

# Environmental Data

Environmental data calculations of FY2022 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

		FY2020	FY2021	FY2022
<b>Energy consumption</b>	<b>GJ</b>	<b>2,054,950</b>	<b>2,197,942</b>	<b>★ 2,067,582</b>
Energy intensity	GJ/100 million yen	1,092	808	722
Total electricity consumption	MWh	331,539	361,089	342,676
Electricity from renewable energy sources	MWh	—	66,149	★ 96,590
Purchased power	MWh	—	66,118	96,500
In-house power generation <sup>3</sup>	MWh	24	31	90
Electricity from non-renewable energy sources	MWh	331,515	294,940	246,086
Rate of renewable energy use	%	0.01%	18%	★ 28%
Heavy oil, light oil, gasoline	kL	980	1,084	1,087
Natural gas, city gas	thousand m <sup>3</sup>	18,241	19,010	17,597
LPG · LNG	t	155	197	174
<b>Materials</b>	<b>t</b>	<b>37,083</b>	<b>31,431</b>	<b>18,079</b>
Raw materials	t	34,376	27,471	14,839
Chemical substances	t	2,707	3,960	3,240
<b>Water resources</b>				
Total water withdrawal	thousand m <sup>3</sup>	3,994	4,902	★ 4,336
By water source				
Municipal water	thousand m <sup>3</sup>	1,043	1,203	993
Ground water	thousand m <sup>3</sup>	2,951	3,700	3,343
Recycled water volume	thousand m <sup>3</sup>	3,145	3,383	3,305
Recycling rate	%	44	41	43

Data boundary

FY2020 and 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: 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

No water intake from water stress areas

<sup>1</sup> In the past, the annual consumption of electricity was multiplied by the calorific value conversion factor specified in Article 4, Appended Table 3 of the Enforcement Regulations of the Law Concerning the Rational Use of Energy, but the method of calculating the annual consumption of electricity was changed as of the current term. Accordingly, the figures for previous years were revised retrospectively.

<sup>2</sup> Retrospective revision of previous years' figures to improve calculation accuracy

<sup>3</sup> No energy sales

<sup>4</sup> Calculated by including energy related to automobiles, etc., traveling outside the premises of plants, etc., which has previously been calculated as within Scope 3. Accordingly, the figures for previous years were revised retrospectively.

<sup>5</sup> Retrospective revision of previous years' figures because of change in method of calculation

Switched from recycled water usage rate for process to recycled water usage rate for entire plant.

<sup>6</sup> 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.

<sup>7</sup> From FY2022 onward, calculated by adding VOC to PRTR substances.

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

### OUTPUT

		FY2020	FY2021	FY2022
<b>Emissions into the air</b>				
Scope1	t-CO <sub>2</sub>	45,131	48,076	★ 44,135
Energy sources	t-CO <sub>2</sub>	43,859	45,854	★ 42,453
Non-energy sources	t-CO <sub>2</sub>	1,272	2,222	★ 1,682
Carbon dioxide(CO <sub>2</sub> )	t-CO <sub>2</sub>	39	37	40
Methane(CH <sub>4</sub> )	t-CO <sub>2</sub>	0	0	0
Tetrafluoromethane(CF <sub>4</sub> )	t-CO <sub>2</sub>	1,041	1,722	1,428
Sulfur hexafluoride(SF <sub>6</sub> )	t-CO <sub>2</sub>	0	74	0
Nitrogen trifluoride(NF <sub>3</sub> )	t-CO <sub>2</sub>	0	0	0
Hydrofluorocarbon(HFCs)	t-CO <sub>2</sub>	192	388	215
Scope2	Location-based t-CO <sub>2</sub>	151,821	163,357	★ 153,211
	Market-based t-CO <sub>2</sub>	—	122,797	★ 105,620
NOx	t	29	28	26
SOx	t	1	0	0
<b>Chemical substances</b>				
PRTR	t	5	6	★ 5
VOC	t	101	130	137
<b>Water</b>				
Total water discharge	thousand m <sup>3</sup>	3,444	3,996	3,574
By drainage destination				
River	thousand m <sup>3</sup>	2,339	2,853	2,534
Sewerage	thousand m <sup>3</sup>	1,105	1,143	1,039
BOD		291	291	213
<b>Waste + Valuables</b>	<b>t</b>	<b>25,130</b>	<b>29,382</b>	<b>★ 26,321</b>
Waste	t	6,134	7,060	★ 6,427
Hazardous				
Effectively utilized	Thermal t	18	50	136
	Material t	1,328	1,343	1,540
	Non-effectively utilized t	10	50	6
Non-hazardous				
Effectively utilized	Thermal t	171	192	196
	Material t	4,476	5,285	4,428
	Non-effectively utilized t	132	140	122
Valuables	t	18,996	22,322	★ 19,894
Effective utilization rate	%	99.4	99.4	99.5
(Landfill disposal)	t	19.3	10.9	★ 25

