

## Environmental Data Collection

### Material Balance

Category	Substance	FY2018		FY2019		FY2020		FY2021		FY2022		Unit
		Consolidated	Non-consolidated	Consolidated	Non-consolidated	Consolidated	Non-consolidated	Consolidated	Non-consolidated	Consolidated	Non-consolidated	
INPUT	Electric power	0.93	0.25	0.95	0.25	0.88	0.22	0.98	0.23	0.94	0.23	TWh
	Gas <sup>*1</sup>	1.72	0.24	1.65	0.23	1.41	0.20	1.66	0.19	1.50	0.20	TWh
	Petroleum <sup>*1</sup>	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	TWh
	Raw materials	18	3	15	3	14	3	16	2	15	3	10 <sup>4</sup> metric tons
	Recycled materials	0	0	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	10 <sup>4</sup> metric tons
	PRTR-listed substances	694	219	589	236	506	188	447	186	511	160	Metric tons
	Water withdrawal	4.53	1.60	4.33	1.55	3.78	1.45	4.37	1.41	4.14	1.20	Million m <sup>3</sup>
OUTPUT	Energy-origin CO <sub>2</sub>	87	16	87	16	76	13	63	12	59	13	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	Energy-origin CO <sub>2</sub> (including effects of CN LNG) <sup>*2</sup>	—	—	—	—	—	—	62	10	56	10	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	Other greenhouse gases	1	0	1	0	0	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	CO <sub>2</sub> (non-energy origin CO <sub>2</sub> )	0	0	0	0	0	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	CH <sub>4</sub>	0	0	0	0	0	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	N <sub>2</sub> O	0	0	0	0	0	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	HFC	0	0	0	0	0	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	PFC	0	0	0	0	0	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	SF <sub>6</sub>	0	0	0	0	0	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	VOC	120	0	68	0	83	0	77	1	107	1	Metric tons
	PRTR-listed substances (emissions into atmosphere)	128	3	76	3	89	3	84	2	110	2	Metric tons
	Discarded materials	6	1	5	1	5	1	5	1	5	1	10 <sup>4</sup> metric tons
	Recycled	4	1	4	1	4	1	4	1	4	1	10 <sup>4</sup> metric tons
	Disposed of externally	2	0	1	0	1	0	1	0	1	0	10 <sup>4</sup> metric tons
	Water discharge	2.81	1.37	3.14	1.40	2.53	1.09	2.74	1.03	2.68	0.80	Million m <sup>3</sup>
	PRTR-listed substances (discharge into bodies of water)	0	0	1	1	0	0	1	1	1	1	Metric tons
	Scope 1 (energy-origin CO <sub>2</sub> )	32	4	31	4	26	4	31	4	28	4	10 <sup>4</sup> metric tons of CO <sub>2</sub>
Scope 1 (energy-origin CO <sub>2</sub> ) (including effects of CN LNG) <sup>*2</sup>	—	—	—	—	—	—	29	2	25	1	10 <sup>4</sup> metric tons of CO <sub>2</sub>	
Scope 2 (energy-origin CO <sub>2</sub> )	55	12	56	11	49	10	33	9	31	9	10 <sup>4</sup> metric tons of CO <sub>2</sub>	

Note: The figures indicating environmental performance in this table have been rounded off for convenience, so the total may not equal the sum of the individual figures.

Note: Discarded materials indicates the sum total of industrial waste and valuable resources.

Note: The figures in the non-consolidated column are the data for NGK production locations (Head Office/Nagoya Site, Chita Site, Komaki Site, Ishikawa Plant).

Note: As with the non-consolidated values, the emission factor for electricity in the consolidated values of Outputs/Energy-origin CO<sub>2</sub> (including effects of CN LNG) and Scope 2 (energy-origin CO<sub>2</sub>), has been changed from a fixed value to the actual value from the power company for each fiscal year, beginning in FY2020.

\*1 Using "TWh" as the unit, we have changed the figures for FY2018 to FY2021 to compare the figures with electric power.

\*2 CN LNG (Carbon Neutral Liquid Natural Gas) is LNG that is offset with CO<sub>2</sub> credits, and thus considered to have no CO<sub>2</sub> emissions. However, we show it as a separate category because it does not qualify for credits under current energy conservation laws.

