

## 5.1 Management of Climate Change Risks and Opportunities

According to the “Global Risks Report” that the World Economic Forum (WEF) has been publishing on a yearly basis since 2005, environmental risks have emerged to become the dominant risk category in the world, with Climate Action Failure and Extreme Weather ranking first in the top-10 list for an extended period of time. Following the enactment of the Paris Agreement, which aims to control the global temperature increase within 1.5°C, governments around the world have followed up with their net zero targets and introduced new regulations in an attempt to mitigate the impact of climate change. The ongoing climate change has made global warming and extreme weather two of the most prominent issues for businesses. In 2021, Kaori voluntarily adopted the guidelines of the Task Force on Climate - related Financial Disclosures (TCFD) and followed the four core elements of “governance”, “strategy”, “risk management”, and “metrics and targets” recommended by the TCFD to identify significant risks and opportunities that climate change may have on Kaori Heat Treatment and propose response strategies.

In addition to closely monitoring climate change, Kaori has made climate change one of the major issues for sustainable development and taken the initiative to disclose relevant information according to the requirements of the report preparation guidelines mentioned above. Through inter-departmental communication, discussions are made on the possible scenarios, the likely impacts, and the timing of impacts on Kaori. Each of the scenarios identified is further evaluated to facilitate proper control and response to the associated risks and opportunities. By adopting a more pro-active governance approach toward climate change, Kaori takes pragmatic steps to fulfill its sustainability vision.

### Procedures for Identifying Climate Change-Related Risks and Opportunities

Kaori devotes ongoing attention to the climate policies and action plans of various industries at home and abroad and conducts thorough surveys on possible impacts from a number of perspectives including extreme weather, regulations, and market requirements. By analyzing past experience, the timing and possibility of future occurrences, and the degree of impact on business operations, reputation, personnel, financial position, etc., the Company requires all responsible units to propose their own response strategies and make corresponding adjustments internally while maintaining open and transparent communication with all stakeholders. Kaori identifies risks and opportunities of climate change by constructing at least two scenarios and hosts studies and discussions on climate change in the form of workshops. Procedures for identifying climate change-related risks and opportunities are explained below:

**A.**



Set climate change scenarios

Two climate change scenarios have been constructed:  
 SSP5-8.5: temperature increased to 6°C  
 SSP1-2.6: temperature increased to 2°C

**B.**



Evaluate impacts on the operating environment

Evaluate how climate change affects and impacts the operating environment and stakeholders

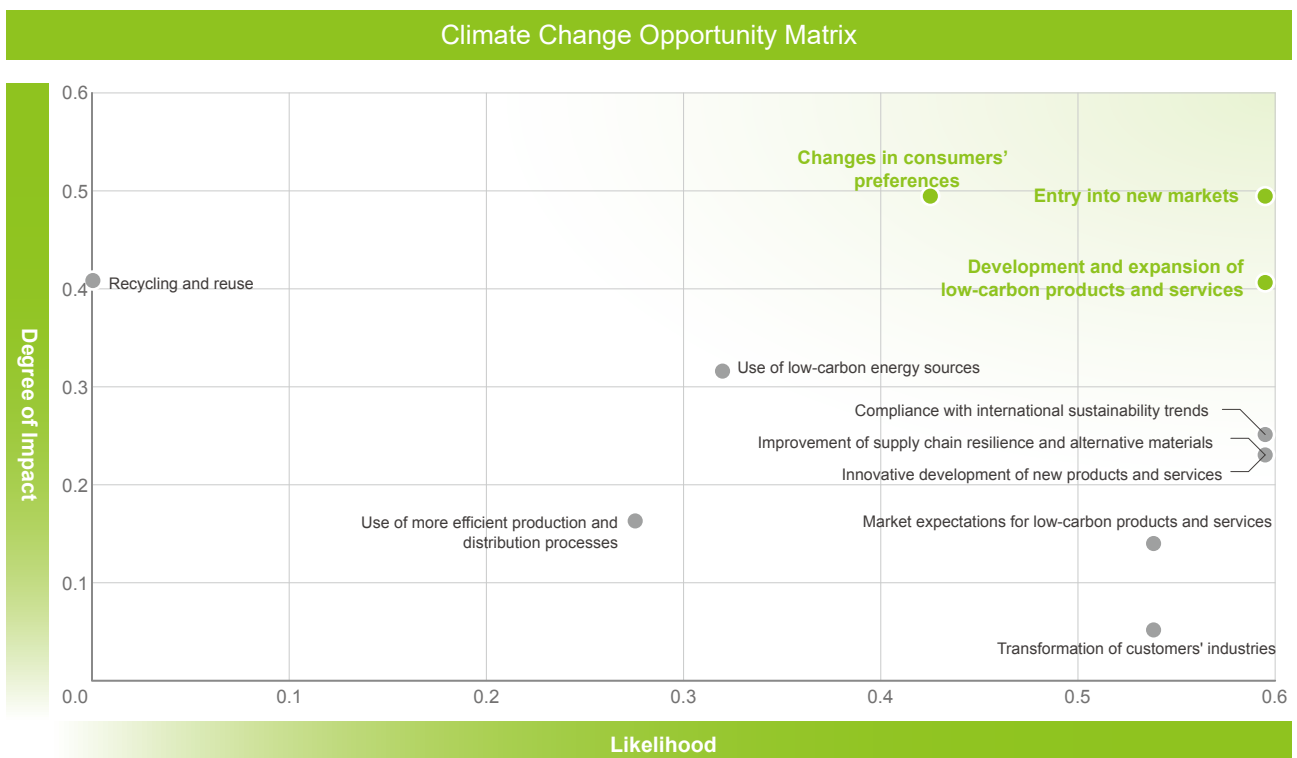
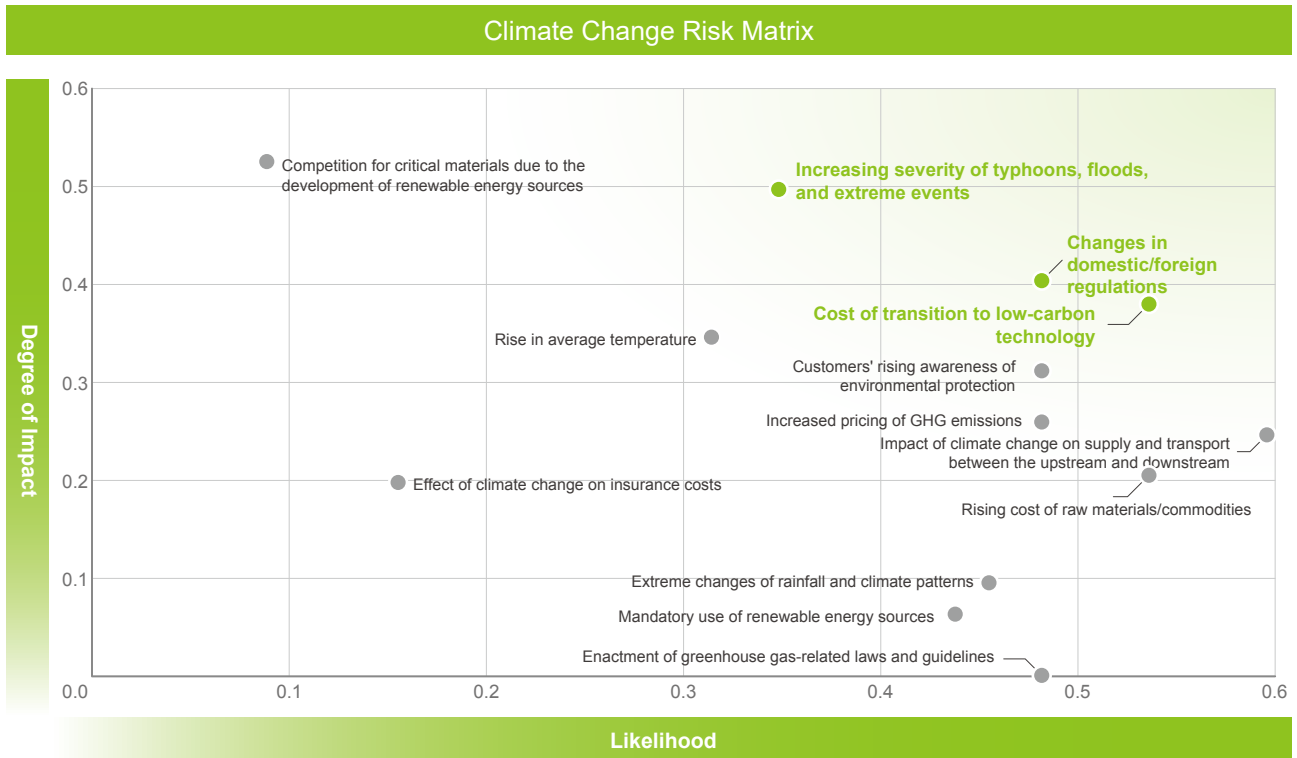
**C.**



