台塑企業
FORMOSA PLASTICS GROUP

2023

Formosa Chemicals & Fibre Corporation

Task Force on Climate-Related Financial Disclosure (TCFD) Report

WE PRODUCE
WE RECYCLE

Table Of Contents

Introduction

Global warming caused by the emission of greenhouse gas (referred to as "GHG") has brought significant risks to the growth of the global economy in recent years and will affect a greater number of businesses in the future. However, it may be difficult for investors to learn which companies are susceptible to the risks of climate change, which companies are adequately prepared, and which ones are taking response actions. Accordingly, the Financial Stability Board (FSB) has assembled a special task force: Task Force on Climate-related Financial Disclosures (TCFD), which has published its "TCFD Recommendations Report" in June 2017 after spending 18 months gathering opinions from business and financial leaders. The Recommendations Report provides businesses and investors with a complete assessment framework for disclosing risks and opportunities associated with climate change and for reflecting risks in financial reports.

As a response to global trends, Formosa Chemicals & Fibre Corporation ("the Company") has disclosed risks and opportunities associated with climate change in accordance with the TCFD Recommendations Report and made a more reasonable and efficient allocation of capital in line with the Company's responsibilities and strategies to realize our vision toward low-carbon transition.

The Company's Climate Change Management Structure

Governance

- The appointment of the Sustainable Development Committee falls under the Board of Directors. The Committee is responsible for the monitoring and strategic decisions of the Company's response to climate change related issues and matters.
- An ESG Promotion Working Group is appointed under the Sustainable Development Committee. The Working Group is to develop strategic plans for climate change risks and opportunities and the compilation of corresponding action plans.
- Regularly convene the Energy Saving, Carbon Reduction and Circular Economy and ESG Review Meetings on a monthly basis, and regularly track the progress of the countermeasure plan.
- Collecting information related to the impact of climate change on the factors of finance, reputation, global energy supply and economic trend and legal compliance, etc., assessing and specifying risk scope, and establishing relevant strategies.

Strategy

According to the environmental assumption scenario of IPCC AR6 SSP1. SSP2. SSP3. SSP4. SSP5, the goal of reduction of GHG by 2°C is set up, and four main strategies for short, medium and long terms are established.

Energy efficiency improvement	Energy transition	Circular economy	Other measures
Perform process optimization and increase energy use efficiency.	Use low-carbon energies, promote the reduction of coal, and develop green electricity, etc.	Promote recycling and reuse of CO_2, marine waste, and waste plastics.	Use low-carbon products, implement paperless offices and develop green products, etc.
358.5	37.8	12.9	0.8
Total			410.0

Carbon reduction amount in 2023 (thousand metric tons of CO_2e)

Indicators and Targets

The Company's GHG emissions in 2010 were 12.23 million metric tons at the peak value. In 2020, the GHG emissions were 8.54 million metric tons, a reduction of 30.2% from the emissions in 2010. The Company has announced 2020 as the base year, and the carbon emissions reduction absolute targets have been established:

- Short-term reduction target: Reduction of carbon emission by **10%** from the base year in 2025 (reduction of **37.1%** from the year of peak emissions)
- Medium-term reduction target: Reduction of carbon emission by **25%** from the base year in 2030 (reduction of **47.6%** from the year of peak emissions)
- Long-term reduction target: Achieving **carbon neutrality** in 2050

Risk Management

- The identification and assessment of climate change related risks and opportunities is conducted through the gathering, analyzing and compilation of related information every half a year.
- Countermeasures for every risk scenario are formulated from the identification of the environmental risks and opportunities each year in accordance with the assessment procedure of ISO 14001.

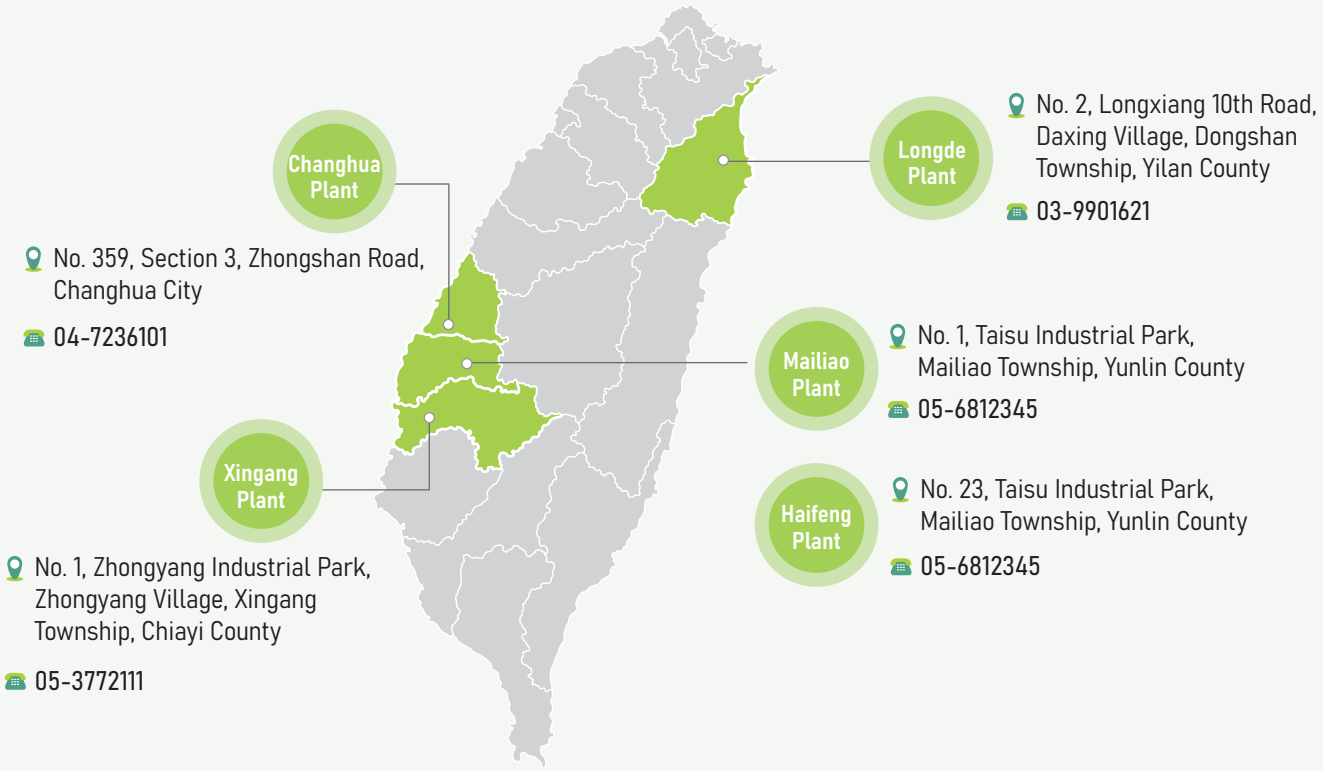
1 Governance

1.1 Company Profile

The capital of Formosa Chemicals & Fibre Corporation (referred to as "FCFC") is NT$58.61 billion, and products include the categories of petrochemical, plastics, fibers and textile. FCFC's business sales and services reach all major continents, and cogeneration plants have been established to produce and supply water, electricity and steam for manufacturing process use of production plants. With the promotion of the circular economy in recent years, the Company has made some achievements in aspects of energy saving and water saving. It is also committed to the research and development of waste recycling and re-manufacturing technologies becoming one of the few companies globally to be able to recycle nylon using chemical method for mass production.

Location of Headquarters	Changhua County, Taiwan	Year of establishment	1965
Consolidated revenue in 2023	NT$332.6 billion	Industry item	Petrochemical, plastic, synthetic fiber, textile, co-generation power
Number of formal employees in Taiwan in 2023	5,085 people		

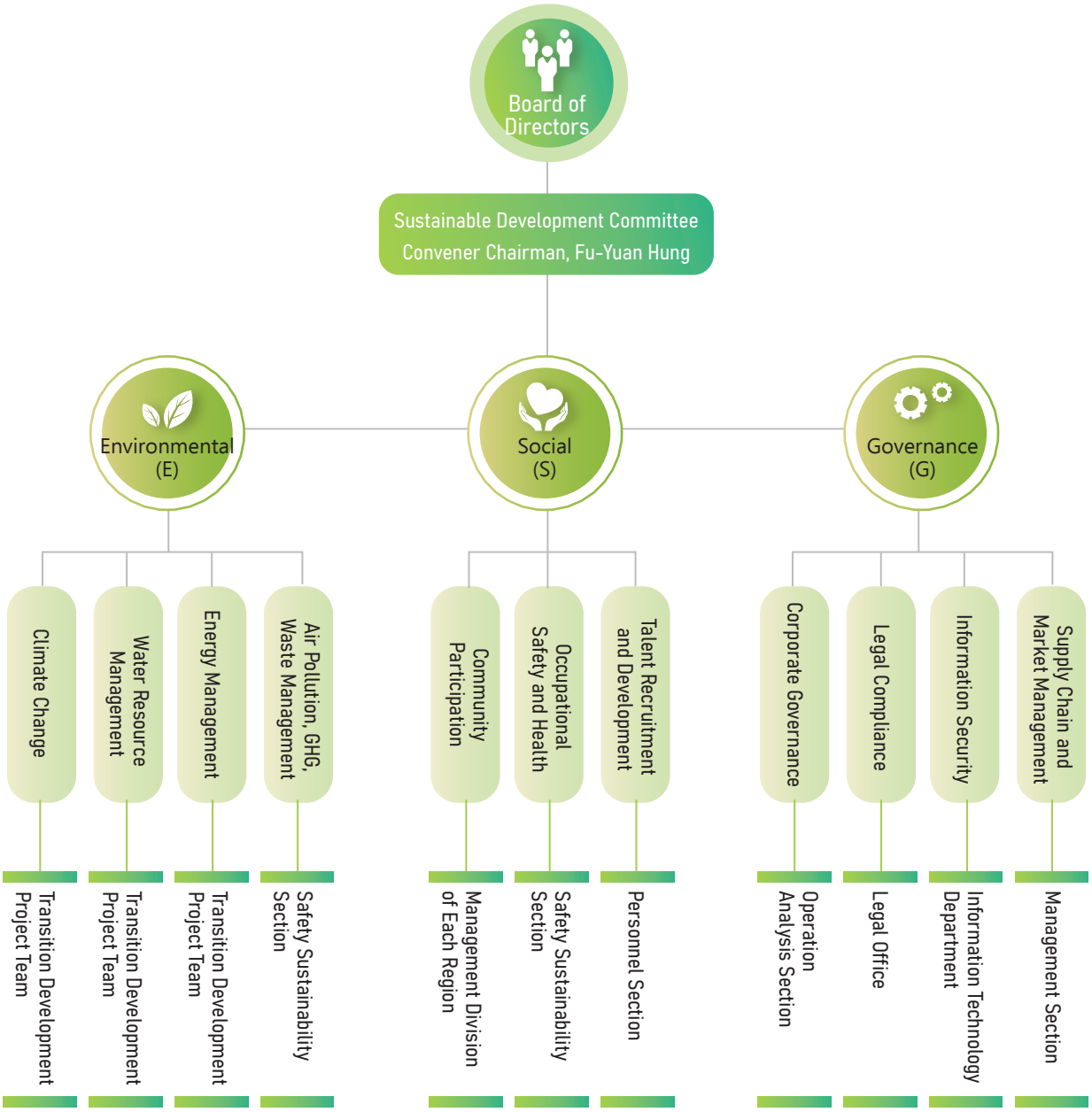
1.2 Organization Boundary



1.3 Organization and Responsibility

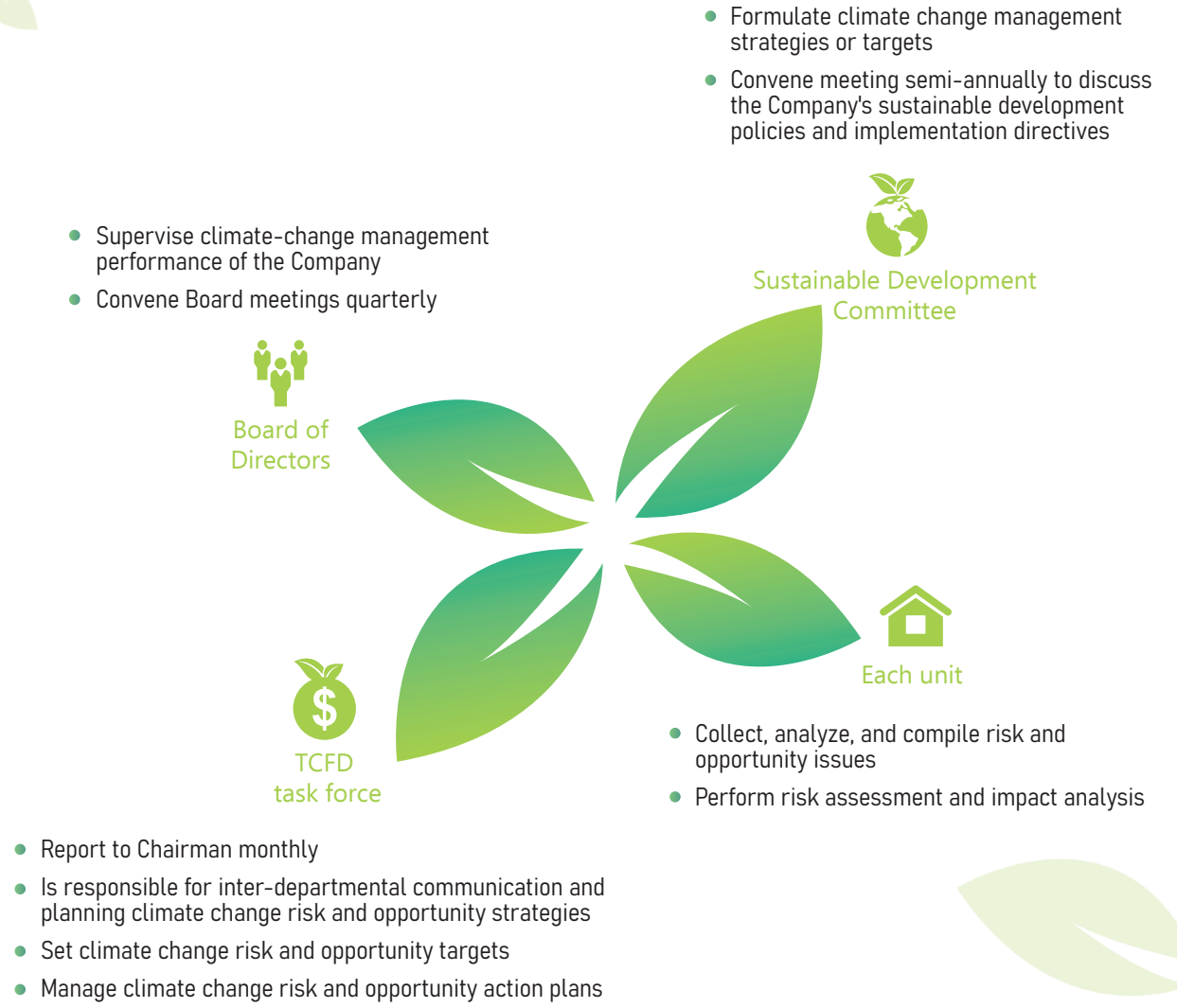
FCFC values Environment, Society and Corporate Governance (ESG) related issues as the fundamental of corporate sustainable development, and on May 6, 2022, the Board of Directors has approved the establishment of the Sustainable Development Committee, in order to enhance the supervision responsibility of the Board of Directors on sustainable matters in response to climate change. For the Sustainable Development Committee, the Chairman of the Board acts as the convener and President acts as the deputy convener, in charge of the establishment of corporate sustainability strategy, performance supervision, and promotion of social responsibility and risk management.