## Material Balance Calculation Basis

INPUT	1. Energy	Electric power	Electric power consumption  Amount obtained by converting the consumption volume for each type of fuel into the heat value = $\Sigma$ (consumption volume of each fuel $\times$ unit heating value of each fuel) <Unit heating value of fuel> Natural gas: 43.5 MJ/Nm <sup>3</sup> , but in China from FY2021: 38.9 MJ/Nm <sup>3</sup> , City gas: 45.0 MJ/Nm <sup>3</sup> , but from FY2021 city gas other than for NGK alone: 44.8 MJ/Nm <sup>3</sup> , LPG: 50.8 MJ/kg, LNG: 54.6 MJ/kg
		Gas	
		Petroleum	Amount obtained by converting the consumption volume for each type of fuel into the heat value = $\Sigma$ (Consumption volume of each fuel $\times$ Unit heating value of each fuel) <Unit heating value of fuel> Light oil: 37.7 MJ/L, Heavy oil A: 39.1 MJ/L, Kerosene: 36.7 MJ/L, Gasoline: 34.6 MJ/L
	2. Water withdrawal	Total tap water, industrial water, groundwater, and rainwater	
3. PRTR-listed substances	Total quantity of Japan's PRTR Type 1 listed substances handled		
4. Raw materials	Total amount of raw materials used to manufacture products		
OUTPUT	5. Energy-origin CO <sub>2</sub> emission volume	Electric power	Energy-origin CO <sub>2</sub> emission volume = $\Sigma$ (Consumption of each type of energy $\times$ CO <sub>2</sub> conversion factor of each type of energy) <CO <sub>2</sub> conversion factor of energy> (Unit of electric power factor) kgCO <sub>2</sub> /kWh (Unit of fuel factor) kgCO <sub>2</sub> /fuel unit  Japan: Emission coefficient for each electric utility adjusted in Japan based on the Act on Promotion of Global Warming Countermeasures US (other than NMC, FMI California, NL): Green-e value; US (NMC, FMI California, NL): Green-e value / value published by electric company* Belgium, France: AIB value Australia: Australian National Greenhouse Accounts value, Poland: AIB value / Poland National Centre for Emission Management* value, China: IEA value / Ministry of Ecology and Environment of the Republic of China value*, IEA values for other countries  Natural gas in China (Nm <sup>3</sup> ) 2.22/2.16*, Natural gas outside China (Nm <sup>3</sup> ) 2.22, City gas for NGK alone (Nm <sup>3</sup> ) 2.244/2.29*, City gas other than for NGK alone (Nm <sup>3</sup> ) 2.23, LPG (kg) 3.00, LNG (kg) 2.70, Light oil (L) 2.58, Heavy oil A (L) 2.71, Kerosene (L) 2.49, Gasoline (L) 2.32, Industrial steam (MJ) 0.06 *Data to left of "/" is for FY2018 to FY2020, data to right is from FY2021
	6. Emission volume of other greenhouse gases	Fuel	
		Emission volume of other greenhouse gases (tCO <sub>2</sub> ) = volume of activity $\times$ emission coefficient $\times$ Global warming potential <Global warming potential> CO <sub>2</sub> : 1, CH <sub>4</sub> : 25, N <sub>2</sub> O: 298, HFC: differs depending on type, PFC: differs depending on type, SF <sub>6</sub> : 22800, NF <sub>3</sub> : 17200	
	7. Water discharge	Total volume of water discharged. However, this does not include the rainwater discharge volume.	
8. PRTR-listed substances	Discharge into bodies of water: Total amount of Japan's PRTR Type 1 listed substances discharged into public bodies of water Emissions into atmosphere: Total amount of Japan's PRTR Type 1 listed substances emitted into the atmosphere		
9. Total amount of discarded materials generated	Total amount of discarded materials generated = Externally disposed amount <sup>1</sup> + Externally recycled amount Recycled amount: Externally recycled amount = Paid disposal <sup>2</sup> + Valuable amount (selling off) <sup>1</sup> Externally disposed amount: Direct disposal by landfill, or simple incineration <sup>2</sup> Paid disposal: Outsourcing disposal and paying for recycling		
10. Scope 1 through 3	Scope 1	Direct emissions of greenhouse gases by the reporting company (generated from industrial processes or the burning of fuel)	
	Scope 2	Indirect emissions of greenhouse gases by the reporting company resulting from the use of electricity, steam, or heat purchased from other companies	
	Scope 3	All other indirect emissions of greenhouse gases (not included in Scope 1 or 2) that occur in the reporting company's value chain	

