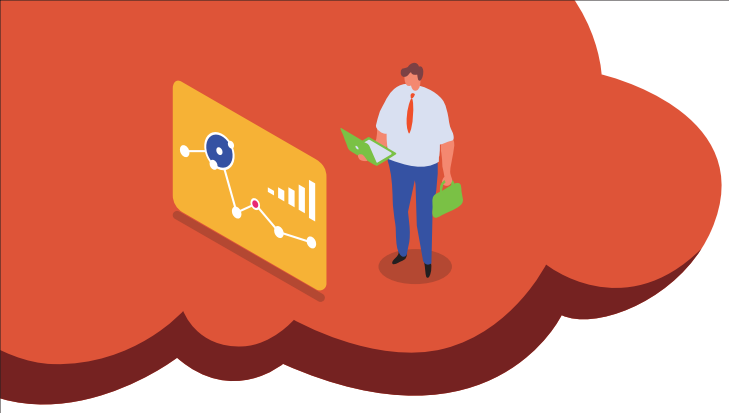


2022 TCFD

Formosa Petrochemical Corporation

Task Force on Climate-related Financial Disclosures (TCFD) Report

CONTENTS

Preamble

In recent years, the phenomenon of climate warming caused by greenhouse gas emissions has posed significant risks to the global economy, thereby impacting numerous enterprises. However, investors have perennially grappled with identifying companies that are susceptible to climate-related risks, those that have undertaken sufficient preparedness measures, and those that are actively taking remedial actions. Consequently, the Financial Stability Board (FSB) established a specialized task force known as the Task Force on Climate-Related Financial Disclosures (TCFD). Over a span of 18 months, this task force diligently sought input from prominent figures in the commercial and financial sectors. In June 2017, they successfully completed the "Recommendations of the Task Force on Climate-Related Financial Disclosures," which expound on comprehensive disclosure mechanisms for addressing the risks and opportunities arising from climate change. These recommendations aim to furnish enterprises and investors with a robust framework that can be effectively integrated into financial reporting practices.

In line with prevailing international trends, Formosa Petrochemical Corporation (hereinafter referred to as Formosa Petrochemical) endeavors to align its practices with the recommendations put forth by the TCFD. By disclosing the risks and opportunities stemming from climate change, the Company aims to underscore its commitment and strategies while assuming due responsibility. Through this approach, Formosa Petrochemical seeks to prudently and efficiently allocate resources, ultimately realizing its vision of transitioning toward a low-carbon economy.

CH1 Governance

1.1 Company introduction

Formosa Petrochemical Corporation (FPCC) was founded in 1992 and deals mainly with the production and sales of oil products and fundamental petrochemical materials. It was the first private oil refining business in Taiwan to produce and sell oil products such as gasoline and diesel. Its naphtha crackers, on the other hand, produce fundamental petrochemical materials such as ethylene, propylene, and butadiene, with a throughput scale topping the domestic list. In addition, there are the qualified heat and power combined cogeneration system to supply various public utility fluids such as steam and power at its facilities in the Formosa Plastics Group Mailiao Industrial Park.

Table 1.1 Basic information on Formosa Petrochemical Corporation

Formosa Petrochemical Corporation

Date of incorporation
April 6, 1992

Date of listed on TWSE
December 26, 2003

Capital
NT$95,259,596,520

Number of employees in 2021
5,218

Operating sites
Headquarters: No. 1-1, Formosa Plastics Group Industrial Zone, Zhongxing Village, Mailiao Township, Yunlin County
Taipei Office: 4F, No. 201, Formosa Building, Dunhua N. Rd., Songshan Dist., Taipei City

Consolidated revenue in 2022
NT$848.04850 billion

Credit ratings
Taiwan Ratings: twAA; Standard & Poor's: BBB+

Note: As of December 31, 2022

In the aspect of oil refining business, our refinery has a daily refining capacity of 540,000 barrels, of which the output of naphtha can reach 3.75 million metric tons, which are supplied to relevant factories in the Mailiao Industrial Park, while producing gasoline, diesel, aviation fuels, and liquefied petroleum gas.

In the olefins business, we have three naphtha cracker plants in place, with a total annual production capacity of 2,935,000 tons of ethylene. In addition, in terms of public utilities, FPCC has power generators which can generate a total electric capacity of 2.75 million KW, and 2.15 million KW of it is qualified as cogeneration facility. All the electricity and steam produced is distributed to our plants, with the remaining power sold back to Taipower. In addition, multiple facilities were set up, including industrial water, ultrapure water, air compressors, and an oxygen plant, to meet the demand of utility fluids in the Mailiao Industrial Complex.

The annual output in 2022 remained stable without major differences from 2021. Petroleum products accounted for 72.0% of the revenue and petrochemicals accounted for 21.5%, both of which are our core products. In 2022, the Company's consolidated revenue amounted to NT$848.04850 billion, an increase of 36.8% compared to 2021; the consolidated net income before tax reached NT$16.96840 billion, a decrease of 71.9% compared to 2021. The decrease in profitability and lower return on equity compared to the previous year can be attributed primarily to the impact of domestic stable pricing policies and weak demand for petrochemical products, which eroded a portion of the Company's profits.

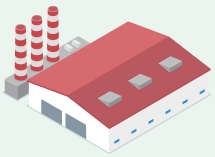
1.2 Organizational boundaries

Table 1.2 Organizational Boundaries of Formosa Petrochemical Corporation

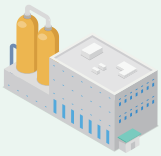
Mailiao Plant 1
No. 7、15, Taisu Industrial Park, Mailiao Township, Yunlin County

Mailiao Plant 2
No. 8、8-5, Taisu Industrial Park, Mailiao Township, Yunlin County

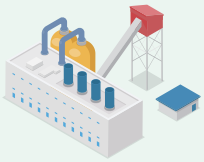
Mailiao Plant 3
No. 17、39, Taisu Industrial Park, Mailiao Township, Yunlin County



Changbin Blending Plant
No. 2, Lugong South 3rd Road, Lugang Township, Changhua County



Taipei Logistic Station
No. 20, Xiazhuwei, Bali District, New Taipei City



Taoyuan Logistic Station
No. 1801, Baiyu North Road, Guanyin District, Taoyuan City

1.3 Organization and responsibilities

The Board of Directors of Formosa Petrochemical is the highest governing body in response to climate change. To strengthen the Board's oversight responsibility regarding sustainability matters and drive the implementation of our sustainable development vision, the Company established the "Sustainable Development Committee" in May 2022, approved by the Board of Directors. The committee aims to review the Company's sustainable development policies and management guidelines, oversee the implementation of sustainable development initiatives, and comply with corporate governance evaluation requirements. The committee consists of five members, with the President's Office assigned as the operational department to support its functions. In line with corporate governance evaluation requirements, the President's Office is responsible for promoting risk management, corporate social responsibility, climate change adaptation, and other sustainability-related initiatives. Through diverse and effective communication channels, the committee seeks to understand the perspectives and needs of stakeholders, utilizing this information as a critical reference for formulating the Company's sustainable policies.

Board of Directors

Sustainable Development Committee

- Review and amend the Company's "Sustainability Guidelines" to continuously optimize the Company's sustainable development policies.
- Review the Company's sustainability report.
- Oversee the implementation of greenhouse gas inventory assessment.

The Sustainable Development Committee, convened by the Chairman, operates with the President's Office as the operational department to facilitate interdepartmental communication and coordination among the heads of various business units. In addressing climate change-related issues, the Company references the framework provided by the Task Force on Climate-related Financial Disclosures (TCFD) to identify relevant risks, establish management strategies, and engage in strategic risk management. The operational department - the President's Office, assumes the following primary responsibilities:

01
Collection, analysis, and consolidation of climate change and energy risk and opportunity information.

02
Identification and assessment of climate change-related risks and opportunities.

03
Responsible for planning mitigation measures.

04
Oversee energy-saving, carbon reduction, and water consumption reduction projects.

05
Internal and external communication on climate change issues.

The operational department - the President 's Office, convenes monthly working meetings chaired by the President. The President is responsible for supervising various energy conservation, carbon reduction and water consumption reduction projects and reviewing the progress of the energy conservation and carbon reduction projects and the achievement of goals, and then reporting on the implementation results of such projects to the Chairman at the Company's weekly meeting on a quarterly basis, and the relevant materials are compiled into attachments to the agenda of Board meetings for reference and discussion.

The Company holds at least six Board meetings per year and reports climate-related issues to the Board of Directors on a regular basis, such as long-term strategic goals for coping with climate change, energy conservation and carbon reduction strategies, medium- and long-term vision, annual energy conservation and carbon reduction performance, green production, and green product plans, etc.

