

Status of GHG Emissions

Facing the severe challenge of climate change, TSRC continues to review and examine the balance between industry and the environment, and dedicates our efforts to energy conservation and carbon reduction with the vision of achieving carbon neutrality. With 2021 as the base year, TSRC aims to reduce Scope 1 + 2 GHG emissions by 10% by 2025 and by 22.5% by 2030, and to achieve a renewable energy ratio of 10% by 2025 and 30% by 2030. TSRC's GHG emissions were reduced by 9.44% in 2024, exceeding the original target of a 7.5% reduction in 2024. Renewable energy accounted for 7.55% of the total, also meeting the 2024 target in the ESG strategy blueprint.

Goals and Achievement	Achievements in 2024	2024 Goals	2025 Goals	2030 Goals
✓	✓ Total emissions decreased by 9.44% compared to base year	• Reduce total carbon emissions by 7.5% compared to 2021 (base year)	• Reduce total carbon emissions by 10% compared to base year	• Reduce total carbon emissions by 22.5% compared to base year

1. Strategy of GHG Emissions Reduction

In response to global climate action, TSRC has set a vision to achieve carbon neutrality. TSRC will continue to invest in green manufacturing processes and increase the use of renewable energy while actively implementing energy conservation and carbon reduction measures. As a manufacturer of specialty chemicals, TSRC prioritizes the reduction of Scope 1 and Scope 2 GHG emissions. TSRC optimizes its processes and utility systems and expanding its green process innovations. In response to the Scope 1 reduction strategy, TSRC has stopped using coal-fired boilers since 2020 to reduce emissions from coal use, while adjusting the fuel used in boilers at all plants to replace fuel oil with natural gas. No fuel oil was used in the entire TSRC Group. From 2022, TSRC has reduced the use of boiler fuel through steam reduction measures. In the future, TSRC will continue to reduce Scope 1 emissions by regulating steam consumption. Scope 2 emissions are reduced through saving energy resources, improving energy efficiency, and reducing the amount of electricity purchased from external sources. Together with using more renewable energy sources, we have further decreased Scope 2 emissions. Regarding Scope 3 emissions and product use, TSRC encourages suppliers to reduce their carbon footprint and continues to develop sustainable and environmentally friendly products. TSRC is continuously developing carbon offset programs as part of its long-term goal to achieve carbon neutrality.

2. Direction of GHG Emissions Reduction

Low-Carbon Processes

TSRC is committed to promoting energy conservation and carbon reduction. All plants optimize their process operations and utility systems and invest in high-efficiency equipment as the main direction of carbon reduction to reduce electricity and steam consumption.

1. **Optimizing Process Operations:** Promotes the optimization of process operation to achieve energy saving and carbon reduction targets by adjusting parameters and operating methods. Adjusted configurations for cooling water pumps and heating pipeline system, and continuously optimized production processes to optimize energy efficiency and reduce electricity and steam consumption, total electricity savings of 210,000 kWh (756 GJ), steam savings of 1,788 metric tons (5,205 GJ), and annual emissions reduction of 687 metric tons of CO₂ equivalent.
2. **Optimizing Utility Systems:** For lighting systems, air conditioning systems, and other utilities, TSRC uses a combination of equipment replacement and optimized operating conditions to save electricity. Optimized the operation of the cooling tower, and adopted internal ceramic coating techniques for the water pumps used for cooling tower circulation, improving pump performance efficiency, and integrated chilled water into the installation area. Total electricity savings of 2,026,988 kWh (7,297 GJ) and annual emissions reduction of 1,031 metric tons of CO₂ equivalent.
3. **Investing in High-Efficiency Equipment:** Actively invests in highly energy efficient process equipment to reduce energy consumption and carbon emissions per unit product. Adopted new high-efficiency steam traps and optimized configurations for raw material pumps. Total electricity savings of 13,320 kWh (48 GJ), steam consumption reduced by 211 metric tons (477 GJ), and annual emission reduction of 40 metric tons of CO₂ equivalent.