Identify climate risks and opportunities

Create a risk and opportunity matrix and confirm climate change risks and opportunities

From the climate change risks and opportunities identified, Kaori further analyzed the “Likelihood” and “Degree of impact” and shortlisted three high-risk factors and three high-opportunity factors for 2022. Kaori’s climate change risk and opportunity matrix for 2022 is presented below:



## Explanation of Climate Change-Related Risks

- List of identified climate change risks

Risk ranking	Risk No.	Risk category	Risk factor	Estimated time of occurrence
1	001	Transition risk - technology	Cost of transition to low-carbon technology	Medium-term
2	002	Transition risk - policies and regulations	Changes in domestic/foreign regulations	Medium-term
3	003	Physical risk - immediate	Increasing severity of typhoons, floods, and extreme events	Short-term

Note: Definition of timeframes: short-term: 2023-2024; medium-term: 2024-2026; long-term: 2026-2028

### Risk 001 - Cost of transition to low-carbon technology

Impact scenario:

The Company will be required to develop products that feature lower carbon footprints to meet the market's demand, and the transition to lower carbon materials, production procedures, and technologies would require more resources, manpower, and time to be committed to research and development. Any attempt to transition to low-carbon products would incur additional investments of R&D resources or capital or give rise to uncertainties that ultimately increase product costs and reduce revenue.

Risk impact assessment	<ol style="list-style-type: none"> <li>Uncertain access to raw materials: Kaori has plans to make use of low-carbon materials, but there are limitations associated with the development and access to low-carbon materials such as eco-friendly steel and copper. Any uncertainty in the supply would make product delivery timelines more difficult to control.</li> <li>Low-carbon transformation increases costs: In an attempt to conform with low-carbon requirements, the Company will have to commit R&amp;D personnel and capital to low-carbon products, which in turn increases the costs and compromises the competitiveness of the Company's products.</li> </ol>
Evaluation of financial impact	Increased operating costs and reduced revenue

### Risk 002 - Changes in domestic/foreign regulations

Impact scenario:

The Company is compelled to acquire new machinery and equipment that conforms with the low-carbon and environmental protection requirements that governments have enforced through policies and regulations, and it therefore has to renew existing equipment prematurely. A drastic change of policy or law would have to be met with additional capital expenditure and incur additional costs on equipment acquisition and employee training, thereby increasing the costs of the Company.

Risk impact assessment	<ol style="list-style-type: none"> <li>Domestic and foreign carbon taxes: Carbon pricing systems are taking shape at increasing rates at home and abroad. The Company may incur additional carbon taxes and see costs rise over time.</li> <li>Energy management requirements: New energy regulations demand higher energy efficiency from production equipment, for which the Company is required to invest in energy conservation and carbon reduction equipment, and the additional expenditures incurred on fixed assets, talent development, or certification will ultimately increase product costs.</li> </ol>
Evaluation of financial impact	Increase in operating costs

**Risk 003** - Increasing severity of typhoons, floods, and extreme events

Impact scenario:

Increasing severity of extreme weather causes weather conditions such as typhoons to occur at stronger intensities, which results in prolonged floods and power outages that affect factory operations. Bad weather has the potential to disrupt production activities, reduce capacity, damage equipment, hinder transportation, disrupt raw material supply, decrease revenue, and increase costs.

Risk impact assessment	Delayed delivery: Extreme weather affects factory operations and causes disruptions to production activities, raw material supply, and transportation. Delivery may be delayed by several days to one week. Impacts to the upstream and downstream: Extreme weather affects the number of parts delivered by suppliers and causes Kaori to underdeliver and delay shipments of goods to customers. Customers' production activities may be halted as a result.
Evaluation of financial impact	Increased operating costs, reduced revenue, loss of credibility

**Explanation of Climate Change-Related Opportunities**

- List of identified climate change opportunities

Opportunity ranking	Opportunity No.	Opportunity category	Opportunity factor	Estimated time of occurrence
1	001	Opportunities - Markets	Entry into new markets	Short-term
2	002	Opportunities - Products and services	Development and expansion of low-carbon products and services	Medium-term
3	003	Opportunities - Products and services	Changes in consumers' preferences	Short-term

**Opportunity 001**- Entry into new markets

Impact scenario:

The need to meet energy and carbon reduction requirements presents the Company with exposure to new markets and different customers, such as the application of fuel cells on ships, hydrogen generation and energy storage for thermal reactors, and recycling of residual hydrogen for power generation. Kaori will actively explore the potential of the new markets and expand the range of products offered as well as customers served for improved revenue and reputation.

