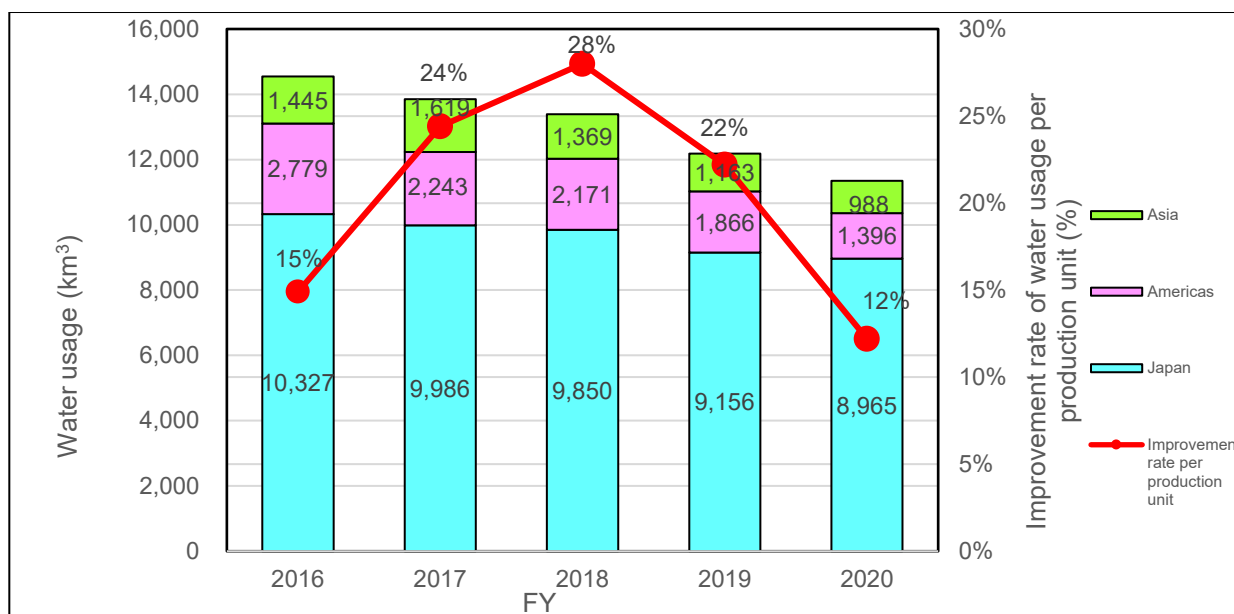
*2. A figure representing the scale of business activities such as sales or production weight

●Fiscal 2020 Results

Improvement rate of water usage per production unit: 12.2%

Since fiscal 2016, we have been working to achieve the targets for effective use of water resources set in the Environmental Action Plan through global efforts. Our water usage amounted to 11,349 thousand m³, a decrease of 837 thousand m³ from fiscal 2019. We reduced water usage per production unit by 12.2% compared to the base year, failing to achieve our target. This sizable decline is attributable to diminished production, resulting in a year-on-year decrease of 13.6% in revenues, chiefly due to the spread of COVID-19. The failure to achieve the per unit usage target is primarily owing to insufficient reduction in water usage for cooling equipment and other purposes, despite lower capacity utilization due to diminished production. We plan to work on raising water use efficiency, in order to reduce water usage.

Trends in Improvement Rate of Water Usage per Production Unit



(4) Chemical Substance Management

(a) Reduction of Substances of Environmental Concern

Of the substances handled by domestic companies in the Hitachi Metals Group that are subject to the PRTR Law,^{*1} six materials which are nickel (including compounds), chromium, molybdenum, manganese, phthalic acid (2-ethylhexyl), and cobalt are essential raw materials used in Hitachi Metals' products. These six substances constitute 95% of regulated materials and 86% of the total amount transferred.

Of the total amount released into the atmosphere, 51% is attributable to toluene and xylene, which are volatile organic compounds (VOCs).

