

Environmental Data

Environmental data calculations of FY2023 have been assured by a third party to improve their reliability.

★: Indicators assured by a third party

[See Independent Assurance Report \(PDF\)](#)

Environmental Impact Data

INPUT

		FY2021	FY2022	FY2023
Energy consumption	GJ	2,197,942	2,067,582	★ 2,107,997
Intensity	GJ/100 million yen	808	722	1,004
Total electricity consumption	MWh	361,089	342,676	★ 345,968
Electricity from renewable energy sources	MWh	66,149	96,590	★ 149,961
Purchased power	MWh	66,118	96,500	149,499
In-house power generation ¹	MWh	31	90	461
Electricity from non-renewable energy sources	MWh	294,940	246,086	196,008
Rate of renewable energy use	%	18	28	★ 43
Steam	t	—	—	6,400
Heavy oil, light oil, gasoline	kL	1,084	1,087	895
Natural gas, city gas	thousand m ³	19,010	17,597	20,264
LPG・LNG	t	197	174	158
Materials	t	31,431	18,079	15,217
Raw materials ²	t	27,471	14,839	13,043
Chemical substances	t ³	3,960	3,240	2,174
Water resources				
Total water withdrawal	thousand m ³	4,902	4,336	★ 4,368
By water source				
Municipal water	thousand m ³	1,203	993	941
Ground water	thousand m ³	3,700	3,343	3,428
Recycled water volume	thousand m ³	3,383	3,305	2,806
Recycling rate	%	41	43	39

Data boundary

FY2021: Shinko Group in Japan and overseas production sites

Overseas production sites:

KOREA SHINKO MICROELECTRONICS CO., LTD. (KSM)
SHINKO ELECTRONICS (MALAYSIA) SDN. BHD. (SEM)
SHINKO ELECTRIC INDUSTRIES (WUXI) CO., LTD. (SEW)

FY2022 and FY2023: Shinko Group in Japan and overseas production sites

Overseas production sites:

KOREA SHINKO MICROELECTRONICS CO., LTD. (KSM)
SHINKO ELECTRONICS (MALAYSIA) SDN. BHD. (SEM)

Some items have totals that do not match due to rounding

¹ No energy sales

² To improve calculation accuracy, weight conversion factors for procured components are revised accordingly.

Due to data availability restrictions, figures for previous years have not been revised.

³ FY2021 values do not include VOCs.

OUTPUT

		FY2021	FY2022	FY2023
Emissions into the air				
Scope1	t-CO ₂	48,076	44,135	★ 45,737
Intensity	t-CO ₂ /100 million yen	18	15	22
Energy sources	t-CO ₂	45,854	42,453	★ 43,792
Non-energy sources	t-CO ₂	2,222	1,682	★ 1,945
Carbon dioxide (CO ₂)	t-CO ₂	37	40	32
Methane (CH ₄)	t-CO ₂	0	0	6
Tetrafluoromethane (CF ₄)	t-CO ₂	1,722	1,428	1,110
Sulfur hexafluoride (SF ₆)	t-CO ₂	74	0	579
Nitrogen trifluoride (NF ₃)	t-CO ₂	0	0	0
Nitrous oxide (N ₂ O)	t-CO ₂	—	—	38
Hydrofluorocarbon (HFC)	t-CO ₂	388	215	174
Acetylene (C ₂ H ₂)	t-CO ₂	—	—	5
Lubricants and grease	t-CO ₂	—	—	0
Scope2	Location-based t-CO ₂	163,357	153,211	★ 154,882
	Market-based t-CO ₂	122,797	105,620	★ 94,077
Intensity (market standard)	t-CO ₂ /100 million yen	45	37	45
Electricity	Location-based t-CO ₂	163,357	153,211	153,883
	Market-based t-CO ₂	122,797	105,620	93,079
Steam	t-CO ₂	—	—	999
NOx	t	28	26	20
SOx	t	0	0	0
Chemical substances				
PRTR	kg	5,976	5,297	★ 8,442
By emission destination				
Atmosphere	kg	1,505	1,416	3,898
Public waters	kg	4,471	3,880	4,544
VOC	t	130	137	119
Water				
Total water discharge	thousand m ³	3,996	3,574	3,523
By drainage destination				
River	thousand m ³	2,853	2,534	2,549
Sewerage	thousand m ³	1,143	1,039	973
Water consumption	thousand m ³	—	—	845
BOD	t	291	213	135
Waste + Valuables	t	29,382	26,321	★ 22,218
Waste	t	7,060	6,427	★ 4,975
Hazardous				
Effectively utilized	Thermal t	50	136	85
	Material t	1,343	1,540	989
Non-effectively utilized	t	50	6	5
Non-hazardous				
Effectively utilized	Thermal t	192	196	158
	Material t	5,285	4,428	3,651
Non-effectively utilized	t	140	122	87
Landfill disposal (included in waste)	t	11	25	★ 21
Valuables	t	22,322	19,894	★ 17,243
Effective utilization rate	%	99.4	99.5	99.6