FCFC's Sustainable Development Task Force



Climate-related topics are ESG aspects particularly concerned by enterprises. Accordingly, the Company has established the TCFD Task Force under the Sustainable Development Committee, in charge of summarizing risks and opportunities identified by all units and corresponding action plans. The response plan progress is tracked through the monthly 'Energy Saving and Emission Reduction Circular Economy Meeting" and "ESG Promotion Meeting", and the result is also reported to the Sustainable Development Committee. Subsequently, the Sustainable Development Committee further reports to the Board of Directors at a frequency of at least once quarterly. The Chairman acts as the highest manager to supervise the climate change related topics and matters.

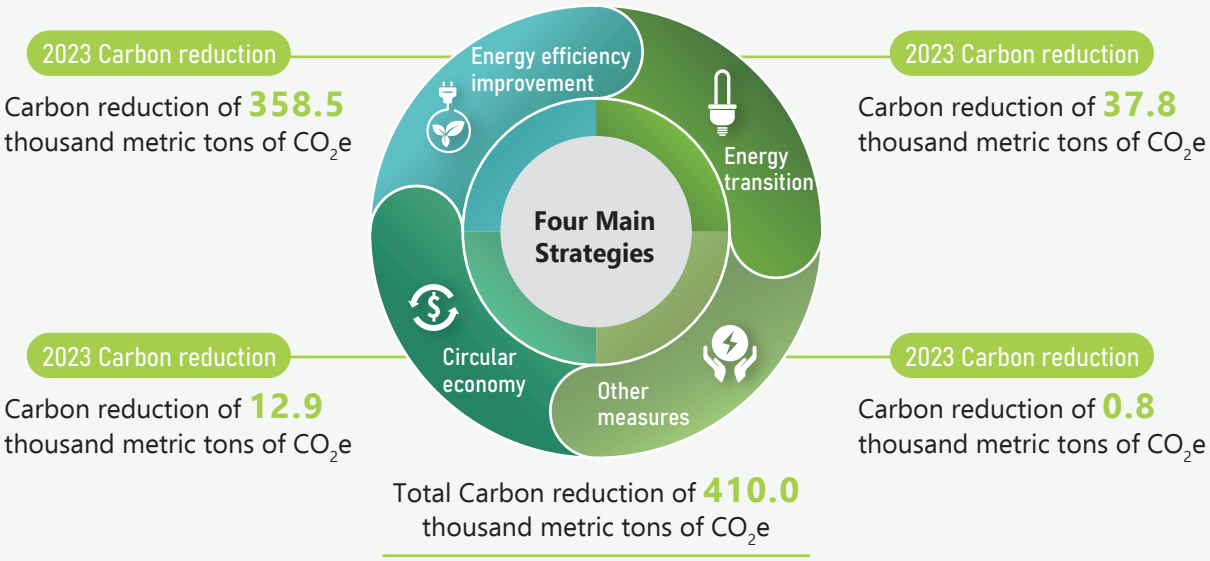
TCFD promotion organizational chart



2 Strategy

The Company upholds the philosophy of "Start from Zero" and actively promotes energy saving and carbon reduction, circular economy and pollution control. Through comprehensive inspection, the Company introduces AI to optimize processes and applies the most optimal and feasible control technologies, such that through the method of source reduction, the Company aims to achieve minimum resource consumption and waste output. We are in pursuit of fulfilling social responsibility and sustainable operation with the spirit of continuous improvement by getting to the root of the problem.

For the "Climate Change Topics", the Company actively faces the risks and opportunities associated with such topics. In response to the global ESG development trend and the 13 climate actions of the United Nations (UN) Sustainable Development Goals (SDGs), the Company has established the goal of carbon neutrality by 2050. For the Company's sustainable development pathway, four main aspects have been specified: 1. Energy efficiency improvement, 2. Energy transition, 3. Circular economy, 4. Other measures.



2.1 Energy efficiency improvement

Completed executions and the recent plans

259 improvement projects were completed in 2023, steam saving of 62.7 tons/hour, electricity saving of 9.1 thousand kWh/hour, fuel saving of 6.2 tons/hour, and annual carbon reduction of 358.5 thousand metric tons of CO_2e.

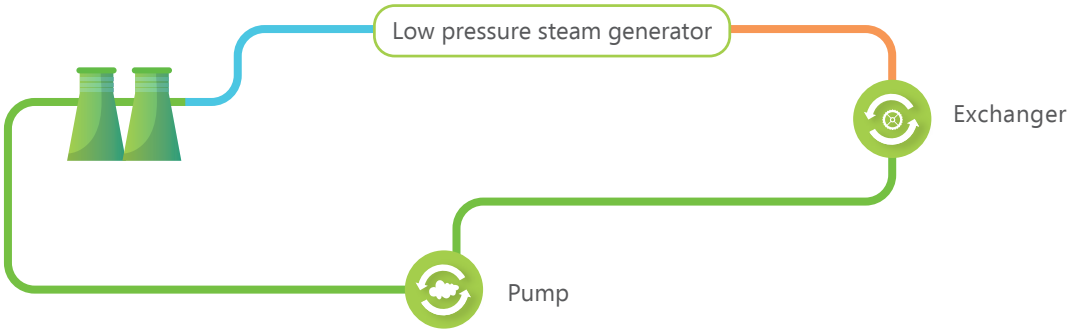
(1) Introduce Artificial Intelligence (AI) technology, implement process optimization, and reduce energy consumption necessary for production from the source.

(2) Recycle the waste heat from processes and conduct heat integration to reduce energy loss.

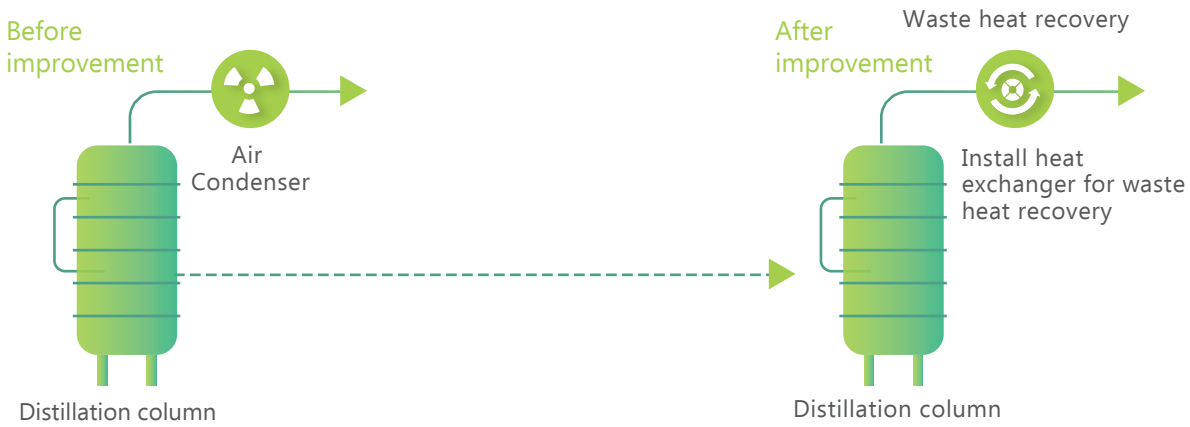
(3) Inventory the actual needs of processes for re-selection of appropriate equipment in order to improve energy efficiency.

Item	Completed in 2023	Estimation for 2024
Number of improvement projects (cases)	259	203
Steam saving (tons/hour)	62.7	69.4
Electricity saving (thousand kWh/hour)	9.1	7.5
Fuel saving (tons/hour)	6.2	0.1
Reduction of CO_2e (thousand metric tons/year)	358.5	207.0
Investment amount (NT$ hundred million)	16.4	17.1
Investment benefit (NT$100 million/year)	8.2	6.2

Heating furnace waste heat recovery system



A waste heat recovery system is installed at the top of the distillation tower



Future planning

In 2024, a total of 203 projects are expected to be implemented, the estimated investment amount is NT$1.71 billion, and the estimated annual carbon reduction is 207 thousand metric tons of CO_2e.

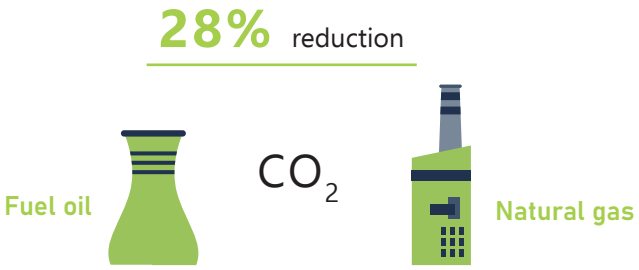
2.2 Energy transition

Completed executions and the recent plans

(1) Use of low-carbon energies: The goal is to change all 29 units of fuel-burning boilers to gas-burning boilers by the end of 2025. In 2023, 2 units of fuel-burning boilers were improved completely, with the annual carbon reduction of 3,527 metric tons of CO_2e.

Item	Unit	2020	2021	2022	2023	2024	2025	Total
Completed volume	ST	3	13	4	2	4	3	29
Carbon Reduction	metric tons/year	4,355	21,704	128,732	3,527	4,275	2,881	165,474

Greenhouse gas emission intensity comparison



(2) Reduction of coal: The cogeneration units in the plant sites are changed to steam power running to reduce the coal-fired power of the plant site and increase green power and low-carbon power consumption. In 2023, due to the increase of machine units running with the additional purchase of electricity from Taipower, the carbon emissions increased.

Year	Target for 2030	Actual data for 2023	Estimation for 2024
Carbon reduction amount (thousand metric tons/year)	826	0	0

Note: For the calculation of carbon reduction, 2020 is used as the base year.

(3) Development of green power: The goal is to achieve the installation capability of 72,000kW of green power by the end of 2030, including solar power generation of 49,000kWp and hydroelectric power generation of 23,000kW. In 2023, the new installation capacity was 8,138kW, and the accumulated installation capacity in 2023 was 39,991kW. The power generation in 2023 was 37,405 thousand kWh with an annual carbon reduction of 34,321 metric tons of CO_2e.

① Installation capacity planning

Year		Target for 2030	2023	2024	2025	2026~2030
Solar power generation (kWp)	Newly-installed	-	8,138	17,782	3,666	10,102
	Accumulated	49,000	17,450	35,232	38,898	49,000
Hydropower (kW)	Newly-installed	-	0	732	0	0
	Accumulated	23,000	22,541	23,273	23,273	23,273
Total (kW)	Newly-installed	-	8,138	18,514	3,666	10,102
	Accumulated	72,000	39,991	58,505	62,171	72,273

② Annual power generation

Year	Target for 2030	Actual data for 2023	Estimation for 2024
Solar power generation (thousand kWh)	60,094	13,986	33,146
Hydroelectric power generation (thousand kWh)	77,312	23,419	73,307
Total (thousand kWh)	137,406	37,405	106,453
Carbon reduction amount (metric tons/year)	127,238	34,321	93,689


Wushantou Power Plant


Xikou Power Plant


Hatta Power Plant


Installed hydroelectric power plant


Xingang Factory


Adding solar power generation equipment to the factory roof

Future planning

(1) Increase of energy efficiency: The hydrogen gas compressor of the original manufacturing process uses the return water steam turbine driving and self-generated low pressure steam for steam turbine power generation, but the energy use efficiency is 20~30% only and it also requires the use of a large amount of cooling water. It is planned to change such equipment to motor driving along with the use of electric compressors to increase pressure for heating of manufacturing process, thereby increasing the energy use efficiency.

(2) Low-level energy for high-level use: The residual heat of low-level manufacturing process cannot be reused but the air-cooled or water-cooled method must be adopted for cooling only. After the residual heat of low-level manufacturing process is recovered to generate low-pressure steam, the electric compressor can be used to increase pressure for the heating of the manufacturing process in the Company's own factory or other factories.