^{*1} Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management

The State of PRTR Substance Handling in Fiscal 2020 (Domestic Group)

Fig. Breakdown of Volume Handled

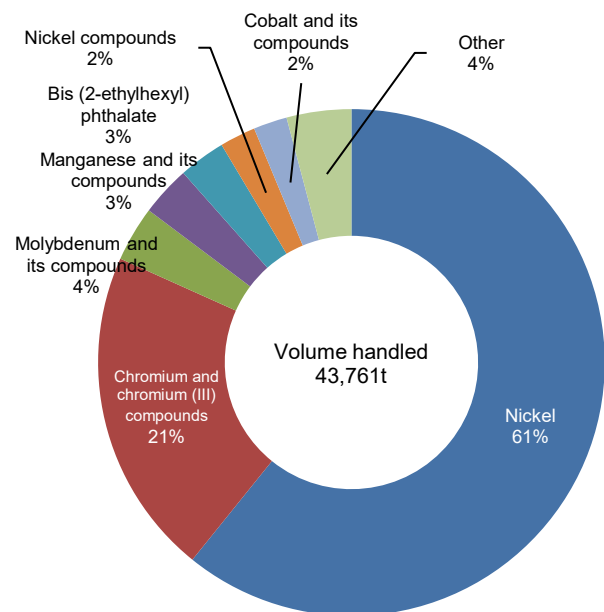


Fig. Volumes Consumed, Released, and Transferred, and Other Breakdowns

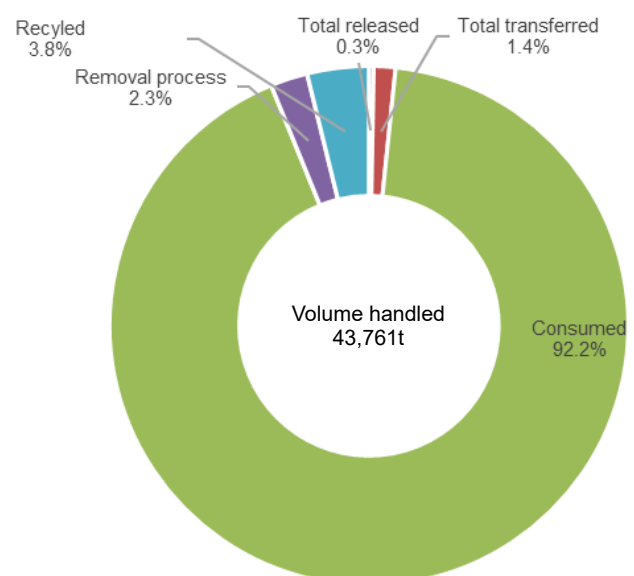


Fig. Breakdown of Release (atmosphere, water)