Opportunity impact assessment	<ol style="list-style-type: none"> <li>Access to new opportunities: In light of the carbon reduction trends around the world, Kaori will engage customers in greater depth to expand the applications of plate heat exchangers, such as in heat pumps. Exposure to new customers and new markets offers the potential for increased revenue and improved reputation.</li> <li>Entry into the hydrogen power market: Kaori invests persistently into the development of hydrogen power products and has been assisting customers with their entry into the hydrogen power market. In light of customers' needs for hydrogen power products, the Company has assigned its Fuel Cell Business to work with customers on the development of production procedures for SOECs, hydrogen power solutions, and fuel cells for ships, and to make samples as deemed necessary. Given the significant increase in shipments and revenue, Kaori is optimistic about the prospect of hydrogen power.</li> <li>Development of immersion cooling modules/systems: As servers/data centers draw more power, liquid cooling presents a viable solution over the long term. Kaori's immersion cooling modules/systems offer the potential to increase energy efficiency, and their persistent development efforts have increased the level of sophistication of the products, bringing them closer to mass production, which will benefit new markets and customers.</li> </ol>
Financial impact assessment	Increased revenue and new collaborative opportunities

**Opportunity 002** - Development and expansion of low-carbon products and services

## Impact scenario:

The Company continues to expand its low-carbon product lines to include new products such as SOFCs, carbon capture solutions, and new fuel cells in line with carbon reduction trends around the world. This additional offering of low-carbon products will improve market competitiveness, increase market share, and raise revenue in the future.

Opportunity impact assessment	<ol style="list-style-type: none"> <li>1. Exploration of low-carbon opportunities: Kaori's heat exchanger and fuel cell businesses have begun introducing low-carbon products to the market, whereas other businesses are also actively developing new products and new green solutions for customers.</li> <li>2. Development of low-carbon technology: Introducing green design into production procedures and technologies helps lower carbon footprints and increase market competitiveness.</li> <li>3. New investment opportunities: Some of the hydrogen power technologies have matured and are ready for mass production. Given their high relevance to green energy and international trends, these technologies are very likely to attract capital from the banking sector and government agencies.</li> </ol>
Financial impact assessment	Cost reduction, increased revenue, and attraction of capital

**Opportunity 003** - Changes in consumers' preferences

## Impact scenario:

The escalating energy crisis and carbon reduction requirements have increased consumers' preference for energy conservation products, such as heat pumps. This change in market trend and consumers' preference increases demand for the Company's products, which ultimately contributes to revenue and business growth.

Opportunity impact assessment	<p>Increased product demand: Carbon reduction trends around the world have turned the market's attention to energy conservation solutions. Kaori is in a good position to capitalize on the increasing demand due to the energy and carbon reduction potential of the products offered and due to the early market advantage it has secured to date.</p>
Financial impact assessment	Increased revenue

## Response Strategies to Climate Change Risks and Opportunities

## Risk Response Strategies

- Response strategies for the cost of transitioning to low-carbon technology:
  - » Diversity of suppliers:  
Kaori maintains relationships with several suppliers to reduce uncertainties associated with the cost of and access to low-carbon materials.
  - » Acquisition of green loans/financing:  
Kaori will negotiate with banks and source green financing at preferential rates to lower operating costs.
  - » Cover risky businesses with consistent product revenue:  
If Kaori's low-carbon products fail, other departments that generate consistent revenue from OEM services, such as the Fuel Cell Business, will try to increase revenue in an attempt to cover the potential loss of revenue associated with transition risks.
- Response strategies to changes in domestic/foreign regulations:
  - » Monitoring of regulations and trends:  
A dedicated team will be assembled to keep track of new product regulations and trends on a regular basis. Regular training will be organized to discuss current trends and to evaluate the needs for product re-modification and re-certification.
  - » Introduction of energy-saving equipment:  
A comprehensive energy management system will be developed to monitor equipment energy efficiency, so as to facilitate the replacement of energy-intensive equipment. Additional investments will also be made for the installation of green power generation and storage equipment at plant sites and offices. Furthermore, the Company will introduce automated production equipment as a way to improve production and energy efficiency, which in turn will reduce the frequency of equipment renewal and allow digital solutions to be used for the optimization of production procedures.
  - » Termination of high-carbon emission production processes and services:  
Kaori sold two pieces of energy-intensive copper brazing equipment in the 4th quarter of 2022 and expects to move the equipment out of plant site before the 1st quarter of 2023.
- Response and strategy to increasing severity of typhoons, floods, and extreme events:
  - » Reducing the risk of supply chain disruption:  
Kaori engages a diversified group of suppliers to secure the sources of its raw materials and the consistency of supply. Negotiations are made to have suppliers increase the level of inventory and turnover and store inventory near customers' locations to minimize the risk of transport disruption.
  - » Compensating production capacity with efficiency:  
If work is suspended due to typhoons, Kaori will evaluate the extent of the delay and ask suppliers to increase production efficiency to make up for capacity shortfall, thereby averting production halt due to supply disruption.

## Cost of Risk Response

- ✓ Increased operating costs
- ✓ Adjustment to capital expenditure and capital allocation

## Execution Strategies for Opportunities

- Execution strategies for entry into new markets:
  - » Development of exclusive products:  
Exclusive products will be developed for heat pumps to capitalize on the current market trend and increase market share, whereas exclusive heat exchangers for air dryers will be developed to expand product lines and engage customers in broader, more frequent interactions.
  - » Development of hydrogen power:  
Kaori continues to develop hydrogen power products and engage technology partners in various innovations to bring technologies to broader applications, thereby satisfying the needs of customers and markets.
  - » Ongoing development of immersion cooling modules/systems:  
Kaori continues to make modular designs and obtain technological certification for its liquid cooling and immersion products, while at the same time maintaining the flexibility needed to customize products according to the needs of different markets. By accumulating data on product design, the Company aims to stay competitive in the market.
- Execution strategies for development and expansion of low-carbon products and services:
  - » Developing products with low carbon footprints:  
Kaori will improve production procedures by incorporating green designs such as the use of low-carbon materials, designs with low material requirements, adoption of product recycling mechanisms, reuse of raw materials or parts, and adoption of low-carbon transport and packaging materials to lower product carbon footprints.
  - » Development of new low-carbon solutions:  
Hydrogen power technology will be incorporated into carbon neutral solutions and new forms of fuel will be developed to capitalize on new opportunities associated with climate mediation.
  - » Investment into the circular economy:  
Technologies relating to the circular economy, such as treatment of waste organic solvents and reuse of waste/residual hydrogen from production activities, will be developed in the future.
- Execution strategies for changes in consumers' preferences:
  - » Establishment of marketing plans:  
Plans will be made to have business units engage existing as well as new customers on a regular basis to ensure that product features do satisfy customers' requirements and are adjusted at appropriate times. Attention will also be directed toward exploring new markets and customers, such as tier-A customers in Europe.
  - » Consistent supply in response to the market's needs:  
Kaori will increase the number of stamped plate and stainless steel suppliers for capacity expansion. An ERP system will be used to monitor all stages of the production process for improved product quality and delivery timing.

