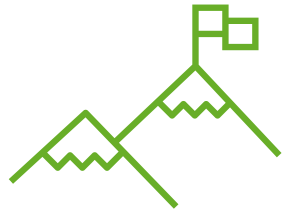


# 3

## Green Production and Climate Governance



- 3.1 Climate Risk/Opportunity Assessment
- 3.2 Green Energy and Carbon Neutrality
- 3.3 Environmental Policy and Investment
- 3.4 Waste Reduction Actions



# 3.1 Climate Risk/Opportunity Assessment

◇ Material Topic: Climate Change and Operational Risk Management ◇

<b>Main Reason</b>	As the climate change issue deteriorates, stakeholders have become increasingly concerned of corporate climate actions, including GHG inventory and reduction, and climate risk assessment and adaptation strategies. How to map out the capital expenditure and long-term strategies of a company amidst the complex variables has become an important issue for corporate competitiveness.
<b>Policy and Strategy</b>	Continuously focus on the various climate action targets after the Paris Agreement and actively align with the international trend of sustainable development to reduce potential climate-related impacts in the future.
<b>Goals and Objectives</b>	<p><b>Short-term goals (2023-2024):</b></p> <ul style="list-style-type: none"> <li>◆ Establish a mechanism to assess and promote climate risk.</li> </ul> <p><b>Medium-term goals (2025-2027):</b></p> <ul style="list-style-type: none"> <li>◆ Publish TCFD Report.</li> </ul> <p><b>Long-term goal (2028~):</b></p> <ul style="list-style-type: none"> <li>◆ Complete and implement specific transition plans.</li> <li>◆ Participate in CDP (Carbon Disclosure Project).</li> </ul>
<b>Management Assessment Mechanisms</b>	The Corporate Governance and Risk Management Team under the Sustainable Development Committee evaluates climate-related risks and opportunities in accordance with the proposed TCFD framework. The results are reported to the Board by the Sustainable Development Committee. The six functional teams under the Committee would execute relevant plans pursuant to Board resolutions.
<b>Performance and Adjustments</b>	In 2022, we completed 2021 GHG inventory based on the ISO 14064:2018 version and preliminarily analyzed the financial impact of climate change on the Company. We will create relevant promotion plans through the Sustainable Development Committee. The Board of Directors will regularly review target achievement status and revise execution details or adjust the strategic direction on an ongoing basis.
<b>Prevention or Remedy Measures</b>	<ul style="list-style-type: none"> <li>◆ The Corporate Governance and Risk Management Team collects information on climate change scenarios on an ongoing basis and dynamically updates the financial impact analysis. The Sustainable Development Committee (Sustainable Development Center) summarizes implementation results of each functional team and provides the information to the Board of Directors to evaluate the effectiveness of climate response strategies.</li> <li>◆ The Company has established a business continuity plan with emergency responses procedures to address potential natural threats, ensuring the continued operations of the Company and reducing the occurrence of incidents and impact.</li> </ul>

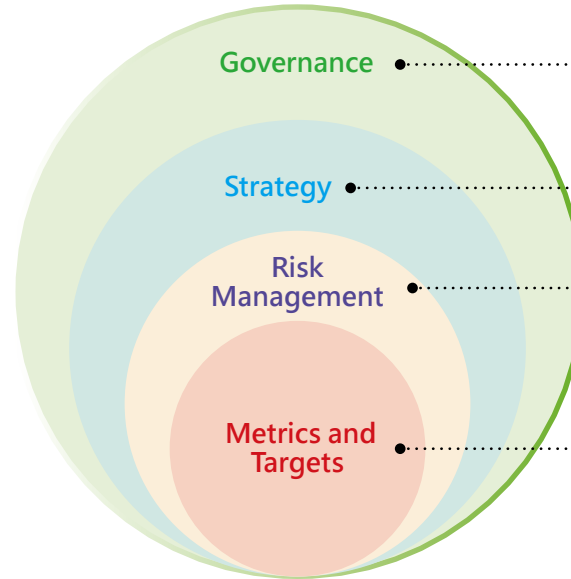
## ◆ Authorization for climate risk management

As countries around the world strengthen their carbon reduction targets and policies, aiming for net zero emission by 2050, the pressure on business operation and customers' demand for supply chain sustainability have intensified. Although Taiflex is not subject to the major electricity consumer clause, we have mapped out relevant investments to reduce carbon emissions in response to the low carbon transition driven by global climate changes. We will continue to focus on and implement the climate action targets after the Paris Agreement as well as the targets of stakeholders, and gradually incorporate them into our sustainable development strategy.

At the end of 2022, the Company established the Sustainable Development Committee, and in January 2023, the Board of Directors approved the sustainable development roadmap. The Group's Sustainable Development Committee includes climate risk management to promote the management of climate action issues and targets, and to implement sustainable strategies and climate action issues in the management of products, operations and value chains.



Core Elements of TCFD



### Governance

The organization's governance of climate-related risks and opportunities

### Strategy

The actual and potential impact of climate-related risks and opportunities on the organization's business, strategy and financial planning

### Risk Management

The organization's process for identifying, assessing and managing climate-related risks

### Metrics and Targets

Metrics and targets for assessing and managing climate-related risks and opportunities

TCFD Framework for Taiflex

 <b>Governance</b>	<ul style="list-style-type: none"> <li>◆ The Board assesses the effectiveness of climate response strategies based on the project outcome of functional teams summarized by the Sustainable Development Committee (Sustainable Development Center) periodically.</li> <li>◆ The Sustainable Development Committee formulates policies and improvement targets based on the discussion results or resolutions of the Board and passes on to each functional team for execution.</li> </ul>
 <b>Strategy</b>	<ul style="list-style-type: none"> <li>◆ Based on the climate risk analysis of the Corporate Governance and Risk Management Team, the Sustainable Development Committee would take inventory on existing resources and the financial impact of changes in the external environment to draw up climate response strategies and various projects.</li> <li>◆ The Company adopts GHG inventory and e-energy management system to set the evaluation basis for power consumption improvement plans, thereby gradually achieving the targets of energy saving and emission reduction.</li> <li>◆ In line with the trend of energy diversification, we move steadily toward the long-term target of 2050 by investing in renewable energy through our subsidiary, Taiflex Green Power Co., Ltd.</li> </ul>
 <b>Risk Management</b>	<p>The Corporate Governance and Risk Management Team under the Sustainable Development Committee has classified climate risks into two categories based on the TCFD framework:</p> <ol style="list-style-type: none"> <li>(1) Transition risks associated with low carbon economy.</li> <li>(2) Physical risks associated with climate change, and identification of the impact and probability of the Company's climate-related risk issues through reports from international institutions, industry analysis of the peers and collection of relevant regulations.</li> </ol>
 <b>Indicator and Target</b>	<p>Increase the proportion of renewable energy within total electricity consumption of Taiflex</p> <ul style="list-style-type: none"> <li>◆ Short-term (2023-2024) : 1%</li> <li>◆ Medium-term (2025-2027) : 6%</li> <li>◆ Long-term (2028~) : 10%</li> </ul>

