4.3 Energy Transformation

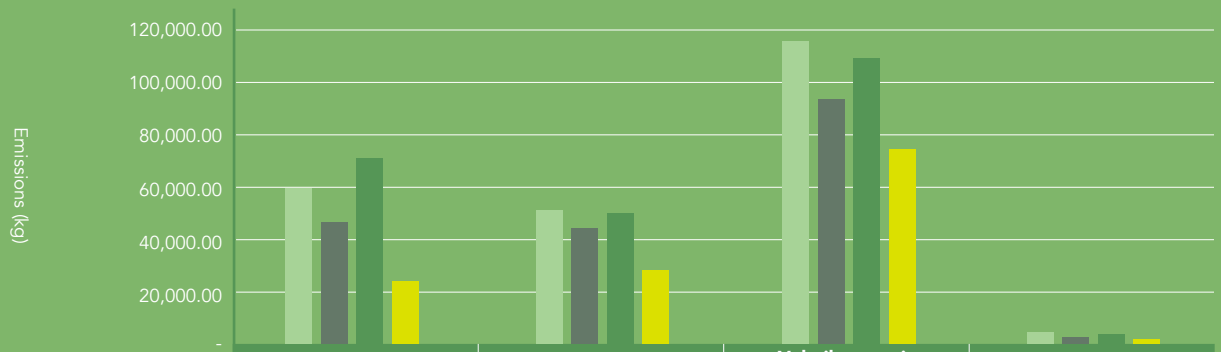
4.3.1 Natural Gas

The fuel oil-fired boilers were gradually replaced by natural gas boilers from 2020 onwards in order to reduce emissions and comply with regulatory standards. In 2020, two natural gas boilers were completed; in 2021, one was completed; and in 2022, three were completed, with a cumulative total of 6 natural gas boilers. All of them have completed flue inspections and are in compliance with environmental protection regulations and standards. The natural gas burners of the boilers were put into operation upon the completion of the renovation, and the use of fuel oil was stopped, thus air pollutant emissions were significantly reduced in 2022.

Another fuel oil boiler will be converted to use natural gas in 2023. In the future, we will switch to the use of natural gas in order to reduce air pollution. In order to prevent pollution and industrial safety hazards caused by natural gas leakage, leak detectors and emergency shut-off valves for the natural gas pipeline were added to the boiler room of the polymerization plant.

A set of air pollution prevention equipment was installed at the Dayuan Plant in 2022, which passed the emissions test in December 2022 and we are currently in the process of applying for the usage permit.

Year-by-year comparison of air pollutant emissions



	Sulfur oxides (SOx)	Nitrogen oxides (Nox)	Volatile organic compounds (VOC) (VOC)	Particulate matter
2019 Total	59,799.44	52,420.58	115,084.60	5,561.05
2020 Total	47,485.44	45,851.40	94,567.36	4,011.36
2021 Total	72,253.47	50,065.11	109,910.04	4,273.37
2022 Total	24,833.17	27,611.26	74,991.52	2,692.87

Note: Calculated based on the emission coefficients announced by the Environmental Protection Administration

4.3.2 Solar Power

Zig Sheng has been actively building renewable energy facilities since 2018 and continues to build solar power panels on the roofs of its plants, reaching a capacity of 3,368.38kW by 2022. We will continue to make plans to find space to install more solar panels to increase our solar energy capacity in the future.

2018
878.58 kW

2021
1930.5 kW

2022
559.3 kW

4.4 Circular Economy

4.4.1 Waste Management

Zig Sheng attaches great importance to the management of waste, and has entrusted qualified vendors to remove general business waste, sludge, slag, etc.
All of the waste generated is non-hazardous business waste, and the total amount removed in 2022 was 1,494.30 metric tons, which is approximately 15% less than the total amount in 2021 (1,762.73 metric tons).

Waste Code	Type of Waste	Treatment Method	Amount to be Treated in 2022				
			Plant 1	Plant 2	Plants 3 and 4	Plant 5	Total
D-1801	Combustible waste (domestic waste)	Incineration	22.79	51.65	157.13	86.70	318.27
D-0299	Waste plastic mixture	Incineration	0	100.87	51.40	46.06	198.33
D-1504	Organic waste liquid or waste solvents	Incineration	17.29	0	0	0	17.29
D-1506	Waste (polluted) water (pH 6.0-9.0)	Incineration	0	0	12.23	0	12.23
D-1703	Waste lubricants	Physical treatment	0	0	106.86	0	106.86
R-1107	Bottom ash	Recycled and reused	0	381.42	363.61	0	745.03
D-0901	Organic sludge	Heat treating	0	0	96.29	0	96.29

4.4.2 Resource Recycling

Each year, we set annual recycling targets in accordance with our environmental policy. We selected recyclable packaging materials for domestically-sold products (polymer bags, filament hole boards, and paper tubes) that are available in large quantities for recycling management, and we keep monthly statistics on the recycled quantity, recycling rate, and achievement rate. The implementation results are reported to senior management in the management meeting on a quarterly basis. In 2022, all of our targets were reached; details are as follows:
Recycling rate: Recycled amount ÷ Amount of domestic sales x 100%

Year / Item	2020	2021	2022			2023
	Actual Value	Actual Value	Target Value	Actual Value	Recycled amount (piece)	Target Value
Polymerization Plant-polymer bag recycling rate	100%	100%	100%	100%	10,780	100%
Spinning Plant-hole board recycling rate	100%	100%	100%	100%	531,759	100%
Spinning Plant I-paper tube recycling rate	74%	80%	80%	87%	1,342,570	80%
Spinning Plant No.2-paper tube recycling rate	96%	95%	100%	100%	888,756	100%