## GHG Emissions

Item	Category	Division	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
GHG emissions (Scope1+2: Energy-origin CO <sub>2</sub> ) <sup>*1</sup>	—	Including effects of CN LNG <sup>*2</sup>	87	87	76	62	56	10 <sup>4</sup> metric tons of CO <sub>2</sub>
GHG emissions (Scope 1: Energy-origin CO <sub>2</sub> ) <sup>*1</sup>	—	Including effects of CN LNG <sup>*2</sup>	32	31	26	29	25	10 <sup>4</sup> metric tons of CO <sub>2</sub>
GHG emissions (Scope 2: Energy-origin CO <sub>2</sub> ) <sup>*1</sup>	—	—	55	56	49	33	31	10 <sup>4</sup> metric tons of CO <sub>2</sub>
Basic unit per net sales (Scope1+2: Energy-origin CO <sub>2</sub> ) <sup>*1</sup>	—	Including effects of CN LNG <sup>*2</sup>	187	198	167	120	100	Metric tons of CO <sub>2</sub> per 100 million yen
GHG emissions (Scope3) (FY2018-FY2020: Non-consolidated, FY2021-FY2022: Consolidated)	Total		104.7	97.7	89.3	344.9	351.9	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	1	Purchased products and services	86.3	84.2	77.0	178.8	192.2	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	2	Capital goods (capital investment)	15.2	9.9	9.0	13.4	13.9	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	3	Energy	1.8	1.6	1.5	8.6	8.2	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	4	Transport (upstream)	0.8	1.4	1.3	18.8	11.1	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	5	Waste	0.3	0.2	0.2	1.2	1.0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	6	Business trips	0.1	0.1	0.1	0.3	0.3	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	7	Employee commutes	0.2	0.2	0.2	0.9	0.9	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	8	Leased assets (upstream)	—	—	—	—	—	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	9	Transport (downstream)	—	—	—	—	—	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	10	Processing of sold products	—	—	—	—	—	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	11	Use of sold products	—	—	—	122.6	123.9	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	12	Disposal of sold products	—	—	—	0.4	0.4	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	13	Leased assets (downstream)	—	—	—	—	—	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	14	Franchises	—	—	—	—	—	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	15	Investment	—	—	—	—	—	10 <sup>4</sup> metric tons of CO <sub>2</sub>
Other GHG emissions <sup>*1</sup>	Total		0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	—	CO <sub>2</sub> (non-energy origin CO <sub>2</sub> )	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	—	CH <sub>4</sub>	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	—	N <sub>2</sub> O	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	—	HFC	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	—	PFC	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>
	—	SF <sub>6</sub>	0	0	0	0	0	10 <sup>4</sup> metric tons of CO <sub>2</sub>

\*1 The scope is consolidated.

\*2 CN LNG (Carbon Neutral Liquid Natural Gas) is LNG that is offset with CO<sub>2</sub> credits, and thus considered to have no CO<sub>2</sub> emissions. However, we show it as a separate category because it does not qualify for credits under current energy conservation laws.

## Consumption of Each Energy

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
Electric power	0.93	0.95	0.88	0.98	0.94	TWh
Gas*	1.72	1.65	1.41	1.66	1.50	TWh
Petroleum*	0.02	0.02	0.02	0.02	0.02	TWh
Basic unit per net sales	577	596	513	522	442	MWh per 100 million yen

The scope is consolidated.

\*Using "TWh" as the unit, we have changed the figure for FY2018 to FY2021 due to the basic unit calculation.