## 3.2 Green Energy and Carbon Neutrality

◇ Material Topics: Green Energy and Carbon Neutrality ◇

<p><b>Main Reason</b></p>	<p>Global warming, international community' s expectation for regulatory changes, and the transition to green power and carbon neutrality would inevitably create challenges of market competitiveness, and this has become a material topic for Taiflex to confront with.</p>
<p><b>Policy and Strategy</b></p>	<p>Taiflex Green Power Co., Ltd. was established for the generation and selling of electricity from renewables to steadily move towards carbon neutrality by 2050. The functional teams under the Sustainable Development Committee would promote energy saving and carbon reduction practices.</p>
<p><b>Goals and Objectives</b></p>	<p><b>Short-term goals ( 2023-2024 ) :</b></p> <ul style="list-style-type: none"> <li>◆ 4% reduction in GHG Category 1 emissions with 2021 being the base year.</li> <li>◆ Use of renewable energy accounts for 1% of total electricity consumption.</li> <li>◆ Cumulative installed renewable capacity of 1,657 kW by Taiflex Green Power Co., Ltd. (subsidiary).</li> </ul> <p><b>Medium-term goals( 2025-2027 ) :</b></p> <ul style="list-style-type: none"> <li>◆ 12% reduction in GHG Category 1 emissions with 2021 being the base year.</li> <li>◆ Use of renewable energy accounts for 6% of total electricity consumption.</li> <li>◆ Cumulative installed renewable capacity of 2,949 kW by Taiflex Green Power Co., Ltd. (subsidiary).</li> </ul> <p><b>Long-term goal ( 2028~ ) :</b></p> <ul style="list-style-type: none"> <li>◆ &gt;27% reduction in GHG Category 1 emissions with 2021 being the base year.</li> <li>◆ Use of renewable energy accounts for 10% of total electricity consumption</li> <li>◆ Cumulative installed renewable capacity of 3,379 kW by Taiflex Green Power Co., Ltd. (subsidiary).</li> </ul>
<p><b>Management Assessment Mechanisms</b></p>	<p>The Sustainability Center evaluates the feasibility of energy-saving themes proposed by each department, and then sets management targets for each business. It regularly summarizes the project progress of each functional team through the Sustainable Development Committee and reports the results to the Board of Directors (at least twice a year).</p>
<p><b>Performance and Adjustments</b></p>	<ul style="list-style-type: none"> <li>◆ Introduction of the zeolite rotor concentrator at Taiflex 3 in 2022 reduced natural gas consumption by 28%. With 2022 as the base year, benefits are expected to be generated from 2023 onwards, with a reduction of approximately 191 MT CO<sub>2</sub>e.</li> <li>◆ Replacement of ceramic media within the RRTO at Taiflex 2 at the end of 2022 cut down natural gas consumption by 37%, i.e., 12,950 m<sup>3</sup> in 2022, which is equivalent to a reduction of 26.9 MT CO<sub>2</sub>e.</li> <li>◆ Installed capacity totaled 647 kW by Taiflex Green Power Co., Ltd. (subsidiary) in 2022.</li> </ul>
<p><b>Prevention or Remedy Measures</b></p>	<p>The Sustainable Development Center collects external climate information (regulations and trends) on an ongoing basis and provides the information along with the progress report of carbon reduction efforts summarized by the Sustainable Development Committee to the Board of Directors to evaluate the effectiveness of energy-saving targets and strategies.</p>

### 3.2.1 Energy structure and carbon emission management

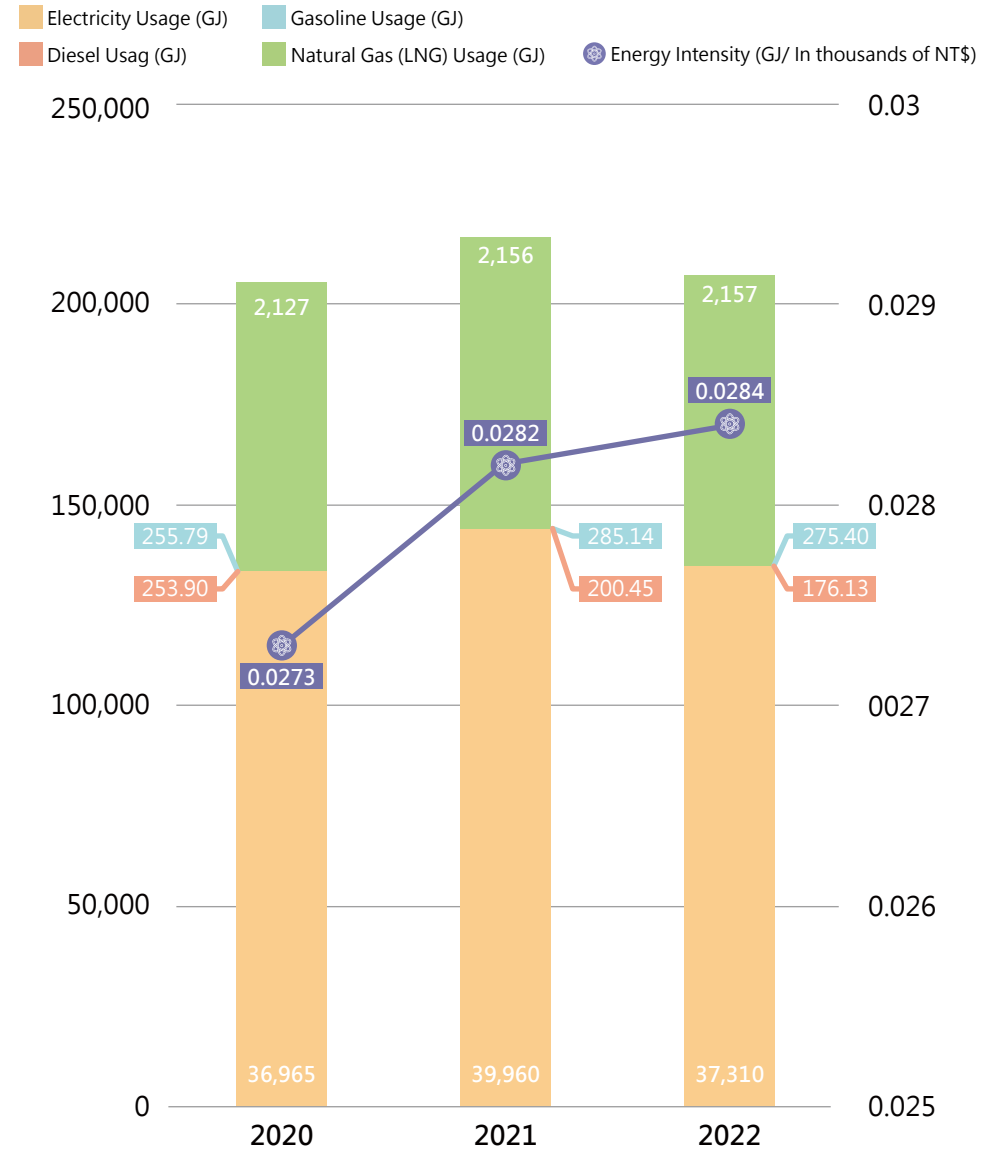
Electricity and natural gas were the major energy sources of the Company in 2022, accounted for 65% and 34% of the total energy consumption, respectively. Details of electricity and natural gas consumption for the past three years are shown in the table below. Since the Company conducted trial runs in 2022 on new equipment scheduled to be adopted in the future, there was an increase in electricity consumption. Also, as the pandemic and sluggish market in the second half of the year led to a relative decrease in revenue, energy intensity rose compared to 2021.