Table 1.3 TCFD Division of Responsibilities

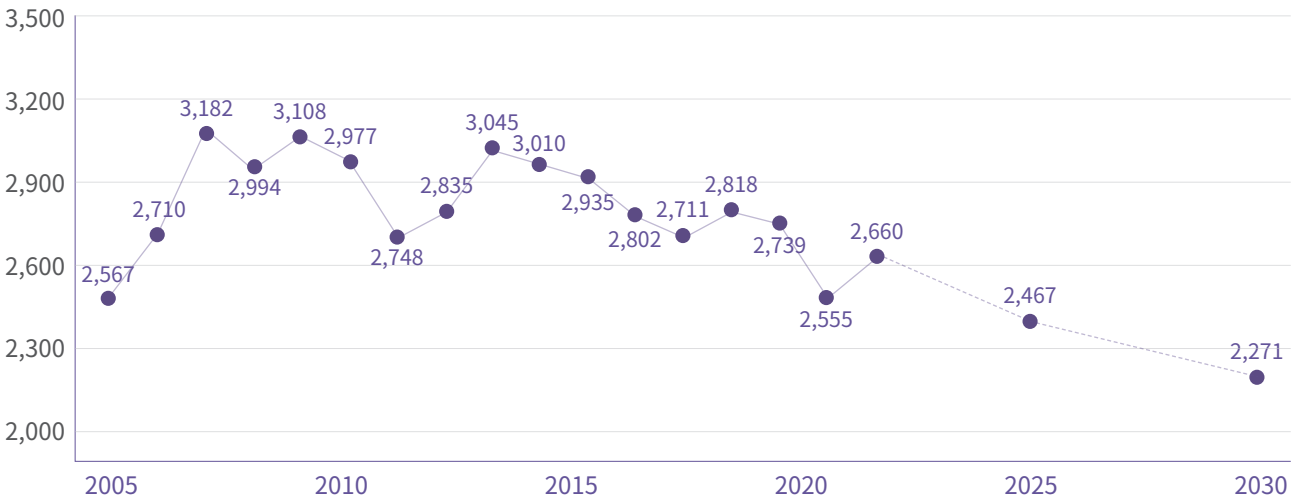
Board of Directors	● Formulate climate change management strategies or targets. ● Monitor Formosa Petrochemical's climate change issues.
Sustainable Development Committee The operational department - the President's Office	● Responsible for inter-departmental communication and planning climate change risk and opportunity strategies. ● Management of climate change risk and opportunity strategy programs. ● Management of climate change risk and opportunity action plans.
Each business unit shall	● Provide information on risks and opportunities. ● Formulate risk and opportunity action plans.

CH2 Strategy

Formosa Petrochemical aims to achieve carbon neutrality by 2050 and is committed to promoting low-carbon measures, reducing unit product energy consumption, and implementing improvement plans such as investing in green energy generation facilities, all in pursuit of the vision for a low-carbon economic transition. The table below outlines the reduction directions planned by Formosa Petrochemical to achieve its short-, medium-, and long-term goals.

Timeline	2025	2030	2050
Targeted emissions	2,467 (A reduction of 22% compared to 2007.)	2,271 (A reduction of 28% compared to 2007.)	Carbon neutrality
Reduction direction	● Energy-saving and carbon reduction measures in a circular economy framework. ● Installation and development of renewable energy sources such as solar power and small hydro. ● Substituting 5% of coal consumption with the co-firing of refuse-derived fuel (RDF) and test-firing of biomass fuel.	● Continual implementation of process technology optimization and energy-saving, carbon reduction measures in a circular economy framework. ● Ongoing installation and development of renewable energy sources. ● Evaluation of self-recovery and reuse of waste oil and waste plastics. ● Assessment of replacing 5% of coal consumption in coal-fired power plants with biomass fuel.	● Evaluation of energy transition. ● Expanded evaluation of technology research and development, value enhancement, and investment in emerging industries related to hydrogen and ammonia applications. ● Evaluation of carbon capture, utilization, and storage (CCUS) technologies. ● Evaluation of carbon sinks and carbon credits offsetting mechanisms.

Figure 2.1 Trend Chart of Greenhouse Gas Emissions for Formosa Petrochemical Corporation (2005-2030)



Unit: 10,000 tCO_2e

Formosa Petrochemical has established five strategies to align with the carbon neutrality goal by 2050. These strategies include process energy reduction, equipment efficiency enhancement, heat recovery, energy management, and renewable energy. The short-term strategy plan from 2021 to 2025 is outlined as follows. In 2022, the implemented carbon reduction strategies resulted in a reduction of approximately 195,099 tCO_2e. The effectiveness of each strategy implementation is summarized in Table 2.2: 2022 Carbon Reduction Strategy Performance Summary.

Five strategies implemented in 2022

Process energy reduction	The process energy reduction strategy involves optimizing process control systems and relevant equipment energy efficiency improvement.
Equipment efficiency improvement	The equipment efficiency improvement strategy includes the installation of fluid couplings for rotating equipment, replacement of energy-efficient motors, and the use of new types of heat exchangers.
Heat recovery	Various heat recovery and utilization of low-grade heat sources are implemented to reduce steam/gas consumption.
Energy management	The energy management strategy includes optimizing the ratio of amine to achieve energy efficiency, system voltage reduction for power conservation, and the replacement of energy-efficient lights.
Renewable energy	Continual assessment of the potential for solar photovoltaic and wind power generation sites, evaluating their feasibility, and gradually increasing the installed capacity of green energy generation.

Table 2.2 Carbon Reduction Strategy Performance Summary in 2022

Promoted strategies	Main project contents	Total emission reduction amount (tCO_2e)	Number of projects
Process energy consumption reduction Process energy reduction	DCU main tower low-grade heat recovery in the reflux	133,409	99
	Implementation of APC to save fuel gas in H-111, 113, and 114		
	Installation of fuel media control optimization system in UPA units		
Equipment efficiency improvement	Operational guidance for GHU#2 C-6770AI to improve steam-saving measures	26,095	90
	Implementation of AI automatic adjustment for steam-saving improvement in PRU#2 B-5551		
	Improvement in the stability of SCR export emission flow rate for HP5		
Heat recovery	Addition of waste heat recovery system for improvement in GHU1 unit	17,912	7
	Addition of waste heat recovery system for improvement in GHU2 unit		
Energy management	Improvement in methane gas feed for increased production of high-pressure steam in HYD1	17,684	18
	Reduction of pump operating power by diverting high and low-pressure cooling water pumps		
Total		195,099	214

CH3 Climate Change Risk and Opportunity Management

3.1 Identification and Assessment Procedure of Risks and Opportunities

Climate change has significant impacts on the Earth and businesses due to extreme weather events. To mitigate the effects of climate change on Formosa Petrochemical, the Company established the "Sustainable Development Committee" (as indicated in section 1.3 Organization and Responsibilities) with the Chairman as the convener. This committee operates as a functional committee under the board of directors and assigns the President's Office as the operational department responsible for coordinating the heads of various business units for inter-departmental communication. The committee identifies relevant climate change risks and establishes management strategies to engage in strategic risk management. Formosa Petrochemical references the framework provided by the Task Force on Climate-related Financial Disclosures (TCFD) to identify these risks and develop corresponding management strategies.

When formulating risk scenarios, Formosa Petrochemical considers transition risks (policy and legal/market/technology/reputation) and physical risks (chronic and acute). Risk descriptions are provided for potential events, including the financial impact severity, impact duration (short, medium, long), impacted stakeholders along the value chain, and the likelihood of occurrence. In assessing opportunities, Formosa Petrochemical considers aspects such as resource efficiency, energy, products and services, market, and resilience. The risk identification and assessment process for climate-related risks at Formosa Petrochemical is outlined as follows:

Background information collection	● Collect background information from news, internet sources, and events occurring in other countries or companies. ● Consider transition risks (policy and legal, market, technology, reputation) and physical risks (including acute, chronic).
Assessment scope of risk and operations	Conduct climate change risk assessment for the upstream and downstream of the value chain and the direct and indirect operational scopes. (Refer to Figure 3.1-1, Figure 3.1-2)
Risk and operational impact analysis	● Analysis Frequency: Annually. ● Analysis Method: Risk Mapping. ● High risk examination and identification: When determining and evaluating climate-related risks and opportunities, the company defines a financial impact of more than NT$1 million and classifies risks into 40 levels. Risks exceeding NT$800 million with a likelihood greater than 80% are considered high-risk, risks exceeding NT$400 million with a likelihood greater than 50% are considered moderate-risk, and the remaining are classified as low risk. Low risk is considered an acceptable level of risk, and moderate risk does not currently require immediate action but still requires ongoing monitoring for changes. For events classified as high risk, corresponding management program must be formulated to reduce loss from the risk, such as reducing the number of occurrences, mitigating the financial impact, and transferring and avoiding risks.
Management measure and target formulation Control measure and target formulation	The operational department - the President's Office, assesses the risk index based on criteria evaluating the consequences and likelihood levels. Once risks and opportunities are identified, corresponding response strategies are developed for mitigation, transfer, control, or acceptance, in order to set short-, medium-, and long-term targets.