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

★ : Indicators assured by a third party

Category		Emissions (t-CO <sub>2</sub> )				
		FY2020	FY2021	FY2022		
Upstream	Scope3	1 Purchased goods and services	686,905 <sup>1</sup>	197,317	★ 188,469	
		2 Capital goods	84,253	97,072	168,971	
		3 Fuel and energy-related activities not included in Scope 1 or 2	28,143	32,086	30,730	
		4 Upstream transportation and distribution	8,215	9,555	8,342	
		5 Waste generated in operations	512	887	840	
In-house	Scope1	Direct emissions	<sup>2</sup> 42,163	<sup>2</sup> 48,076	★ 44,135	
	Scope2	Indirect emissions from energy sources	Location-based	137,651	163,357	★ 153,211
			Market-based	—	122,797	★ 105,620
	Scope3	6 Business travel	207	225	171	
		7 Employee commuting	7,011	7,691	8,169	
		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 <sup>1</sup>	179,814	211,433	197,346	
		Scope3	815,246	344,833	405,692	

Data boundary: FY2020: Shinko Group in Japan  
 FY2021: Shinko Group in Japan and overseas production sites  
 Overseas production sites:  
 KOREA SHINKO MICROELECTRONICS CO., LTD.(KSM)  
 SHINKO ELECTRONICS (MALAYSIA) SDN. BHD.(SEM)  
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FY2022: 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

<sup>1</sup> To improve calculation accuracy, weight conversion factors for procured components are revised accordingly. Based on the results of the review, the figures for FY2021 were revised retrospectively. Due to data availability restrictions, figures for FY2020 have not been revised.

<sup>2</sup> Retrospective revision of previous years' figures to improve calculation accuracy