2.3 Circular economy

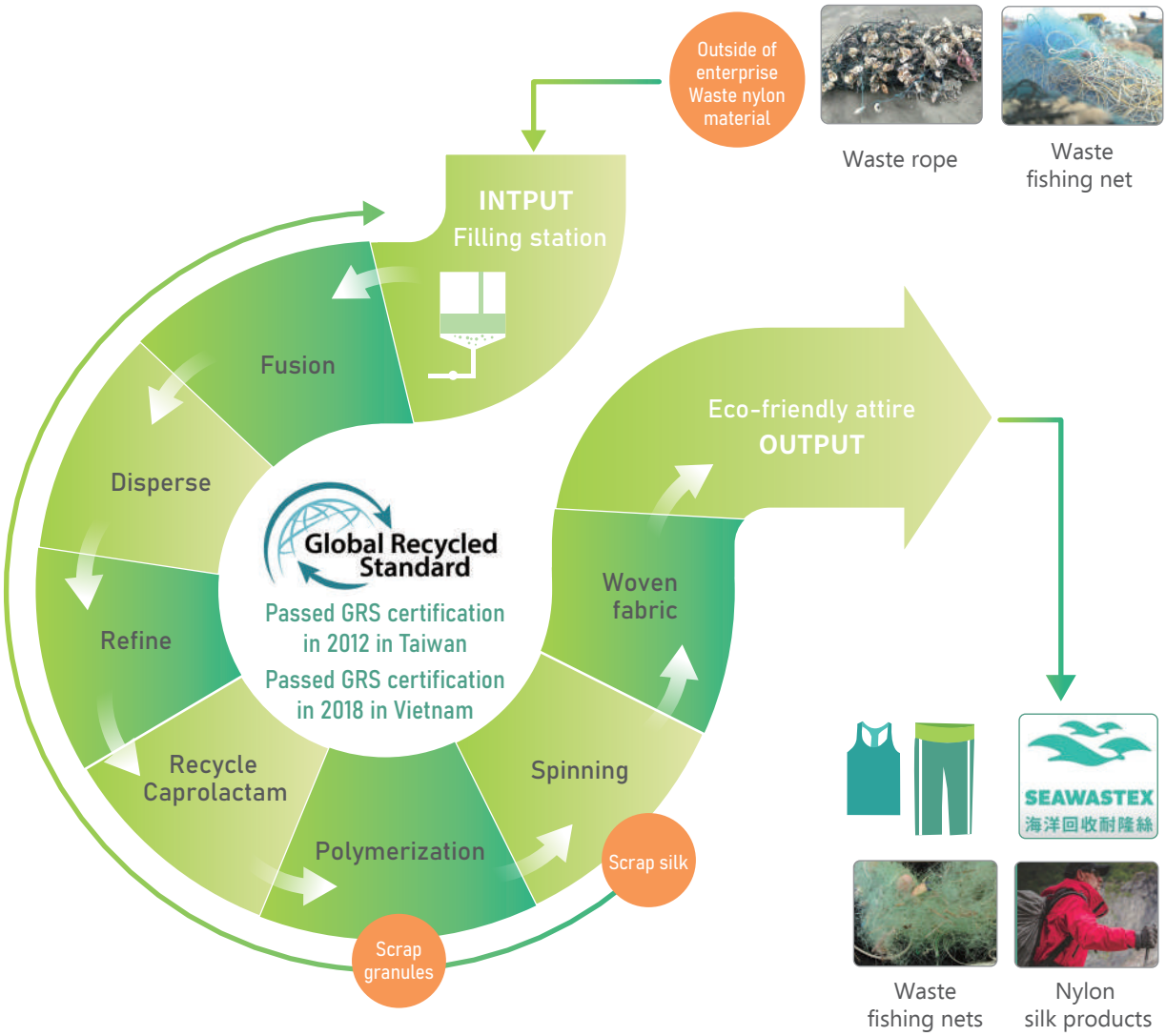
Completed executions and the recent plans

(1) CO_2 recycle and reuse: CO_2 generated from the manufacturing process of an acetic acid factory can be further converted into CO, and under the condition where the feed of naphtha is not increased, the CO production capacity can be increased. Carbon reduction amount in 2023 was 2,612 metric tons of CO_2e.

Year	Target for 2030	Actual data for 2023	Estimation for 2024
CO_2 recycle amount (metric tons/year)	9,400	2,612	8,681
Carbon reduction amount (metric tons/year)	9,400	2,612	8,681

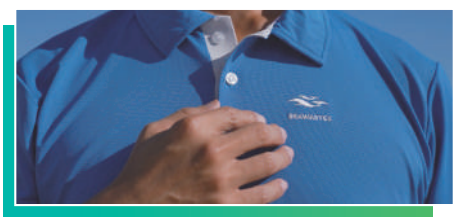
(2) Marine waste recycle and reuse: Waste fishing nets, and waste ropes (the main ingredient of Nylon 6, and the raw material of caprolactam (CPL) of Nylon 6 mainly comes from the petrochemical process) are recovered for the nylon recycling process. After the processes of fusion, dispersion, refinement, and filtering, the recycled nylon becomes CPL, following which it is manufactured into recycled and eco-friendly filaments that can be used for the manufacturing of outdoor sportswear and bicycle tire cord fabric. In 2023, the carbon reduction amount was 5,157 metric tons of CO_2e.

Year	Target for 2026	Actual data for 2023	Estimation for 2024
Sales Volume (tons/year)	9,000	2,316	6,960
As a percentage of the total sales	15%	6%	11%
Carbon reduction amount (metric tons/year)	20,039	5,157	15,496



Recycling process

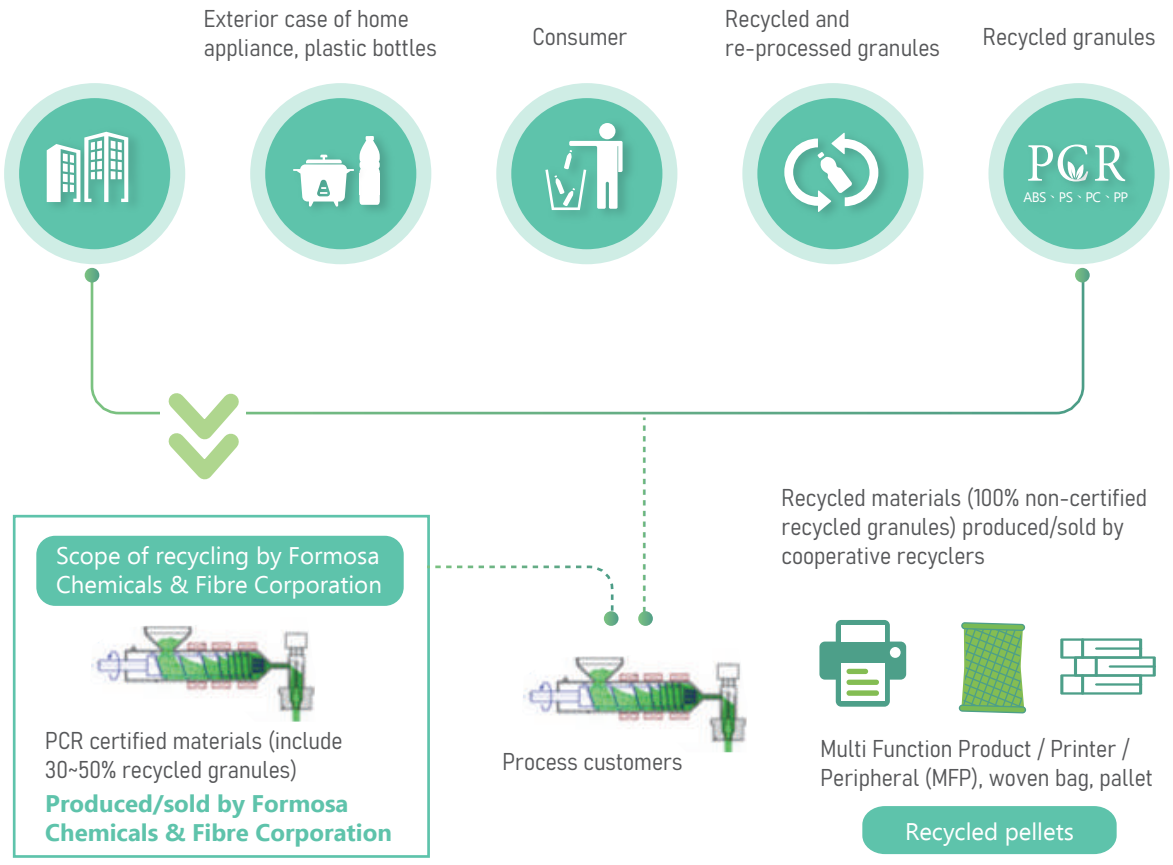
The recycled materials underwent the processes of fusion, dispersion, refine and filter to become Caprolactam (CPL) for reuse.



(3) Waste plastic recycle and reuse: Promotion of plastic pellets recycled products (ABS, PS, PC, PP)
Recently, brand manufacturers have consecutively announced the use of renewable materials, and the market demand for recycle material sources also increases gradually. Accordingly, it is important to obtain PCR material sources of high quality and stable supply. Typically, 100% PCR recycle pellets cannot satisfy customer demands due to limitations in the material's physical properties and quality. Despite such limitations, FCFC's technology development team is able to develop a formula to adjust the physical property according to customer demands, and third-party certification has also been obtained. Through stable production, rigorous quality control, and professional sales service, FCFC allows customers to obtain PCR eco-friendly recycle pellets capable of satisfying quality requirements. In 2023, the carbon reduction amount was 3,135 metric tons of CO_2e.

Year	Target for 2026	Actual data for 2023	Estimation for 2024
Sales Volume (tons/year)	16,000	2,898	6,843
As a percentage of the total sales of hard rubber	2.1%	0.4%	0.9%
Carbon reduction amount (metric tons/year)	17,312	3,135	7,404

FCFC performs compounding at PABS factory or PP factory in order to manufacture plastic eco-friendly recycle pellets containing 30~97% of renewable materials. The plastic recycle cycle and process are explained in the following:



(4) Eco-friendly yarn product: Waste PET bottles are recycled and re-fabricated to obtain polyester fibers for the yarn manufacturing process. With the use of different materials (such as natural cotton, rayon, etc.), eco-friendly yarn products satisfying customer demands can be manufactured, such that the yarns can be further used in the downstream production of daily living clothes and sportswear, etc. In 2023, the carbon reduction amount was 553 metric tons of CO_2e.

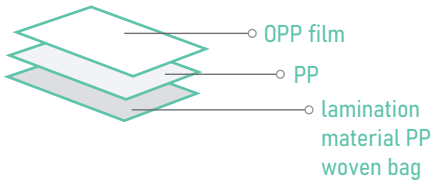
Year	Target for 2026	Actual data for 2023	Estimation for 2024
Sales Volume (tons/year)	1,356	246	603
As a percentage of the total sales of hard rubber	36.5%	6.9%	16.2%
Carbon reduction amount (metric tons/year)	3,052	553	1,357

(5) Eco-friendly woven bag/pallet: To continuously reduce the environmental burden, FCFC actively develops and promotes eco-friendly PP woven bags and eco-friendly pallets made of PCR, and they are applied to all product packaging bags and pallets of the Department of Plastics of FCFC. With the complete conversion and use of eco-friendly PP woven bags and pallets, the carbon reduction amount in 2023 was 1,349 metric tons of CO_2e.

Year	Target ratio in 2026	Actual ratio in 2023	Estimation for 2024
Sales Volume (tons/year)	1,094	647	710
Carbon reduction amount (metric tons/year)	2,282	1,349	1,481

Eco-friendly PP pallets

Eco-friendly PP woven bags



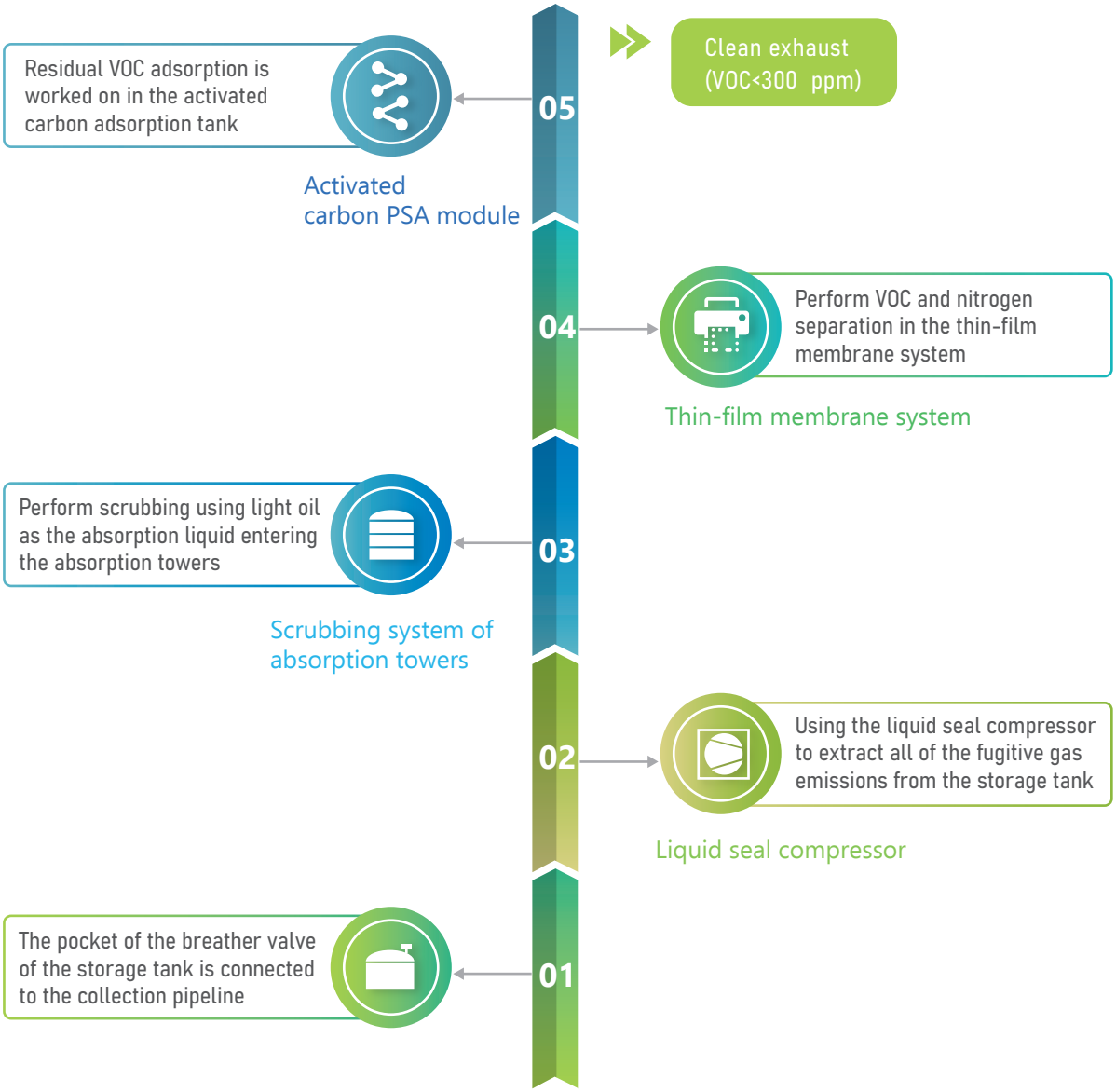
(6) Storage tank VOC recycle: Film recycle and treatment system is installed, and VOC escaping from the storage tank breather valve is properly collected, recycled and treated, followed by transmitting back to the process for use, in order to reduce emissions of waste gas. The carbon reduction amount in 2023 was 110.4 metric tons of CO_2e.