Figure 3.1-1 Climate Change Risk Issue Analysis Procedure

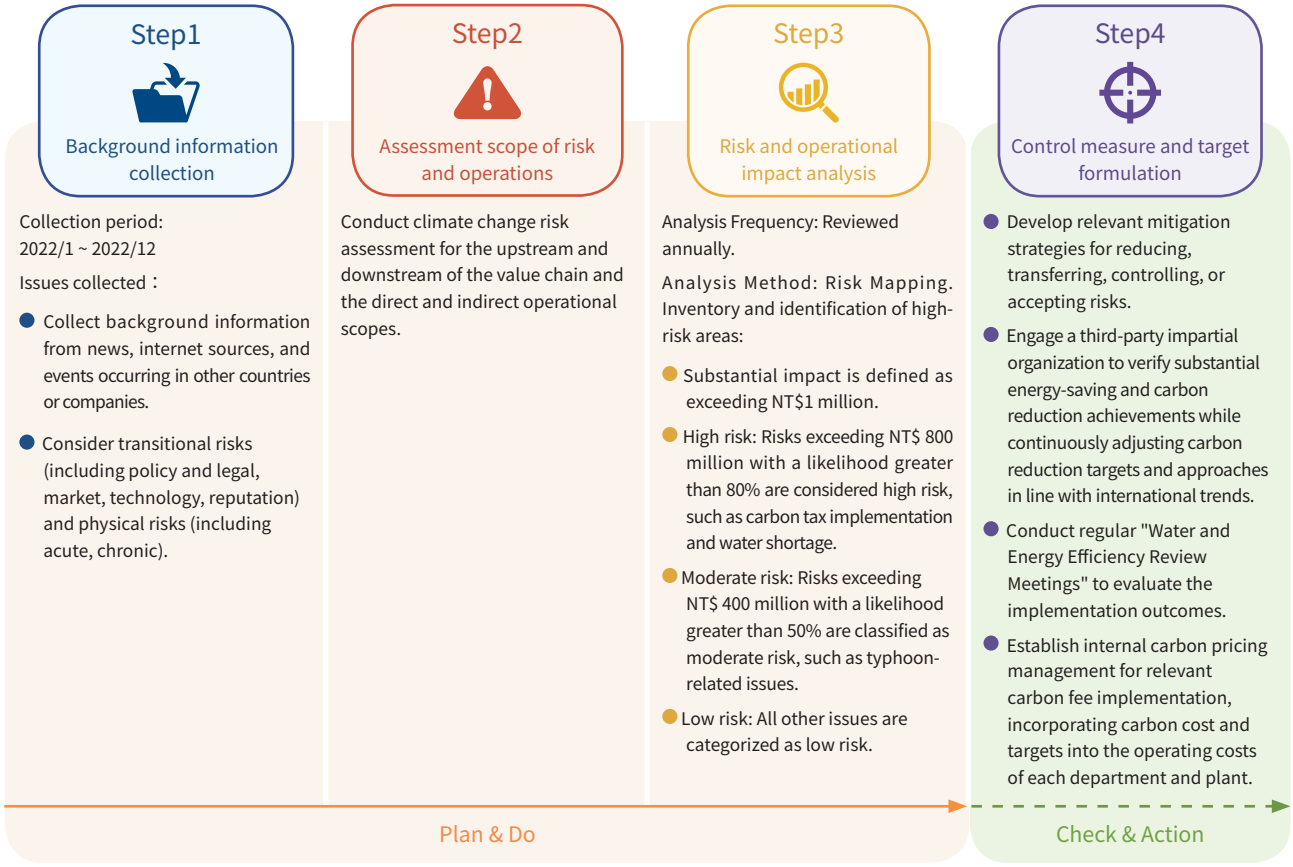


Figure 3.1-2 Framework for Identifying and Analyzing Climate Change Risks and Opportunities

Establish management strategies to conduct risk management	Risks	Transition Risks	Policy / Legal	Increased carbon pricing, carbon reporting obligations, regulatory requirements for existing products/services, exposure to litigation risks	Safety and Health Department, President's Office Operations Management Team
			Technology	Product obsolescence, cost of transitioning to low-carbon technologies	President's Office Technology Team, President's Office Management Team
			Market	Shift in consumer preferences, rising raw material costs	President's Office Operations Management Team, President's Office Business Analysis Team
			Reputation	Stakeholder concerns, industry stigmatization	President's Office Business Analysis Team
		Physical Risks	Acute	Typhoon, flood	Safety and Health Department, President's Office Business Analysis Team, Energy Conservation and Emission Reduction Circular Economy Task Force
			Chronic	Rainfall, rising temperatures, sea level rise	
	Opportunities		Resource Efficiency	Adopting more efficient processes, distribution and transportation methods, utilizing new technologies, and participating in the carbon market	Energy Conservation and Emission Reduction Circular Economy Task Force
			Energy	Utilizing low-carbon energy, embracing new technologies, and participating in the carbon market	Safety and Health Department, President's Office Technology Team, Energy Conservation and Emission Reduction Circular Economy Task Force
			Products and Services	Developing low-carbon products in response to changing consumer preferences	President's Office Technology Team, President's Office Operations Management Team
			Market	Exploring new market entry channels and leveraging government incentive measures	President's Office Technology Team
			Resilience	Implementing renewable energy projects and promoting energy substitution/diversification	President's Office Technology Team, Energy Conservation and Emission Reduction Circular Economy Task Force

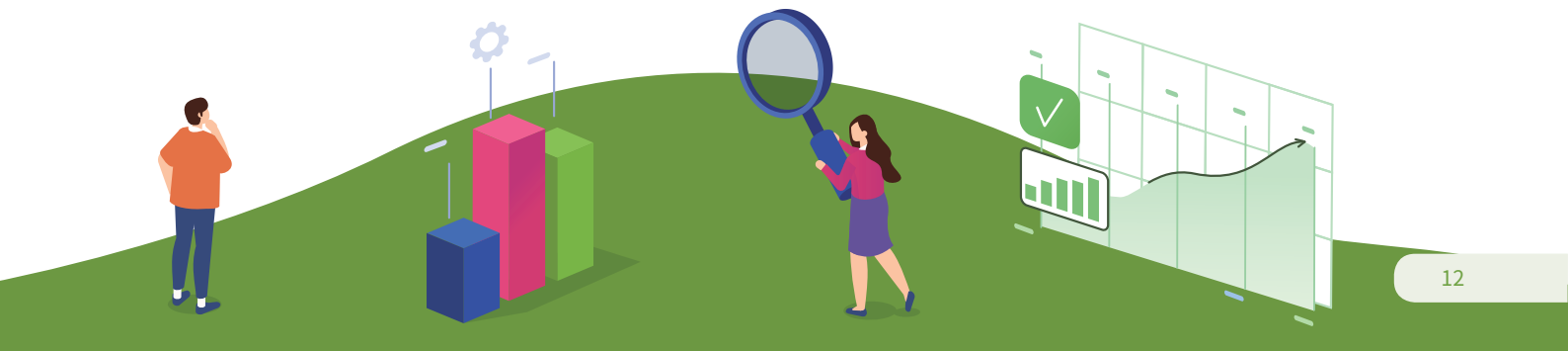
3.2 Management Approaches for Risks and Opportunities

The operational department – the President's Office identifies climate risks and opportunities and assesses the risk index based on criteria such as impacts and likelihood levels. After confirming the levels of risks and opportunities, relevant countermeasures to mitigate, transfer, control, or accept risks are formulated to set short-, medium-, and long-term targets. The operational department – the President's Office develops action plans for the targets and conducts monthly work meetings to review progress and target attainment. They also participate in monthly energy-saving and carbon reduction review meetings throughout the company and report the results of energy-saving and carbon reduction efforts to the Chairman and the President during quarterly company meetings. The outcomes are compiled as attachments in board meetings for reference and discussion.

Through a comprehensive assessment of global sustainability trends and Formosa Petrochemical's operational development goals, key issues in governance, economy, environment, and society are analyzed. The impacts of these issues are evaluated, and the disclosed response methods are presented in Table 3.2-1 and 3.2-2.

Figure 3.2-1 Consolidated Table of Risk Topics with the Greatest Financial Impact and Associated Management Plans

Risk Categories	Risk Level	Major climate event Associated risk factors	Risk management program
Transition risks - Policy and Legal	High risk	Greenhouse Gas Reduction and Management Law - Carbon Tax ● Non-excessive Carbon Emissions: To implement carbon reduction regulations, the government announced the amendment of the "Greenhouse Gas Reduction and Management Act" to the "Climate Change Response Act" in 2023. Based on an estimated greenhouse gas emission of approximately 26.6 million tCO_2e in 2021, without measures to reduce carbon emissions, the carbon pricing of NT$100 per metric ton is estimated to result in a financial impact of approximately NT$1.735 billion per year (excluding the sale of electricity to other companies). ● Excessive Carbon Emissions: For carbon emissions exceeding the allocated quota by the central authority, the maximum penalty fee remains at NT$1,500 per metric ton. Based on an estimated greenhouse gas emission of approximately 26.6 million tCO_2e in 2021, if carbon emissions are not reduced and carbon credits are not purchased to offset emissions by 2050, there may be a requirement to pay a carbon fee of NT$1,500 per metric ton for the excessive emissions.	● To enhance the sense of personal involvement in carbon reduction among all employees, our company implemented an internal carbon pricing mechanism in 2022. Referring to the draft "Climate Change Response Act" and the pricing calculation for carbon emissions exceeding the target, we incorporate carbon costs into our internal management profit and loss statements as a basis for implementing carbon risk management. In addition to developing greenhouse gas reduction measures based on this, the relevant data also serve as important indicators for performance evaluation, product operations, and investment assessment, aiming to maintain our company's competitiveness. ● We are promoting various energy-saving and carbon reduction initiatives and gradually moving towards a low-carbon transformation. Investments are evaluated in: 1. Green energy generation facilities (wind energy, solar energy) and energy storage systems. 2. Recycling and reuse of waste oil and waste plastic. 3. Hydrogen and ammonia industries. 4. Partial replacement of coal usage in coal-fired power plants with biofuels. 5. Evaluation of carbon capture, utilization, and storage (CCUS) technologies. 6. Process technology optimization and other technical measures.