## Cost of Opportunity Response

- ✓ Increased operating costs
- ✓ Adjustment to capital expenditure and capital allocation

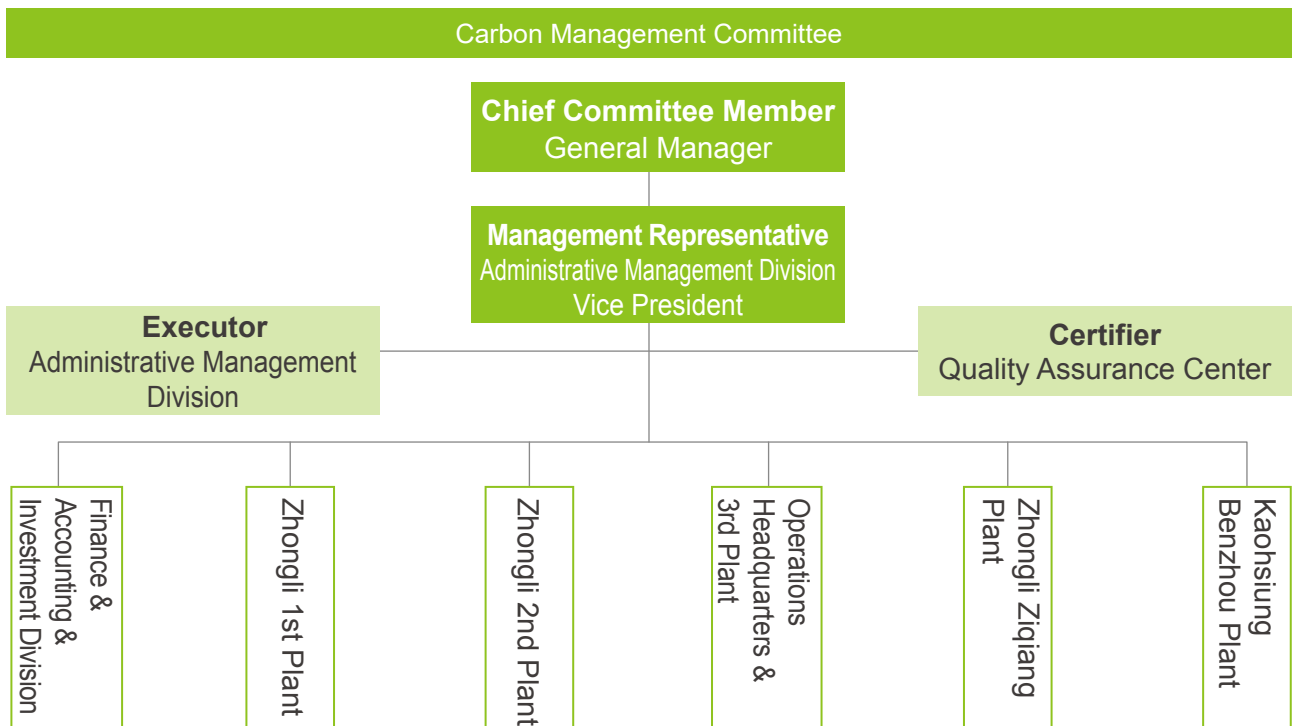
**Goals and Indicators**

Kaori conducted a greenhouse gas inventory covering all plant sites in Taiwan in 2022 according to the ISO 14064-1:2018 standard and was able to obtain third-party validation for the inventory outcome. The Company plans to conduct greenhouse gas inventories on a yearly basis going forward to keep track of emissions and trends. Details of the greenhouse gas emissions for 2021 and 2022 are disclosed in section [5.2 Environmental and Energy Management](#). Aside from exploring ways to reduce carbon emissions, Kaori also plans to include its subsidiary in Ningbo, China, into the inventory starting from 2023 for a more comprehensive understanding of greenhouse gas emissions, so that short-/medium-/long-term reduction goals can be set to guide reduction efforts.

Kaori expects to complete its first product carbon footprint (ISO 14067) survey in 2023, through which it intends to gather data that is useful for carbon footprint reduction plans. The Company also plans to survey carbon footprints for a wider range of products in the future. By learning the level of emissions at various stages of product life cycles, the Company will be able to better respond to carbon reduction trends and needs of the market and the rest of the world. Kaori will continue committing resources and manpower to the research of low-carbon products and new technologies, while taking the initiative to increase the percentage of low-carbon products offered for greater market exposure and improved competitiveness.

## 5.2 Environmental and Energy Management

Climate change has emerged to become one of the most critical issues in the 21st century. Extreme weather, floods, and droughts in recent years have prompted government agencies, businesses, and private organizations to undertake more active mitigations of the risks. Meanwhile, Kaori contributes its part to environmental protection and social values by enforcing energy management throughout its operations and by investing into the research and development of new materials and production procedures. A Carbon Management Committee has also been assembled to oversee GHG reduction, energy/resource conservation, water conservation, waste recycling, and mitigation of environmental impact. At the same time, Kaori continues to invest into environmental protection facilities and incorporate green management and energy conservation practices into business activities for sustainable growth.





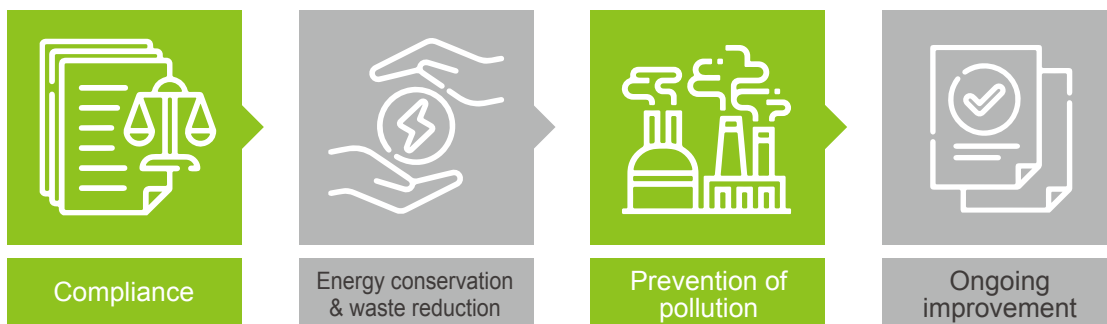
## Environmental Management System

Kaori (Kaohsiung Benzhou Plant) passed certification for ISO 14001 Environmental Management System in 2019. From greenhouse gases, air pollution, and effluent discharge to waste treatment, Kaori is fully committed to making improvements and minimizing environmental impact. As a result, no major violations of environmental regulations have occurred in the year of the report.