Supply Chain Emissions (GHG Emissions based on the GHG Protocol Standard)

★ : Indicators assured by a third party

Category				Emissions (t -CO ₂)		
				FY2021	FY2022	FY2023
Upstream	Scope3	1	Purchased goods and services ¹	197,317	188,469	★ 163,604
		2	Capital goods	97,072	168,971	184,913
		3	Fuel and energy-related activities not included in Scope 1 or 2	32,086	30,730	31,969
		4	Upstream transportation and distribution	9,555	8,342	7,366
		5	Waste generated in operations	887	840	660
In-house	Scope1	Direct emissions		48,076	44,135	★ 45,737
	Scope2	Indirect emissions from energy sources	Location-based	163,357	153,211	★ 154,882
			Market-based	122,797	105,620	★ 94,077
	Scope3	6	Business travel	² 230	² 303	310
		7	Employee commuting	7,691	8,169	8,460
		8	Upstream leased assets	NA	NA	NA
Downstream	Scope3	9	Downstream transportation and distribution	NA	NA	NA
		10	Processing of sold products	NA	NA	NA
		11	Use of sold products	NA	NA	NA
		12	End-of-life treatment of sold products	NA	NA	NA
		13	Downstream leased assets	NA	NA	NA
		14	Franchises	NA	NA	NA
		15	Investments	NA	NA	NA
		Scope1 + Scope2 ³			170,873	149,755
Scope3			344,838	405,824	397,282	

Data boundary:

FY2021: Shinko Group in Japan and overseas production sites

Overseas production sites:

KOREA SHINKO MICROELECTRONICS CO., LTD.(KSM)
SHINKO ELECTRONICS (MALAYSIA) SDN. BHD.(SEM)
SHINKO ELECTRIC INDUSTRIES (WUXI) CO., LTD.(SEW)

FY2022 and FY2023: Shinko Group in Japan and overseas production sites

Overseas production sites:

KOREA SHINKO MICROELECTRONICS CO., LTD.(KSM)
SHINKO ELECTRONICS (MALAYSIA) SDN. BHD.(SEM)

Some items have totals that do not match due to rounding

¹ To improve calculation accuracy, weight conversion factors for procured components are revised accordingly.

Due to data availability restrictions, figures for previous years have not been revised.

² Retrospective revision of previous years' figures to improve calculation accuracy

³ Scope2 values were calculated based on market criteria

Environmental Data Calculation Standards

■ Environmental Impact Data

INPUT

Index		Unit	Calculation Method
Energy	Energy consumption	GJ	Σ [annual use of electricity + (annual consumption of fuel oil and gas) × calorie conversion factor for each energy source] Conversion factor: Ministry of the Environment "Greenhouse Gas Emission Calculation and Reporting Manual" (Ver. 5.0) (February 2024) Σ [Annual steam consumption × Specific enthalpy of steam (total heat value)]. Specific enthalpy: 1999 JSME Steam Tables * JSME = the Japan Society of Mechanical Engineers
	Energy intensity	GJ/100 million yen	Energy consumption/Net sales
Electricity from renewable energy sources	Purchased power	MWh	Amount of electricity purchased from renewable energy sources (including purchase of renewable electricity certificates)
	In-house power generation	MWh	Amount of renewable energy generated and consumed by the company
Electricity from non-renewable energy sources		MWh	Amount of electricity purchased from depletable energy sources such as fossil fuels
Rate of renewable energy use		%	Electricity from renewable energy sources/Total electricity consumption
Chemical substances		t	Total amount of substances with annual handling volume of 100 kg or more per substance, among the substances subject to the PRTR system (Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management) or the 20 volatile organic compounds (VOCs) specified in the Voluntary Action Plan on the Environment adopted by the 4 electrical and electronics organizations (Data boundary: Shinko Group in Japan)
Water resources	Total water withdrawal	thousand m ³	Amount of water withdrawn from waterworks and groundwater (However, groundwater for snow removal is not included)
	Recycled water volume	thousand m ³	The amount of water used at the plant that is collected and treated and then used again at the plant
	Recycling rate	%	Recycled water volume / (total water withdrawal + recycled water volume)