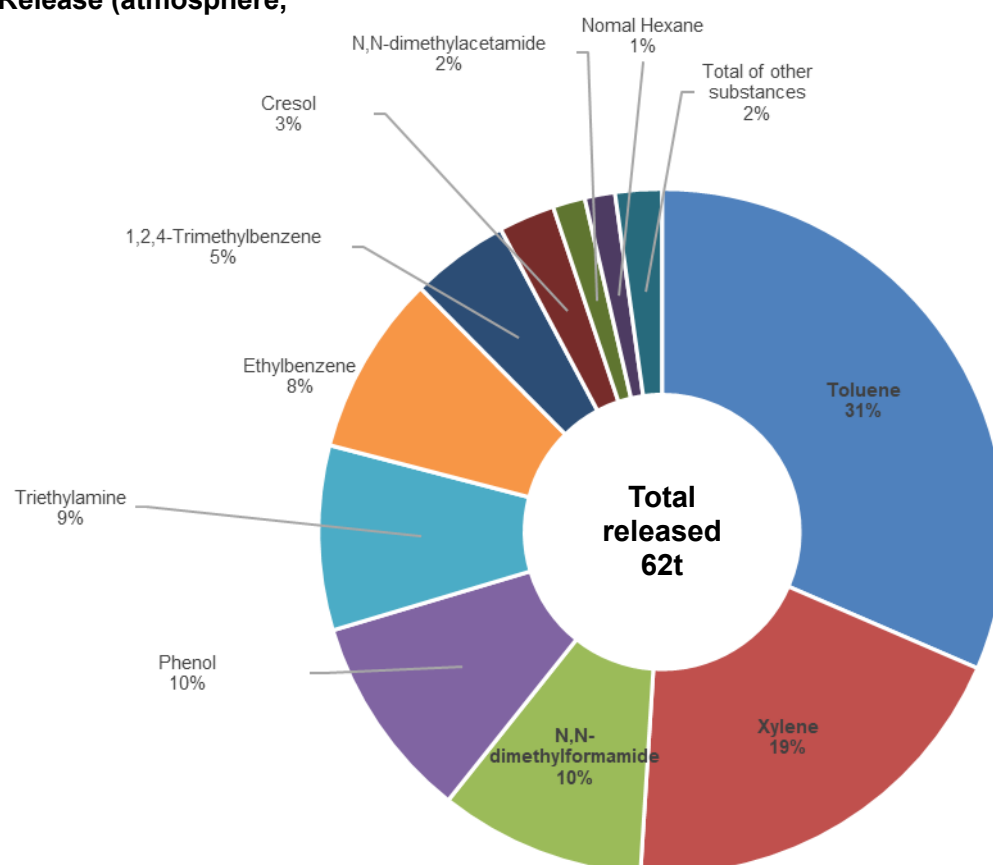
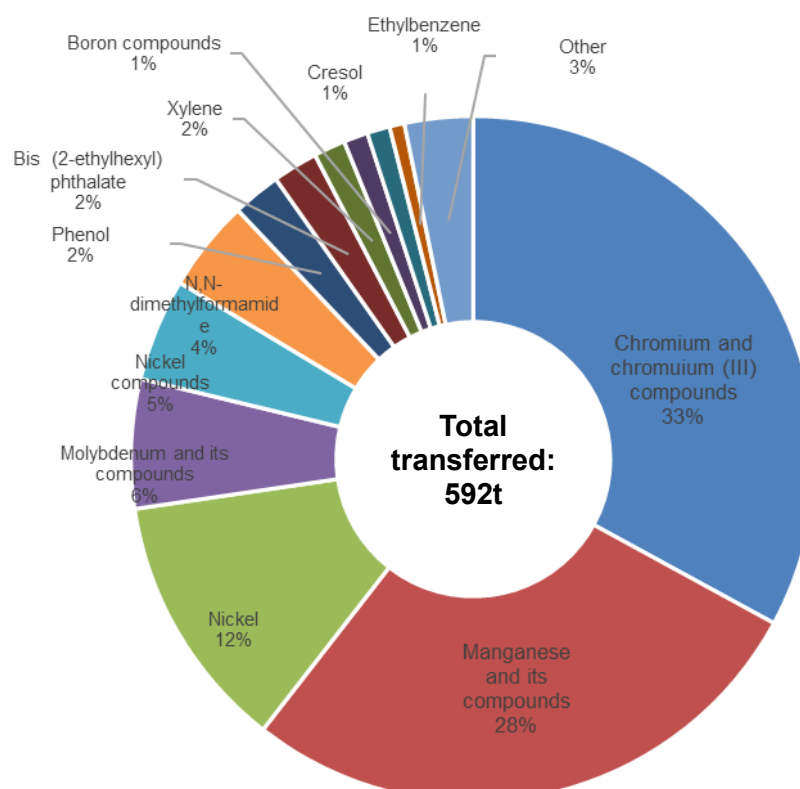


Fig. Breakdown of Transfer (waste, sewerage)



Fiscal 2020: PRTR Data (in Japan) (Unit: Tons/year)