<sup>3</sup> Scope 2 values were calculated based on location criteria

# Environmental Data Calculation Standards

## Environmental Impact Data

### INPUT

Index		Unit	Calculation Method
Energy	Energy consumption	GJ	$\Sigma$ [annual use of electricity + (annual consumption of fuel oil and gas) $\times$ calorie conversion factor for each energy source] Conversion factor: Ministry of the Environment "Greenhouse Gas Emission Calculation and Reporting Manual" (Ver. 4.9) (April 2023)
	Energy intensity	GJ/100 million yen	Energy consumption/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 <sup>3</sup>	Amount of water withdrawn from waterworks and groundwater (However, groundwater for snow removal is not included)
	Recycled water volume	thousand m <sup>3</sup>	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	Energy sources	t-CO <sub>2</sub>	CO <sub>2</sub> emissions from the use of heavy oil, gasoline, light oil, natural gas, city gas, LPG, and LNG  $\Sigma$ [(annual consumption of fuel oil and gas) $\times$ CO <sub>2</sub> conversion factor for each energy source] Conversion factor: Ministry of the Environment "Greenhouse Gas Emission Calculation and Reporting Manual" (Ver. 4.9) (April 2023)
	Non-energy sources	t-CO <sub>2</sub>	CO <sub>2</sub> emissions from the use of CO <sub>2</sub> from non-energy sources, methane (CH <sub>4</sub> ), carbon tetrafluoride (CF <sub>4</sub> ), sulfur hexafluoride (SF <sub>6</sub> ), nitrogen trifluoride (NF <sub>3</sub> ), and fluorocarbons (HFC)  $\Sigma$ (annual emissions of each type of gas $\times$ global warming potential of each type of gas) Global warming potential: Ministry of the Environment "Greenhouse Gas Emission Calculation and Reporting Manual" (Ver. 4.9) (April 2023)
Scope 2		t-CO <sub>2</sub>	CO <sub>2</sub> emissions from the purchased electricity Electricity purchased $\times$ CO <sub>2</sub> conversion factor  Location based Conversion factor: In Japan: From adjusted emission factor of "The Electric Power Council for a Low Carbon Society" FY2022: 0.436 t-CO <sub>2</sub> /MWh (announced on February 13, 2023) FY2021: 0.441 t-CO <sub>2</sub> /MWh FY2020: 0.444 t-CO <sub>2</sub> /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)
NOx		t	Amount of nitrogen oxides emitted from boilers at plants $\text{NOx concentration (ppm)} \times 10^{-6} \times \text{dry gas emissions (m}^3\text{N/hr)} \times \text{operating time (hr/year)} \times 46/22.4 \times 10^3$
SOx		t	Amount of sulfur oxides emitted from boilers at plants $\text{SOx concentration (ppm)} \times 10^{-6} \times \text{dry gas emissions (m}^3\text{N/hr)} \times \text{operating time (hr/year)} \times 64/22.4 \times 10^3$
Chemical substances	PRTR	t	Total emissions to air and water of 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)

Index		Unit	Calculation Method		
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 <sup>3</sup>	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 to decompose organic matter in water BOD concentration (mg/L) × effluent (m <sup>3</sup> /year) × 10 <sup>-6</sup>		
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 <sup>1</sup>
		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 <sup>2</sup>
		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	Material	t	Amount of thermally recycled waste <sup>1</sup> among non-hazardous waste
				t	Amount of materially recycled waste <sup>2</sup> among non-hazardous waste
				t	Amount of non-hazardous waste that is simply incinerated or landfilled
Valuables				t	Amount of unwanted substances resulting from business activities that is sold for value
Effective utilization rate (Landfill disposal)		%	(Effectively used waste + valuables) / (valuables + waste)		
		t	Total amount of residue that is directly landfilled or landfilled after intermediate treatment (among waste)		

<sup>1</sup> Thermal recycling: reusing thermal energy generated during incineration

<sup>2</sup> 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. 3.3 • 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. 3.3
	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. 3.3 • 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. 3.3 • Domestic Emission factors Database (2) CO <sub>2</sub> 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 <sub>2</sub> 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. 3.3 • IDEAv2.3 (for supply chain greenhouse gas emissions calculation)
In-house	6 Business travel	(By means of transportation) Σ (transportation expenses paid × emission factors) Emission factors: • Database for calculating an organization's greenhouse gas emissions through its supply chain ver. 3.3 For private and company-owned vehicles Σ (fuel consumption × emission factors)
	7 Employee commuting	Σ (Distance of commute × emission factors) Emission factors: • Database for calculating an organization's greenhouse gas emissions through its supply chain ver. 3.3 • 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	540	187	
Amount of suspended solids	600	600	300	88	33	
n-Hexane	5	5	4.5	<1	<1	
Copper	3	3	1	0.62	0.33	
Zinc <sup>1</sup>	2	2	1	0.09	0.07	
Soluble iron	10	10	5	0.11	0.02	
Hydrogen ion exponent	5.0 ~9.0	5.0 ~9.0	5.2 ~8.8	Minimum	Maximum	7.4
				7.0	8.0	