OUTPUT

Index		Unit	Calculation Method
Scope 1	Intensity	t-CO ₂ /100 million yen	Scope 1/Net sales
	Energy sources	t-CO ₂	CO ₂ emissions from the use of heavy oil, gasoline, light oil, natural gas, city gas, LPG, and LNG Σ [(annual consumption of fuel oil and gas) × CO ₂ conversion factor for each energy source] Conversion factor: Ministry of the Environment "Greenhouse Gas Emission Calculation and Reporting Manual" (Ver. 5.0) (February 2024)
	Non-energy sources	t-CO ₂	CO ₂ emissions from the use of CO ₂ from non-energy sources, methane (CH ₄), carbon tetrafluoride (CF ₄), sulfur hexafluoride (SF ₆), nitrogen trifluoride (NF ₃), nitrous oxide (N ₂ O), fluorocarbons (HFC), Acetylene, and Lubricants and grease Σ (annual emissions of each type of gas × global warming potential of each type of gas) Global warming potential: Ministry of the Environment "Greenhouse Gas Emission Calculation and Reporting Manual" (Ver. 5.0) (February 2024)
Scope 2	Intensity	t-CO ₂ /100 million yen	Scope 2 (Market-based)/Net sales
	Electricity	t-CO ₂	CO ₂ emissions from the purchased electricity Electricity purchased × CO ₂ conversion factor Location based Conversion factor: In Japan: From adjusted emission factor of "The Electric Power Council for a Low Carbon Society" FY2023: 0.437 t-CO ₂ /MWh (announced on February 6, 2024) FY2022: 0.436 t-CO ₂ /MWh FY2021: 0.441 t-CO ₂ /MWh Overseas: latest IEA values (by country) Market based Conversion factor: In Japan: Use emission factors (adjusted emission factors) for each electric power company. * Based on the Ministry of the Environment Greenhouse Gas Emission Calculation, Reporting and Publication System "Emission Factors by Electric Utility" Overseas: latest IEA values (by country)
	Steam	t-CO ₂	CO ₂ emissions for production of supplied steam Σ [Annual consumption of city gas used for production of supplied steam × CO ₂ conversion factor] Conversion factor: Ministry of the Environment "Greenhouse Gas Emission Calculation and Reporting Manual" (Ver. 5.0) (February 2024)
NOx		t	Amount of nitrogen oxides emitted from boilers at plants NOx concentration (ppm) × 10 ⁻⁶ × dry gas emissions (m ³ N/hr) operating time (hr/year) × 46/22.4 × 10 ⁻³

Index					Unit	Calculation Method
SOx					t	Amount of sulfur oxides emitted from boilers at plants SOx concentration (ppm) × 10 ⁻⁶ × dry gas emissions (m ³ N/hr) operating time (hr/ year) × 64/22.4×10 ³
Chemical substances	PRTR				kg	Substances with an annual handling volume of 100 kg or more per substance, among substances subject to the PRTR system (Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management) (Data boundary: Shinko Group in Japan)
	VOC				t	Total emissions of substances with an annual handling volume of 100 kg or more per substance, among the 20 volatile organic compounds (VOCs) specified in the Voluntary Action Plan on the Environment adopted by the 4 electrical and electronics organizations (Data boundary: Shinko Group in Japan)
Water	Total water discharge				thousand m ³	Annual discharge to public waters and sewerage (not including groundwater for snow removal)
	BOD				t	An indicator of the degree of water pollution, this is the amount of oxygen required when microbes decompose organic matter in water BOD concentration (mg/L) × effluent (m ³ /year) × 10 ⁻⁶
	Water consumption				thousand m ³	Total water intake - Total water discharge (based on GRI Sustainability Reporting Standard (Disclosure 303-5))
Waste + Valuables					t	Total output of waste and valuables
Waste	Hazardous	Effectively utilized	Thermal	t	Amount of waste classified as hazardous waste according to the laws and regulations of each country (specially controlled waste in Japan) that is thermally recycled ¹	
			Material	t	Amount of waste classified as hazardous waste according to the laws and regulations of each country (specially controlled waste in Japan) that is materially recycled ²	
			Non-effectively utilized		t	Amount of waste classified as hazardous waste according to the laws and regulations of each country (specially controlled waste in Japan) that is simply incinerated or directly landfilled
	Non-hazardous	Effectively utilized	Thermal	t	Amount of thermally recycled waste ¹ among non-hazardous waste	
			Material	t	Amount of materially recycled waste ² among non-hazardous waste	
		Non-effectively utilized		t	Amount of non-hazardous waste that is simply incinerated or landfilled	
		Landfill disposal (included in waste)				t
	Valuables				t	Amount of unwanted substances resulting from business activities that is sold for value
	Effective utilization rate				%	(Effectively used waste + valuables) / (valuables + waste)