① Annual carbon reduction amount:

Year	Actual data for 2023	Estimation for 2024
VOC emissions reduction amount (metric tons/year)	114.02	114.02
Carbon reduction amount (metric tons/year)	110.4	110.4

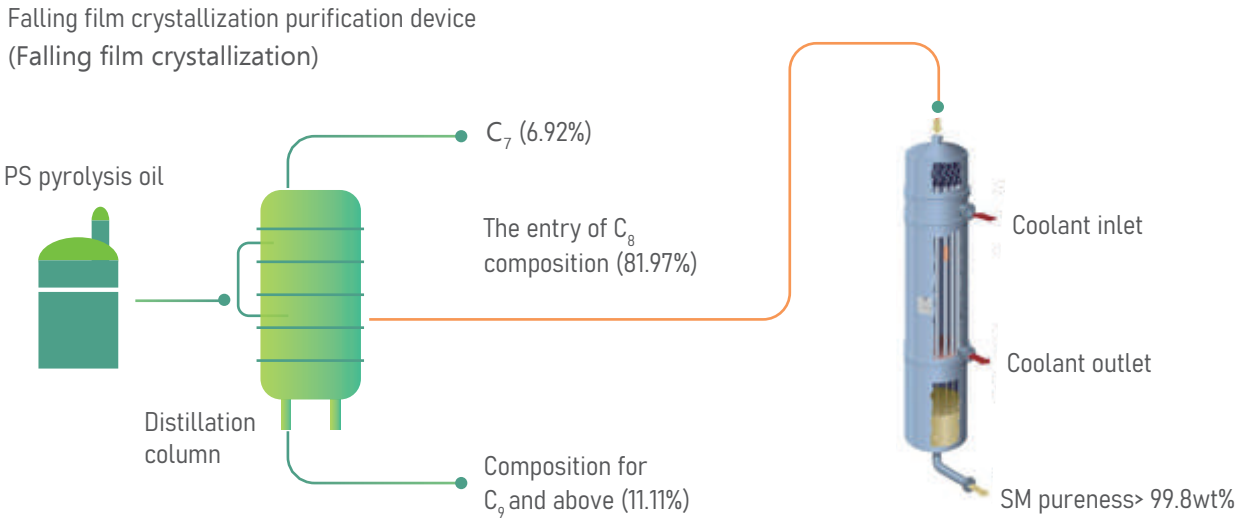
② Equipment improvement planning:

Department	Storage tank VOC emissions (metric tons/year)		Processing efficiency	Year of completion
	Before improvement	After improvement		
Chemical Department I	74.30	2.07	97.2%	2016
	51.97	15.58	70.0%	2022
Chemical Department II	6.50	0.30	95.4%	2023
Total	132.77	17.95	86.5%	-



Future planning

(1) Waste plastic chemical recycled pyrolysis oil: Due to quality of recycled material with the use of physical recycle method for plastics recycle, the issues of physical property deterioration and unstable processability are likely to occur during the manufacturing of products. To satisfy the use demand and the concept of circular economy, the Company will actively develop chemical recycle method for waste plastics. Through pyrolysis technology, it can be transformed into raw material with re-polymerization to form plastics. Accordingly, performance similar to new materials can be achieved, and the use of petrochemical raw material and carbon emissions can be reduced at the same time. For the early stage, the technology for separating and purifying styrene monomer (SM) from polystyrene (PS) pyrolysis oil will be developed, followed by applying such technology to the PCR plastic production.



2.4 Other measures

Completed executions and the recent plans

(1) Transportation low carbonization: Subsidy for employees' new purchase (replacement) of electric motorcycles is provided, of which the subsidy amount for new purchase of electric motorcycles is NT$10 thousand, and the subsidy amount for replacement of motorcycles is NT$16 thousand. In addition, the purchase of energy-saving company vehicles is also implemented as a priority. Fuel vehicles of the vehicle age above 11 years old are replaced first. For newly purchased passenger cars and trucks, energy-saving vehicle models (hybrid, electric vehicles, etc.) are selected as a priority for purchase. Up to 2023, the accumulated carbon reduction amount is 30.4 metric tons of CO_2e.

Year		Actual data for 2023	Estimation for 2024
Subsidy for electric motorcycles (units/year)	Newly-installed	25	30
	Accumulated	100	130
Purchase of energy-saving company vehicles (units/year)	Newly-installed	2	2
	Accumulated	11	13
Carbon reduction amount (metric tons/year)	Newly-installed	6.5	7.2
	Accumulated	30.4	37.6

Remarks:

i. Electric motorcycle carbon reduction amount: 55g/km for fuel motorcycle; 26.5g/km for electric motorcycle; driving distance: 20km/day × 252 days/year = 5,040km/year; carbon reduction amount is calculated based on 0.144 metric ton/unit.year

ii. Hybrid vehicle carbon reduction amount: 341g/km for fuel vehicle; 196g/km for hybrid vehicle; driving distance: 10,000km/year; carbon reduction amount is calculated based on 1.45 metric ton/unit.year.

Formosa Plastics Corporation's Subsidy Program for Employees' Purchase (Replacement) of Electric Motorcycles

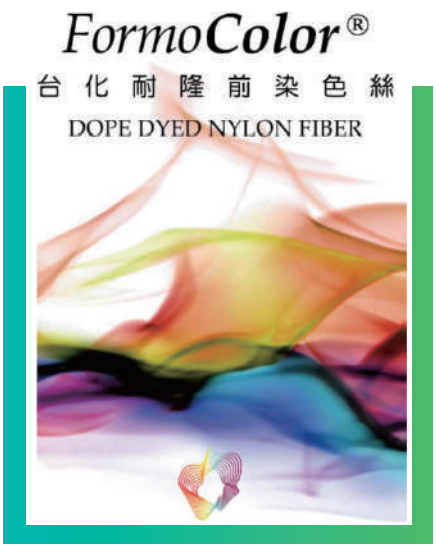
(2) Paperless office operation: iPADs are used for meetings and electronic document transmission and signing are implemented, in order to reduce paper printing. The carbon reduction amount in 2023 was 134 metric tons of CO_2e.

Year	2019	Actual data for 2023	Estimation for 2024
Total paper usage quantity (thousand sheets/year)	22,255	12,428	11,127
Usage reduction quantity (thousand sheets/year)	Base year	9,827	11,128
Carbon reduction amount (metric tons/year)		134	152

Note: Calculation of carbon emissions for papers: 7.2kg CO_2e/A4 per sheet, 6.48g CO_2e/black and white printing per sheet.

(3) Spun-dyed yarn: To satisfy the colors demanded by customers, yarn undergoes the DTY processing and weaving, followed by direct cutting into clothes, such that the dyeing procedure can be omitted, thereby reducing the dyeing and finishing cost and preventing the issue of wastewater discharge. Accordingly, the reduction of environmental pollution and carbon emissions can be achieved by providing an eco-friendly and low-carbon green product. Carbon reduction amount in 2023 was 667 metric tons of CO_2e.

Year	Target ratio in 2026	Actual data for 2023	Estimation for 2024
Sales Volume (tons/year)	2,400	413	1,200
Carbon reduction amount (metric tons/year)	3,876	667	1,938



Future planning

Bio-based polyamide PA11(Polyamide 11): PA11 is a monomer extracted from castor oil and undergoes polymerization to form PA11 nylon pellets. Since castor oil plants grow on dry land without the need for water irrigation and are inedible, the issue of biological competition for food and growing land does not exist. The Department of Fibers collaborated with a French enterprise to develop PA11 fibers that can be applied to shoe materials and garment fabrics. Accordingly, it is a low-carbon, biomass green product that can be recycled and reused.

3 Management of Climate Change Risks and Opportunities

3.1 Risk and opportunity identification process

With respect to the climate change risk identification method, we follow the Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017) and take into consideration transition risks (Policy and Legal/Market/Technology/Reputation) and physical risks (chronic and acute) when devising risk scenarios. Meanwhile, we provide risk descriptions for potential events, including the degree of financial impact, impact duration (short, medium, long), parties in the value chain impacted, and risk likelihood. When we create an opportunity scenario, we consider resource efficiency, energy, products and services, markets, and adaptability, and we make an opportunity description for events that may occur, including the degree of financial impact, impact duration (short, medium, long), parties in the value chain impacted, and risk likelihood.

Accordingly, to allow the internal of the Company to properly stipulate risk response strategies, the Company's Transition Development Project Team has been established. The climate change risk topic analysis process is as shown in the following diagram.

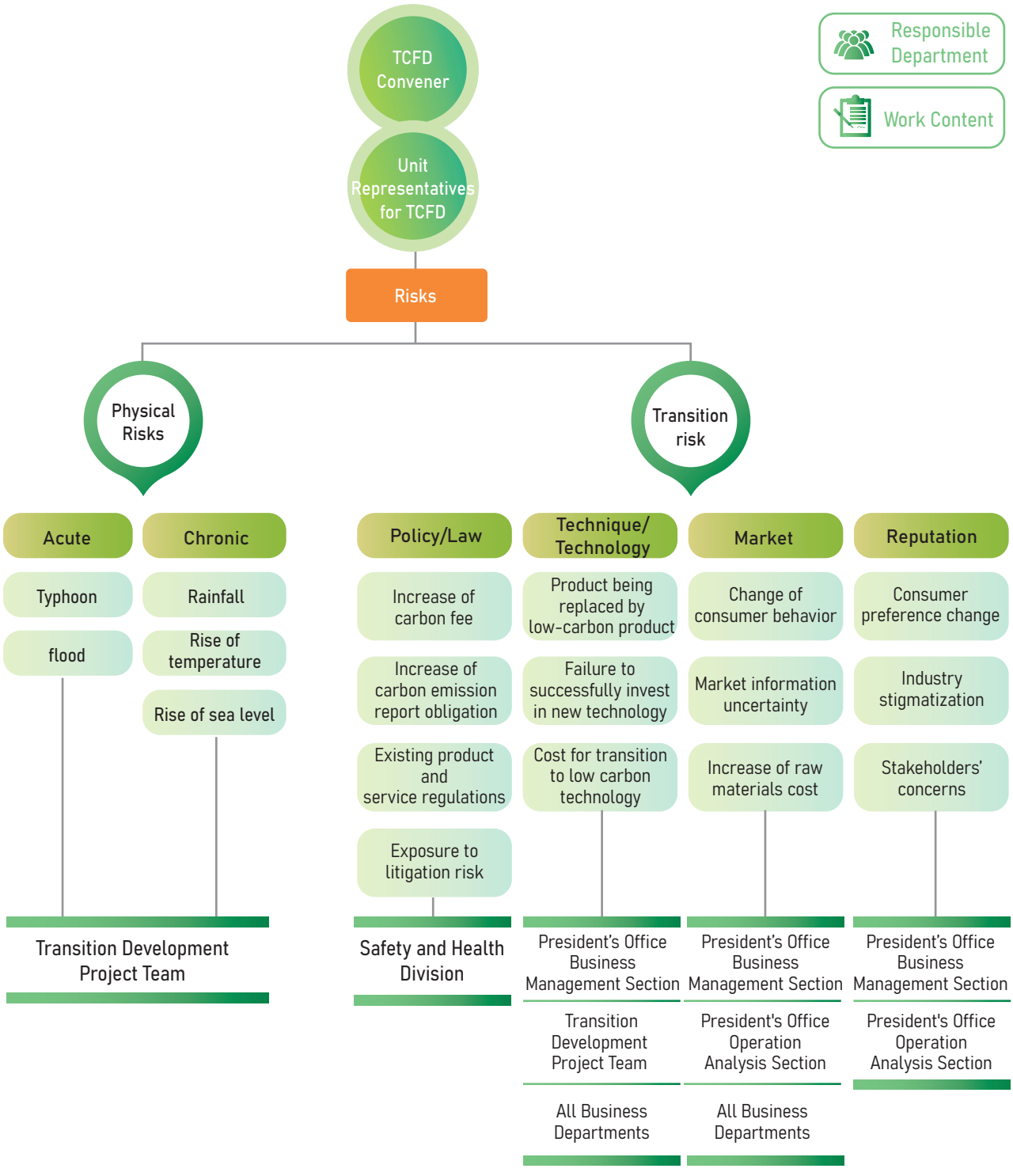
Climate change risk issue analysis process

Transition Development Project Team identifies and defines an environmental risk and opportunity inspection table annually. In the inspection table, for each risk type, a responsible person is designated for such risk, he/she is required to systematically collect risk related information. Risks and opportunities with impact period assessed to be less than 10 years are included in the aforementioned periodic goal planning procedure directly, in order to establish response plans. For risks and opportunities with an impact period assessed to be greater than 10 years, the Chairman reports such risks and opportunities to the Board of Directors during the annual business management meeting in order to establish specific response strategies. The Company's Transition Development Project Team is responsible for tracing the progress of the response plan through the "Monthly Energy Saving and Carbon Reduction Circular Economy Meeting".

