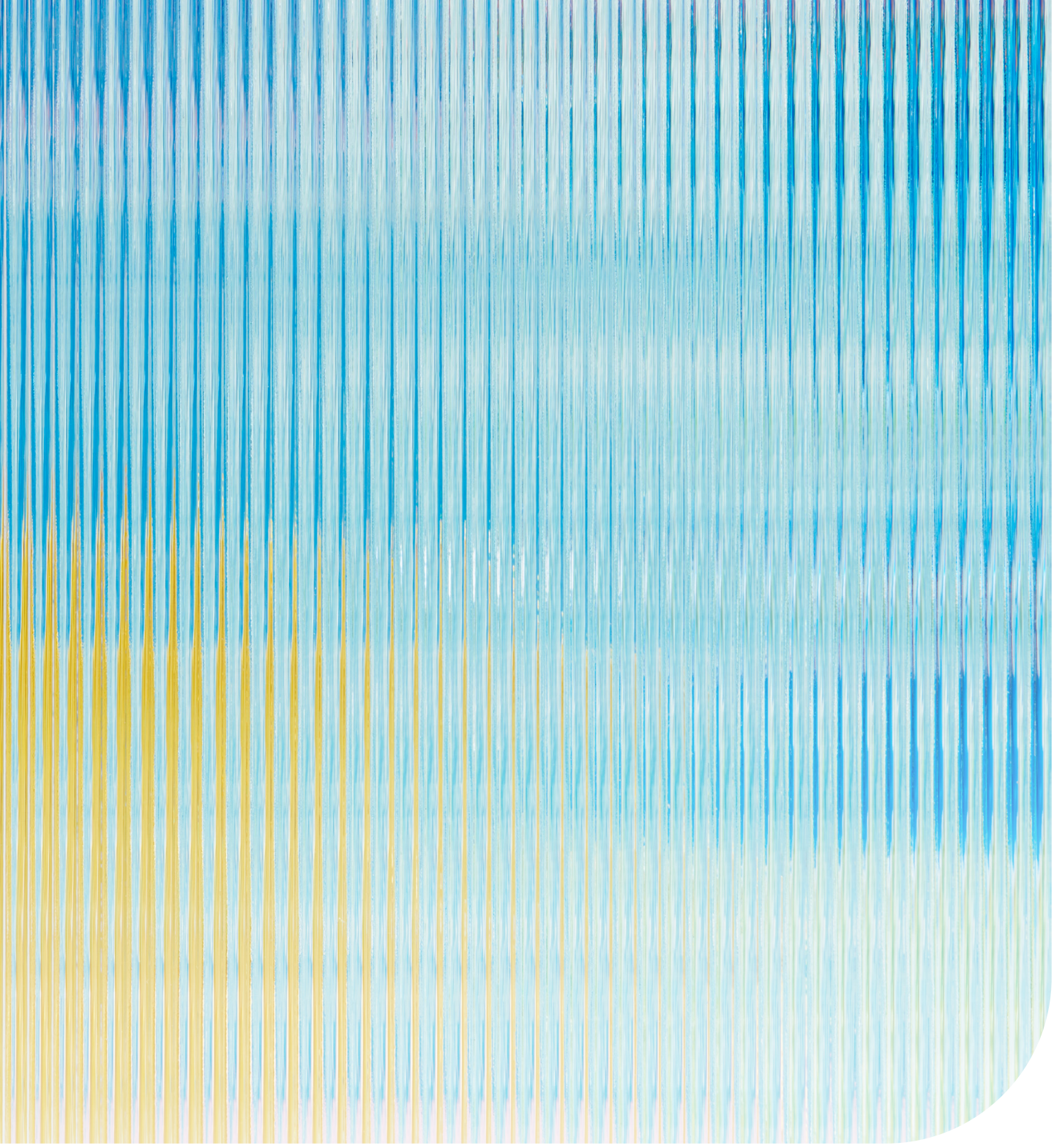
TAIWAN GLASS IND. CORP.

2024
TCFD Report



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chapter 1

Preamble

1.1 Preamble

Through the announcement "Taiwan 2050 Net Zero Roadmap and Strategy" in March 2022, the government of Taiwan outlined its net zero transformation goals and took steps toward accomplishing them. Stage-by-stage targets and action plans for 2050 net zero transformation were later introduced in December 2022, including a Nationally Determined Contributions (NDC) plan to reduce carbon by 24%±1% by 2030 In 2023, the Legislation Yuan of Taiwan passed the Climate Change Response Act, which states that the nation shall achieve net zero greenhouse gas emission by 2050 and implement a carbon fee system. The Act thus became the legislative basis for future climate governance efforts.

TGI Group is dedicated to addressing the risks and opportunities of climate change as part of its sustainability efforts, and has identified climate change a major issue and critical risk for sustainable growth, which is being analyzed and managed persistently and supported with low-carbon transformation as well as climate mediation measures. The Company has adopted the TCFD (Task Force on Climate-Related Financial Disclosures) Guidelines published by Financial Stability Board (FSB) and developed a risk framework using the four core elements of climate-related financial disclosure, namely: "governance," "strategy," "risk management," and "metrics and targets," to identify any major risks and opportunities that are significant to business operations, followed by appropriate response strategies. Based on this framework, the Company has implemented climate-related metrics and targets for sustainable management.