## Conservation of Water Resources

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit	
Water withdrawal	Tap water/industrial water	3.910	3.710	3.135	3.720	3.494	Million m <sup>3</sup>
	Groundwater	0.620	0.620	0.640	0.614	0.648	Million m <sup>3</sup>
	Rainwater	0.002	0.001	0.002	0.002	0.001	Million m <sup>3</sup>
	Total	4.532	4.331	3.777	4.336	4.143	Million m <sup>3</sup>
Water discharge	Rivers	0.767	0.828	0.734	0.733	0.705	Million m <sup>3</sup>
	Lakes	0.000	0.000	0.000	0.000	0.000	Million m <sup>3</sup>
	Sea	1.330	1.618	1.201	1.218	1.152	Million m <sup>3</sup>
	Sewerage	0.382	0.419	0.376	0.458	0.507	Million m <sup>3</sup>
	Factory complex processing	0.319	0.241	0.207	0.238	0.233	Million m <sup>3</sup>
	Other	0.012	0.013	0.017	0.057	0.079	Million m <sup>3</sup>
	Total	2.810	3.140	2.534	2.704	2.677	Million m <sup>3</sup>
Amount of water consumption	1.722	1.191	1.243	1.632	1.466	Million m <sup>3</sup>	
Volume recycled	0.090	0.090	0.066	0.063	0.077	Million m <sup>3</sup>	
Recycling rate*	2.0	2.0	1.7	1.5	1.9	%	

The scope is consolidated.

\*(Recycling rate) = (Volume recycled) / (Total water withdrawal)

## Raw Materials

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
Raw materials	18	15	14	16	15	10 <sup>4</sup> metric tons
Recycled materials	0.4	0.4	0.4	0.4	0.5	10 <sup>4</sup> metric tons

The scope is consolidated.

## Chemical Management System

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
VOC	120	68	83	77	107	Metric tons
PRTR-listed substances (emissions into atmosphere)	128	76	89	84	110	Metric tons

The scope is consolidated.

## Discarded Materials

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
Discarded materials	6	5	5	5	5	10 <sup>4</sup> metric tons
Recycled	4	4	4	4	4	10 <sup>4</sup> metric tons
Disposed of externally	2	1	1	1	1	10 <sup>4</sup> metric tons
Basic unit per net sales	12.8	12.5	10.3	10.5	8.4	Metric tons per 100 million yen
Reduction rate against BAU <sup>*</sup>	20	24	24	26	31	%
Water discharge	2.810	3.140	2.534	2.704	2.677	Million m <sup>3</sup>
PRTR-listed substances (discharge into bodies of water)	0	1	0	1	1	Metric tons

The scope is consolidated.

\*This is the improvement rate in the basic unit for production output based on FY2013.

## Products and Services Contributing to Environmental Protection

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
Ratio of sales of products and services contributing to environmental protection of the sales of all products and services	52	59	57	59	59	%

The scope is consolidated.

## Environmental Accounting

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
Environmental conservation costs/Capital investment <sup>*1</sup>	14.8	13.6	26.8	9.4	19.4	100 million yen
Environmental conservation costs/Expenditures <sup>*1</sup>	27.9	29.8	35.0	41.4	31.8	100 million yen
Economic benefits <sup>*1</sup>	4.3	5.7	4.5	6.9	7.7	100 million yen
Cost-effectiveness <sup>*1 *2</sup>	15.5	19.2	12.9	16.7	24.1	%
CO <sub>2</sub> eco-efficiency <sup>*3 *4 *5</sup>	115	109	122	187	226	%
Discarded materials eco-efficiency <sup>*3 *4 *6</sup>	144	146	176	172	216	%

\*1 The scope is NGK and domestic group companies

\*2 (Cost-effectiveness) = (Economic benefits) / (Expenditures)

\*3 The scope is consolidated.

\*4 FY2013 = 100%

\*5 (CO<sub>2</sub> eco-efficiency) = (Net sales) / (CO<sub>2</sub> emissions)

\*6 (Discarded materials eco-efficiency) = (Net sales) / (Amount of discarded materials)

## Environmental Management System

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
NGK	4	4	4	4	4	Number of bases certified
Domestic Group	20	22	18	19	19	Number of bases certified
Overseas Group	20	21	21	21	21	Number of bases certified

New manufacturing sites that have been in operation for less than two years are excluded.

## Environmental Audits

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
Significant findings	0	0	0	0	0	Cases

## Environmental Risk Management

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
Major violations	0	0	0	0	0	Cases

## External Recognition of Environmental Performance

Item	FY2018	FY2019	FY2020	FY2021	FY2022
CDP-Climate Change	B	A-	B	B	A-
CDP-Water Security	B-	B-	B	B	A-
CDP-Supplier Engagement	B	B	B	A	A-

## Eco Test Certification

Item	FY2018	FY2019	FY2020	FY2021	FY2022	Unit
Number of successful examinees	90	37	73	44	29	Persons