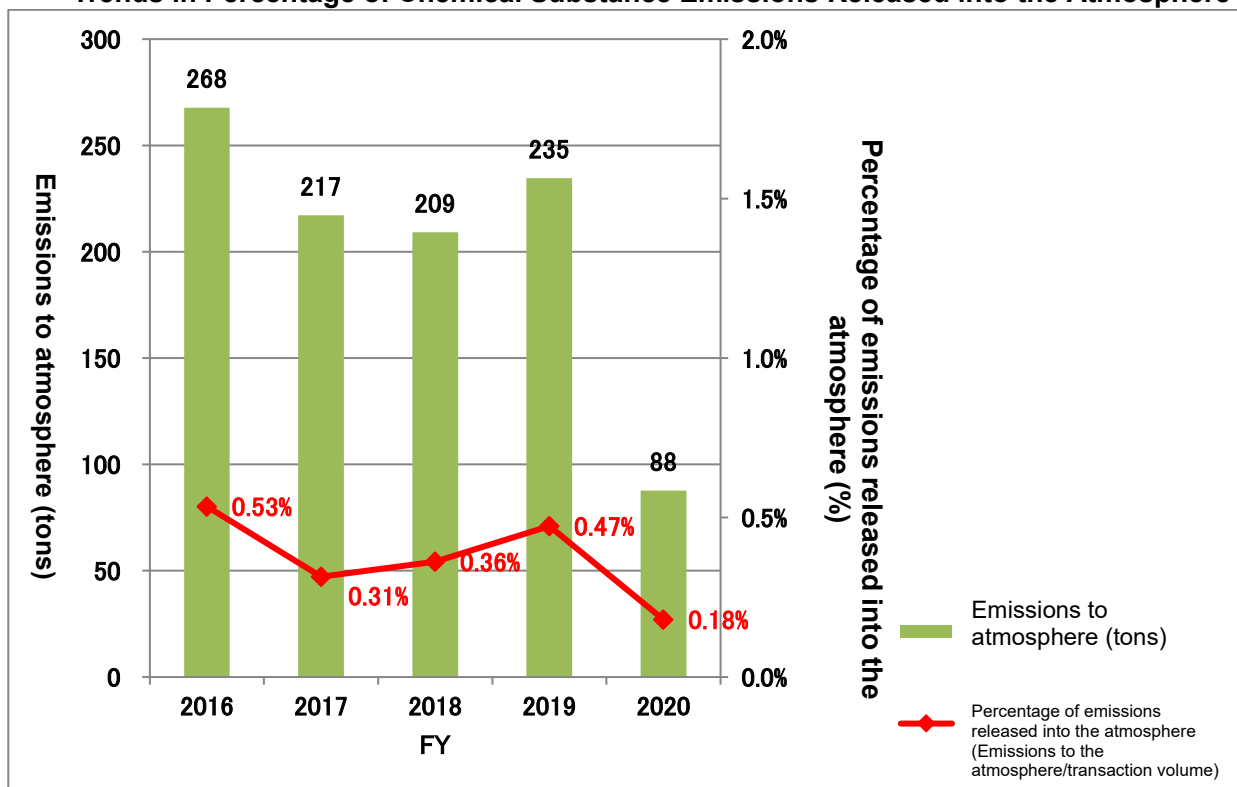
Number	Name	CAS Number	Volume handled	Volume released					Volume transferred		
				Atmosphere	Public water system	Soil	Landfill	total	Sewerage	Waste	Total
31	Antimony and its compounds	-	82	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
37	4,4'-Isopropylidenediphenol (alias: bisphenol A)	80-05-7	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	2-imidazolidinone	96-45-7	1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
53	Ethylbenzene	100-41-4	18	5.2	0.0	0.0	0.0	5.2	0.0	4.2	4.2
71	Ferric chloride	7705-08-0	303	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3
80	Xylene	1330-20-7	77	12.0	0.0	0.0	0.0	12.0	0.0	8.8	8.8
82	Silver and its water-soluble compounds	-	31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86	Cresol	1319-77-3	266	1.6	0.0	0.0	0.0	1.6	0.0	6.4	6.4
87	Chromium and chromium (III) compounds	-	9,152	0.0	0.1	0.0	45.7	45.8	0.0	194.9	194.9
132	Cobalt and its compounds	-	940	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.3
188	N,N-dicyclohexylamine	101-83-7	1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
207	2,6-di-tert-butyl-4-cresol	128-37-0	3	0.0	0.0	0.0	0.0	0.0	0.0	2.8	2.8
213	N,N-dimethylacetamide	127-19-5	37	0.9	0.0	0.0	0.0	0.9	0.0	1.1	1.1
230	N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine	793-24-8	3	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
232	N, N-dimethylformamide	68-12-2	222	6.0	0.0	0.0	0.0	6.0	0.0	25.6	25.6
277	Triethylamine	121-44-8	89	5.4	0.0	0.0	0.0	5.4	0.0	0.0	0.0
296	1,2,4-Trimethylbenzene	95-63-6	30	2.9	0.0	0.0	0.0	2.9	0.0	3.0	3.0
297	1,3,5-Trimethylbenzene	108-67-8	11	0.9	0.0	0.0	0.0	0.9	0.0	0.4	0.4
300	Toluene	108-88-3	26	19.4	0.0	0.0	0.0	19.4	0.0	4.1	4.1
304	Lead	7439-92-1	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
305	Lead compounds	-	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
308	Nickel	7440-02-0	26,608	0.0	0.0	0.0	0.0	0.0	0.0	71.8	71.9
309	Nickel compounds	-	1,002	0.0	0.2	0.0	17.7	17.9	0.0	28.6	28.6
330	Bis (1-methyl-1-phenylethyl) peroxide	80-43-3	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
349	Phenol	108-95-2	288	6.0	0.0	0.0	0.0	6.0	0.0	13.5	13.5
355	Manganese and its compounds	117-81-7	1,308	0.0	0.0	0.0	0.0	0.0	0.0	12.6	12.6
374	Hydrofluoric acid and its water-soluble salts	68-12-2	3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
391	Hexamethylene = diisocyanate	822-06-0	46	0.0	0.0	0.0	0.9	0.9	0.0	0.0	0.0
392	Normal Hexane	110-54-3	2	0.9	0.0	0.0	0.0	0.9	0.0	0.8	0.8
405	Boron compounds	-	205	0.0	0.0	0.0	0.0	0.0	0.0	6.8	6.8
412	Manganese and its compounds	-	1,399	0.0	0.3	0.0	2.6	2.9	0.0	163.2	163.3
438	Methylnaphthalene	1321-94-4	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
453	Molybdenum and its compounds	-	1,546	0.0	0.0	0.0	0.0	0.0	0.1	35.9	36.0
(A total of 44 substances with handled volumes of less than one ton)			8	0.3	0.0	0.0	0.0	0.3	0.0	1.0	1.0