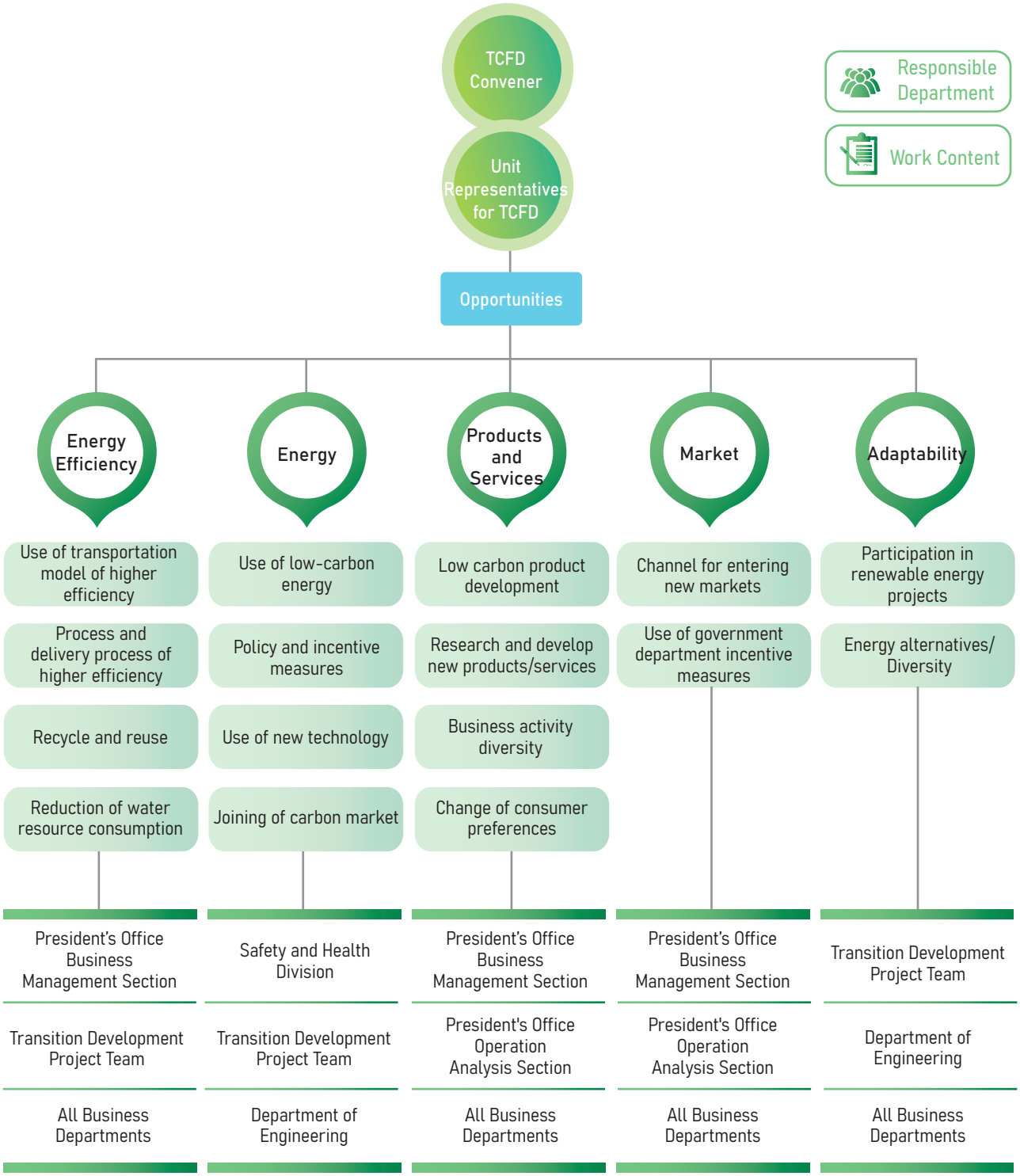
Each production department and the Safety and Health Department adopt a risk and opportunity matrix in the ISO 14001 environmental review guidelines to identify and evaluate the risks and opportunities related to climate change. The internal and external issues in the identification and assessment process are divided into physical risk and transition risk, including climate and weather, environmental policies and regulations, as well as market risk, including transportation and logistics and energy supply, reputation, and technology development.

In addition, due to the increasing impact of the ever-changing internal and external environments on the enterprise's operation, every change will pose a certain degree of risk to the enterprise. Therefore, the Company aims to minimize the impact of each risk. The defects in risk management can be reported to the Company's Audit Office, independent directors, or the Board of Directors. Each risk department self-assesses the identification mitigation execution performance for the risk items, and the President's Office of the Company also conducts performance evaluation and guidance to the risk departments.

Division of labor of climate change risk identification



Division of labor of climate change opportunity identification



The risk and opportunity matrix takes into account the factors of the probability of each risk and opportunity and the level of impact in order to classify the severity and occurrence probability of financial impact of risks and opportunities on the Company into five levels, and scores are provided for different financial impact and occurrence probability. The risk matrix completed according to the financial impact and weighted occurrence probability is as shown in the following:

Climate change financial impact and likelihood matrix

Climate Change Risk Matrix

Financial impact level: Potential impact amount (NT$)	Scoring of corresponding risk				
Above NT$8 billion	5	10	15	20	25
$4 billion to $8 billion	4	8	12	16	20
$500 million to $4 billion	3	6	9	12	15
$50 million to $500 million	2	4	6	8	10
$1 million to $50 million	1	2	3	4	5
	<20%	20%<X<50%	50%<X<75%	75%<X<95%	>95%
Occurrence probability	Rare	Unlikely	Possible	Likely	Almost certain

When confirming and assessing climate-related risks, the Company defines a financial impact of over NT$1 million as a material impact.

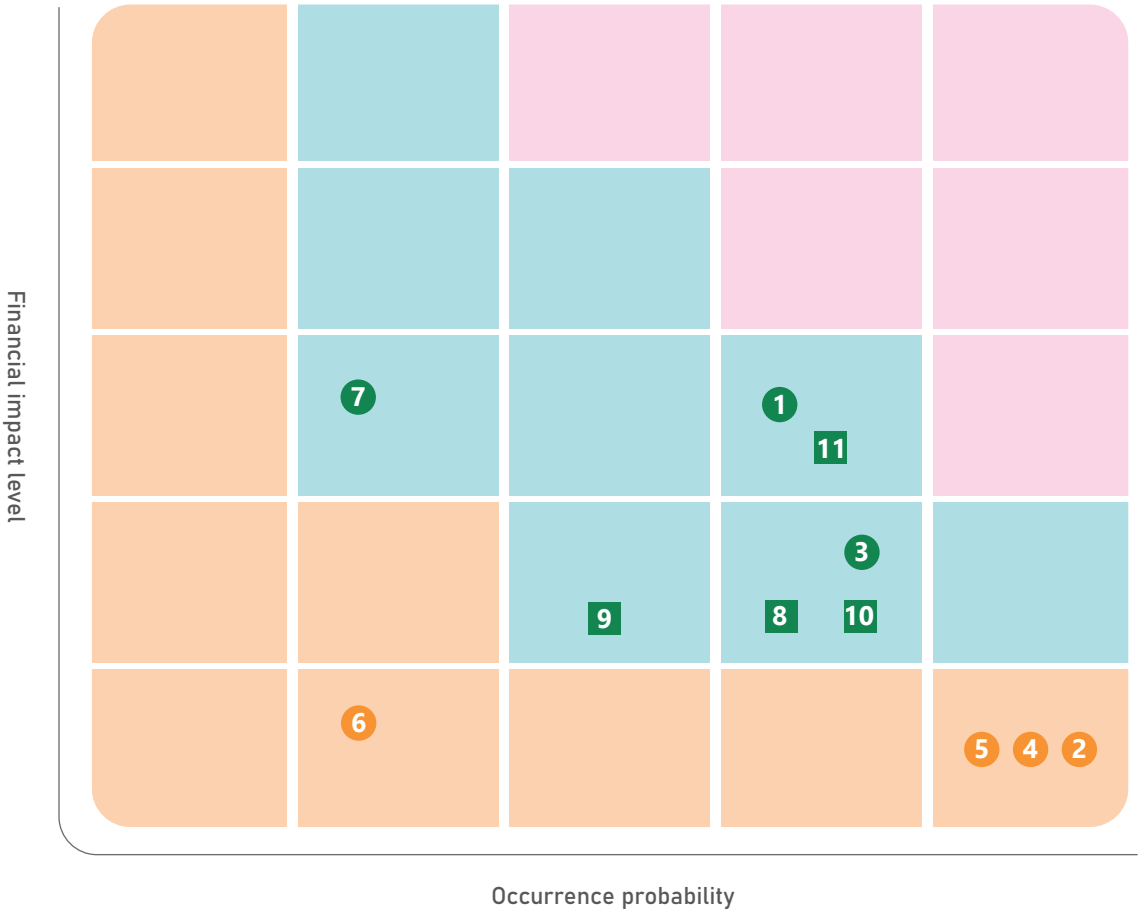
According to the results of the above risk and opportunity matrix, the risks and opportunities are classified as follows:

1. Score of 15-25 points:
   High risk - Corresponding response strategies shall be established in priority

2. Score of 6-14 points:
   Medium risk - Presently, action is not required to be adopted, and continuous monitoring is implemented

3. Score of 1-5 points:
   Low risk - Risk is acceptable

After the climate change risks and opportunities are assessed by each unit, the risks and opportunities are compiled into a risk-opportunity matrix correspondingly. The risk-opportunity matrix is as shown in the figure below



Major risk
Medium risk
Low risk
Major opportunity
Medium opportunity
Low opportunity

1 Proposed carbon tax collection
2 Collection of "Water Conservation Charge"
3 Levy carbon border tax
4 Impact of high-carbon products
5 Negative impact on reputation
6 Plant site flooding due to strong wind or typhoon
7 Water shortage or drought

8 Use recycled materials for products
9 Customer demands for carbon substitution products
10 Low carbon fuel or renewable energy
11 Diverse product applications

3.2 Climate Risk and Opportunity Topic and Financial Impact List

Risk/Opportunity Topic List

Topic No.	Risk/Opportunity Topic	Topic Description	Level of Impact (High, Medium, Low)
1	Risk/Policy and Regulations	To cope with the climate change, government plans to collect carbon tax in the future	Medium
2	Risk/Policy and Regulations	On February 1, 2023, the government started to collect the water conservation fee from large water consumption users with single-month water consumption amount exceeding 9000 tons (1m^3), and the water consumption fee rate is NT$3 per m^3 of water. To encourage large water consumption users to implement water-saving measures, as long as the water reclaim rate reaches the announced standard, the fee rate can be preferably discounted to NT$2 or NT$1 per m^3.	Low
3	Risk/Policy and Regulations	In 2026, the European Union (EU) will start to collect carbon border tax, and for the first stage, the direct emissions of five main industries and products of electricity, cement, chemical fertilizer, steel, and aluminum will be charged with the carbon border tax.	Medium
4	Risk/Technology	With increasing awareness in green consumption among customers, the number of clients who require eco-friendly products continues to increase. Therefore, if the product life cycle and product value chain are considered, high-carbon products will have an impact on the Company.	Low
5	Risk/Reputation	In recent years, with the boom in ESG, investment institutions will evaluate clients' ESG performance when evaluating their investments and lending. If a business fails to meet the ESG requirements, its reputation will be negatively affected.	Low
6	Physical Risk/ Chronic	FCFC considers the impact of strong winds or typhoons caused by abnormal climate events, it is necessary to provide safe parking at the plant site in order to prevent process hazard. Considering the impact of heavy rainfall/flood, operation at the plant site will be suspended due to flood, resulting in the risk of loss of revenue.	Low
7	Physical Risk/ Chronic	The period of 1986~2005 is used as the base period to predict the climate condition of the plant site in recent period (2016~2035). It is predicted that there will be two months of water shortage or drought every year. Water shortage or drought caused by abnormal climate will cause risks of revenue loss.	Medium
8	Opportunity/ Technology	Research and develop low-carbon products. From raw material recycling and reuse, recycling end customers' marine wastes for re-fabrication into products in order to reduce production costs and promote sustainable use of resources.	Medium
9	Opportunity/ Resource efficiency	Brand customers request company products contain PCR (Post-Consumer Recycled) material. With leading technologies, FCFC is able to provide such products earlier than other competitors, thereby increasing the company's revenue.	Medium
10	Opportunity/ Resource efficiency	The Company installs renewable energy systems, including solar and hydroelectric power, to satisfy the requirements specified in the Renewable Energy Development Act of R.O.C.	Medium
11	Opportunity/ Technology	On the requirements for renewable energy, as the Company's products are applicable for renewable energy equipment, we are able to seize the business opportunities arising from the policies driving green power and energy storage facility construction and increase our revenue.	Medium