Through the introduction of ISO 14001 Environmental Management System, Kaori has been able to implement environmental management policies along with effective management processes at plant sites to enforce environmental compliance, order, safety, training, and so on to lessen the impact of organizational activities on the environment, while at the same time ensuring the safety of products and services offered as well as employees' health and safety at work.

In the early stages of ISO 14001 adoption, Kaori requested a series of reviews to ensure compliance with environmental protection laws (including air, water, waste, soil, and noise). After making improvements in accordance with the opinions of the Environmental Protection Bureau, Kaohsiung City Government, the Company was deemed to have fully complied with legal requirements.

## Environmental Policy



## Execution of Environmental Tests, Methods of Environmental Risk Assessment, and Outcomes

1. Drinking fountains in plant areas are tested for E. coli every 3 months
2. Kaori reports effluent volume to Benzhou Service Center every 6 months, and engages a certified environmental protection service provider to conduct tests
3. Effluent values and reporting
4. The effluents meter is calibrated (by certified service providers) on a regular basis each year

Kaori passed all above tests in 2022 and continues to execute them.

## Environmental Management Aspect

### Energy Management

The Company introduces new energy conservation measures on a yearly basis, such as purchasing energy-efficient models, replacing outdated machinery, and optimizing production schedules. Kaori draws on the wisdom of many to achieve energy and carbon reduction goals. In the future, more attention will be directed toward improving production procedures and reducing energy consumption and promoting Kaori as a green, sustainable business. Electricity intensity was lowered by 16.9% in 2022 compared to 2021.

- Management goals and attainment:

- » 1% energy conservation:

The Company's vacuum furnace capacity enhancement project aims to increase production capacity of each furnace by at least 50%, which has the potential to reduce excess vacuum furnace cycles and operating time by at least 50%, thereby lowering the cost of electricity and the volume of energy used in production.

- » Saving of energy in lighting:

Stair areas and motorcycle parking areas are installed with sensor tube lights; plant workers turn off lights during lunch hours and break times.

- » 1% waste reduction:

Kaori recycles and reuses 100% of its protective materials and containers.

- » The Kaohsiung Plant has set goals to reduce gasoline and diesel by 5% from the previous year.

Energy usage	Unit	2021	2022	YOY
Gasoline and diesel	Liter	16,585	14,357	-13%

### Energy Usage

Kaori persistently monitors the energy consumption of its equipment and makes appropriate adjustments to increase energy efficiency, reduce waste, and lower energy consumption. The photovoltaic system at the Kaohsiung Plant commenced production in September 2022 and currently generates about 1.06% of the total energy used in the year. Kaori expects to retire diesel-based forklifts in 2023 and is currently evaluating the feasibility of using electric forklifts as a way to reduce carbon emissions and air pollution to implement sound energy management.

Unit: Gigajoules (GJ)

Year		2021		2022	
Equipment name	Energy source	Energy usage	Weight	Energy usage	Weight
Plant power usage	Purchased electricity (excluding green power)	49,823.64	2.56%	52,916.17	95.28%
Company vehicles	Gasoline	1,040.47	0.05%	1,056.51	1.90%
Forklifts					
Emergency generators	Diesel	611.04	0.03%	437.88	0.79%
Company vehicles					
Production processes	Natural gas (NG)	1,895,678.35	97.36%	1,129.68	2.03%
Production processes	Acetylene	0.43	0.00%	0.00	0.00%
Total		1,947,153.93	100.00%	55,540.24	100.00%

Note: Kaori ceased high carbon production services in the 4th quarter of 2022 by selling off two pieces of energy-intensive copper brazing equipment, which significantly reduced the volume of natural gas used.

### Energy Efficiency and Electricity Intensity

Year	2020	2021	2022
Electricity intensity	6.50	6.62	5.50
Energy efficiency value	153.94	151.10	181.74

Calculation:

Electricity intensity (kWh/NT\$1,000) = power usage (kWh) / standalone revenue (NT\$1,000)

Energy efficiency (NT\$/kWh) = standalone revenues (NT\$) / power usage (kWh)

### Energy Conservation Targets

Short-term  
(within 1 to 3 years)

- Replace diesel forklifts with electric forklifts
- Replace mercury vapor lamps with LED lights at the Zhongli 1st Plant
- Replace conventional air compressors with variable-frequency air compressors at the Zhongli 1st Plant
- Replace air conditioners with variable-frequency models for heat pumps at the Zhongli 2nd Plant

Medium-term  
(3 to 5 years)

- Progressively replace 7.5-horse power reciprocating air compressors with energy-saving, variable-frequency air compressors at plant sites
- Replace air conditioners with variable-frequency models at plant sites
- Implementation of solar power system

Long-term  
(over 5 years)

- Implementation of energy storage systems



- ☰
- Preamble
- 1 Sustainability and development
- 2 Honor and Integrity
- 3 Innovation and quality
- 4 Responsibility and care
- 5 Environmental protection and inclusion

## Progress of Energy Conservation and Improvement Solutions in 2022

Kaori invests pro-actively into projects that aim to reduce electricity, energy consumption, and carbon footprints. Energy savings totaled 298,036 kWh in 2022, which produced energy conservation benefits amounting to NT\$934,609.