(b) Reduction of Chemical Substance Emissions

Since fiscal 2016, we have revised our management of chemical substances, which had previously targeted only volatile organic compounds (VOCs), based on risks such as acute toxicity and carcinogenesis, and have identified 50 new substances for management from among substances handled in large amounts. We are engaged in activities aimed at controlling the release of these substances to the environment. Most are emitted into the atmosphere, and VOCs account for over 90% of the total. We are therefore continuing improvement activities that focus on the treatment of solvent components used for product coating, as in the past, working to reduce emissions by conducting technological investigations and making changes in equipment to find substitutes for coating materials and improve processes.

Emissions released into the atmosphere decreased by 147 tons from fiscal 2019 to 88 tons. Also, the percentage of emissions released into the atmosphere decreased by 0.29% from fiscal 2019 to 0.18%. These results were primarily from withdrawal of the aluminum wheels business that involves organic solvent coating process as well as a changeover from organic solvent coating to electrodeposition coating for manufacturing automobile products (related to tires).

Trends in Percentage of Chemical Substance Emissions Released into the Atmosphere



(5) Eco-Factory Case Study

CO₂ reduction by introducing a forging and rolling planning system (Yasugi Works)

The Yasugi Works, which manufactures specialty steel products with large-scale equipment, such as melting furnaces, 10,000 ton-class free forging presses, and high-speed radial forging machines, is striving to raise productivity and reduce CO₂.

Our hot-working sites, which employ 10,000 ton-class free forging presses, strive continuously to engage in improvement activities aimed at enhancing productivity (improving capacity utilization rates), reducing wasted heating time, among other purposes. The introduction of 10,000 ton-class free forging presses has improved the product performance and productivity of hot molds and tool steel, which are tending to become larger than ever before, and we have also made other improvements. As improvement measures, we have introduced a system that can manage the shutdown and repair of heating furnaces, as well as a system that can efficiently plan forging and rolling. Furthermore, to enhance the effects of these systems, we have also worked to efficiently recover exhaust heat by introducing a heating furnace with a regenerative burner system, and to improve thermal efficiency by applying heat-insulating material, along with other initiatives.

As a result, we have successfully improved the efficiency of putting steel ingots into our forging machines, including 10,000 ton-class free forging presses, and reduced the energy consumption ratio by up to 13.2% (compared with that of fiscal 2019). In addition, we reduced overall working site fuel costs by roughly 7.50 million yen per month and CO₂ emissions by 13,000 t-CO₂ per year.