Financial Impact of Risk Topic

Impact Scope Illustration: ▲ Upstream ● Operation ▼ Downstream

Topic number	Risk category/ Risk topic	Scope of impact	Level of impact	Topic analysis		
				Topic description	Potential financial impact	Management countermeasures (Eliminate risk/reduce/risk/accept risk)
1	Policy and Law/ Carbon Fee Collection	●	Medium	The Ministry of Environment announced the "Draft for Completion of Regulations Governing the Collection of Carbon Fees" in the newsletter of its official website on December 29, 2023, and the collection of carbon fees for GHG emissions in 2024 is planned to be started in 2025, and the subjects for the collection of carbon fees refer to electric power industry and manufacturing industry with the annual emissions reaching 25 thousand metric tons.	FCFC's GHG emissions are approximately 7.865 million metric tons, and after the deduction of the externally purchased steam, externally supplied electricity and emission allowance for carbon emissions, based on the fee rate calculation of NT$300/metric ton, the annual carbon fee cost is estimated to be NT$450 million~NT$1.35 billion, such that the Company's expenditure will be increased significantly.	1. Perform GHG inventory inspection annually, and determine emission sources. 2. Promote energy saving improvement and energy transition, in order to reduce GHG emissions. 3. Establish carbon reduction target and strategy, in order to obtain lower carbon fee discount rate. 4. Promote energy-saving technologies and obtain carbon reduction project subsidies. 5. Implement internal carbon pricing in order to use it as an important indicator for performance evaluation, production operation, and investment assessment, thereby maintaining competitiveness.
2	Policy and Law/ Collection of Water Conservation Charge	●	Low	On February 1, 2023, the government started to collect the water conservation fee from large water consumption users with single-month water consumption amount exceeding 9000 tons (1m^3), and the water consumption fee rate is NT$3 per m^3 of water. To encourage large water consumption users to implement water-saving measures, as long as the water reclaim rate reaches the announced standard, the fee rate can be preferably discounted. Before June 30, 2025, the water conservation fee is collected at a discount price of half of the original fee rate for large water consumption users.	During the dry season, for excessive water consumption, it is necessary to pay a water conservation fee (fee rate of NT$1~3/m^3). In 2023, the Company has paid NT$2.21 million; for 2024 and 2025, the Company is expected to pay NT$3.45 million annually; for 2026 and subsequent years, the Company is expected to pay NT$6.9 million annually.	1. Increase the water reclaim rate of each factory of the Company to reach the industry standard and above, such that the Company is able to enjoy the discount rate of NT$2/m^3 or NT$1/m^3. 2. For plant sites with water reclaim rates lower than the standard value, guidance on water consumption and reclamation is enhanced. 3. Apply AI technologies to increase the water saving amount for the entire company.
3	Policy and Law/ EU's collection of carbon border tax	▲ ●	Medium	On July 14, 2021, the EU announced the Carbon Border Adjustment Mechanism (CBAM) such that for high carbon emission products of cement, steel, electronics, plastic materials, plastics, petrochemical products imported to the Europe, it is necessary to declare the carbon emissions of the products, and carbon tax is collected, which is expected to be implemented in 2027. The collection method for the carbon border tax payment is based on the differences in the benchmark value for carbon emissions during the production process.	The future export products of the Company to the EU that may be affected mainly refer to plastics and organic chemicals, including PIA, PTA, ABS, PS, and PP, such that the Company's cost will be increased, which is unfavorable to product competitiveness. The export amount to the EU in 2023 was NT$2.01 billion, and based on the assumption of an increase of cost by 10%, then the cost would be increased by NT$201 million.	1. Continue to promote energy saving and carbon reduction, and implement energy transition and circular economy, in order to reduce the unit product carbon emissions. 2. Taiwan will start to collect carbon fees, and it can be used for deduction of carbon border tax collection.

Topic number	Risk category/ Risk topic	Scope of impact	Level of impact	Topic analysis		
				Topic description	Potential financial impact	Management countermeasures (Eliminate risk/reduce/risk/accept risk)
4	Market/Carbon reduction demanded by customers	▲●▼	Medium	For customers of textile products, to achieve the goal of net zero carbon emissions by 2050 according to the Paris Agreement, presently, some of the brand manufacturers have requested that more than 50% of the materials shall be recycled and re-fabricated in 2025, in order to reduce carbon emissions.	Staple fibre yarns for carbon-reduction products of "Eco-friendly yarn" are abundant in the market, such that based on the calculation assumption of price difference of NT$5,000/piece between conventional and eco-friendly yarns, with the production capacity of the Department of Textile of 20,000 pieces/year, and the target ratio of 24%↑, it is estimated that an amount of NT$24 million can be affected annually.	1. Manufacture and promote PET bottle recycled polyester yarns, and develop differential and high value low-carbon products while reducing the carbon footprint of textile products at the same time. 2. For the production of raw materials, in addition to Nan Ya Plastics, the Company has also obtained the information of numerous material source suppliers in order to replace raw materials at low prices, thereby reducing the production cost. 3 Develop white polyester fibers without the need for dyeing in order to reduce customers' subsequent dyeing process and to reduce the carbon footprint of products.
5	Company Reputation/ Reputation	●	Low	As ESG becomes more important, financial operators will consider the ESG performance of companies during the assessment of investment and loaning of funds. The Ministry of Finance requested all public banks to sign an agreement committing to stop financing coal power plants. Eight other private companies, such as Fubon Bank, have also joined in.	In case FCFC's response to climate change cannot satisfy the requirements of financial institutions, it would cause a negative impact on the Company's reputation, and if a financial institution is to increase its loan interest rate under such impact, the interest expense may be increased by NT$10 million to NT$50 million.	1. Actively participate in the Carbon Disclosure Project (CDP), TCFD advocacy and Science Based Target initiative (SBTi), etc., demonstrate the Company's determination in promoting ESG and carbon reduction outcome, in order to gain discount interest rate. 2. Continue to monitor the hydrogen energy development schedule and government's related regulations, and assess the most appropriate energy transition pathway. 3. FCFC engages with domestic banks of Taiwan Cooperative Bank and Hua Nan Commercial Bank for the "Sustainability Linked Loan". In the future, when the Company complies with the ESG KPI specified by the banks, FCFC will be able to obtain an interest rate discount.
6	Acute Physical Risk/Flooding	●	Low	Due to the impact of heavy rainfall/flood caused by abnormal climate, operation at the plant site will be suspended due to flood, resulting in a loss of revenue.	Based on the calculation assumption of the revenue of NT$212.98 billion in 2023, it is estimated that the suspension of operation would cause the loss of revenue of NT$584 million per day.	1. Periodically monitor and manage the energy consumption and water consumption of each plant site on a monthly basis and establish climate change countermeasures to mitigate the risk arising from climate change. 2. All plant sites will increase the height of all major drainage cutter embankment, install additional flood gates and pumps, in order to prevent flooding at plant sites.

Topic number	Risk category/ Risk topic	Scope of impact	Level of impact	Topic analysis		
				Topic description	Potential financial impact	Management countermeasures (Eliminate risk/reduce/risk/accept risk)
7	Chronic Physical Risk/Water shortage	●	Medium	The impact of water shortage caused by abnormal climate is considered. Under the condition of restricted water supply, if the such condition cannot be improved, reduction of production will be adopted for manufacturing processes. In case of severe water shortage condition, production load reduction or suspension of operation will occur.	According to the water shortage response measures for the Mailiao Plant established by the Company, when the Mailiao Plant faces a water supply restriction of 10%, the Company will adopt the measure of reducing the production capacity of the PTA factory to 80% and the production capacity of the PC factory to 90%. Assuming that a water supply restriction of 10% occurs for a period of 4 months in the future, then the Company's revenue of NT$1.29 billion can be affected.	1. Promote emergency water saving measures. 2. Longde Plant is installed with a drought-relief well of 10st, and its water supply capacity is approximately 49,000 tons/day. 3. Xingang Plant is installed with a drought-relief well of 12st, and its water supply capacity is approximately 30,000 tons/day. 3.Mailiao Plant has installed a seawater desalination plant with a daily capacity of 100,000 tons in order to be used as one of the water sources during the dry season. Examples: 1. For air cooled + water cooled cooling system, the air cooled load is assessed to be increased for a short term, in order to reduce the water cooled evaporation loss. 2. For the cooling tower effluent reclamation system of phenol plant, the water quality is assessed to be reduced for a short timer, in order to increase the water production volume.

Financial Impact of Opportunity Topic

Impact Scope Illustration: ▲ Upstream ● Operation ▼ Downstream

Topic number	Opportunity Type/Topic	Scope of impact	Level of impact	Topic analysis		
				Topic description	Potential financial impact	Management countermeasures
8	Technology/ Circular economy	▲ ● ▼	Medium	Considering the product life cycle and product value chain, the Company invests in the research and development of low-carbon products. With raw material recycling and reuse as well as process improvement, development is implemented, and a circular economy is introduced. In addition to recycling and reuse of scraps generated from the manufacturing process, we further recycle marine wastes from end customers in order to reduce production costs and promote sustainable use of resources at the same time.	For the raw material of caprolactam (CPL) of nylon fiber products, to achieve environmental sustainability and to expand circular economy, FCFC increases the use of recycled materials (marine wastes or nylon 6 recycled and purified materials) for recycling and re-fabrication into CPL. The sales volume target is NT$750 tons/ month, and based on the estimation of NT$25,270 per ton of benefit gained from the recycling and re-fabrication of fiber products, the annual benefit is estimated to be NT$230 million.	FCFC implements a circular economy and develops PCR (post-consumer recycled resin) material in order to effectively reduce petrochemical raw materials and product carbon emissions. <Case Example> Marine wastes - waste fishing nets and ropes are recycled and re-fabricated into CPL, which can be further manufactured into nylon filaments via polymerization and spinning process, in order to be used in the production of functional, outdoor wear and sportswear. Accordingly, low energy consumption and green products can be achieved from raw materials to the manufacturing process. We will continue to develop the recycling of qualified fishing nets, ocean waste nylon and other recyclable nylon products in Taiwan and overseas.
9	Resource Efficiency/Reuse of wastes	●	Medium	Brand customers request company products to contain PCR (Post-Consumer Recycled) material. If the Company is able to provide such product, the Company's revenue can be increased.	Based on the estimation of the Department of Plastics, with annual sales of 16,000 tons and a sales amount of NT$33/kg, it is estimated that revenue amount of approximately NT$530 million/year can be affected.	Products made of new material containing 30%~97% of PCR plastic pellets are sold to brand customers, in order to satisfy customers' demand for PCR materials. <Case Example> Brand customers request that the Company's products must contain PCR (Post-Consumer Recycled) material. If the Company is able to provide such product, the Company's revenue can be increased.
10	Resource Efficiency/ Renewable energy	●	Medium	The amendment to the "Renewable Energy Development Act" in Taiwan was officially passed in April 2019. According to the law, it is necessary to install 10% of the contracted capacity of renewable energy power generation facilities and storage facilities or to purchase renewable energy certificates within five years; otherwise, monetary substitution must be paid.	Based on the estimation of the solar power capacity of 38,898kWp, the benefit is estimated to be NT$91,427 thousand/year. With the hydropower capacity of 23,273, the benefit is estimated to be NT$155,356 thousand/year. Accordingly, the total benefit is estimated to be NT$247 million/year.	1. Solar Power (1). The Company installed solar power capacity of 1,497kWp at the Xingang Plant in 2018; (2). According to the statistics up to 2023, the solar power capacity for the solar power facilities installed by the Company at the roofs of Xingang, Mailiao, Longde Plants has achieved the grid-connected capacity of 17,450kWp. The capacity for sites under construction and design is 15,007kWp, and the capacity for sites under planning is 6,441kWp, which is expected to be completed in 2025.

Topic number	Opportunity Type/Topic	Scope of impact	Level of impact	Topic analysis		
				Topic description	Potential financial impact	Management countermeasures
10	Resource Efficiency/ Renewable energy	●	Medium			2. Hydropower: (1). The Company has invested in the hydropower of the capacity of 22,466kW for three water reservoirs of Jia Nan Enterprise. (2). Xingang Lan Pond water distribution pipe small hydropower of 75kW has been completed in 2022. (3). Taichung Shalu hydropower of 732kW is expected to be completed in 2024. 3. Presently, for the projects up to 2025, the Company's accumulated solar power capacity is 38,898kWp and hydropower capacity is 23,273kW. In addition to the bulk sale of electricity to Taipower and self-use of the green electricity, the Company can also perform trading in the renewable energy market.
11	Technology/ Product application diversity	●	Medium	Presently, for the domestic market, to enhance power supply stability and development of renewable energies, the Ministry of Economic Affairs (MOEA) has set up three main goals increasing the net supply capacity to greater than 3,000MW, installation of renewable energy storage capacity reaching 1,500MW, and installation of solar power/ offshore wind power achieving 20GW/5.6GW respectively by the end of 2025. To cope with the government's policies, the entire nation will accelerate the construction and installation of green electricity and energy storage equipment. Accordingly, FCFC is expected to seize business opportunities from the implementation of the aforementioned policies.	The Department of Plastics has estimated that the business opportunities for the plastic materials consumed by new energy vehicles, solar power energy storage tank, portable energy storage devices and charging piles is NT$580 million. The monitoring system developed by the Department of Engineering is able to save software expense of NT$15/(year kWp)×85,670kWp=NT$1,285 thousand/year.	1. The composite materials of the Company's Department of Plastics PABS factory can be used in the applications of cable trays, pipes, connectors of solar power and wind power equipment as well as the casing of charging piles and energy storage cabinet equipment. 2. The Automatic Control Division of the Department of Engineering has self-developed a monitoring system, such that in addition to solar power equipment monitoring, it can be integrated with the department's AI technology in order to provide system failure diagnosis and early warning functions. Accordingly, it can be applied to the projects of the Company, the Company is also able to seize business opportunities of other enterprises outside the Company. 3. The Electrical Equipment Division of the Department of Engineering has developed the microgrid system, integrating solar power, energy storage, and charging piles. In view of the growth of renewable energy and the government's promotional policy, it is expected to have great business development opportunities.

3.3 Climate Risk Scenario Analysis

As per the TCFD's recommendations, the Company adopts the worst-case scenarios for the transition and the physical risks and includes the analysis results in the strategic resilience assessment.