Quantitative Indicators	Unit	2020	2021	2022
Electricity Usage	kWh	36,965,320	39,960,616	37,310,040
	GJ	133,075.15	143,858.22	134,316.14
Gasoline Usage	L	7,780	6,142	5,397
	GJ	253.90	200.45	176.13
Diesel Usage	L	7,278	8,113	7,836
	GJ	255.79	285.14	275.40
Natural Gas (LNG) Usage	m <sup>3</sup>	2,127,331	2,158,929	2,157,471
	GJ	71,206.02	72,263.67	72,214.87
Total Energy	GJ	204,790.86	216,607.48	206,982.54
Revenue (In thousands of NT\$)	In thousands of NT\$	7,491,041	7,671,215	7,287,918
Energy Intensity	GJ/ In thousands of NT\$	0.0273	0.0282	0.0284

Note:

- Heat value of electricity is converted at 1kWh=0.0036GJ.
- Heat value of fuel is calculation using conversion factors in the Greenhouse Gas Emission Factor Table (6.0.4) of the Environmental Protection Administration, where gasoline is 7,800 kcal/L, diesel is 8,400 kcal/L, and natural gas is 8,000 kcal/m<sup>3</sup>, and 1 kcal = 4.184 KJ.
- This year, the calculation of energy intensity was adjusted to Total energy use (GJ) / Taiflex's parent company only revenue for the year (in thousands of NT\$). As the basis for calculation was different from the one in 2021, information was restated.
- The data of 2021 electricity and natural gas (LNG) consumption was misprinted. Therefore, information was restated this year.

Total Energy & Energy Intensity



### ◆ GHG inventory

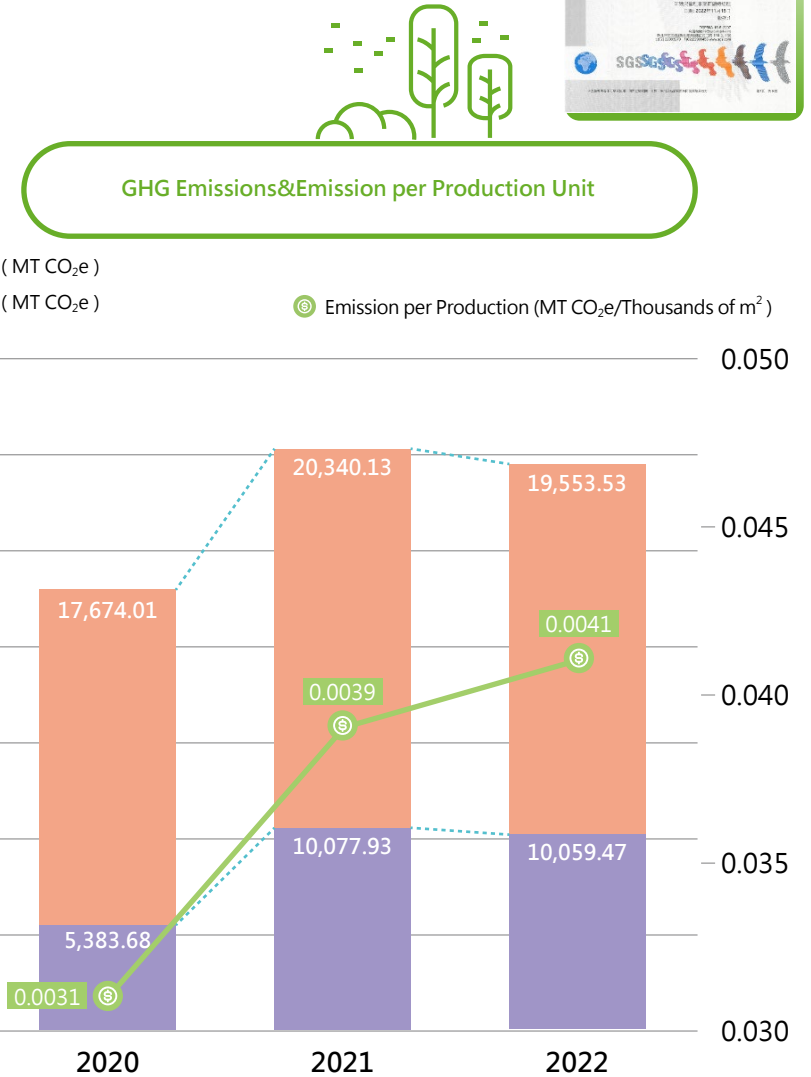
In recent years, climate issues have become an international phenomenon. From governments to private enterprises, all sectors are striving for the goal of net zero by 2050. The largest consumer electronics brand in the U.S. has even proposed to achieve 100% carbon neutral supply chain by 2030. Although we are not a direct supplier to the brand, we still actively map out our carbon reduction goals so as to jointly contribute in cooling down the planet. We adopted the GHG inventory system in 2022 and performed inventory on 2021 GHG emissions. A third-party verification was completed pursuant to ISO 14064-1:2018 and we have obtained a verification statement. We will drive carbon reduction measures through the inventory results.



Quantitative Indicators	Unit	2020	2021	2022
Scope 1	MT CO <sub>2</sub> e	5,383.68	10,077.93	10,059.47
Scope 2	MT CO <sub>2</sub> e	17,674.01	20,340.13	19,553.53
Scope 1 + Scope 2	MT CO <sub>2</sub> e	23,057.69	30,418.06	29,613.00
Revenue (In thousands of NT\$)	In thousands of NT\$	7,491,041	7,671,215	7,287,918
GHG Emission Intensity	MT CO <sub>2</sub> e / In thousands of NT\$	0.0031	0.0039	0.0041

Note:

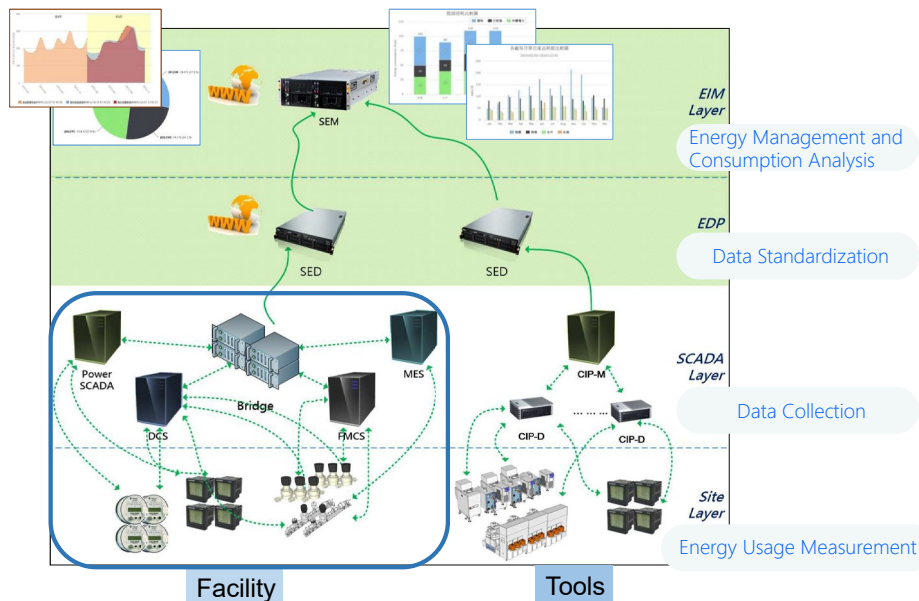
1. Scope 1: Direct GHG emissions, Scope 2: GHG emissions from energy usage, Scope 3: GHG emissions from transportation, Scope 4: GHG emissions from the use of product.
2. Emission intensity = (Scope 1 + Scope 2) / Taiflex' s parent company only revenue for the year (in thousands of NT\$).
3. Scope 3 and 4 GHG emission totaled 81,116.77 MT CO<sub>2</sub>e in 2021 and their volume in 2022 will be disclosed in the next report after verification in 2023.
4. We adopted voluntary inventory pursuant to the 2006 version in 2020 and updated to the 2018 version for the 2021 inventory; therefore, the inventory data were different. Also, the 2014 air pollution inspection report was used for the calculation of material balance coefficient for RTO in 2020. With an exhaust gas concentration (VOC and methane) of 35 ppm, the plant-specific factor calculated was lower compared to the use of 2021 air pollution inspection report with an exhaust gas concentration of 220 ppm in 2021. On top of having a higher carbon emission factor, RTO was the carbon hotspot in the factory. This was the main reason for the significant increase of 2021 carbon emission compared to 2020.
5. In 2022, the Company conducted 2021 GHG inventory in accordance with ISO 14064-1:2018; therefore, data concerning 2021 GHG emissions were restated.
6. The calculation of GHG emissions intensity in this report is adjusted to: Scope 1 + Scope 2 GHG CO<sub>2</sub>e / parent company only revenue for the year (thousands of NT\$). As the basis for calculation was different from the one in 2021, information was restated.