Item No.	Energy conservation measure	Execution outcome	Before improvement	After improvement	Energy conservation benefits (NT\$)
I	Energy-saving air compressors	<ul style="list-style-type: none"> <li>Location: Zhongli 1st Plant - Replacement of air compressors near high-voltage substations</li> <li>Equipment: In-plant air compressors</li> <li>Practices: Replacement of conventional air compressors</li> </ul>	<ul style="list-style-type: none"> <li>The plant currently has three air compressors installed (A, B, and C); A and B are the main units used, whereas unit C serves as a backup. All three units are conventional air compressors with 3-phase 220V, 30A, and 7.5 horse power (HP).</li> </ul>	<ul style="list-style-type: none"> <li>Replaced with 15 HP/7.5kW air compressors</li> <li>Total power saved: 4,500 kWh</li> </ul>	NT\$ 54,000
II	Increased batch volumes of small, mass-produced products	<ul style="list-style-type: none"> <li>Location: Zhongli 2nd Plant - Production area for vacuum furnaces</li> <li>Equipment: The project targets small plate products</li> <li>Practices: The number of small-size plate heat exchangers produced per furnace session was increased from 56 to 75</li> </ul>	<ul style="list-style-type: none"> <li>A total of 32,000 small-size products were produced in 2022</li> <li>The old process produced 56 small plate heat exchangers per furnace, and it would take 32,000/56= 571 batches</li> </ul>	<ul style="list-style-type: none"> <li>The new process produces 75 small plate heat exchangers per furnace, and it takes 32,000/75= 426 batches</li> <li>Doing so can save 145 furnace sessions</li> <li>Total power saved: 128,325 kWh</li> </ul>	NT\$384,975
III	The vacuum furnace has internal and external circulating pumps operating persistently during standby while running the external circulating pump without heat source, which increases production cost and energy consumption	<ul style="list-style-type: none"> <li>Location: Kaohsiung Benzhou Plant - Front part of Area 1 in the 2nd Plant</li> <li>Equipment: VA-14 vacuum furnace</li> <li>Practices: By modifying the “equipment wire control”, the Company is able to shut off the external circulating pump and cooling fans when the vacuum furnace has finished production activities (i.e., in “standby” mode), and thereby effectively reduce power usage</li> </ul>	<ul style="list-style-type: none"> <li>External circulating pump operates 5,976 hours a year</li> <li>Cooling fan operates 5,976 hours a year</li> <li>Total power consumption = 78,883.2 kWh</li> </ul>	<ul style="list-style-type: none"> <li>External circulating pump operates 4,980 hours a year</li> <li>Cooling fan operates 4,980 hours a year</li> <li>Total power consumption = 65,736 kWh</li> <li>Total power saved: 13,147.2 kWh</li> </ul>	NT\$ 39,442
IV	Improvement of production processes for vacuum furnace VA-11	<ul style="list-style-type: none"> <li>Location: Kaohsiung Benzhou Plant - Rear part of Area 1 in the 2nd Plant</li> <li>Equipment: VA11 vacuum furnace</li> <li>Practices: Shutdown of diffusion pumps</li> </ul>	<ul style="list-style-type: none"> <li>The heating element of a diffusion pump has a power rating of 24 kW; using it 6,336 hours a year</li> <li>draws 152,064 kWh of power</li> </ul>	<ul style="list-style-type: none"> <li>Total power saved after shutdown: 152,064 kWh</li> </ul>	NT\$ 456,192

## Power Conservation Rate by Plant

All plant sites comply with the laws of the Bureau of Energy, Ministry of Economic Affairs. As a major energy user that Taiwan Power Company has signed a contract with to supply at least 800 kW of power, the Company reports annual energy performance and improvement plans in accordance with Article 9 of the Energy Administration Act. The Company has set goals to achieve an “annual power conservation rate” or “average annual power conservation rate” of more than 1%. The Zhongli 2nd Plant and Kaohsiung Benzhou Plant have appointed dedicated energy management officers to enforce energy conservation plans and achieve an average annual power conservation rate of more than 1%.

Plant	Year	Power conservation rate 2021 (%)	Power conservation rate 2022 (%)	Average power conservation rate 2015-2022 (%)
Zhongli 1st Plant		1.97	0.17	2.09
Zhongli 2nd Plant		1.75	3.03	1.39
Kaohsiung Benzhou Plant		1.19	3.05	3.05

## GHG Management

Kaori passed ISO 14064-1:2018 Greenhouse Gas Inventory certification of SGS Taiwan Ltd. (SGS) on August 10, 2022, and obtained certificate for ISO 14064-1:2018 that indicated 100% attainment rate. Furthermore, the subsidiary in Ningbo, China, has made plans to initiate its own inventory in sync with the parent company starting from 2023.

## Greenhouse Gas Inventory

The Company conducts greenhouse gas inventories covering all plant sites in Taiwan in a manner that conforms with the ISO 14064-1:2018 standards. By developing a comprehensive understanding of greenhouse gas emissions, the Company is able to set short-/medium-/long-term reduction goals to guide reduction efforts. Scope 1 and Scope 2 emissions aggregated to 7,762.9435 tonnes of CO<sub>2</sub>e in 2022; the carbon intensity was 17% lower compared to 2021.

Unit: tonnes CO<sub>2</sub>e

Type of emissions	2021	2022
Scope 1 + Scope 2 (A)	7,358.1998	7,762.9435
Unit of measurement (B)	2,087	2,684
Greenhouse gas emissions Intensity ratio (A)/(B)	3.5	2.9

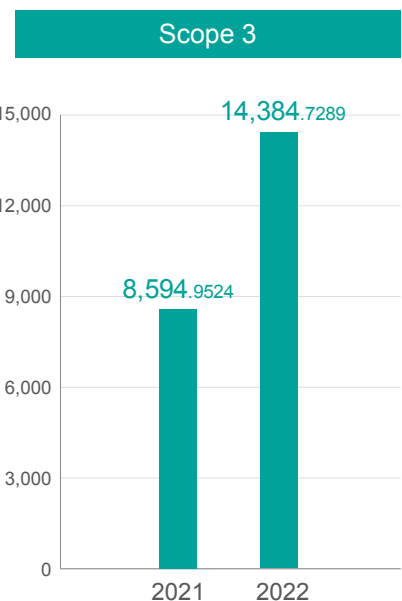
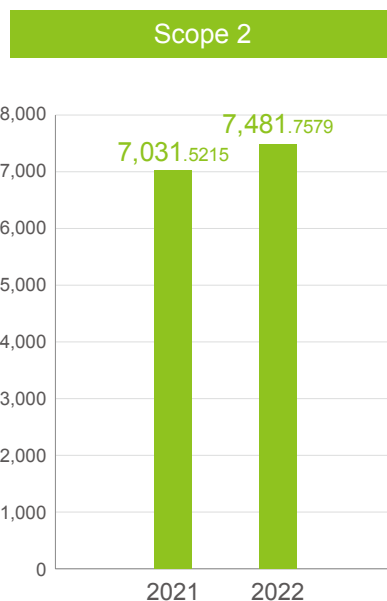
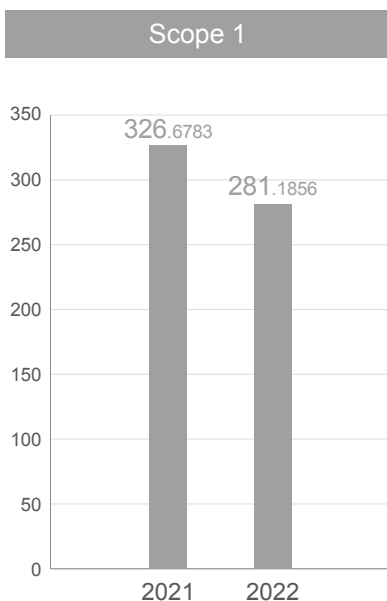
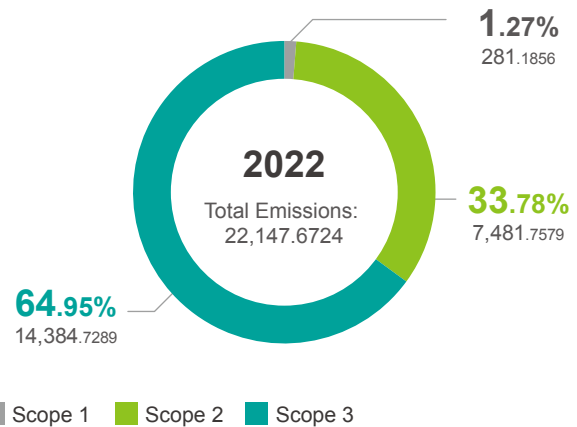
Note: Unit of measurement (B) is defined as standalone revenue (NT\$ million) in the current year