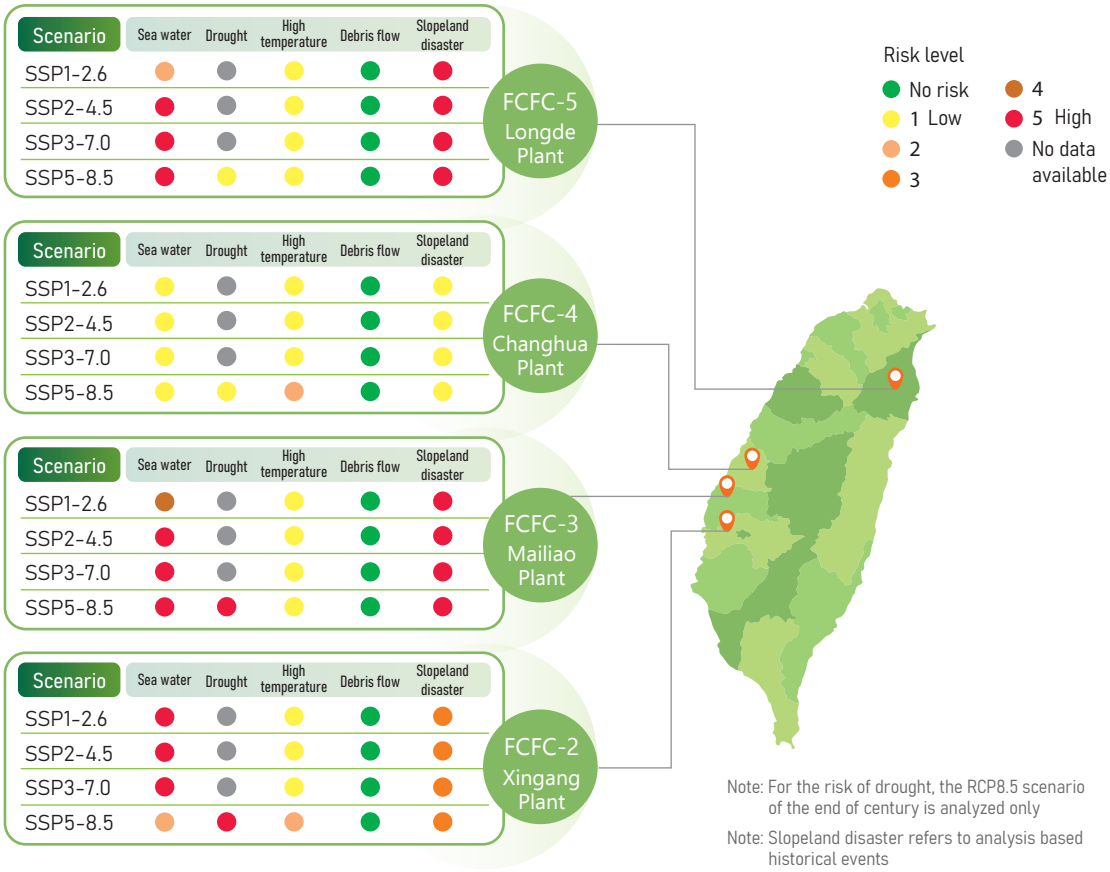
The transition risk refers to the IEA WEO 450 Scenario (2016) and the Nationally Determined Contribution (NDC) target set by each manufacturing site. In Taiwan's Intended Nationally Determined Contribution (INDC) report in 2015, the GHG emissions are set to be reduced by 50% by 2050 based on the business-as-usual (BAU) scenario. Under such a scenario, the power generation structure in 2025 will be 20% renewable energy, 30% coal, and 50% gases. After the above scenarios are imported, the impact on the Company in terms of market, technology, reputation, finance, and operations in the future is analyzed.

The physical risk scenarios adopt the five scenarios of (SSP1.SSP2.SSP3.SSP4.SSP5) of the "Shared Socioeconomic Pathway (SSP)" proposed by the IPCC AR6 (The Sixth Assessment Report of the Intergovernmental Panel on Climate Change), in order to analyze the future change of climate change key indicators of domestic temperature rise, rainfall, flood, and drought under different GHG emissions scenarios (Shared Socioeconomic Pathways (SSPs). Relevant data sources include the Climate Change Knowledge Portal, Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP), and the National Science & Technology Center for Disaster Reduction, such that climate disaster risk can be determined according to the climate change key indicator result. Please refer to the following table for details of the scenarios.

SSP 5-8.5 Summary Table of Scenarios Under Different Climate Change Key Indicators

	Mailiao Plant	Xingang Plant	Changhua Plant	Longde Plant
Scenario Analysis	Prediction is made according to the scenarios of SSP1. SSP2. SSP3. SSP4. SSP5, and the SSP 5-8.5 scenario is used to perform extreme climate risk assessment			
Mean temperature (temperature change in degrees Celsius)	1.6 °C (1.1°C - 2.3°C)	1.6 °C (1.1°C - 2.3°C)	1.6 °C (1.1°C - 2.3°C)	1.6 °C (1.1°C - 2.3°C)
Daily maximum high temperature (temperature change in degrees Celsius)	1.5 °C	1.5 °C	1.5 °C	1.5 °C
Heat Wave Duration Index (HWDI) (days)	70.7	54.9	54.8	40
Total rainfall (rainfall change rate %)	8.8% (-18.5% - 38.3%)	9.3% (18%-40.2%)	9.7% (-29.3 % - 39.4 %)	4.9% (-16.8%-30.2 %)
2060 flood line overflow risk	Not directly located in the overflow area, but there are within 500 meters	Not directly located in the overflow area, but there are within 500 meters	Not directly located in the overflow area, but there are within 500 meters	Not directly located in the overflow area, but there are within 500 meters
Sea level rise overrun risk (2m)	Not directly located in the overflow area, but there are within 500 meters	Not directly located in the overflow area, but there are within 500 meters	Not directly located in the overflow area, but there are within 500 meters	Not directly located in the overflow area, but there are within 500 meters
Longest consecutive days without rainfall in one year	62.4	54.7	63.6	22.6

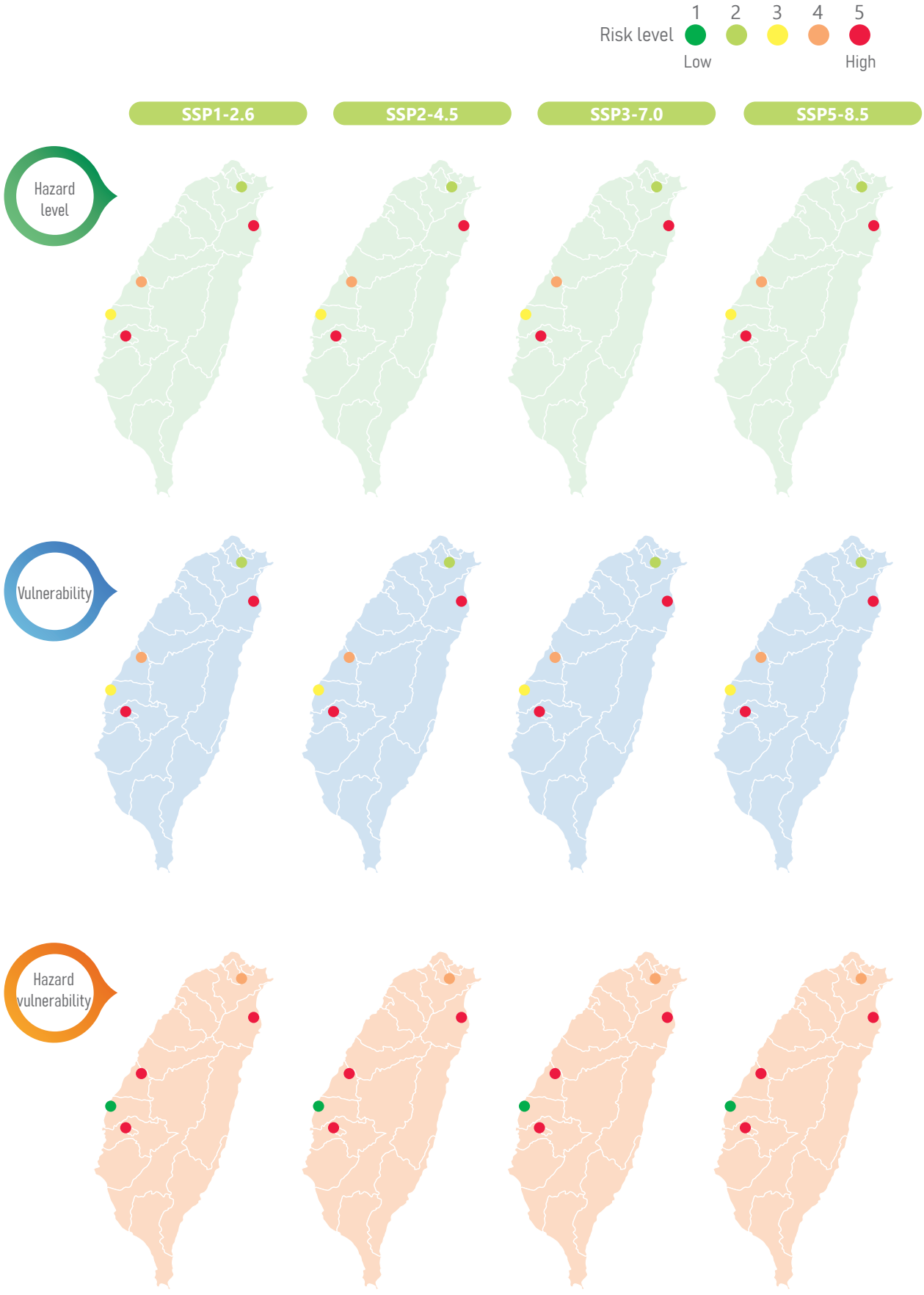
Plant Site Climate Disaster Risk Summary Table



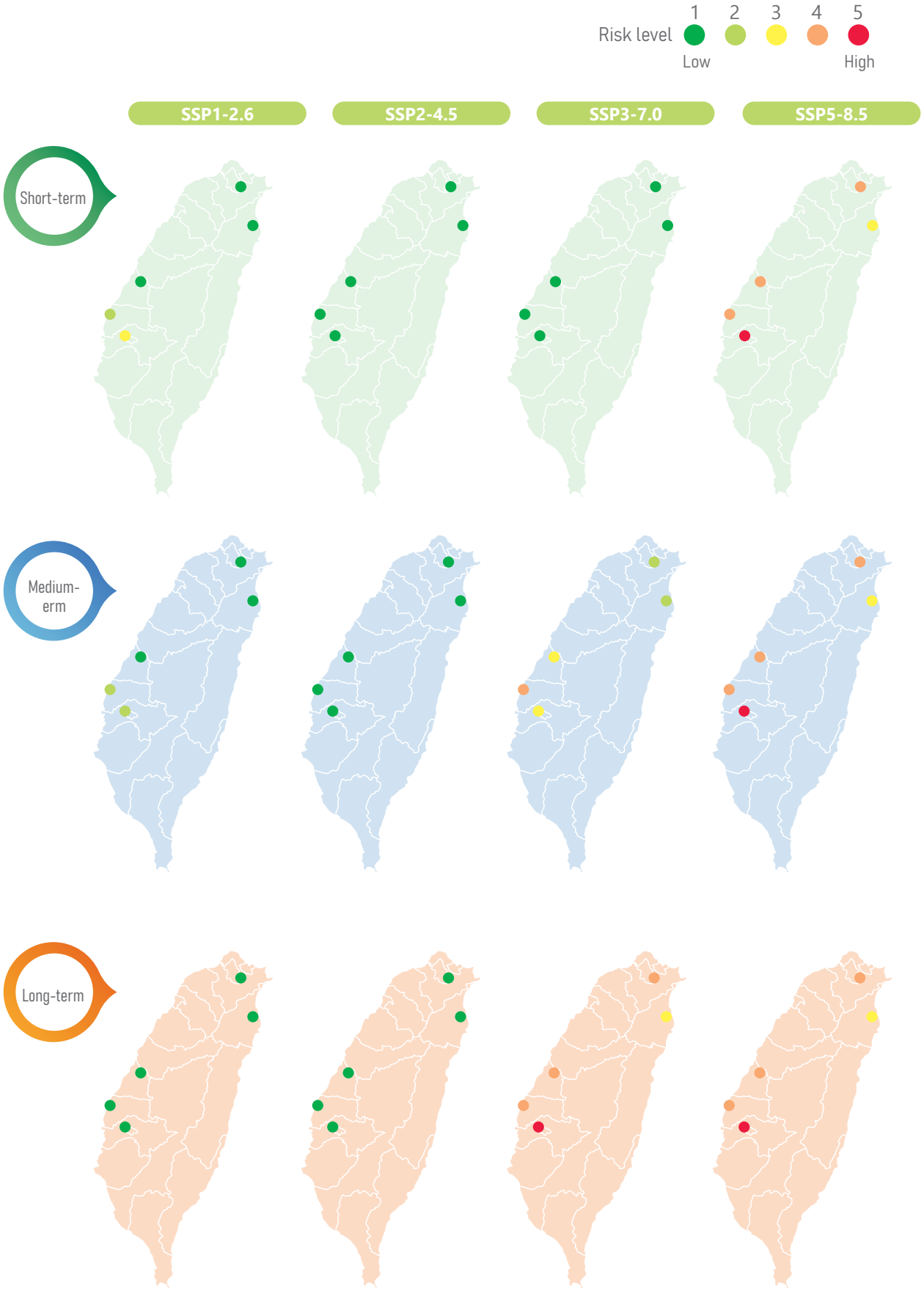
Note: For the risk of drought, the RCP8.5 scenario of the end of century is analyzed only