Risk Categories	Risk Level	Major climate event Associated risk factors	Risk management program
Transition risks - Policy and Legal	High risk	From February 1, 2023, the Ministry of Economic Affairs announced the implementation of a water consumption fee for water-intensive users whose monthly water consumption during the dry season exceeds 9,000 cubic meters. The fee will be set at NT$3 per cubic meter. Users who meet the water recovery targets will be eligible for a discounted rate of NT$2 or NT$1. A grace period is also provided, where water-intensive users will receive a 50% reduction in the water consumption fee until June 30, 2025. Based on an estimated water consumption of 22.5 million cubic meters during the dry season of 2021 (November to April of the following year), it is projected that there will be an annual financial impact of NT$4.49 million for the three years prior to the implementation (2023 to 2025), and starting from 2026, an annual financial impact of NT$8.98 million.	In response to the risks of drought, water scarcity, and water consumption fees, our company has developed two strategies for water resource management: diversification of water sources and water conservation. In the short term, we have planned the following initiatives to increase water sources and implement water-saving measures on our premises. These initiatives aim to mitigate the risks associated with drought, water scarcity, and water consumption fees, while also promoting sustainable water resource management within our operations. ● Construction of a seawater desalination plant: To increase water resources and reduce reliance on freshwater sources, our company plans to construct a seawater desalination plant with a daily water production capacity of 100,000 cubic meters. The annual water production is projected to reach 17 million cubic meters, resulting in a reduction of 17 million cubic meters of freshwater usage. This is expected to save approximately NT$8.45 million in water consumption fees. ● Annual implementation of water-saving measures: Our company allocates a budget of over NT$40 million annually for various water-saving programs. In 2022, we invested NT$5.1 million and implemented 36 water-saving improvement projects, resulting in a daily water saving of 985 cubic meters and an annual cost-saving benefit of NT$3.54 million.
Transition risks – Changes in customer behavior	High risk	According to the International Energy Agency, it is projected that by 2040, approximately 300 million electric vehicles will be on the road, leading to a daily reduction in global oil demand by 3.3 million barrels. Based on the estimated daily oil demand of 99.56 million barrels for transportation in 2022, this will result in a 7% decrease in oil demand for transportation, causing a contraction in the fuel market and revenue reduction, leading to financial losses.	In response to the anticipated decrease in oil demand for transportation, our company is planning to produce high-value products and enhance the production of such products. This strategic approach aims to mitigate the financial losses resulting from changing customer behaviors.

Figure 3.2-2 Assessment and Management of Opportunity Categories with the Greatest Financial Impact

Opportunity Categories	Opportunity Level	Primary climate related opportunity factors	Opportunity management plans
Transition Opportunity – Low-carbon energy technology transition	High	Taking into consideration the opportunities in the company's technological transition towards low-carbon energy and circular economy, we have developed plans for low-temperature waste heat recovery and waste-derived fuel projects in recent years. These initiatives aim to significantly reduce fuel consumption and lower greenhouse gas emissions.	● Low-temperature waste heat recovery system: The implementation of a ten-year greenhouse gas offset project (low-temperature waste heat recovery power generation) is estimated to obtain carbon credits equivalent to 13,220 tCO_2e. With an estimated carbon price of NT$100 per tCO_2e, the potential profit is approximately NT$1.32 million. The annual electricity generation is projected to be 1,559,160 kWh and based on an average electricity price of NT$4.18 per kWh, the cost savings in electricity purchase over ten years would amount to NT$6.56 million. ● Waste-derived fuel project: Since 2019, we have replaced a portion of coal consumption with waste-derived fuel. The maximum annual usage of waste-derived fuel is estimated to be 499.32 million metric tons, with a purchase cost of NT$900 per metric ton. This is expected to increase fuel costs by NT$45 million. However, it will also result in savings of 233.49 million metric tons of coal, equivalent to a reduction in energy purchase costs of NT$190 million (based on a coal price of US$275 per metric ton). Additionally, it will reduce greenhouse gas emissions by approximately 72,000 metric tons, leading to an estimated reduction of NT$7.2 million (assuming a carbon price of NT$100 per metric ton). The overall potential financial income from this project is approximately NT$200 million.

Opportunity Categories	Opportunity Level	Primary climate related opportunity factors	Opportunity management plans
Transition Opportunity – Increased energy efficiency	High	By leveraging the concept of circular economy, our company recognizes the opportunities for emissions reduction through enhanced energy efficiency. We have implemented a process to capture and reuse exhaust gases emitted during the production process, resulting in reduced air pollution. By converting these process gases into fuel, we are able to decrease fuel consumption.	In 2022, we successfully recovered and utilized 69,000 metric tons of surplus process gases, which led to a reduction in greenhouse gas emissions by approximately 150,000 tCO_2e. Furthermore, these recovered gases replaced the need for approximately 107,000 metric tons of coal. Considering a coal price of US$275 per metric ton, this translates to cost savings of approximately NT$890 million (based on an exchange rate of 30 TWD to 1 USD) in coal expenses.
Transition Opportunity – Renewable energy	Moderate	The installation and procurement of renewable energy are integral parts of our company's carbon reduction strategy, as they contribute to the reduction of fuel consumption. The establishment of solar power systems allows for a decrease in the use of traditional fuels.	"Renewable energy power generation system establishment project ": Currently, we have planned the installation of 58 solar power plants with a total capacity of 20.992 MW. The total investment cost for these 58 solar power plants amounts to NT$1.01 billion. It is projected that these plants will generate 27,778,000 kWh of electricity annually, resulting in savings of NT$61 million in electricity costs (based on a solar capacity factor of 14.26% in Yunlin area and an electricity rate of NT$2.2 per kWh).

3.3 Integration of Climate Change-related Issues

Sustainable business operations require consideration of various potential risk issues and operational assessments. In line with the principles of sustainable development, Formosa Petrochemical continuously observes global risk trends. Risk issues have evolved from a singular "economic" dimension to encompass various aspects, including environmental, social, technological, and geopolitical considerations. Climate change-related issues are integrated within the environmental dimension. The Risk Management function, centered in the operational department – the President's Office, identifies risks that may impact the company's operations. Based on the nature of the risks, relevant business units collaborate to assess the likelihood and impact of potential events. Timely feedback is provided to the management level to adjust the company's operating strategies.

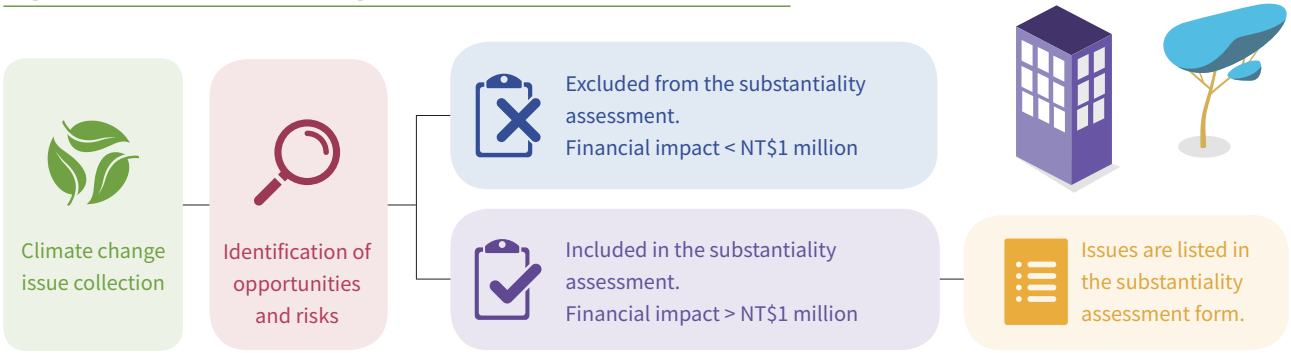
In terms of risk management, the company further categorizes risks into two major types: "inherent operational risks" and "emerging risks." Inherent operational risks refer to the 12 risk factors required to be disclosed according to the "Regulations Governing Information to be Published in Annual Reports of Public Companies". The operational department - the President's Office conducts analysis and evaluation of these risk factors on a case-by-case basis. Emerging risks, on the other hand, encompass potential risks that the company may face in its operations over the next five years. These risks are gathered and assessed using the COSO Enterprise Risk Management (ERM) framework, and the company collaborates with ESG experts to analyze emerging risks. Currently, climate change-related issues predominantly fall under the category of emerging risks.

Based on the company's integrated risk analysis and assessment process, inherent operational risks and emerging risks have been identified. The analyzed and assessed risk issues related to climate change include changes in corporate image, technological advancements, physical risks associated with climate change, stakeholder focus on low-carbon energy, energy transition, and compliance with domestic and international energy policies.

The operational department – the President's Office has undertaken a reevaluation of the physical risks associated with climate change. In terms of risks, the identified aspects include the transition risks of climate change (policy and legal/market/technology/reputation) as well as the physical risks of climate change (chronic and acute). In terms of opportunities, the considerations encompass improving resource efficiency, alternative energy sources, low-carbon products and services, low-carbon product markets, and the adaptability of low-carbon products.

After identifying and evaluating climate-related risks and opportunities, Formosa Petrochemical defines financial impacts exceeding NT$1 million as having a substantial impact, as shown in Figure 3.3-1. Risks and opportunities are categorized into four groups as i) great financial impact and high likelihood, ii) great financial impact but low likelihood, iii) low financial impact but high likelihood, and iv) low financial impact and low likelihood.

Figure 3.3-1 Climate Change Risk Issue Analysis Procedure



Formosa Petrochemical follows a climate change risk identification procedure, using a matrix chart of financial impact and risk likelihood to determine high risks. The indicators for risk likelihood are divided into 8 levels, classified based on the likelihood of occurrence: 5%, 5-20%, 20%-35%, 35%-50%, 50%-65%, 65%-80%, 80%-95%, and above 95%. The financial impact is classified into 5 levels, where a financial impact exceeding NT$1 million is considered substantial. The levels are: above NT$1.7 billion, between NT$1.7 billion and NT$800 million, between NT$800 million and NT$400 million, between NT$400 million and NT$20 million, and between NT$20 million and NT$1 million. A risk matrix chart is created, with the horizontal axis representing the likelihood of risk occurrence, and the vertical axis representing the financial impact. Refer to Figure 3.3-2 for illustration.