¹ Thermal recycling: reusing thermal energy generated during incineration

² Material recycling: reusing as material or raw material

Supply Chain Emissions (GHG Emissions based on the GHG Protocol Standard)

Category		Calculation method
Upstream	1 Purchased goods and services	Amount of material procurement within fiscal year and production outsourcing cost × emissions factor per procurement amount Parts procured in Japan are calculated on a weight basis, and parts procured from domestic manufacturing consignment and overseas are calculated on a value basis. The top 90% of each category (by weight or value) is included in "purchased goods and services." Emission factors: • Database for calculating an organization's greenhouse gas emissions through its supply chain ver. 3.4 • IDEAv2.3 (for supply chain greenhouse gas emissions calculation)
	2 Capital goods	Amount of capital investment related to capital goods in the fiscal year × emissions factor Emission factors: • Database for calculating an organization's greenhouse gas emissions through its supply chain ver. 3.4
	3 Fuel and energy-related activities not included in Scope 1 or 2	Annual purchases of purchased fuel and gas and electricity procured from outside sources × emissions factor Emission factors: • Database for calculating an organization's greenhouse gas emissions through its supply chain ver. 3.4 • IDEAv2.3 (for supply chain greenhouse gas emissions calculation)
	4 Upstream transportation and distribution	(1) + (2) (1) Transportation volume during the fiscal year (for suppliers equivalent to the top 90% of procurement value) × emission factor Emission factors: • Database for calculating an organization's greenhouse gas emissions through its supply chain ver. 3.4 • Domestic Emission factors Database (2) CO ₂ emissions from domestic transportation where the Shinko Group is the shipper Calculation method: Based on the Act on Rationalizing Energy Use (Energy Conservation Act) CO ₂ emissions from domestic transportation where the Shinko Group is the shipper Fuel consumption method (some vehicles) and improved tonkilometer method (automobiles, railroads, aircraft)
	5 Waste generated in operations	Annual amount of waste discharged by business sites that is treated or recycled, according to type of waste and treatment method × emission factor per amount of waste treated and recycled per year Emission factors: • Database for calculating an organization's greenhouse gas emissions through its supply chain ver. 3.4 • IDEAv2.3 (for supply chain greenhouse gas emissions calculation)
In-house	6 Business travel	(1)+(2) (1) (By means of transportation) Σ (transportation expenses paid x emission factors) Emission factors: • Database for calculating an organization's greenhouse gas emissions through its supply chain ver. 3.4 (2) Private cars Σ (transported persons-kilometer x emissions factor) Emission factors: IDEAv2.3 (for supply chain greenhouse gas emissions calculation)
	7 Employee commuting	Σ (transported persons-kilometer x emissions factor) Emission factors: IDEAv2.3 (for supply chain greenhouse gas emissions calculation)

Environmental Measurement Data

■ Water quality Unit: Other than hydrogen ion index (mg/L)

Kohoku Plant (Water discharge destination: Sewerage)

Item	National standards	Prefectural standards	Voluntary standards	Actual value	
				Maximum	Average
BOD	600	600	540	250	122
Amount of suspended solids	600	600	300	120	32
n-Hexane	5	5	4.5	<1	<1
Copper	3	3	1	0.40	0.24
Zinc	2	2	1	0.09	0.05
Soluble iron	10	10	5	0.12	0.06
Hydrogen ion exponent	5.0 ~9.0	5.0 ~9.0	5.2 ~8.8	Minimum	Maximum
				6.5	7.7