Note: Slopeland disaster refers to analysis based historical events

Mid-century flood disaster hazard - Vulnerability risk simulation summary map

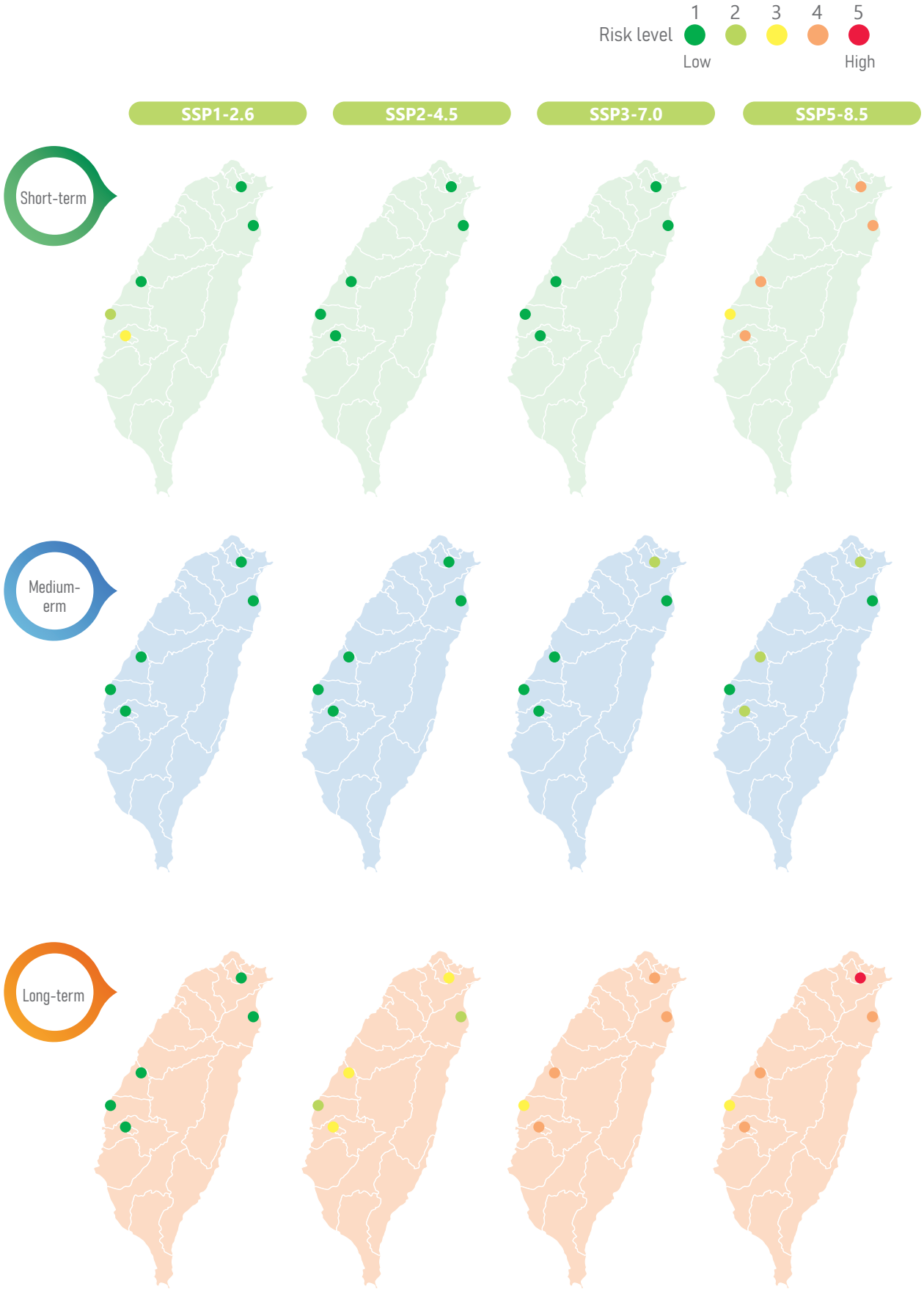


Drought disaster risk simulation summary map



According to the reference periods used in IPCCAR6, the future period is classified into short-term for 2021-2040, medium-term for 2041-2060, and long-term for 2081-2100.

High-temperature disaster risk simulation summary map



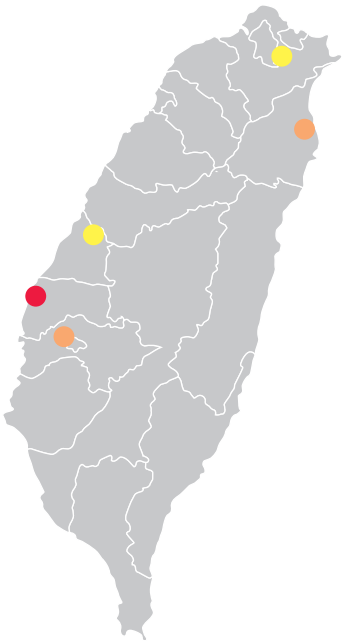
According to the reference periods used in IPCCAR6, the future period is classified into short-term for 2021-2040, medium-term for 2041-2060, and long-term for 2081-2100.

Slopeland disaster risk map

Disaster potential	FCFC-1 Taipei Office	FCFC-2 Xingang Plant	FCFC-3 Mailiao Plant	FCFC-4 Changhua Plant	FCFC-5 Longde Plant
Potential debris flow torrent	🟢	🟢	🟢	🟢	🟢
Large scale landslide potential area	🟢	🟢	🟢	🟢	🟢
Dip slope	🟢	🟢	🟢	🟢	🟢
Rock slide	🟢	🟢	🟢	🟢	🟢
Debris slide	🟢	🟢	🟢	🟢	🟢
Rockfall	🟢	🟢	🟢	🟢	🟢
Soil liquefaction potential area	🟡	🟠	🔴	🟡	🟠
Active faults	🟢	🟢	🟢	🟢	🟢

Risk level

- 🟢 No risk (no potential disaster area within the range of 500m)
- 🟡 Low risk (not located at the potential area directly, but within nearby 500m)
- 🟠 Medium risk (located at low potential area directly)
- 🔴 High risk (located at medium or high potential area directly)

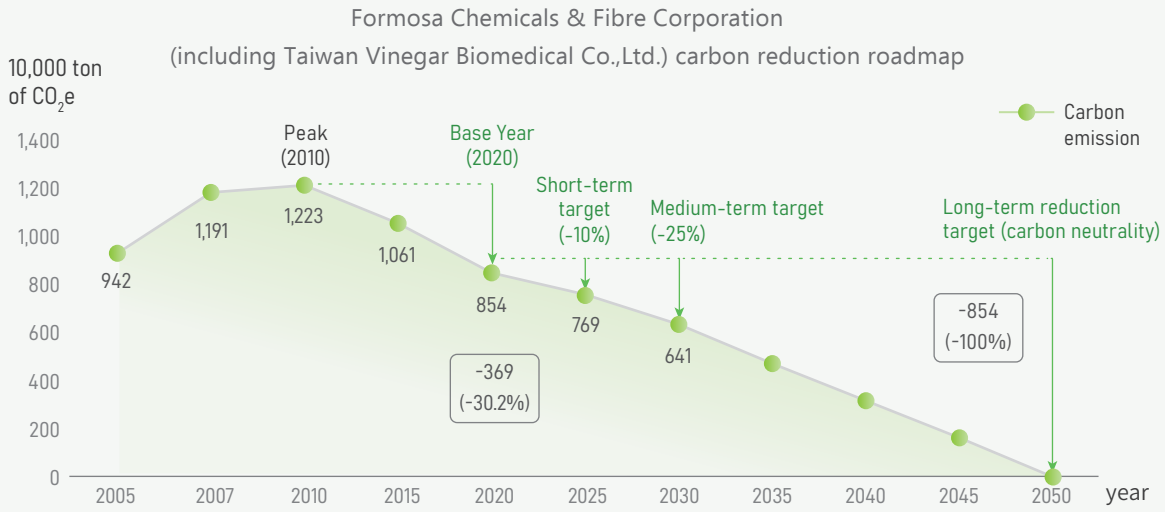


4 Indicators and Targets

4.1 Carbon Reduction Goal

The GHG emissions of the Company's plant sites in Taiwan have reached the peak value in 2010. In 2020, the GHG emissions were reduced by 30.2% from the emissions in 2010. The Company has announced 2020 as the base year, and the short, medium and long-term carbon emissions reduction targets have been established as described in the following:

- **Short-term target:** Reduction of carbon emissions by 10% from the base year in 2025.
- **Medium-term target:** Reduction of carbon emissions by 25% from the base year in 2030.
- **Long-term target:** Achieving carbon neutrality in 2050.



The Company has applied to participate in the SBTi initiative. With the goal of temperature rise not exceeding 2℃, we commit that for the reduction of Scope 1 and Scope 2 emissions, with 2018 as the base year, and the emissions target is to reduce 22.5% in the target year (2027) in comparison to the base year. In 2022, emissions were 9.735 million metric tons, a reduction of 23.3% from the base year.

Item	Base Year (2018)	Target year (2027) commitment		2022	
	Emissions (metric ton of CO_2e)	Emissions (metric ton of CO_2e)	Reduction ratio target	Emissions (metric ton of CO_2e)	Reduction ratio
Scope 1+Scope 2	12,684,787	9,830,750	22.5%	9,734,885	23.3%

Note 1: The scope of statistics for FCFC's Scope 1 and Scope 2 emissions application refers to the emissions of all plant sites in Taiwan of FCFC and Formosa Thermal Power (Ningbo) Co., Ltd.

4.2 Information on greenhouse gas emissions

Since 2009, the Company has promoted GHG emissions inventory inspection and verification operations according to the ISO 14064-1 standard. In addition, for Yunlin Mailiao Plant, British Standards Institution (BSI) is entrusted to perform verification, and for plant sites in Changhua, Chiayi Xingang and Yilan Longde, System & Serviced Certification Taiwan (SGS Taiwan) is entrusted to perform verification. After the verification was completed in 2022, the data was reported and registered on the National Greenhouse Gas Registration Platform at the end of August in accordance with the EPA's Greenhouse Gas Emissions Inventory Registration Management Regulations. The GHG emissions of the plant sites disclosed in this report refer to the data for 2022, as shown in the figure below:

2022 GHG Emissions

Unit: metric tons of CO_2e

Plant Site	Mailiao Plant (including Haifeng and Acetic Acid)	Xingang Plant	Changhua Plant	Longde Plant	Subtotal for each scope
Scope 1	1,727,498	1,727,980	942	1,242,260	4,698,681
Scope 2	2,973,281	167,725	25,569	13	3,166,588
Subtotal for each plant	4,700,779	1,895,705	26,511	1,242,273	7,865,269

The Company conducts an annual inventory of the relevance and emission data of Scope 3 and such data has been verified by a third party (please refer to Table 4.2-1 for details).

Scope 3 Emissions in 2022

Scope 3 Emission Source	Relevance	Emissions (metric ton of CO_2e)	Calculation Scope
Products and services purchased	Relevant and counted	5,647,605.0736	The present inspection scope refers to manufacturing-related emissions of key raw materials for the first stage of 2022. After the deduction of fuel and energy as well as returned products, the carbon emissions of purchased products accounted for approximately 81.15% of the procurement amount.
Capital goods	Relevant and counted	92,667.9608	The present inspection scope covers the carbon emissions of 100% of fixed assets acquired in 2022.
Fuel and energy-related activities (not included in Scope 1 or 2)	Relevant and counted	829,339.1742	The scope of this inventory covers 100% of fuel and energy activities not included in scope 1 or 2, such as coal, pyrolysis low sulfur fuel oil, and natural gas, as well as energy extraction and transport activities.
Upstream transportation and distribution	Relevant and counted	17,994.9057	The scope of this inventory covers 100% of emissions from the first-tier raw material suppliers' transport activities.

Scope 3 Emission Source	Relevance	Emissions (metric ton of CO_2e)	Calculation Scope
Business waste output	Relevant and counted	3,986.8136	The scope of this inventory covers 100% of the emissions from the disposal of business waste.
Business trips	Relevant and counted	89.2574	The scope of this inventory covers 100% of the emissions from business trips by air.
Employee commuting	Relevant and counted	214.802	The scope of this inventory covers 100% of the emission from transportation services of vehicles used for employee commuting.
Upstream asset leasing	Irrelevant	-	The Company does not engage in upstream asset leasing activities.
Downstream transportation and distribution	Relevant and counted	355,345.7745	The scope of this inventory covers 100% of products shipped to main clients.
Processing of sold products	Relevant and counted	4,640,124.3981	The boundary setting of the present inspection refers to the products of top five sales amount in 2022, and the carbon emissions of key processing procedure of next stage.
Used of products sold	Irrelevant	-	The Company manufactures plastic raw materials. Our products need to be processed after being sold, and our products after sold do not produce greenhouse gas emissions.
Final disposal of products sold	Relevant and counted	7,454.8532	Accordingly, the boundary setting of the present inspection refers to the packaging materials used in the products sold in 2022, and the carbon emissions from the final disposal thereof.
Downstream asset leasing	Irrelevant	-	The Company does not engage in downstream asset leasing activities. None of the downstream assets leased generated additional greenhouse gas emissions in 2022.
Franchising	Irrelevant	-	The Company does not have franchise rights.
Investment	Relevant and counted	2,893,446.0524	For the GHG emission source assessment of the Company, the calculation scope refers to the GHG emissions of investees directly invested by the Company as disclosed in the annual report.

4.3 Other Indicators

FPC's other energy saving and carbon reduction targets are as follows:

1. Water Resource Management:

In addition to the methods of process improvement, equipment performance enhancement, operating criteria optimization, waste recycling, and reuse, FCFC also promotes rainwater recycling and reuse to increase water consumption efficiency. Accordingly, the target product unit's water consumption shall be 5% less than the average value of the previous year.

2. Product carbon footprint inspection performed in 2023:

To enhance the carbon management, in addition to the establishment of the carbon emission target, FCFC has declared to perform product carbon footprint inspection in 2023.

3. Electricity for the office area and control rooms of the plant sites will completely use renewable energy in 2024:

FCFC plans to gradually increase the renewable energy use ratio via the methods of self-installation of renewable energy power generation facilities. The 2024 renewable energy target is to completely use renewable energy for the electricity consumption of the office area and control rooms of the plant sites.

5 Appendices

Report management

This report covers the period of January 1, 2023~December 31, 2023.

- Preparation frequency of this report: Annually
- This report has been prepared primarily based on the Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017).
- Report Contact Information
  - Lai Yin-Ming, Senior Engineer
  - Transition Development Project Team
  - TEL: (02)27122211 #5423
  - Email: ymlai.egr@fcfc.com.tw

TCFD Report Index

Themes	TCFD Recommended Disclosure	Corresponding Pages
Governance	Describe the board's oversight of climate-related risks and opportunities.	P3-P5
	Describe management's role in assessing and managing climate-related risks and opportunities.	P3-P5
Strategy	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	P6-P18
	Describe the impact of climate-related risks and opportunities on the organization's business, strategy, and financial planning.	P6-P18
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	P6-P18
Risk Management	Describe the organization's processes for identifying and assessing climate-related risks.	P19-P35
	Describe the organization's processes for managing climate-related risks.	P19-P35
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	P19-P35
Metrics and Targets	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	P36-P39
	Disclose Scope 1, Scope 2, and if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	P36-P39
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	P36-P39

Formosa Chemicals & Fibre Corporation

Address : No. 388, Sec. 6, Nanjing E. Rd., Neihu Dist., Taipei City, Taiwan
Tel:886-2-27122211#5423
Fax:886-2-27133229
Email:ymlai.egr@fcfc.com.tw