### ◆ Energy conservation & carbon reduction measures

In response to the national energy saving goal, we continue to invest in various energy saving measures. In 2021, the ISO 50001 Energy Management System Platform was established at our Kaohsiung factory in Taiwan. Through the e-energy management platform, the Company can implement comprehensive energy inventory and set various performance indicators as well as the best power consumption strategy for equipment to ensure the optimal use of energy, thereby achieving the targets of carbon emission management. Projects implemented since 2021 are expected to lower electricity consumption by 1,866,441 kWh in 2022, which is equivalent to a savings of NT\$5,599 thousand, a carbon reduction of 950 MT CO<sub>2</sub>e, or the carbon sequestration by 2.47 Daan Park in one year.

Note: Based on the calculation that each hectare of forest can absorb 15 MT of carbon per year, one Daan Park (25.8 hectares) can absorb 384.6 MT of carbon per year.



Energy-saving programs executed in 2022 included efficiency enhancement for chillers, improvement on cooling water pump within the air conditioning system and nitrogen preheating for ovens. These measures saved 1,392,821 kWh of electricity, which was equivalent to 708.95 MT CO<sub>2</sub>e or a total of NT\$4,178 thousand. Electricity consumption was down by 3.15%, meeting the 1% requirement stipulated in the Energy Administration Act.

Measures	Energy Saving (GJ)	Carbon Reduction Benefits (MT CO <sub>2</sub> e)
Install inverters for cooling water pump within the air conditioning system	910.78	128.77
Nitrogen preheating for ovens	506.91	71.67
Improvements on fans and pumps of cooling water towers	253.67	35.87
Use of LED lighting to replace bulbs in the factories	369.40	52.23
Ventilators at toilets switched to routine operation	29.60	4.18
Optimized FFU control for clean room air conditioning	245.96	34.78
Improved efficiency of cooling water and cooling water flows for chillers	1,430.38	202.24
Installed inverters and adopted high efficiency motors for the air conditioning units in the factories	761.33	107.64
Use of LED lighting to replace bulbs in the office	71.12	10.06
Optimized air compressors at factories	117.83	16.66
Installed timers on air conditioners at employee cafeteria	9.62	1.36
Adopted waste heat recovery units to reduce energy consumption of heating system	307.57	43.49
Replaced ceramic media within the RRTO at Taiflex 2	433.46	26.90
<b>Total for 2022</b>	<b>5,447.63</b>	<b>735.85</b>





### 3.2.2 Promote construction of renewable energy

On December 31, 2020, the Bureau of Energy, MOEA announced that major electricity users with contracted capacity of 5,000 kW or above are required to install renewable energy power generation equipment for 10% of their average chartered capacity in the previous year within five years, or purchase renewable energy and certificates, or install energy storage facility in order to perform their obligations pursuant to the “Renewable Energy Development Act”. The contracted capacity of our factories has yet to meet the criteria for major electricity users. Although we are not subject to the aforementioned regulations at this stage, we took actions in response to the government policy. We established Taiflex Green Power in March 2021 and installed 375.9 kWp (450,752 kWh of electricity) at Taiflex 2 in 2022. At the same time, we bought back the installed capacity of 271.2kWp (349,544 kWh of electricity) leased to other companies at Taiflex 5.

**Note:**

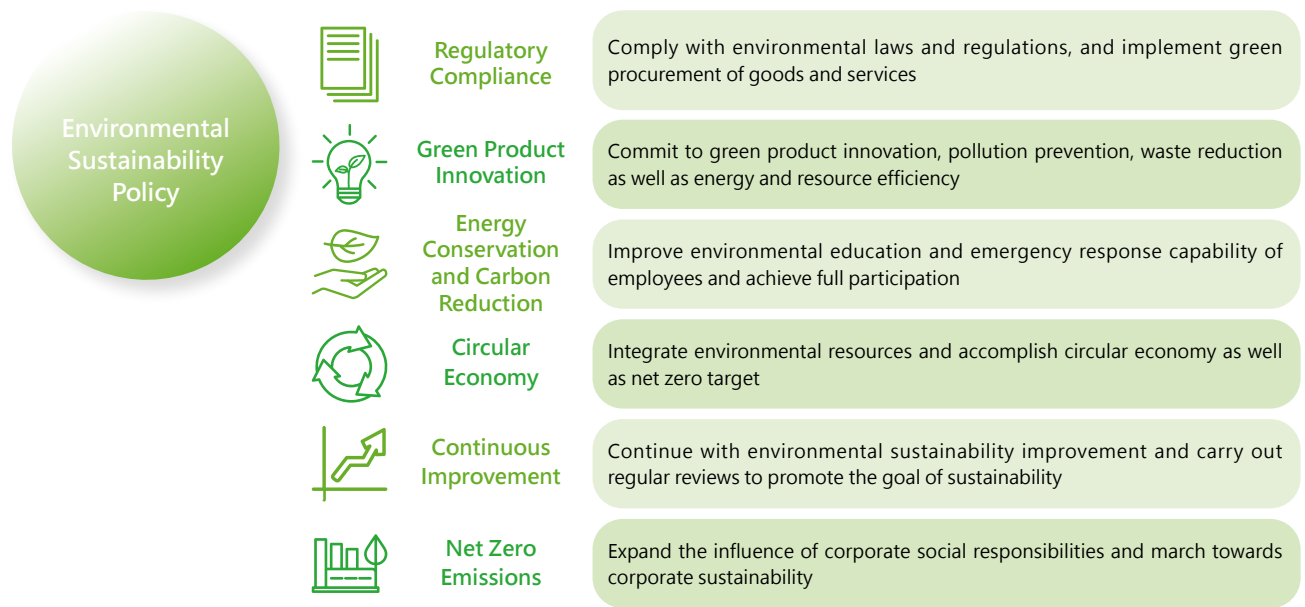
The installed capacity at Taiflex 3 since 2015 and the installed capacity at Taiflex 5 till 2022 were leased to other companies. As they were not PV facilities constructed by the Company, they were not included in the calculation of performance. Relevant information was restated.