Renewable Energy

TSRC plans to build its own solar power, purchase green power contracts, renewable energy certificates or other means to gradually increase the proportion of renewable energy in its production sites in Taiwan and China, and achieved 7.55% of total electricity consumption in 2024, exceeding the original target of 7.5% in 2024. In the future, the share of renewable energy is expected to reach 10% by 2025 and 30% by 2030 to achieve carbon reduction.

From 2023, our subsidiary Nantong Industries signed a contract with power suppliers to purchase green power and green power certificates. In 2024, Nantong Industries used 17,664,960 kWh of renewable energy and purchased 939,000 kWh of green power certificates. In response to Taiwan's "Renewable Energy Development Act" and "Regulations for the Management of Setting up Renewable Energy Power Generation Equipment of Power Users above a Certain Contract Capacity," TSRC completed the installation of solar power generation facilities at its Kaohsiung Factory at the end of 2023 and began to generate electricity. In 2024, Kaohsiung Factory began using 1,589,505 kWh of solar power.

3. GHG Emissions

Direct Emissions and Indirect Emissions from Energy Use (Scope 1 + Scope 2)

The 2021-2024 reporting boundary covers all factories and subsidiaries identical to the reporting scope in the financial statements. The operational control approach is adopted in accordance with

ISO14064-1:2018. Verification conducted by DNV GL Business Assurance Co., Ltd. (DNV). Data is rounded to the second decimal place. Please refer to the [TSRC website](#) for the Verification Statement.

2021-2024 Greenhouse Gas Emissions and Emission Intensity (by Subsidiary)

(Unit: t CO₂e)

		TSRC Corporation (Includes the Global Business Headquarters, Gangshan Factory, and Kaohsiung Factory)	Shen Hua Chemical	Nantong Industries	TSRC-UBE	Shanghai Industries	TSRC (Vietnam) Company Limited	TSRC Specialty Materials LLC	Polybus	TSRC (Lux.)	TSRC Group Total
2021	Scope 1	90,211.10	5,069.98	9,074.54	3,213.34	30.84	7.32	21,968.98	0.00	0.00	129,576.10
	Scope 2	70,806.11	101,334.73	153,827.13	80,507.77	1,751.53	1,820.73	21,038.58	1.57	20.82	431,108.98
	Scope 1+2	161,017.21	106,404.71	162,901.67	83,721.11	1,782.37	1,828.05	43,007.56	1.57	20.82	560,685.08
	Production volume	194,194	170,988	73,815	65,285	9,934	0	47,921	0	0	562,138
	GHG Emissions Intensity (tCO ₂ e/metric ton of production)	0.83	0.62	2.21	1.28	0.18	0.00	0.90	0.00	0.00	1.00
2022	Scope 1	96,900.17	6,380.22	7,485.08	3,192.44	25.81	5.58	24,274.45	0.00	0.00	138,263.75
	Scope 2	53,670.89	96,102.37	149,597.03	84,735.95	1,135.13	840.36	21,150.90	1.54	0.11	407,234.28
	Scope 1+2	150,571.06	102,482.59	157,082.11	87,928.39	1,160.94	845.94	45,425.35	1.54	0.11	545,498.03
	Production volume	178,484	170,522	72,822	67,217	5,494	577	44,910	0	0	540,026
	GHG Emissions Intensity (tCO ₂ e/metric ton of production)	0.84	0.60	2.16	1.31	0.21	1.47	1.01	0.00	0.00	1.01
2023	Scope 1	101,462.37	6,474.18	8,658.28	3,237.44	32.63	5.74	19,379.14	0.00	0.00	139,249.78
	Scope 2	44,228.41	93,787.78	130,157.52	85,609.78	1,024.61	995.63	19,113.65	1.15	0.17	374,918.70
	Scope 1+2	145,690.78	100,261.96	138,815.80	88,847.22	1,057.24	1,001.37	38,492.79	1.15	0.17	514,168.48
	Production volume	178,370	171,221	66,747	67,622	6,094	1,101	39,846	0	0	531,001
	GHG Emissions Intensity (tCO ₂ e/metric ton of production)	0.82	0.59	2.08	1.31	0.17	0.91	0.97	0.00	0.00	0.97

(Unit: t CO₂e)

(Continued)