10,000 ton-class free forging press

VI. Report on Environmental Aspects

(6) Site Data

Materials Flow at Major Domestic Manufacturing Sites in the Hitachi Metals Group in Fiscal 2020

Classification	INPUT				OUTPUT									
	Raw materials, etc. (t / year)	Energy consumption (crude oil kl / year)	Water (thousand m ³ / year)	PRTR chemical substances (t / year)	Emissions (t / year)	CO ₂ *1 (t / year)	SO _x *2 (t / year)	NO _x *2 (t / year)	BOD*2 (t / year)	COD*2 (t / year)	PRTR emissions *3 (t / year)	Transferred amount of PRTR *3 (t / year)	Drainage (thousand m ³ / year)	Main Discharge Destinations
Kyushu Works	7,878	29,244	160	3,456	10,709	45,381	0.0	1.7	0.0	0.4	77.7	0.0	45	Seto Inland Sea
Moka Works	32,366	26,576	326	54	13,840	48,954	0.1	1.2	4.3	0.0	0.1	0.0	261	Kinugawa River
Kuwana Works	11,543	14,453	441	24	10,047	29,811	0.9	3.8	0.0	0.1	3.5	6.0	427	Inabegawa River
Yasugi Works	100,873	132,850	5,219	15,656	48,361	275,849	17.3	182.9	0.7	10.7	0.6	442.2	5,084	Nakaumi Lake
Okegawa Works	2,171	16,809	310	708	1,041	31,312	0.2	5.8	2.3	2.8	0.0	5.6	310	Arakawa River
Kumagaya Magnetics Works	8,693	28,027	709	152	3,874	50,744	1.6	0.0	0.0	0.0	0.1	2.3	0	Arakawa River
Yamazaki Manufacturing Dept.	46	2,560	52	3	345	4,399	0.0	0.0	0.0	0.1	1.1	2.6	39	Sewerage
Metglas Yasugi Works	11,960	6,097	0	2	291	14,264	0.0	0.0	0.0	0.0	0.0	0.0	0	Nakaumi Lake
Saga Works	0	6,736	45	9	309	10,110	0.0	0.0	0.0	0.0	0.0	0.0	45	Rokkakugawa River
Ibaraki Plant	154,689	36,181	1,062	1,777	7,079	65,915	0.3	7.0	16.8	15.0	24.4	65.4	782	Public Discharge to Kinugawa River
HMY, Ltd.	0	8,544	8	15,816	1,183	16,952	0.6	0.5	0.0	0.0	0.0	0.0	4	Nakaumi Lake
Hitachi Metals Precision, Ltd.	2,879	8,501	21	2,011	3,657	19,831	0.0	10.7	0.0	0.0	0.0	2.3	3	Nakaumi Lake
Hitachi Metals Neomaterial, Ltd.	47,836	40,441	502	2,476	12,687	74,698	0.5	6.0	2.0	1.0	1.0	1.4	422	Sewerage*1
Hitachi Metals Wakamatsu, Ltd.	34,122	25,287	138	707	36,048	41,396	0.0	8.0	0.0	0.0	0.5	44.5	76	Sewerage
Hitachi Metals Tool Steel, Ltd.	0	5,393	15	0	1,293	9,516	0.0	0.0	0.0	0.0	0.0	0.0	11	Sewerage
Hitachi Ferrite Electronics, Ltd.	672	5,202	52	51	731	9,965	0.0	0.0	1.8	0.0	0.0	1.4	45	Sewerage
NEOMAX KINKI Co.,Ltd.	2,514	15,529	176	0	1,141	19,976	0.0	1.1	0.2	0.3	0.0	0.0	176	Maruyamagawa River
NEOMAX KYUSHU Co., Ltd.	7,549	8,889	55	58	1,238	14,339	0.0	14.5	0.0	0.0	2.7	2.1	55	Rokkakugawa River
Tonichi Kyouzan Cable, Ltd.	35,875	4,733	65	515	1,870	8,334	0.1	0.2	0.0	0.0	0.3	12.3	65	Kasumigaura
Tohoku Rubber Co.,Ltd.	1,085	1,531	75	34	375	3,549	0.3	0.4	0.5	0.5	17.2	3.5	66	Pacific Ocean
Santoku Corporation	7,528	5,460	140	254	2,055	10,876	0.0	0.0	0.0	0.0	0.0	0.0	140	Sewerage

*1. Calculations of CO₂ emissions for electric power use the adjusted emission coefficients for each power company.

*2. Atmospheric emission concentrations measured based upon the Air Pollution Control Law and Water Pollution Prevention Act.

PRTR emission quantities are totals of emissions to the atmosphere, public waterways, and soil. PRTR Transfers are totals of transfers to waste materials and to sewers.