In order to achieve the vision of carbon neutrality, we have set medium and long-term targets of having more than 10% of the Company’s total electricity consumption generated from renewable energy by 2030 and 50% of the Group’s total electricity consumption from renewables by 2050. Therefore, upon evaluation by the Sustainable Development Committee and review by the Board of Directors, the subsidiary, Taiflex Green Power Co., Ltd., was assigned to operate the Company’s green power equipment and promote the expansion of renewable energy facilities.

## 3.3 Environmental Policy and Investment

### 3.3.1 Green commitment

Environmental sustainability is an important core value to the business strategy of the Taiflex Group. The Company is committed to adopting eco-friendly approaches in operation and management as well as devoted to pollution prevention and reduction control in compliance with environmental regulations. We work toward the long-term goals of carbon neutrality by 2050, 100% renewable energy and zero waste. Our environmental sustainability policy and commitments are as follows:



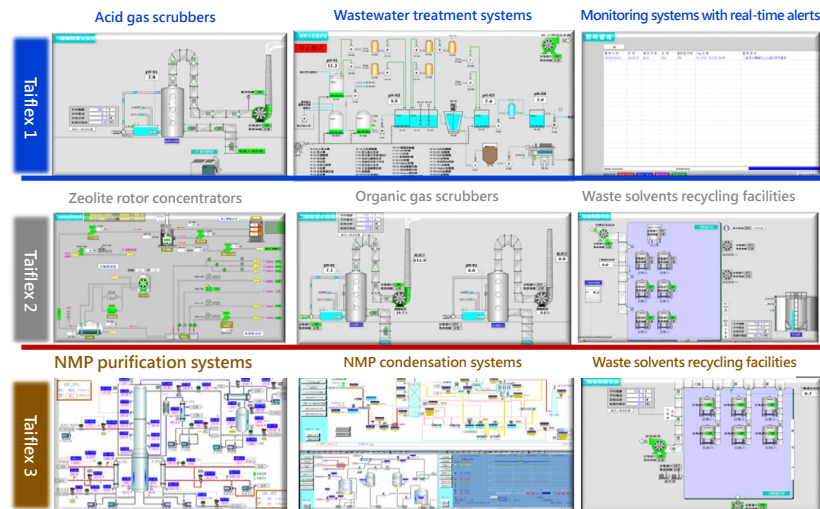
With “zero environmental incident” as the basis, we adopted the ISO 14001 Environmental Management Systems and obtained certification in 2004 (as shown in the figure to the right). Through comprehensive ESH management procedures, we control the potential adverse environmental risk. The Environmental Protection Department conducts quarterly assessments on air pollution, water pollution, waste, toxins, and other items for compliance with laws and regulations, and takes measures to address applicable laws and regulations. Improvement and preventive measures would be taken immediately if any risk of non-compliance is found. Over the past five years, we have no record of environmental protection penalties nor serious pollution leakage or violation of environmental protection regulations.



We would continue to drive the upgrade and improvement of pollution prevention and control facilities as well as monitor the pollutant emissions. Abnormal figures would be handled immediately by on-site personnel according to the emergency and reporting procedures as a precaution and to prevent pollution as well as violation of laws and regulations. There are no ecological reserves nor endangered species in the vicinity of our operation sites, and our operation activities have no adverse impact on the environment or surrounding species. Also, there are no species on the IUCN Red List in the neighborhood.



Optimization of Environmental Facilities and Equipment



### 3.3.2 Build a green industry chain

#### ◆ All products comply with international regulations

Given the rising awareness in maintaining a green environment, the use of electronic materials stresses on pollution reduction. Thus, material suppliers intensify their efforts in the research and development of eco-friendly materials, which initiates a material revolution in the CCL industry. Nowadays, electronics manufacturers gradually shift towards eco-friendly substrates. Demanded by environmental awareness and regulations, eco-friendly materials will become the basic requirement for products.

Through the establishment of IECQ QC 080000 Hazardous Substance Process Management System, we update the information of international regulations when needed and incorporate them into management rules of the Company. Suppliers are asked to provide relevant information to ensure our FPC materials comply with international regulations and customers' requirements concerning hazardous substance management.

Project	Description	Product Conformity
EU's Restriction of Hazardous Substances Directive (EU RoHS)	The maximum levels of restricted substances: Lead, Cadmium, Hexavalent Chromium, Polybrominated Biphenyls and Polybrominated Diphenyl Ethers < 1,000ppm. The RoHS 2.0 includes four more restricted substances: Bis (2-Ethylhexyl) Phthalate (DEHP), Benzyl Butyl Phthalate (BBP), Dibutyl Phthalate (DBP) and Diisobutyl Phthalate (DIBP) < 1,000ppm.	Full compliance
Halogen-free electronics	The product must contain less than 900 ppm of bromine and chlorine each, with a total of less than 1,500 ppm.	Full compliance
Restrictions on Perfluorooctane Sulfonate (PFOS), Perfluorooctanoic acid (PFOA) and relevant substance	Raw materials containing PFOS, PFOA and relevant substances are no longer used in our process.	Full compliance
Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) of the EU	Hazardous substances announced and the Substance of Very High Concern (SVHC) gradually released by REACH	Full compliance
Waste Electrical and Electronic Equipment Directive (WEEE)	The directive is formulated to cope with the increasing waste electrical and electronic devices, mitigate the burden on landfills and incinerators, and prevent hazardous substance within the waste electrical and electronic devices from polluting the environment. Our products are not the end products; thus, we are not directly subjected to the WEEE. After the end products are used by the end users, FPC materials would turn into waste which shall then be recycled by the manufacturers of the end products.	Not applicable

### ◆ Reduce the environmental footprint of industry chain

In addition to high frequency, speed, density, and dimensional stability, our research and development pursues more advanced and energy-saving as well as thinner and lighter substrate materials to meet the higher environmental standards in the future. Through continuous improvement on process technology and collaboration with upstream raw material suppliers and downstream FPC customers, we gradually reduce the resources and energy consumed per production unit, thereby mitigating the environmental impact and contributing to the sustainable development of a green earth.

We have incorporated environmental performance as one of our supplier evaluation items (please refer to "2.4.2 Supply Chain Management Framework" for details) and have requested and assisted our suppliers to do a better job in hazardous substance management, pollution prevention, energy saving, water conservation and waste reduction. Step by step, the green supply chain is taking shape after several years of efforts. In order to further reduce the environmental footprint of our products, the R&D Center has been testing and developing copper foil materials made from recycled copper, aiming to replace the use of existing copper foil in the future. As for packaging materials, we make every effort to recover pallets, wooden boxes and packaging materials for repetitive use by us, the suppliers and customers to minimize waste.