Wakaho Plant (Water discharge destination: Sewerage)

Item	National standards	Prefectural standards	Voluntary standards	Actual value	
				Maximum	Average
BOD	600	600	540	290	172
Amount of suspended solids	600	600	200	140	70
n-Hexane	5	5	4.5	<1	<1
Copper	3	2	1.8	0.36	0.28
Zinc ¹	4	3	1	<0.02	<0.02
Soluble iron	10	10	3	<0.02	<0.02
Soluble manganese	10	10	4	0.07	0.02
Chromium	2	2	0.4	<0.02	<0.02
Hydrogen ion exponent	5.0 ~9.0	5.0 ~9.0	5.2 ~8.8	Minimum	Maximum
				7.2	8.4

Takaoka Plant (Water discharge destination: River)

Item	National standards	Prefectural standards	Voluntary standards	Actual value	
				Maximum	Average
BOD	160	30	27	11	4.6
Amount of suspended solids	200	50	25	23	8
n-Hexane	5	5	2	<1	<1
Copper	3	2	1	0.23	0.11
Zinc ¹	4	3	1.5	0.04	0.02
Soluble iron	10	10	3	0.09	0.05
Soluble manganese	10	10	3	0.05	0.03
Chromium	2	1	0.5	<0.02	<0.02
Hydrogen ion exponent	5.8 ~8.6	5.8 ~8.6	6.0 ~8.4	Minimum	Maximum
				6.3	8.1

Arai Plant (Water discharge destination: River)

Item	National standards	Prefectural standards	Voluntary standards	Actual value	
				Maximum	Average
BOD	160	25	23	5.3	3.4
Amount of suspended solids	200	50	32	8	3
n-Hexane	5	5	4	<1	<1
Copper	3	2	1	0.14	0.05
Zinc ¹	4	4	1	0.06	0.06
Soluble iron	10	10	5	2.60	1.53
Soluble manganese	10	10	3	0.53	0.41
Chromium	2	2	0.5	<0.02	<0.02
Hydrogen ion exponent	5.8 ~8.6	5.8 ~8.6	6.0 ~8.4	Minimum	Maximum
				6.9	7.7

Kyogase Plant (Water discharge destination: River)

Item	National standards	Prefectural standards	Voluntary standards	Actual value	
				Maximum	Average
BOD	160	160	80	8.2	6.1
Amount of suspended solids	200	200	65	2	1
n-Hexane	5	5	2	<1	<1
Copper	3	3	1	0.03	0.02
Zinc ¹	4	4	1	0.02	<0.02
Soluble iron	10	10	3	0.17	0.13
Soluble manganese	10	10	3	0.06	0.02
Chromium	2	2	0.5	<0.02	<0.02
Hydrogen ion exponent	5.8 ~8.6	5.8 ~8.6	6.2 ~8.2	Minimum	Maximum
				6.3	7.1

¹ National and prefectural standards are provisional standards until December 10, 2024.

Environmental Management System ISO 14001

Percentage of Shinko Group Business Sites with ISO 14001 Certification

	FY2019	FY2020	FY2021	FY2022	FY2023
In Japan	100% (1)	100% (1)	100% (1)	100% (1)	100% (1)
Overseas production sites	100% (3)	100% (3)	100% (3)	100% (2)	100% (2)

Japan: Acquired integrated certification as Fujitsu Group

Overseas production sites: Individual companies obtained certification

List of Business Sites with ISO 14001 Certification

■ In Japan

SHINKO ELECTRIC INDUSTRIES CO., LTD.	
Registration office	SHINKO ELECTRIC INDUSTRIES CO., LTD. Head Office (Kohoku Plant), Wakaho Plant, Takaoka Plant, Arai Plant, Kyogase Plant, SHINKO R&D Center Domestic Subsidiary SHINKO TECHNOSERVE CO., LTD.
Certification body	Japan Audit and Certification Organization for Environment and Quality (JACO)
Registration number	EC98J2005-D601
Date of registration	September 12, 1995

■ Overseas

SHINKO ELECTRONICS (MALAYSIA) SDN. BHD.	
Certification body	Bureau Veritas Quality International
Registration number	MY008657
Date of registration	October 18, 2000
KOREA SHINKO MICROELECTRONICS CO., LTD.	
Certification body	Korean Foundation for Quality
Registration number	EAC-0642801
Date of registration	July 3, 2003