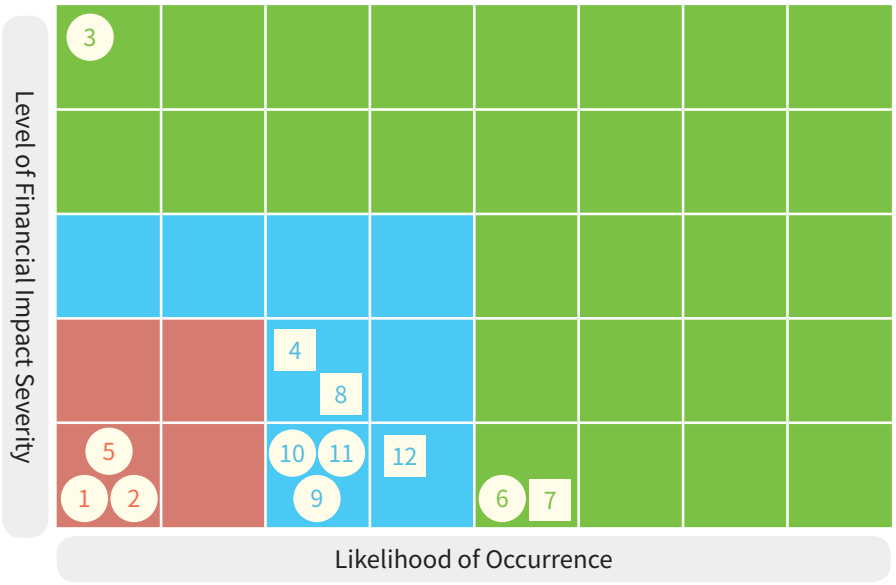
Figure 3.3-2 Risk Matrix

● Low risk/opportunity ■ Moderate risk/opportunity ▲ High risk/opportunity

Level of Financial Impact	High	Medium High	Moderate	Medium Low	Low
Amount (TWD)	Above NT$1.7 billion	Between NT$800 million and NT$1.7 billion	Between NT$400 million and NT$800 million	Between NT$20 million and NT$400 million	Between NT$1 million and NT$20 million
Almost improbable (<5%)	●	●	●	●	●
Very unlikely (5%<x<20%)	●	●	●	●	●
Unlikely (20%<x<35%)	●	●	●	●	●
Slightly unlikely (35%<x<50%)	●	●	●	●	●
Slightly likely (50%<x<65%)	■	■	■	●	●
Likely (65%<x<80%)	■	■	■	●	●
Very likely (80%<x<95%)	▲	▲	■	●	●
Almost Certain (>95%)	▲	▲	■	●	●

The completed risk matrix, as shown in Figure 3.3-3, defines 40 levels of risk. Risks that exceed NT$800 million and have a likelihood of occurrence greater than 80% are categorized as high risk. Risks that exceed NT$400 million with a likelihood of occurrence of 50% are classified as moderate risk. The remaining risks are categorized as low risk. Low risk is considered acceptable, and moderate risk does not require immediate action but should be continuously monitored for changes. High-risk events necessitate the development of corresponding management strategies to mitigate the potential losses, such as reducing the frequency of occurrence, minimizing financial impacts, risk transfer, and risk avoidance.

Figure 3.3-3 Climate change risk and opportunity and risk map conversion table



Substantial risk/opportunity
Develop corresponding management plans as a priority and track their performance.

Moderate risk/opportunity
Continuously monitor changes without taking immediate action.

Low risk/opportunity
Acceptable risk.

Transition/Physical Risks

Transition/Physical Opportunity

1 Transition Risk / Policy and Legal – Carbon tax

2 Transition Risk / Technology – Renewable energy

3 Transition Risk / Policy and Legal – CBAM

4 Transition Opportunity / Energy – Diversified energy sources

5 Transition Risk / Market – Change in customer behavior: EVs/ Decrease in combusting oil

6 Transition Risk / Reputation – ESG investment

7 Transition Opportunity / Resilience – Water conservation

8 Transition Opportunity / Resilience – Development of low-carbon products

9 Physical Risk / Chronic – Water scarcity, drought

10 Physical Risk / Acute – Heavy rainfall

11 Physical Risk / Acute – Strong wind and typhoons

12 Transition Opportunity / Resilience – Development of low-carbon process

3.4 Summary of Impacts on the Company from Risks and Opportunities

Low risk/opportunity Moderate risk/opportunity High risk/opportunity

Climate Issues	Impact Analysis	Levels of Risk / Opportunity
Potential Impact on Company/Organization Analysis and Strategies for Current Risks and Opportunities	Issue Categories	Levels of Risk
On February 15, 2023, the President revised the name of the "Greenhouse Gas Reduction and Management Act" to the "Climate Change Response Act" and made amendments to its provisions. The amendment is primarily in response to the increasingly severe global climate change situation, the growing carbon reduction requirements in international industrial supply chains, and the imminent implementation of stricter carbon emission regulations worldwide. The aim is to promote our country's transition to net-zero emissions, enhance industrial competitiveness, and address key areas such as incorporating the 2050 net-zero emissions target and establishing a dedicated fund for carbon fees. Enterprises regulated by the Environmental Protection Administration (EPA) with emissions exceeding 25,000 tCO_2e are expected to start paying carbon fees from 2024. Among them, Formosa Petrochemical, with annual emissions exceeding 20 million tCO_2e, is defined as a large carbon emitter and is among the first organizations to be included in the regulatory framework. Based on an estimation of greenhouse gas emissions of approximately 26.6 million tCO_2e in 2021, if measures to reduce carbon emissions are not implemented, a carbon fee of NT$100 per tCO_2e is projected to result in an estimated annual financial impact of NT$1.735 billion.	Transition Risk / Policy and Legal	▲

Climate Issues Potential Impact on Company/Organization Analysis and Strategies for Current Risks and Opportunities	Impact Analysis Issue Categories	Levels of Risk / Opportunity Levels of Risk
The government's regulations such as the "Climate Change Response Act" , "A Nuclear-Free Taiwan by 2025" , "Policy for the renewable energy to reach 20% of total power generated by 2025" , "Gas-fired power generation" , "Regulations for the management of setting up renewable energy power generation equipment of power users above a certain contract capacity" , will lead to emission reduction and energy transition. However, they may result in increased electricity prices and electricity supply instability, posing medium-term and high-risk challenges for companies. In response to the risks associated with adjustments in renewable energy policies, companies are actively investing in the construction of renewable energy facilities, including wind power and solar power. As part of the "Renewable energy power generation system establishment project "Formosa Petrochemical has currently planned to build 58 solar photovoltaic sites, with a total installed capacity of 20.992 MW.	Transition Risk / Technology	▲
From 2026 onwards, the European Union (EU) will begin implementing a carbon border tax. Initially, the tax will be imposed on direct emissions from five major industrial products: electricity, cement, chemical fertilizers, steel, and aluminum. Currently, Formosa Petrochemical's exported products are not included in the scope of taxation. This is because the product emission standards set by the EU in COMMISSION IMPLEMENTING REGULATION (EU) 2021/447 cover VCM, PVC, phenol, and acetone, which are not produced by our company. In the risk assessment of "Environmental Policies," the potential impact of the EU's carbon border tax is evaluated, as countries such as the United States, the United Kingdom, Japan, Canada, and Singapore have expressed support for such a tax. While there is no immediate impact expected in the short term, we will continue to monitor the situation closely.	Transition Risk / Policy and Legal	●
The COP26 has achieved the "Glasgow Climate Pact" to address the climate crisis. For the first time in the history of the United Nations climate agreements, it explicitly states the reduction in the use of unabated coal and the gradual phasing out of subsidies for fossil fuels without carbon capture technology. This poses a medium to long-term and high-risk situation for Formosa Petrochemical. Therefore, the company is not only planning for renewable energy but also actively seeking alternative energy sources. For example, the "Waste-Derived Fuel Program" aligns with government policies and has demonstrable benefits. It helps the government reduce household waste and effectively enhances the company's reputation. The Waste-Derived Fuel Program is projected to utilize a maximum of 49,932 metric tons of waste-derived fuel annually, with a purchasing cost of NT$900 per metric ton. It is estimated to increase fuel costs by NT$45 million while saving 233.49 million metric tons of coal. If calculated at a coal price of US$275 per metric ton, it could reduce energy purchasing costs by approximately NT$190 million. Additionally, it would lead to a reduction of approximately 72,000 metric tons of greenhouse gas emissions. Considering a carbon fee of NT$100, it is estimated to reduce costs by NT$7.2 million. The overall potential financial income from this project is estimated to be around NT$200 million.	Transition Opportunity / Energy	■
The "Climate Change Risk and Opportunity Identification" and "Design and Development" categories include risks related to product design and development, raw materials, markets, business, and process technology. The review of changes in customer behavior focuses on consumer preferences, such as the reduction in gasoline demand due to the increase in electric vehicles and the decrease in plastic usage, which can lead to a decline in demand for goods and services. Furthermore, the impact on revenue is evaluated. With the gradual growth of the electric vehicle market, the International Energy Agency predicts that by 2040, global demand for oil will decrease by 3.3 million barrels per day. Based on th e estimated daily demand of 99.56 million barrels for transportation fuel in 2022, the demand for oil in the transportation sector is expected to decrease by 7%. In response to the reduced demand for gasoline, Formosa Petrochemical adjusts its production volume and focuses on the production of high-value plastic raw materials from naphtha, mitigating the impact.	Transition Risk / Market	▲
In recent years, there has been a surge in ESG (Environmental, Social, and Governance) practices. Investment institutions evaluate the performance of clients in ESG aspects when assessing investments and loans. Failure to meet ESG sustainability requirements not only has a negative impact on corporate reputation but also raises concerns that financial institutions may increase borrowing interest rates or even refuse to lend to high-carbon industries. Formosa Petrochemical evaluates the risk associated with "reputation," which is immediate but considered low risk.	Transition Risk / Reputation	●