Year	2020			2021			2022		
	Recycled	Purchased	Recovery rate	Recycled	Purchased	Recovery rate	Recycled	Purchased	Recovery rate
Recycling for suppliers	685			805			530		
Resources recycling (plastic pallet)	5,072	7,464	77.13%	5,270	7,496	81.04%	4,672	6,796	76.55%
Recycling of tube core, end plug and end plate	3,087	3,087	100.00%	3,087	3,087	100.00%	3,456	3,456	100.00%
Recycling of wooden box	873	-	-	866	-	-	877	-	-
Recycling for customers	2,253	13,332	16.90%	6,324	15,160	41.72%	2,856	14,000	20.40%
<b>Total</b>	<b>11,970</b>	<b>-</b>	<b>-</b>	<b>16,352</b>	<b>-</b>	<b>-</b>	<b>12,393</b>	<b>-</b>	<b>-</b>



### 3.3.3 Environmental investments and benefits

Environmental expenditure totaled NT\$44,236 thousand in 2022, including audits on environmental system standards, pollution control, environmental monitoring, eco-education, sponsorship to eco-organizations, etc. We collaborate with impartial third-party assurance agencies and agencies engaging in recycling, professional waste disposal and environmental monitoring.

The purpose of Taiflex’s environmental accounting system is to identify and measure the Company’s environmental costs as well as to conduct benefit assessments and compile statistics on costs reduced or revenue generated as a result of executing environmental projects, thereby encouraging and promoting environmental projects with economic benefits. Economic benefit is calculated by estimating the potential cost savings from reductions in energy, water consumption and waste for carrying out the environmental projects plus the revenues from waste recycling and reuse. The environmental benefit amounted to NT\$91,199 thousand in 2022.

#### 2022 Environmental investments and Benefits

##### Environmental expenditure

- Pollution control (regulatory fees and charges: e.g., air pollution control fee, etc.).
- Eco-projects to reduce environmental impact (e.g., improvements on exhaust treatment system, application fees for operating permits).
- Industrial waste disposal charge
- Industrial waste recycling charge (reuse).
- Environmental management fee (maintenance and certification of ISO 14001 and 14064-1 management system).

Total spending: NT\$44,236 thousand

##### Environmental benefits

- Savings on pollution control and reduction measures of NT\$23,802 thousand.
- Savings on reduction, recycling and reuse of industrial waste of NT\$ 15,437 thousand.
- Savings from measures to improve wastewater treatment efficiency of NT\$8,800 thousand.
- Savings on resource recycling (recycling + copper foil + solvent) of NT\$43,160 thousand.

Total savings: NT\$91,199 thousand

##### Improvements

###### 1 Reduce air pollution (NOx, TSP, CO<sub>2</sub>)

Reduction in Natural Gas (km <sup>3</sup> )	12.95	Reduction in TSP (kg)	0.98
Reduction in NOx (kg)	20.75	Reduction in CO <sub>2</sub> (kg)	20.9

###### 2. Cut down resource consumption (e.g., recycling and reuse of organic solvent waste)

Reduction in Waste Adhesive (kg)	83,630	Solvent Recycled and Reused (kg)	83,630
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###### 3. Improve the efficiency of control facilities (waste gas condensation)

4. Waste reuse	Recycled and Reused (kg)	570,540
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##### Impact upon improvement

- Reduce environmental impact by reducing energy use and improving equipment efficiency.
- Reduce air pollutant emissions to reduce the impact on the environment
- Continuous improvement to enhance competitiveness and meet the sustainable development targets.

# 3.4 Waste Reduction Actions

◇ Material Topic: Waste and Air Pollution Emissions ◇

<b>Main Reason</b>	After analyzing stakeholders' concerns and the level of impact, the topic of emissions is relatively important to the Company.
<b>Policy and Strategy</b>	Our emission policy is "as an end-customer, Taiflex is duty bound to follow sustainable environmental management practices with targets of energy conservation, emissions reduction, circular economy and environmental sustainability, carbon neutrality and net-zero GHG emissions."
<b>Goals and Objectives</b>	<p><b>Short-term goals (2023-2024):</b></p> <ul style="list-style-type: none"> <li>◆ Natural gas consumption of air pollution control equipment down 10% from 2016.</li> <li>◆ Emission per unit for VOCs down 3% from the base year (2021).</li> <li>◆ VOC recovery rate &gt; 1%</li> </ul> <p><b>Medium-term goals (2025-2027):</b></p> <ul style="list-style-type: none"> <li>◆ Overall waste recycling rate &gt; 80% by 2025.</li> <li>◆ Natural gas consumption of air pollution control equipment down 20% from 2016.</li> <li>◆ Emission per unit for VOCs down 10% from the base year (2021).</li> <li>◆ VOC recovery rate &gt; 5%</li> </ul> <p><b>Long-term goals (2028~)</b></p> <ul style="list-style-type: none"> <li>◆ Overall waste recycling rate &gt; 90% by 2030 with UL2799 certificate.</li> <li>◆ Natural gas consumption of air pollution control equipment down 30% from 2016.</li> <li>◆ Emission per unit for VOCs down 30% from the base year (2021).</li> <li>◆ VOC recovery rate &gt; 30%</li> </ul>
<b>Management Assessment Mechanisms</b>	In accordance with ISO 14001 internal management review procedures, we conduct annual PDCA effectiveness evaluations for emissions management.
<b>Performance and Adjustments</b>	<ul style="list-style-type: none"> <li>◆ Introduction of the zeolite rotor concentrator at Taiflex 3 in 2022 reduced natural gas consumption by 28%. With 2022 as the base year, benefits are expected to be generated from 2023 onwards, with a reduction of approximately 191 MT CO<sub>2</sub>e.</li> <li>◆ Replacement of ceramic media within the RRTO at Taiflex 2 at the end of 2022 cut down natural gas consumption by 37%, i.e., 12,950 m<sup>3</sup> in 2022, which is equivalent to a reduction of 26.9 MT CO<sub>2</sub>e.</li> <li>◆ Unit emissions of VOCs in 2022 decreased by 22% compared to 2021.</li> <li>◆ NMP recycling rate was 93.71% in 2022 for a total of 286.82 MT.</li> <li>◆ MEK recycling rate was 54.39% in 2022 for a total of 83.63 MT.</li> </ul>
<b>Prevention or Remedy Measures</b>	Implement controls in accordance with the "ESH objectives and program management procedures" of ISO.

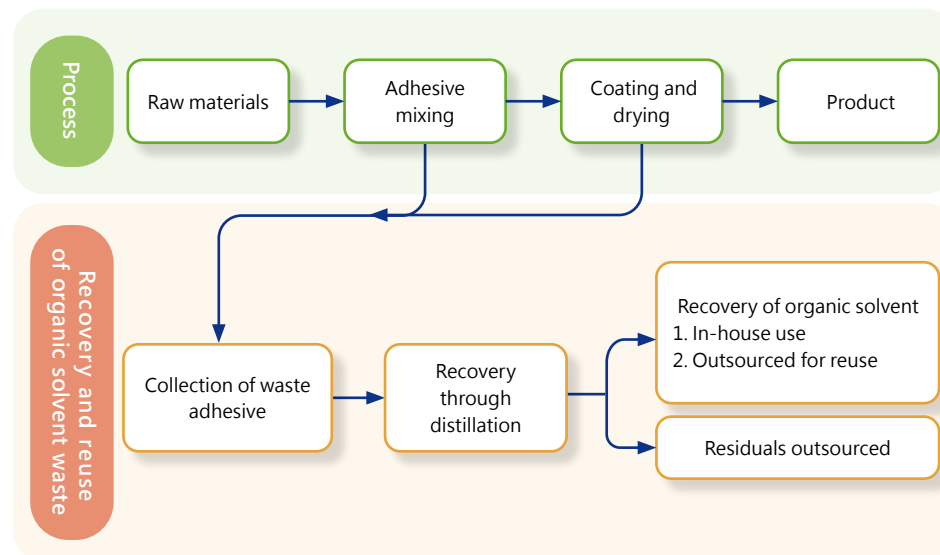
### 3.4.1 Source reduction

Taiflex is committed to zero waste. Besides promoting the concept of resource conservation to employees during daily operation, Taiflex focuses on process enhancement for source reduction. As we reduce the consumption of resources and materials, we also minimize the pollutants generated. For air pollution, wastewater, and solid waste which we cannot eliminate completely at present, we establish pollution control facilities or engage qualified professional companies to handle the matters. We strive to reduce the environmental impact of our operations and seek the best solution in order to gradually achieve the ultimate goal of zero pollution.