## GHG Emissions

Unit: tonnes CO<sub>2</sub>e

Scope	2021	2022
Scope 1	326.6783	281.1856
Scope 2	7,031.5215	7,481.7579
Scope 3	8,594.9524	14,384.7289
<b>Total volume</b>	<b>15,953.1522</b>	<b>22,147.6724</b>

Remarks: The 2022 inventory was carried out in accordance with ISO 14064-1:2018. Internal assurance was completed in May 2023, and third-party assurance is scheduled to proceed in September.



## Carbon Management Plans for CBAM

The European Union expects to enact the “Carbon Border Adjustment Mechanism (CBAM)” in 2023 as a support for the world’s first “carbon tax” scheme, whereas the US is also introducing its Clean Competition Act (CCA). Kaori plans to introduce product carbon footprint (ISO 14067) in the third quarter of 2022 and obtain certification by the end of 2023. Once reliable data has been established, the Company will be able to devise carbon footprint reduction plans based on the emissions of a product’s entire life cycle to conform with CBAM requirements. Furthermore, the Company has been making use of the export carbon reduction counseling service offered by the Taiwan External Trade Development Council since November 2022 and completed analysis of the composition of key products and raw materials exported to Europe and the US in order to establish a preliminary understanding of the carbon reduction controls implemented in the two markets. According to the opinions of the consultancy team, stainless steel—a raw material used in brazed plate heat exchangers—is one of the controlled materials outlined in the EU’s CBAM, whereas the equipment and raw materials used in the production of external casings for fuel cells are not regulated by the US CCA. Based on this knowledge, the Procurement Center is currently coordinating with raw material suppliers in the upstream to explore ways to reduce carbon.

## Plans for Green and Renewable Energy Sources

The net zero movement has become the world’s most important issue today, and all leading businesses with strong sustainability awareness are starting to adopt green energy as the first step. The 744.51 kW commercial rooftop photovoltaic system installed at Kaori’s Kaohsiung Benzhou Plant began production in September 2022. It is expected to generate 18,448,369 kWh of green power over 20 years to reduce 9,390 tonnes of CO<sub>2</sub> emissions, which is 23 times the CO<sub>2</sub> absorption capacity of Da’an Park. The amount of power generated between September and December 2022 was approximately 1.06% of the total energy usage for the year. The Company continues to promote energy transformation as a way to reduce GHG emissions and contribute to Earth’s environment.



## Air Pollution Management

Kaori did not emit any nitrogen oxide (NO<sub>x</sub>), sulfur oxide (SO<sub>x</sub>), or other gases of significant impact.

## 5.3 Water Resource Management

Kaori has developed an environmental management system along with water resource management practices based on ISO 14001. Through data monitoring, the Company keeps track of water used as well as the water resource management practices adopted at various plant sites on a daily basis. Any abnormal change in water volume is met with appropriate inspection and response. Meanwhile, Kaori organizes campaigns from time to time to promote employees’ awareness of the conservation and use of water.

All major operating sites draw water entirely from the municipal water supply system (i.e., tap water). Most of the water drawn is used for employees’ living activities and kitchen equipment, and any effluents generated from living activities are either treated using appropriate treatment facilities or discharged into the municipal water treatment system, and therefore should have no significant impact on the local water body. Furthermore, Kaohsiung Benzhou Plant has installed its own water treatment facilities to treat wastewater in a legal manner. No incidents of illegal pollution occurred in 2022, and the Company’s business activities had no significant impact on water sources.

## Total Water Drawn

Unit: million liters

Year	2021		2022			
	All locations	Locations prone to water stress	All locations	Locations prone to water stress		
Surface water (total volume)	0	0	0	0		
Fresh water (total dissolved solids ≤1,000 mg/L)	0	0	0	0		
Other water sources (Total dissolved solids >1,000 mg/L)	0	0	0	0		
Groundwater (total volume)	0	0	0	0		
Water withdrawal by source	Fresh water (total dissolved solids ≤1,000 mg/L)	0	0	0		
	Other water sources (Total dissolved solids >1,000 mg/L)	0	0	0		
	Seawater (total volume)	0	0	0	0	
	Fresh water (total dissolved solids ≤1,000 mg/L)	0	0	0	0	
	Other water sources (Total dissolved solids >1,000 mg/L)	0	0	0	0	
	Water from third parties (total volume)	21.31	0	26.97	0	
	Fresh water (total dissolved solids ≤1,000 mg/L)	21.31	0	26.97		
	Other water sources (Total dissolved solids >1,000 mg/L)	0	0	0	0	
	Total water drawn	Surface water (total volume) + groundwater (total volume) + seawater (total volume) + water from third parties (total volume)	21.31	0	26.97	0

Note: There were errors in the total volume of water drawn by Kaohsiung Plant in 2021, and the errors have since been corrected.