#### Wakaho Plant (Water discharge destination: Sewerage)

Item	National standards	Prefectural standards	Voluntary standards	Actual value		
				Maximum	Average	
BOD	600	600	540	400	261	
Amount of suspended solids	600	600	200	130	66	
n-Hexane	5	5	4.5	<1	<1	
Copper	3	2	1.8	0.46	0.24	
Zinc <sup>1</sup>	4	3	1	<0.02	<0.02	
Soluble iron	10	10	3	<0.02	<0.02	
Soluble manganese	10	10	4	0.11	0.07	
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	7.8
				7.5	8.0	

#### Takaoka Plant (Water discharge destination: River)

Item	National standards	Prefectural standards	Voluntary standards	Actual value		
				Maximum	Average	
BOD	160	30	27	9.4	2.9	
Amount of suspended solids	200	50	25	14	7	
n-Hexane	5	5	2	<1	<1	
Copper	3	2	1	0.19	0.09	
Zinc <sup>1</sup>	4	3	1.5	0.05	0.02	
Soluble iron	10	10	3	1.60	0.17	
Soluble manganese	10	10	3	0.17	0.04	
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	7.4
				6.9	8.2	

#### Arai Plant (Water discharge destination: River)

Item	National standards	Prefectural standards	Voluntary standards	Actual value		
				Maximum	Average	
BOD	160	25	23	3.9	2.5	
Amount of suspended solids	200	50	32	4	3	
n-Hexane	5	5	4	<1	<1	
Copper	3	2	1	0.05	0.03	
Zinc <sup>1</sup>	4	4	1	0.10	0.10	
Soluble iron	10	10	5	3.70	1.98	
Soluble manganese	10	10	3	0.54	0.43	
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	7.4
				7.1	7.7	

#### Kyogase Plant (Water discharge destination: River)

Item	National standards	Prefectural standards	Voluntary standards	Actual value		
				Maximum	Average	
BOD	160	160	80	15	6.8	
Amount of suspended solids	200	200	65	2	1	
n-Hexane	5	5	2	<1	<1	
Copper	3	3	1	0.05	0.02	
Zinc <sup>1</sup>	4	4	1	0.02	<0.02	
Soluble iron	10	10	3	0.54	0.19	
Soluble manganese	10	10	3	0.03	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	6.8
				6.4	7.0	

<sup>1</sup> National and prefectural standards are provisional standards until December 10, 2024.

## Environmental Accounting

Conforms to the Ministry of the Environment's Environmental Accounting Guidelines 2005

Note: Data boundary: SHINKO ELECTRIC INDUSTRIES CO., LTD.

(millions of yen)

Item	Main contents	Amount invested			Expenses			Economic effect			
		FY2020	FY2021	FY2022	FY2020	FY2021	FY2022	FY2020	FY2021	FY2022	
Within business area	Pollution prevention	Prevention of air pollution, water pollution, etc.	-	612	1,415	-	2,158	2,479	-	13,245	9,320
	Global environmental conservation	Climate change policy, energy conservation, etc.	-	196	321	-	1,657	1,906	-	63	66
	Resource circulation	Waste disposal, resource circulation	-	0	0	-	529	568	-	13,486	13,695
Upstream, downstream	-	-	-	-	-	-	-	-	-	-	
Management activities	ISO 14001, environmental education, conservation, etc.	-	0	0	-	346	356	-	71	78	
R&D	Research into environmentally friendly products, etc.	-	0	0	-	1	8	-	1,640	1,846	
Social activities	-	-	0	0	-	0	0	-	-	-	
Environmental damage response	-	-	0	0	-	0	0	-	0	0	
<b>Total</b>			-	808	1,736	-	4,691	5,317	-	28,505	25,004

## Environmental Management System ISO 14001

### Percentage of Shinko Group Business Sites with ISO 14001 Certification

	FY2018	FY2019	FY2020	FY2021	FY2022
In Japan	100% (1)	100% (1)	100% (1)	100% (1)	100% (1)
Overseas production sites	100% (3)	100% (3)	100% (3)	100% (3)	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-06428
Date of registration	July 3, 2003