Climate Issues	Impact Analysis	Levels of Risk / Opportunity
Potential Impact on Company/Organization Analysis and Strategies for Current Risks and Opportunities	Issue Categories	Levels of Risk
Formosa Petrochemical is a major water user, with monthly water consumption exceeding 1,000 cubic meters. The availability of stable water quality and an ample water supply directly impacts the stable production and excellent product quality across various operations within the company. To reduce the reliance on water, enhance competitiveness, and achieve cost savings, Formosa Petrochemical is committed to implementing energy-saving and water-conservation programs. In 2022, a total of 36 water-saving improvement projects were implemented, resulting in a daily water saving of 985 metric tons and an annual improvement benefit of NT$3.54 million.	Transition Opportunity / Resilience	
Formosa Petrochemical, considering the product life cycle and value chain, has invested an average of NT$560 million R&D expenses from 2017 to 2021 in developing low-carbon products. Improvements have been made in three aspects: reducing raw material usage, process enhancements, and supply chain transportation reduction. The concept of circular economy has been introduced to recycle and reuse waste gases and materials generated during the production process. This approach not only lowers production costs but also promotes sustainable resource utilization. Key initiatives include: ● Utilizing chemical pyrolysis technology to convert waste plastics into cracked fuel oil, which is then used as feedstock in the olefin plant to produce certified low-carbon products such as low-carbon ethylene and propylene. ● The global market for recycled plastics and waste plastics continues to grow, providing significant development opportunities. ● Biomass energy is used, e.g., biomass naphtha as one of the feedstock sources in the olefin plant, to produce internationally certified biomass by-products such as ethylene, propylene, and C4.	Transition Opportunity / Resilience	
Formosa Petrochemical relies on stable and abundant high-quality water resources for its production processes. The main production facilities are located in Mailiao, and the water supply is primarily sourced from the Jiji Barrage. In 2017, through the analysis of four Representative Concentration Pathways (RCPs) using climate change scenario analysis software, namely RCP 2.6, RCP 4.5, RCP 6.0, and RCP 8.5, the most severe water scarcity scenario for the Mailiao Plant during the defined medium to long-term period (2021-2040) was identified with a 49.27% decrease in annual rainfall. In response to this situation, Formosa Petrochemical developed a water resource management strategy during the initial setup phase. This strategy includes various water-saving initiatives, wastewater recycling plans, rainwater harvesting plans, and recent efforts to establish a seawater desalination plant with a daily production capacity of 100,000 metric tons (17 million metric tons annually). These measures aim to gradually reduce the plant's reliance on water resources and have provided opportunities for Formosa Petrochemical to mitigate operational risks and enhance competitiveness.	Physical Risk / Chronic	
From 2021 to 2040, there is a decreasing trend in average rainfall (with the largest decrease of 49.27% under the RCP 6.0 scenario in Yunlin). ● Heavy rain events are most common during the plum rain season in May and June, as well as the typhoon season from July to September, or due to convective rainfall associated with frontal systems in spring and autumn or the summer monsoon flow from the southwest. ● The frequency of extreme weather events, such as heavy rainfall and flooding, is increasing due to glob al climate change. Equipment may be susceptible to flooding during heavy rainfall, leading to disruptions in stable operations and resulting in downtime losses. The Mailiao Plant's projection was estimated based on the period from 1986 to 2005. Considering the recent climate conditions (2016-2035) under the RCP 4.5 and RCP 8.5 scenarios, the maximum days of consecutive rainfall is 7.5-7.7 days, with a total rainfall of 1,078 mm-1,085 mm, representing a 15% increase compared to the average. The RCP 8.5 scenario projects a decrease in typhoon frequency in Taiwan by 15%, an increase in severe typhoons by 100%, and a 20% increase in typhoon-related rainfall. ● In response to the impact of water scarcity or drought caused by climate anomalies, measures related to water-saving improvements in processes, or the adoption of water-efficient processes or equipment need to be implemented, which may require additional investment costs for equipment upgrades or improvements. ● Under water usage restrictions, if adaptation measures are insufficient, reducing production in each process may be necessary. Severe water shortages could lead to production downsizing or even shutdowns.	Physical Risk / Acute	

Climate Issues	Impact Analysis	Levels of Risk / Opportunity
Potential Impact on Company/Organization Analysis and Strategies for Current Risks and Opportunities	Issue Categories	Levels of Risk
Based on the baseline period of 1986-2005, the recent climate conditions in the Mailiao Plant (2016-2035) under the RCP 4.5 and RCP 8.5 scenarios indicate the maximum duration of continuous rainfall to be 7.5-7.7 days, with a total rainfall of 1,078 mm-1,085 mm. This represents a 15% increase in total rainfall compared to the average. Under the RCP 8.5 scenario, it is projected that typhoon frequency in Taiwan will decrease by 15%, the proportion of severe typhoons will increase by 100%, and typhoon-related rainfall will increase by 20%. ● Typhoons represent extreme weather events in Taiwan. On average, Taiwan experiences about 3 to 4 typhoons per year. The direct financial losses caused by catastrophic weather events in Taiwan amount to an annual average of approximately NT$15 billion, with typhoons accounting for about 85% of the total. ● Typhoons are representative of extreme weather events in Taiwan. With the influence of global climate change, Taiwan is facing an increasing severity of typhoons. In 2020, for example, Taiwan issued 5 typhoon warnings. The Mailiao Plant, located near the coast in Taiwan, is exposed to strong winds and heavy rain associated with typhoons, which can lead to equipment damage and disrupt production.	Physical Risk / Acute	■
Formosan Petrochemical, in pursuit of sustainable development, promotes various initiatives related to risk management, corporate social responsibility, and climate change adaptation through its "Sustainable Development Committee." In response to climate change, Formosa Petrochemical strives to achieve the goals of energy conservation, emission reduction, resource integration, and zero waste by implementing circular economy practices across its plants and companies, focusing on raw materials, water resources, energy, and waste. In recent years, Formosa Petrochemical has continuously improved resource efficiency and reduced operational costs. It explores the possibilities of recycling process waste or gases, thereby lowering greenhouse gas emissions and aligning with Formosa Petrochemical's sustainable development objectives. Previously, excess process gases generated in Formosa Petrochemical's operations were sent to the waste gas incineration tower for combustion and subsequent emission. However, through cross-plant resource integration, Formosa Petrochemical now recovers and utilizes the excess process gases in the common Unit 4 boiler, replacing a portion of the coal consumption. In 2022, a total of 38,269 tons of excess process gases were recovered and utilized in the common Unit 4, resulting in a reduction of approximately 22,004 tons of greenhouse gas emissions and displacing approximately 33,070 tons of coal usage. Considering a coal price of US$275 per ton, this translates to savings of approximately NT$273 million (at an exchange rate of 30 TWD per USD) in coal expenses.	Transition Opportunity / Resilience	●

3.5 Climate Change Scenario Analysis

Formosa Petrochemical referred to the scenario model used to analyze the Nationally Determined Contributions (NDC) targets by government agencies and provided the analysis results to the operational department – President's Office as the basis for strategic planning of risk and opportunity identification, assessment, and management. Details of identified risks and opportunities and associated financial impacts and management approach are as follows:

Formosa Petrochemical mainly adopted the climate change scenario models of RCP 2.6, RCP4.5, RCP 6.0, and RCP 8.5 for future simulation with reference to the IEA Net Zero Emissions by 2050 Scenario (NZE) and the Nationally Determined Contributions (NDC) established by the manufacturing sites' respective countries. In Taiwan's Intended Nationally Determined Contribution (INDC) report, the target is set to reduce greenhouse gas emissions by 50% by 2030, based on the Business as Usual (BAU) scenario, and achieve net-zero emissions by 2050. Within this context, the impacts on the Company's market, technology, reputation, finance, and operations are analyzed, considering the power generation structure and sectoral developments from 2030 to 2050.

Physical risks are assessed based on sources such as the World Bank's Climate Change Knowledge Portal, Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP), and the National Science and Technology Center for Disaster Reduction. These sources provide information on temperature rise, precipitation, flooding risk, and drought risk for the period between 2020 and 2050 under various scenarios such as RCP2.6, RCP4.5, and RCP8.5.

Table 3.5-1 Summary of Assumptions for Climate Change Scenarios

Physical Risk Scenario	Mailiao Plant
Rising sea levels	Impacted
Below-tidal-line area (risk of flooding)	Partially impacted (temperature rises of 4° C)
Area below the 2050 flood line	Impacted
Average duration of drought	2 months
Rise in temperature	2.59° C
Total rainfall	1,085 mm
Maximum intensity of heavy rainfall	Maximum consecutive rainfall for 7.5 days
Risk of flooding	Medium-low risk
Risk of drought	Medium-low risk