## Water Discharge

Unit: million liters

Year	2021		2022		
	All locations	Locations prone to water stress	All locations	Locations prone to water stress	
Water discharge by destination	Surface water	15.46	0	20.88	0
	Groundwater	0	0	0	0
	Seawater	0	0	0	0
	Water from third parties (total volume)	0	0	0	0
	Water from third parties supplied to other organizations	0	0	0	0
Total water discharge	Surface water + groundwater + seawater + water from third parties (total volume)	15.46	0	20.88	0
Water discharge by fresh water and others	Fresh water (total dissolved solids ≤1,000 mg/L)	0	0	20.88	0
	Other water sources (Total dissolved solids >1,000 mg/L)	0	0	0	0
Water discharge by level of treatment	Untreated	9.86	0	20.88	0
	Level 1 treatment	5.60	0	0	0
	Level 2 treatment	0	0	0	0
	Level 3 treatment	0	0	0	0

Note: There were errors in the total volume of water drawn by Kaohsiung Plant in 2021, and the errors have since been corrected.



Preamble

1

Sustainability and development

2

Honor and Integrity

3

Innovation and quality

4

Responsibility and care

5

Environmental protection and inclusion

## Water Consumption

Unit: million liters

Year	2021		2022	
Location	All locations	Locations prone to water stress	All locations	Locations prone to water stress
Total water consumption	5.85	N/A	6.095	N/A
Change in water storage	N/A	N/A	N/A	N/A

## 5.4 Waste Management

Kaori observes the ISO 14001 standard and has created a dedicated unit to track the sources and volumes of waste and adopted waste management practices that aim to maximize resource utilization and minimize waste generation. All departments are committed to minimizing waste volumes from production activities, increasing the life cycles of raw materials used, and promoting circulation and reuse of resources and waste for total waste reduction. Kaori engages qualified service providers to dispose of waste and uses appropriate forms to audit waste handlers, thereby ensuring the appropriateness of waste treatment and that the waste generated does not pose a significant impact on the nearby environment. There were no violations of environmental laws in 2022.

### Waste Reduction Measures

Kaori reduces the volume of waste by recycling waste iron, carton boxes, and waste glass and reusing waste pallets. Waste pallets are handed over to qualified service providers for reuse, thereby minimizing environmental impact. Driven by the mission of a responsible producer, Kaori duly reports how waste generated from plant sites is handled and retains complete documents to ensure that waste is properly treated.

- Establishment of employee cafeterias and use of environment-friendly tableware
- Total recycling of paper containers
- Use of kitchen waste recycling bins





## Total Waste

Unit: tonnes

Waste Composition	2021			2022		
	Waste generated	Waste diverted from disposal	Waste directed to disposal	Waste generated	Waste diverted from disposal	Waste directed to disposal
General Waste	66.44	0.00	66.44	85.15	0.00	85.15
Scrap - Waste stainless steel	0.49	0.49	0.00	0.00	0.00	0.00
Scrap - Waste black steel	0.83	0.83	0.00	0.00	0.00	0.00
Scrap - Waste INCO601	0.78	0.78	0.00	0.00	0.00	0.00
Scrap - waste INCO625	6.68	6.68	0.00	25.61	25.61	0.00
Scrap - Waste HS230	0.65	0.65	0.00	0.40	0.40	0.00
Scrap - Waste INCO800	9.75	9.75	0.00	23.74	23.74	0.00
Scrap - Waste mix	0.30	0.30	0.00	0.83	0.83	0.00
Scrap - Waste inco600	0.03	0.03	0.00	0.39	0.39	0.00
Scrap - Waste sus446	1.11	1.11	0.00	0.69	0.69	0.00
Scrap - Swarf from machining	0.00	0.00	0.00	0.94	0.94	0.00
Scrap - Waste 304 + copper	0.00	0.00	0.00	76.11	76.11	0.00
Scrap - Waste 316 + copper	0.00	0.00	0.00	241.92	241.92	0.00
Scrap - Waste aluminum	0.00	0.00	0.00	0.26	0.26	0.00
Scrap - Waste copper	0.00	0.00	0.00	4.57	4.57	0.00
Scrap - Pure 304	0.00	0.00	0.00	50.61	50.61	0.00
Scrap - Pure 316	0.00	0.00	0.00	66.50	66.50	0.00
Scrap - Waste 304 swarf	0.00	0.00	0.00	118.99	118.99	0.00
Scrap - Waste 316 swarf	0.00	0.00	0.00	30.31	30.31	0.00
Waste wooden materials (R-0701)	0.00	10.39	0.00	70.48	70.48	0.00
Waste oil mixture (D-1799)	0.00	0.00	2.21	7.50	7.50	0.00
Night soil (D-0104)	0.00	0.00	3.82	4.01	0.00	4.01
Waste plastic (R-0201)	0.00	0.00	0.00	18.64	18.64	0.00
Total waste	87.05	31.00	72.47	827.64	738.48	89.16

Note: There were errors in the total volume of waste generated by the Kaohsiung Plant in 2021. The errors have since been corrected.

### Waste Diverted from Disposal

Unit: tonnes

Waste Composition		2021			2022		
		On-site	Off-site	Total volume	On-site	Off-site	Total volume
Hazardous waste	Preparation for reuse	0.00	0.00	0.00	0.00	0.00	0.00
	Recycling	0.00	0.00	0.00	0.00	0.00	0.00
	Other recovery	0.00	0.00	0.00	0.00	0.00	0.00
	Total volume	0.00	0.00	0.00	0.00	0.00	0.00
Non-hazardous waste	Preparation for reuse	0.00	20.61	0.00	0.00	0.00	0.00
	Recycling	0.00	10.39	0.00	0.00	719.84	719.84
	Other recovery	0.00	0.00	0.00	0.00	0.00	0.00
	Total volume	0.00	31.00	0.00	0.00	719.84	719.84

Note: There were errors in the total volume of waste generated by the Kaohsiung Plant in 2021. The errors have since been corrected.

### Waste Directed to Disposal

Unit: tonnes

Waste Composition		2021			2022		
		On-site	Off-site	Total volume	On-site	Off-site	Total volume
Hazardous waste	Incineration (including recycling of energy sources)	0.00	0.00	0.00	0.00	0.00	0.00
	Incineration (excluding recycling of energy sources)	0.00	0.00	0.00	0.00	0.00	0.00
	Landfill	0.00	0.00	0.00	0.00	0.00	0.00
	Other methods of disposal	0.00	0.00	0.00	0.00	0.00	0.00
	Total volume	0.00	0.00	0.00	0.00	0.00	0.00
Non-hazardous waste	Incineration (including recycling of energy sources)	0.00	0.00	0.00	0.00	85.15	85.15
	Incineration (excluding recycling of energy sources)	0.00	84.84	84.84	0.00	0.00	0.00
	Landfill	0.00	0.00	0.00	0.00	0.00	0.00
	Other methods of disposal	0.00	6.03	6.03	0.00	0.00	0.00
	Total volume	0.00	90.87	90.87	0.00	85.15	85.15