#### ◆ Process material recovery

Taiflex insists on controlling the use of raw materials in the directions of optimization and best feasibility, aiming to strike a balance between environmental protection and economy by minimizing waste and production cost. The Company produces FCCL and related adhesive materials by modifying the properties of polymer materials. Organic solvents are used during the mass production process which produces waste gas, waste solvents as well as waste adhesive materials. For these by-products to be used effectively, we invest in facilities for solvent recovery from waste adhesive. We have 12 sets of 60-liter and 2 sets of 200-liter solvent recovery units. In 2020, vacuum pumps for the solvent recovery units were installed to prevent waste gas emission, reduce the solvents' boiling point for distillation and minimize electricity consumption of heaters. Remote monitoring devices were installed in the same year to ensure solvent recycling efficiency and regional environmental safety. Details are illustrated in the figure below:



The facilities refine chemicals into industrial grade raw materials through distillation, purification and other related processes for them to be used at the production line. The recycling not only cuts down stationary pollution sources and exhaust emissions to stay environmentally friendly but also reduces the volume of raw materials purchased to enhance the Company's competitiveness.

Year	Category	Recycled Volume	Method of Disposal		Used at Production Line (%)
			Product Line	Outsourced	
2020	NMP	335.92	Product Line	335.92	100%
			Outsourced	0	
2020	MEK	128.22	Product Line	75.75	59.08%
			Outsourced	52.47	
2021	NMP	379.35	Product Line	319.21	84.15%
			Outsourced	60.35	
2021	MEK	124.16	Product Line	69.21	55.74%
			Outsourced	54.95	
2022	NMP	306.07	Product Line	286.82	93.71%
			Outsourced	19.25	
2022	MEK	153.76	Product Line	83.63	54.39%
			Outsourced	70.13	

### ◆ Saving water resources

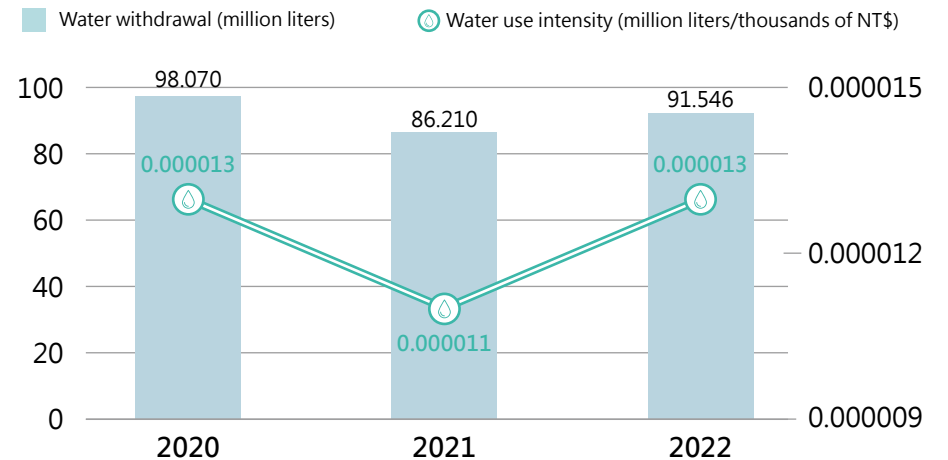
Taiflex is located in the Kaohsiung Cianjhen Technology Industrial Park, which has water supply from the Fongshan Reservoir. According to the World Resources Institute’s “Aqueduct Water Risk Atlas”, the risk of water resources in Taiwan is rated low to medium. Since we adopt dry process, production line is not where most of the water is consumed. As tap water is mainly used as cooling water for air conditioning, followed by employee daily usage and firefighting purposes, water resource management focuses on the promotion of domestic water conservation, including the recycling of RO and wastewater from drinking fountains as cooling water for air conditioning, dual flush toilet, recycling of rainwater from the roof and condensed water from air conditioning system for watering plants, and adjustments on the conductivity of water discharged from the air conditioning systems.



Water consumption of Taiflex 5 was included in the statistics of this year because the installation of water meter and related equipment was completed in 2022, resulting in increasing water use intensity this year.

Year	2020	2021	2022
Water withdrawal (million liters)	98.070	86.210	91.546
Water discharge (million liters)	46.140	39.670	55.010
Water consumption (million liters)	51.930	46.540	36.536
In-plant water recycled (million liters)	0.000	2.420	6.850
Water recycling rate (%)	0.000	2.730	6.962
Revenue (in thousands of NT\$)	7,491,041	7,671,215	7,287,918
Water use intensity (million liters/thousands of NT\$)	0.000013	0.000011	0.000013

Water withdrawal & Water use intensity



Note:

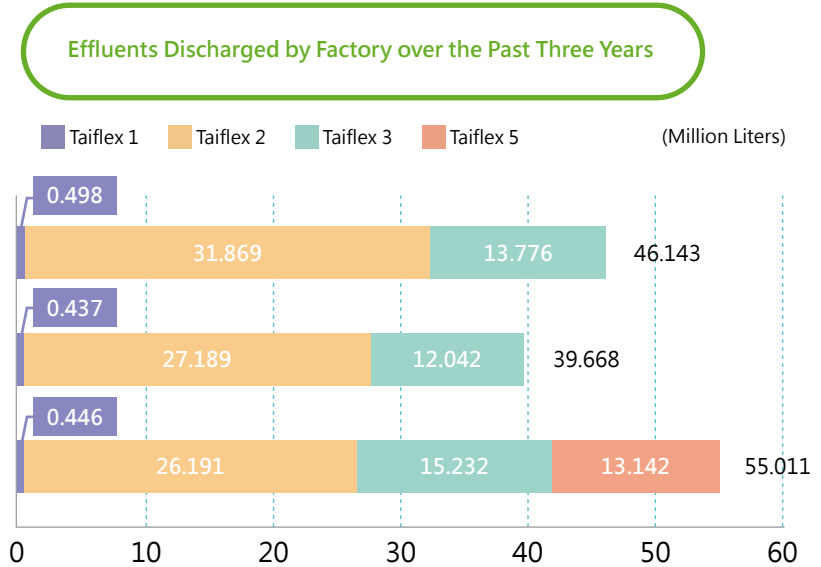
1. Water consumption = water withdrawal - water discharge.
2. Water recycling rate = In-plant water recycled / (water withdrawal + in-plant water recycled)\*100%.
3. Water use intensity is calculated as: Water withdrawal (million liters) / Taiflex’s parent company only revenue for the year (in thousands of NT\$).