		TSRC Corporation (Includes the Global Business Headquarters, Gangshan Factory, and Kaohsiung Factory)	Shen Hua Chemical	Nantong Industries	TSRC-UBE	Shanghai Industries	TSRC (Vietnam) Company Limited	TSRC Specialty Materials LLC	Polybus	TSRC (Lux.)	TSRC Group Total
2024	Scope 1	107,440.13	5,781.87	7,763.53	4,252.66	29.26	6.71	26,088.11	0.00	0.00	151,362.26
	Scope 2	34,438.12	91,750.15	121,349.87	82,971.64	1,472.96	1,011.38	23,425.09	1.05	0.18	356,420.45
	Scope 1+2	141,878.25	97,532.02	129,113.40	87,224.30	1,502.23	1,018.09	49,513.20	1.05	0.18	507,782.71
	Production volume	178,727	181,266	68,434	68,253	6,540	1,291	47,732	0	0	552,243
	GHG Emissions Intensity (tCO ₂ e/metric ton of production)	0.79	0.54	1.89	1.28	0.23	0.79	1.04	0.00	0.00	0.92

Note 1: This table includes seven types of greenhouse gases: carbon dioxide, methane, nitrous oxide, HFCs, PFCs, sulfur hexafluoride, and nitrogen trifluoride. GWP values for 2021 are based on IPCC AR5, and GWP values for 2022-2024 are based on IPCC AR6.

Note 2: Scope 1 emissions are calculated using the emissions factor and the mass balance calculation method. Scope 2 and 3 emissions are calculated using emissions factors, and the factors used in this table are as follows:

Taiwan Global Business Headquarters, Kaohsiung Factory, Gangshan Factory: Uses emission factors published by the Taiwan Environmental Protection Agency (version 6.0.4).

China 2021-2023: Shen Hua Chemical, Nantong Industries, and TSRC-UBE uses China's provincial electricity emission factors, the United Nations Intergovernmental Panel on Climate Change (IPCC) assessment reports, and the Shanghai Bureau of Ecology and Environment [2022] No. 34 The Notice of Shanghai Ecological Environment Bureau on the Adjustment of Emission Factor Values related to the City's Greenhouse Gas Emission Accounting Guidelines. 2024: Based on the information announced by the competent authority in China and due to differences in operations between different factories, we have used the China average carbon dioxide emissions factor for electricity (not including electricity from market-traded non-fossil fuel energy) of 0.5856 kg CO₂/kWh for Nantong Industries, and the China average carbon dioxide emissions factor for electricity of 0.5366 kg CO₂/kWh, as well as data from the United Nations IPCC assessment report, for Shen Hua Chemical, TSRC-UBE, and Shanghai Industries.

Vietnam TSRC (Vietnam) Company Limited: Uses the electricity emission factors published by Vietnam's Ministry of Industry and Trade and Ministry of Natural Resources and Environment and the IPCC assessment reports.

USA TSRC Specialty Materials LLC: Uses the US Environmental Protection Agency database and the IPCC assessment reports.

Note 3: Pursuant to the ISO14064-1:2018 standards, the Greenhouse Gas Verification Statement disclosed that Shen Hua Chemical, Nantong Industries, TSRC-UBE, and Shanghai Industries all cited the China average carbon dioxide emissions factor for electricity (not including electricity from market-traded non-fossil fuel energy) of 0.5856kg CO₂/kWh, resulting in the TSRC Group having 360,432.32 metric tons CO₂e of Scope 2 emissions for 2024.

Note 4: The 2021-2024 reporting boundary covers all factories and subsidiaries identical to the reporting scope in the financial statements. The operational control approach is adopted in accordance with ISO14064-1:2018. Verification conducted by DNV GL Business Assurance Co., Ltd. (DNV) in 2024. Data is rounded to the second decimal place. Please refer to the [TSRC website](#) for the Verification Statement.

Other Indirect Emissions (Scope 3)

Since 2021, TSRC has complied with ISO 14064:2018 to identify and screen other indirect emissions according to the materiality criteria, and to inventory other material indirect emissions, including Category 3 (indirect GHG emissions from transportation) and Category 4 (indirect GHG emissions from products used by an organization), reporting boundary covers all factories and subsidiaries identical to the reporting scope in the financial statements.