Figure 3.5-1 Simulated Sea Level Rise under Different Warming Scenarios

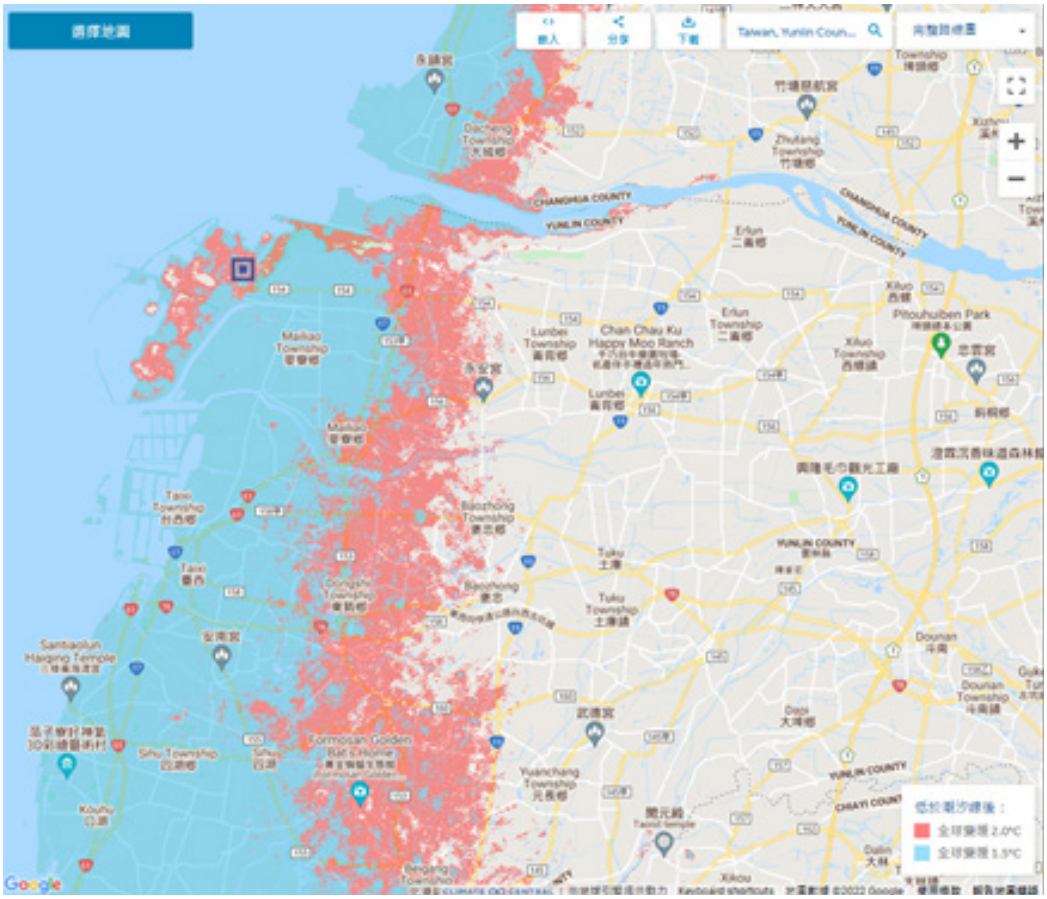
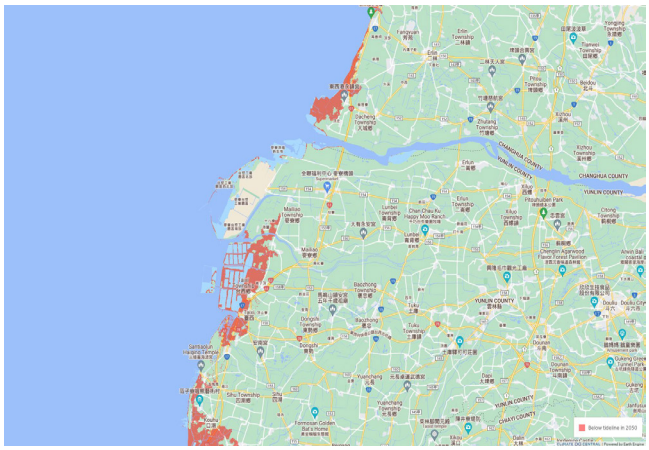
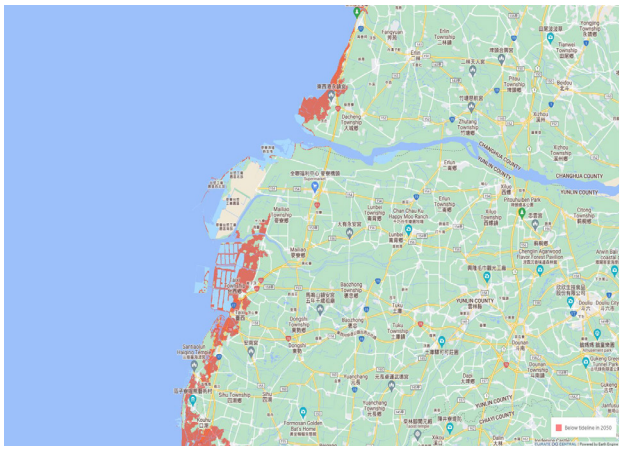


Figure 3.5-2 Simulated Scenarios of Areas Below the Tidal Line in 2050 under Different Warming Scenarios

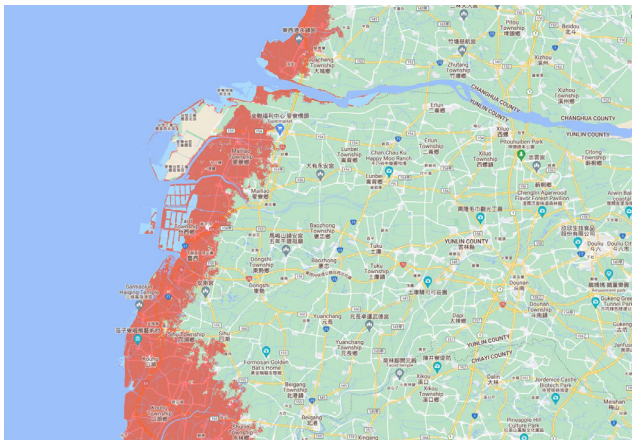


Temperature rises of 1.5° C.

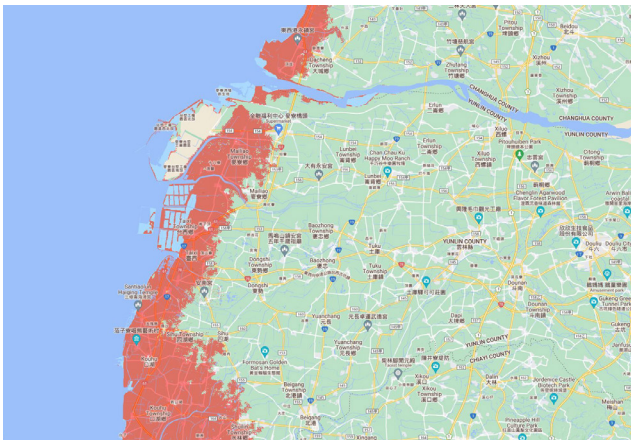


Temperature rises of 4° C.

Figure 3.5-3 Simulated Scenarios of Land Below the Flood Line in 2050 under Different Warming Scenarios



RCP 4.5 Scenario



RCP 8.5 Scenario

Figure 3.5-4 Future Flood Risk Assessment Based on RCP 4.5 / RCP 8.5 Scenarios

Classification of Flood Risk Assessment

Assessment of flood risk for production sites to facilitate organizational strategic planning: There is a total of 1 (100%) production site classified as medium to low risk.

RCP 8.5
Medium-low risk

RCP 4.5
Medium-low risk

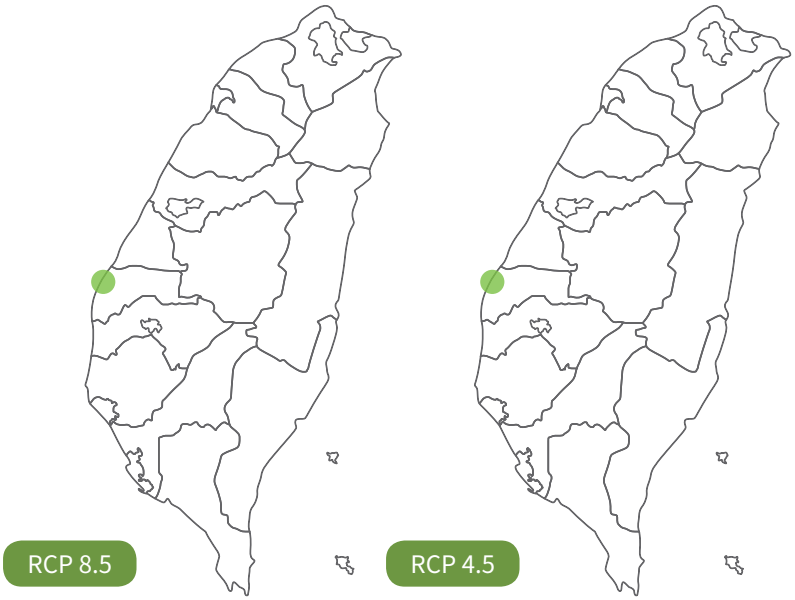


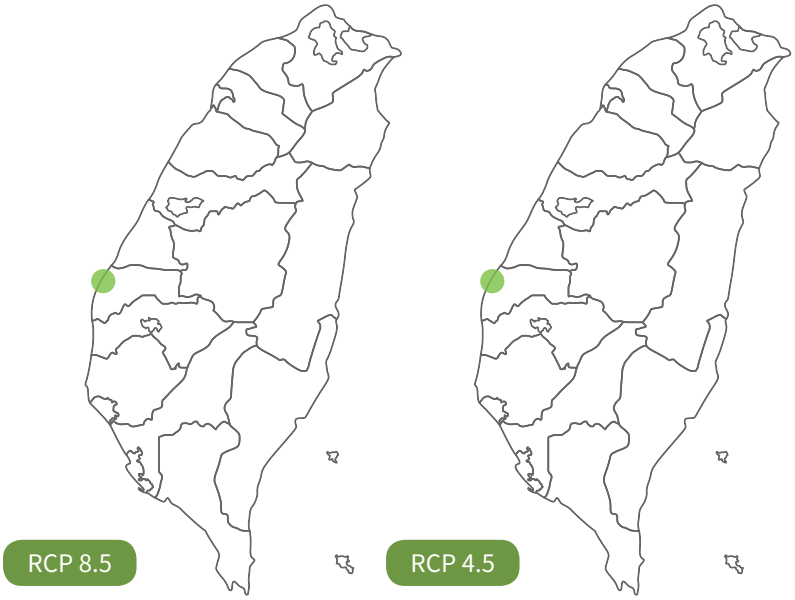
Figure 3.5-5 Future Drought Risk Assessment Based on RCP 4.5 / RCP 8.5 Scenarios