### 3.4.2 Pollution control

#### ◆ Effluents meeting the standard

Effluents from operation are mostly wastewater discharged from the cooling tower of factories and water used for domestic purposes, e.g., wash up or kitchen waste cleaning. Since they are discharged to sewers of the park, they would not affect the biodiversity in the area.

Factory/Year	2020	2021	2022
Taiflex 1	0.498	0.437	0.446
Taiflex 2	31.869	27.189	26.191
Taiflex 3	13.776	12.042	15.232
Taiflex 5	-	-	13.142
<b>Total</b>	<b>46.143</b>	<b>39.668</b>	<b>55.011</b>



Our etching laboratory in Taiflex 1 would discharge etching wastewater; thus, a wastewater treatment system was installed. The system is equipped with pH and flow meters connected to the central monitoring system for constant online monitoring to ensure the effluents discharged fully meet the standards set by the Processing Zone. Testing at the outfalls are conducted twice every year and we carry out monthly testing as well. Test results not only meet the discharge standards but also stay far below the regulatory requirements. The Company has never been penalized by the competent authorities since operation.

Test Items	2020		2021		2022	
	Emission Standard (ppm)	Annual Average (ppm)	Emission Standard (ppm)	Annual Average (ppm)	Emission Standard (ppm)	Annual Average (ppm)
pH	5~9	8.08	5~9	8.3	5~9	7.96
Suspended solids	450	12.77	450	14.46	450	60.93
Biochemical oxygen demand	450	41.07	450	43.73	450	91.63
Chemical oxygen demand	600	92.25	600	98.4	600	76.55
Copper	3	0.06	3	0.67	3	0.21



### ◆ Air pollution monitoring and prevention

Our air pollution control facilities adopt the best technology available recommended by regulatory bodies, and are in compliance with the “Air Pollution Control Act” as well as the “Air Pollutant Emission Standards of Stationary Pollution Sources” . As the Company mainly uses natural gas as the fuel for exhaust gas equipment, in addition to reducing the total amount of exhaust gases to be treated through raw material recovery, Taiflex 3 has introduced the zeolite rotor concentrator in 2022, which is expected to reduce natural gas consumption of RTO by approximately 30%.

By reducing natural gas consumption, we can effectively lower NOx emissions. The air pollution control facilities of each factory operate 24 hours a day and 350 days a year, with a real-time monitoring system to ensure normal operation. Furthermore, we would engage a third-party certification body to conduct tests on the emission concentration of various air pollutants annually. The results show that our emissions have all complied with the emission standards and stayed far below the threshold.

Test Items	2020			2021			2022		
	Emission (kg)	Emission Standard (ppm)	Annual Average (ppm)	Emission (kg)	Emission Standard (ppm)	Annual Average (ppm)	Emission (kg)	Emission Standard (ppm)	Annual Average (ppm)
VOCs	111,540.00	None	312.00	118,112.00	None	220.00	120,590.00	None	210.00
TSP	386.00	100.00	1.00	387.00	100.00	0.40	367.00	100.00	1.00
SOx	-	-	-	-	-	-	-	-	-
NOx	6,995.00	150.00	10.00	6,740.00	150.00	10.00	6,407.00	150.00	12.00

Note:

1. The emission standards for VOCs have yet to be established; therefore, annual average is not available. Only the latest (2022/4/13) third-party testing data is disclosed.
2. SOx is not released from natural gas combustion; therefore, testing is not required.

At present, some of the existing refrigeration equipment within the factory still contain R22 refrigerant, and we continue to use GHG emission rate to calculate its emission volume. We will opt for environmentally friendly refrigerant in the future and gradually replace the older models.

ODS	ODS Statistics		
	2020	2021	2022
R22	0.040 MT	0.040 MT	0.039 MT

◆ Waste treatment

Hazardous industrial waste generated from our operating activities is mostly organic solvent waste. It is collected in 53-gallon steel drums in the synthesis, front-end and back-end departments and then purified for reuse through the recovery facilities to effectively reduce the outsourced volume and related treatment costs as well as realize circular economy (please refer to 3.4.1 for details).

The Company constantly promotes the concept of reuse internally and strives to recycle all reusable waste (please refer to 3.3.2 for details) as well as improves resource efficiency to reduce environmental burden. Waste that cannot be reused are handled by third-party waste management professionals certified by the Environmental Protection Administration and we conduct on-site audits annually to ensure waste has been properly treated and to prevent environmental pollution due to negligence or violation of laws.

Except for the reuse of NMP and MEK in the factory, all other waste is treated off-site. The treatment complies with the Company’s ISO14001 Waste Disposal Management Standard (EI-PD-06), the “Waste Disposal Act” and the “Regulations Governing Determination of Reasonable Due Care Obligations of Enterprises Commissioning Waste Clearance”. There was no leakage in 2022.

Composition	Hazardous/ Non-hazardous	On-site		Off-site	
		Waste Generated (MT)	Processing Method	Waste Generated (MT)	Processing Method
Waste Adhesive / Solvent	Hazardous	-	-	280.04	Incineration (with energy recovery)
NMP Solvent Waste	Hazardous	286.82	Recycling	19.25	Other recycling measures
MEK Solvent Waste	Hazardous	83.63	Recycling	70.13	Other recycling measures
Copper Sludge Waste	Hazardous	-	-	5.99	Recycling
Mixture Containers	Hazardous	-	-	37.10	Recycling
Waste Plastic Mixture	Non-Hazardous	-	-	118.62	Incineration (with energy recovery)
Waste Rubber Mixture	Non-Hazardous	-	-	51.50	Incineration (with energy recovery)
Waste Paper Mixture	Non-Hazardous	-	-	54.52	Incineration (with energy recovery)
Domestic Waste	Non-Hazardous	-	-	219.58	Incineration (with energy recovery)
Waste Wood	Non-Hazardous	-	-	188.66	Recycling
Liquid Manure	Non-Hazardous	-	-	6.74	Other disposal measures
Waste Oil Mixture	Non-Hazardous	-	-	0.60	Recycling
Scrap CCL	Non-Hazardous	-	-	224.33	Recycling
Pure Copper Foil	Non-Hazardous	-	-	10.29	Recycling
General Recycling (Waste Plastic)	Non-Hazardous	-	-	82.39	Prepared for reuse
General Recycling	Non-Hazardous	-	-	122.93	Prepared for reuse
Pallet Recycled for Suppliers	Non-Hazardous	-	-	54.69	Prepared for reuse
Empty Drums	Non-Hazardous	-	-	16.12	Prepared for reuse

Waste

Composition Processing Method	Hazardous Waste		Non-Hazardous Waste		Total
	On-site	Off-site	On-site	Off-site	
Transfer During Disposal	370.45	132.47	0.00	700.01	1,202.93
	502.92		700.01		
Direct Disposal	0.00	280.04	0.00	450.96	731.00
	280.04		450.96		
<b>Total</b>	782.96		1,150.97		1,933.93
Total Waste			1,933.93		
Recycling Rate			62.20%		

Notes:

1. Transfer during disposal: recycling; Direct disposal: incineration (with energy recovery), incineration (without energy recovery), landfill.
2. Recycling rate is calculated as: Recycled waste volume / Total waste volume × 100%.

