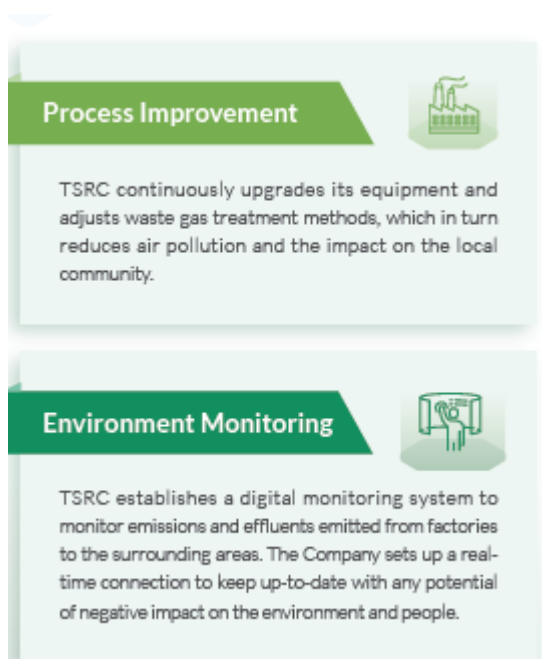


# Environmental Management

## I. Management Approach

TSRC follows the ISO 14001 Environmental Management Systems and implements measures on energy conservation, waste reduction, air pollution prevention, and wastewater recycling to mitigate the potential negative impact on the environment. We regularly conduct comprehensive inspections and employ technologies to monitor factories and surrounding areas. TSRC's environmental management strategy focuses on "process improvement" and "environment monitoring." The global business headquarters is in charge of developing strategic plans and supervising the implementation outcomes delivered by all factories and subsidiaries. In 2022, TSRC spent NT\$139.51 million on environment-related projects such as energy-saving and carbon reduction, air pollution prevention, waste management, and water resources management, representing an increase of 29.85% from 2021.



## II. Air Pollution Prevention and Management

TSRC focuses on managing volatile organic compounds (VOCs) among other air pollutants. The Kaohsiung Factory implemented VOCs improvement programs in 2021, replacing cock valves with low leakage type valves, using new gaskets for pipeline flanges, and updating the closed sampling system. A waste gas recovery system was introduced to direct waste gas into boilers for heat recovery and waste gas emissions reduction.

Shen Hua Chemical installs an online VOCs monitor, which sends real-time data to the municipal authorities. It operates an adsorption device with activated charcoal inside to

reduce VOCs by 0.554 metric tons (annual). A Leak Detection and Repair (LDAR) system was launched in 2022, inspecting a total of 14,775 conjunctive spots. Other actions are constantly adopted, such as timely closure and replacement of old gaskets at leaks supporting to reduce VOCs by 0.074 metric tons (annual). Nantong Industries uses closed samplers, dry connectors, and air collectors to prevent VOCs emissions. TSRC-UBE improves the M-2 and DEAC configuration tanks and continuously optimizing equipment. Shen Hua Chemical, Nantong Industries, and TSRC-UBE was recognized by the government with the "Free Odor" Award. In 2019, TSRC Vietnam installed scrubbers to reduce VOCs fugitive emissions. TSRC also collaborated with partners to conduct on-site VOCs monitoring every quarter to inspect the scrubbers' removal efficiency. TSRC Specialty Materials LLC implements a co-generation system channel waste gas into the co-generation system for electricity and steam generation. In addition to VOCs, TSRC put efforts on reducing other air pollutants by upgrading equipment and optimizing process. In the last three years, SO<sub>x</sub> emissions consistently decreased. Since 2020, when all sites phase out of coal-fired boilers (the last one is Nantong Industries), the Company no longer releases any VOCs from boilers.

2020-2022 Emissions of Air Pollutants in (by Subsidiaries)

(Unit: Metric tons)	TSRC		Shen Hua Chemical	Nantong Industries	TSRC-UBE	Shanghai Industries	TSRC (Vietnam) Company Limited	TSRC Specialty Materials LLC	TSRC Group
	Kaohsiung Factory	Gangshan Factory							
2020	Nitrogen Oxides (NO <sub>x</sub> )	6.22	0.94	45.58	70.00	0.00	N/A	11.63	134.00
	Sulfur Oxides (SO <sub>x</sub> )	3.41	0.00	5.60	8.00	0.00	N/A	0.87	18.00
	Volatile Organic Compounds (VOCs)	140.51	0.71	5.77	2.47	0.00	N/A	12.64	162.10
2021	Nitrogen Oxides (NO <sub>x</sub> )	5.02	0.00	0.00	0.00	0.00	0.00	10.64	15.66
	Sulfur Oxides (SO <sub>x</sub> )	0.1344	0.00	0.00	0.00	0.00	0.00	0.73	0.86
	Volatile Organic Compounds (VOCs)	169.77	3.25	2.41	2.46	0.00	0.00	14.23	192.12
2022	Nitrogen Oxides (NO <sub>x</sub> )	3.17	0.00	0.48	0.00	0.00	0.00	9.68	15.66
	nitrogen oxides excluding N <sub>2</sub> O (NO <sub>x</sub> )	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Sulfur Oxides (SO <sub>x</sub> )	0.18	0.00	1.06	0.00	0.00	0.00	0.68	0.86
	Volatile Organic Compounds (VOCs)	149.67	4.42	2.97	4.12	1.78	0.00	0.26	13.22
	Hazardous Air Pollutants (HAPs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note:

1. This chart only includes manufacturing sites and subsidiaries with manufacturing activities within the reporting boundary. Two holding subsidiaries, Polybus and TSRC (Lux), which mainly engage in trading activities, and the Global Business Headquarters which mainly handles office affairs, are therefore excluded from the table as they have no manufacturing activities.
2. Data of TSRC Kaohsiung Factory, Gangshan Factory, Corporation, Shen Hua Chemical, Nantong Industrial, and TSRC-UBE is from continuous measurement. Data of TSRC (Vietnam) Company Limited and TSRC Specialty Materials LLC is based on the US EPA standard. The data in this table is rounded to two decimal places.
3. TSRC conducted CEMS monitoring for air pollution detection in compliance with regulations, but did not conduct testing for individual species. Nitrogen oxides (NO<sub>x</sub>) could not be measured separately from N<sub>2</sub>O. As there were no regulatory requirements for testing hazardous air pollutants (HAPs), there is no data available for these pollutants.

## TSRC Air Pollution Violations and Improvement Plan

### The factory with fines: TSRC Kaohsiung Factory

Regulation violated	Reason	Amount of Penalty	Solution and Improvement Plan
Article 23, Paragraph 2 of the Air Pollution Control Act, Taiwan	The flare (A107) of the Kaohsiung Factory engaged in the petrochemical process did not comply with Article 4 of the Air Pollution Control and Emission Standards for Volatile Organic Compounds.	NT\$225,000	TSRC has paid the full amount of the fine and set up another thermal oxidizer (TO) to treat hydrogen-containing waste gas.
Article 23 of the Air Pollution Control Act, Taiwan	The synthetic rubber manufacturing process (M03) at the Kaohsiung Factory did not effectively collect air pollutants. The test value at the front end of the activated carbon adsorption and desorption equipment was 2,407 ppm, which was not in compliance with Article 13 of the Air Pollution Control and Emission Standards for Volatile Organic Compounds, which stipulates that emission pipes should have a closed air collection system.	NT\$450,000	TSRC has paid the full amount of the fine and revised the WI Waste Gas Standard Procedure (K31-6400-03) to conduct regular inspection of PC-6601A/B water seal tank piping.
Article 20, Paragraph 1 of the Air Pollution Control Act, Taiwan	The petrochemical processes of the Kaohsiung Factory, such as the synthetic rubber manufacturing process and thermoplastic rubber manufacturing process, were inspected and the measured value of odor pollutants is 100, which exceeded the "Standards for Air Pollutant Emission from Stationary Pollution Sources."	NT\$195,000	TSRC has paid the full amount of the fine and arranges aerial trucks to inspect the exhaust air ducts every six months to find out leaking points and repair them.
Article 22, Paragraph 3 of the Air Pollution Control Act, Taiwan	The Kaohsiung Factory's boiler steam and electricity co-generation process (M01) emission pipeline (P001) was not inspected once a week before the completion of the audit of the confirmation report of the monitoring facilities in accordance with the regulations, so the monitoring data could not be considered as valid data during the period. The percentage of effective monitoring hours in Q3 did not reach 85%. This is a violation of Article 18 of the "Regulations for the Administration of Continuous Automatic Air Pollutant Monitoring Facilities for Stationary Sources" and Article 22, Paragraph 3 of the Air Pollution Prevention Law.	NT\$100,000	TSRC has paid the full amount of fine and participated in environmental lectures
Article 22, Paragraph 3 of the Air Pollution Control Act, Taiwan	The Kaohsiung Factory's boiler steam and electricity co-generation process (M01) emission pipeline (P001) was not inspected once a week before the completion of the audit of the confirmation report of the monitoring facilities in accordance with the regulations, so the monitoring data could not be considered as valid data during the period. The percentage of effective monitoring hours in Q4 did not reach 85%. This is a violation of Article 18 of the "Regulations for the Administration of Continuous Automatic Air Pollutant Monitoring Facilities for Stationary Sources" and Article 22, Paragraph 3 of the Air Pollution Prevention Law.	NT\$100,000	TSRC has paid the full amount of fine and participated in environmental lectures

### III. Ecological Conservation and Prevention of Other Pollution

TSRC's production sites and offices are not located in protected and restored habitats, nor in any of the six protected areas, biologically diverse areas, or genetically diverse areas specified by the International Union for Conservation of Nature (IUCN). None of the species in the industrial park are listed on the "Red List" of IUCN or "National List of Protected Species in Taiwan." Shen Hua Chemical, TSRC-UBE, and Nantong Industries conduct regular soil and groundwater monitoring inventories every year in accordance with China's "HJ 1209-2021 Technical Guidelines of Soil and Groundwater Self-Monitoring for Industrial Enterprises." There were no spills or contaminations in 2022.