Classification of Drought Risk Assessment

Assessment of flood risk for production sites to facilitate organizational strategic planning: There is a total of 1 (100%) production site classified as

RCP 8.5
Medium-low risk

RCP 4.5
Medium-low risk

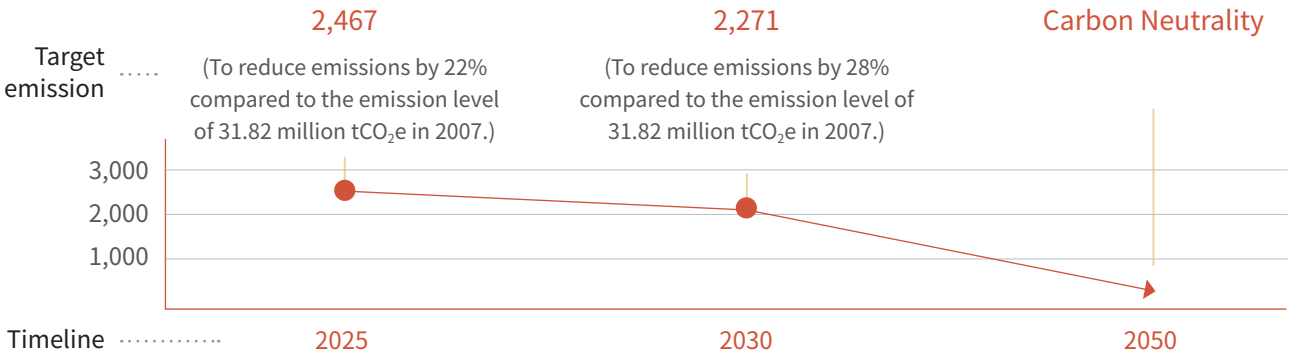


CH4 Indicators and targets

4.1 Carbon neutrality target by 2050

To achieve the vision of a low-carbon economy, Formosa Petrochemical has set a long-term goal of carbon neutrality by 2050 and established short-term (2025) and mid-term (2030) targets to assess progress towards the goal. The timeline and target emissions are presented in the table below.

Table 4.1-1 Short-, medium-, and long-term carbon reduction targets



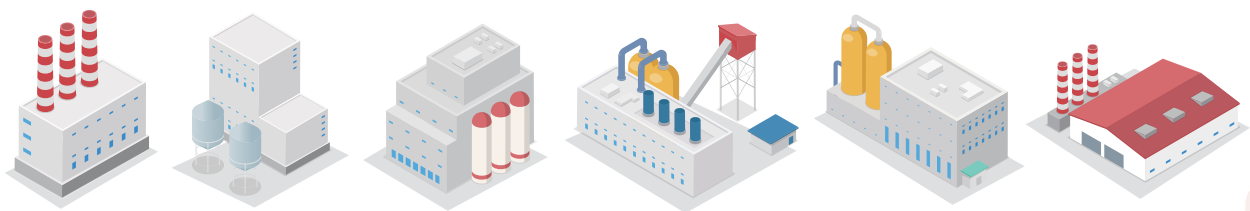
4.2 Information on greenhouse gas emissions

Formosa Petrochemical has been conducting greenhouse gas inventory in accordance with ISO 14064-1 since 2005, and entrusted bsi Taiwan to conduct relevant verifications. The greenhouse gas emissions in 2022 were still under investigation prior to the publication of this report. This report discloses the greenhouse gas emissions in 2021 with the inventory and verification completed. After the verification was completed in 2021, the data was reported and registered on the National Greenhouse Gas Registration Platform at the end of August in accordance with the EPA's Management Regulations Governing Greenhouse Gas Emission Inventories and Registration. The greenhouse gas emissions from each plant disclosed in this report are the data for 2021, as shown in the figure below:

Table 4.2-1 Formosa Petrochemical's greenhouse gas emissions in 2021

Unit: tCO_2e

Plants	Scope 1	Scope 2	Total Emissions
Mailiao Plant #1	14,558,251	0	14,558,251
Mailiao Plant #2	4,524,696	152,025	4,676,721
Mailiao Plant #3	7,399,773	46,069	7,445,842
Taipei Logistic Station	15	1,039	1,054
Taoyuan Logistic Station	20	827	847
Changbin Blending Plant	10	604	614
Total	26,482,767	119,051	26,601,818



Since 2019, the Company has conducted annual inventory of Scope 3 emissions and its relevance, which has been independently verified by a third party (please refer to Table 4.2-2 for details).

Table 4.2-2 Scope 3 emission indicators for the Year 2021

Scope 3 Sources	Relevance	Emissions (tCO_2e)	Scope of Calculation
Purchased goods and services	Relevant and calculated	6,985,842	The scope of this inventory includes manufacturing-related emissions from primary tier one suppliers, covering 100% of the major raw material suppliers.
Capital goods	Relevant and calculated	34,292	The scope of this inventory covers 100% of the capital goods for the year 2021.
Fuel- and energy-related activities (not included in scope 1 or 2)	Relevant and calculated	1,482,854	The reported emissions cover 100% of the fuel and energy activities not included in Scope 1 or 2, such as coal, light cracked fuel oil, natural gas, and other activities related to the extraction and transportation of dyes and energy sources.
Upstream transportation and distribution	Relevant and calculated	6,168,576	The reported emissions include transportation activities associated with 100% of the primary tier one raw materials.
Waste generated in operations	Relevant and calculated	10,522	The reported emissions include 100% of the emissions generated from the treatment of operational waste.
Business travel	Relevant and calculated	0.0732	The reported emissions include 100% of the emissions generated from air travel.
Employee commuting	Relevant and calculated	1,059	The reported emissions include 100% of the emissions generated from employee commuting transportation services associated with company shuttles.
Upstream leased assets	Not relevant	-	Formosa Petrochemical does not engage in upstream asset leasing activities.
Downstream transportation and distribution	Relevant and calculated	1,286,276	The reported emissions include 100% of the emissions generated from the transportation of products delivered to the main customers' premises.

Scope 3 Sources	Relevance	Emissions (tCO_2e)	Scope of Calculation
Processing of sold products	Relevant and calculated	9,424,320	Our company's products are typically upstream products. Formosa Petrochemical identifies its current products as naphtha, gasoline, diesel, aviation fuel, and base oil. Among them, naphtha and base oil are present in the value chains of products in sectors such as food, healthcare, agriculture, automobiles, and consumer goods. For example, our products serve over 20,000 different customers in these various sectors, each with distinct greenhouse gas profiles. These customers sell our products to a wider range of end users, with gasoline, diesel, and aviation fuel used in mobile transportation vehicles. After identification, gasoline, diesel, and aviation fuel are further specified for use in automobiles, motorcycles, and aircraft respectively. No emissions from the processing of sold products are accounted for. Naphtha, after being sold, undergoes further processing into various other products, making it currently impractical to identify and quantify emissions from such processing. Base oil is primarily processed into lubricating oil, and the carbon emissions from the processing of sold products are primarily calculated based on the emissions from lubricating oil production.
Use of sold products	Relevant and calculated	34,891,492	Our company primarily produces upstream products. Formosa Petrochemical distinguishes its current product portfolio into naphtha, gasoline, diesel, aviation fuel, and base oil. Among these, naphtha and base oil are used in value chains related to food, healthcare, agriculture, automotive, and consumer goods. For instance, our products have over 20,000 customers across these diverse sectors, each with varying greenhouse gas profiles. These customers further sell our products to a broader range of end users. Gasoline, diesel, and aviation fuel are used in mobile transportation vehicles, specifically automobiles, motorcycles, and aircraft, respectively. The emissions associated with the sold products are calculated based on the carbon emissions generated from the use of Formosa Petrochemical's products in automobiles, scooters, and airplanes.
End-of-life treatment of sold products	Not relevant	-	Our company primarily produces upstream products. Formosa Petrochemical identifies its current products as naphtha, gasoline, diesel, aviation fuel, and base oil. Among these, naphtha and base oil are found in value chains related to food, healthcare, agriculture, automotive, and consumer goods. Due to the extensive nature of these value chains, it is not feasible to quantify the emissions associated with the disposal of the final products.
Downstream leased assets	Not relevant	-	Formosa Petrochemical does not have any downstream leased assets. In the year 2021, there were no downstream leased assets that resulted in additional greenhouse gas emissions.
Franchises	Not relevant	-	Formosa Petrochemical does not have any franchising operations.
Investments	Not relevant	-	Investments mainly focus on specific product innovation activities, which have limited impact. Therefore, we consider this Scope 3 category to be irrelevant.
Other (upstream)	Not relevant	-	The assessment of greenhouse gas emissions sources for Formosa Petrochemical does not currently take into account other relevant upstream greenhouse gas emissions sources.
Total Emissions (tCO_2e)		60,285,232	

Appendices

Report management

The coverage period of this report is as follows:

January 1, 2022 ~ December 31, 2022

Frequency of report preparation : Annually

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TCFD Index

Core Elements	Recommended Disclosures	Pages
Governance	Describe the board's oversight of climate-related risks and opportunities.	P4-5
	Describe management's role in assessing and managing climate-related risks and opportunities.	P4-5
Strategy	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	P7-8
	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	P7-8
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2° C or lower scenario.	P19-22
Risk Management	Describe the organization's processes for identifying and assessing climate-related risks.	P10-11
	Describe the organization's processes for managing climate-related risks.	P12-13
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	P14-18
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.	P24-26
	Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	P24-26
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	P24-26

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