Climate change is a common major issue for mankind. According to "Global Risks Report" published by World Economic Forum, climate action failure ranks first in the top 10 long-term risks for two consecutive years; this means that businesses will have to adopt more pro-active actions and make faster adjustments to climate change to better respond to the impending challenge. Being a part of the global industries, TGI has and continues to enforce its own climate change management strategies, such as improvement of glass-making technique, power generation using residual heat, development of alternative materials and fuel, renewable energy plans, support for circular economy etc., as ways to mitigate and adapt to the impact. In addition to improving our own techniques, we also coordinate with supply chain partners to lessen carbon emission, and adopt solutions such as low-carbon construction materials and resource recycling to provide customers with products and services that have lower carbon footprint, and thereby involving them in our goals to strengthen climate resilience and achieve net zero by 2050.

Furthermore, TGI will actively cooperate with the community and local government agencies to promote environmental protection and sustainability. This strengthened sense of social responsibility and improved corporate image will help TGI maintain competitiveness and sustainability in future climate changes. Through ongoing improvement and implementation of these strategies, TGI will play an important role in the world's carbon reduction efforts and contribute to the green transformation and sustainability of the industry.

Message from the Chairman

Greetings to all our directors and shareholders:

The global economy faced numerous uncertainties in 2024, and the market widely expects an easing cycle to begin. However, since taking office, US President Trump has introduced a number of tariff policies, shrouding the global economic and industrial development in uncertainties and high risks. Countries around the world have adopted different response measures, making global trade full of tricky and complex situations.

The government is requested to study its strategy for coping with the economic changes in Sino-US relations under the US tariff policy. With foreign trade as its main focus, Taiwan should actively negotiate for a Taiwan-US Investment Protection Agreement and continue to promote cross-strait economic and trade exchanges to maintain its market share. At the same time, the government should accelerate the upgrading and transformation of traditional industries, encourage the development of new business models, adjust supply chain configurations, diversify its layout and expand the market. It should prudently respond to issues such as customer order transfers, overcapacity, and export products squeezing out the domestic market that may be caused by tariffs, to mitigate the impact on the industry, and improve relevant supporting policies to ensure competitiveness in the international market. Looking back at TGI in 2024, the Group's consolidated revenue reached NT$42.5 billion, with a net loss after tax of NT$1.57 billion. The following report is provided for each product category:

Regarding flat glass, the use of low-emissivity (Low-E) glass in residential applications has increased, reflecting rising market demand for high-performance building materials. In response to rising raw materials, industrial water, and electricity prices, various factories have responded to carbon reduction and clean energy policies. In addition to installing waste heat recovery boiler systems to effectively utilize excess heat from kilns, Lukang Factory has set natural gas as the primary fuel for the kiln, with heavy oil as backup fuel. The replacement rate has reached 90%. Factories are also increasing production automation and digitization, adding AI application analysis to achieve optimal production and energy consumption parameters. To pursue growth, the Company continues to focus on emerging application areas, such as smart cities and net-zero carbon emission policy industry development, which may increase product demand.

For the mainland China market, despite the continued release of revitalization policies to drive the recovery of real estate and domestic demand markets, structural challenges still exist. Demand growth in the construction sector remains weak. The rise of new energy vehicles and smart homes is expected to drive the supply of high-end application products such as ultra-thin and optoelectronic glass in the future.

In the fiber business, information transmission has entered the era of high frequency and high speed. Printed circuit boards (PCBs) used in network communication equipment must use low dielectric (Low DK) materials and special specifications of low coefficient of thermal expansion (Low CTE) fiberglass cloth to effectively meet the performance requirements of high frequency, high speed and AI intelligent applications. TGI's first and second generation low-dielectric Low DK fiberglass cloth and low-expansion coefficient Low CTE fiberglass cloth have all passed customer certification and adoption. The Company continues to refine and improve its product development and makes the latest adjustments in response to industry market demand. In terms of the kitchenware brand, the domestic market remains stable, and heat-resistant products for export are highly recognized by customers for their excellent quality. Foreign customers all possess strong brand influence and channel advantages in the market, which have increased order volumes and profits.

Regarding external and regulatory environmental risks, Taiwan will implement a carbon fee system that differs from the global one, which may create resistance to domestic industrial transformation. The design of the carbon fee system will not only affect the industry, but also should comprehensively consider the impact on the economy and society. Minimum wages, electricity costs and other costs will be raised simultaneously, which will create a burdensome financial impact on the industry. In the future, corporate operations will inevitably have to incorporate carbon costs into their assessments, actively adopt energy-saving measures, and improve energy efficiency to reduce cost pressures. The government also needs to comprehensively consider the impact of Taiwan's carbon fee on international trade and supply chains, and encourage companies to invest in low-carbon technologies and green energy. Further measures are provided, including investment incentives, tax credits, and financial interest subsidies.

In terms of corporate sustainability, TGI has received the TCSA Taiwan Sustainability Award - [Traditional Manufacturing Industry Silver Award] for 10 consecutive years, and simultaneously received the [Corporate Sustainability Award - Outstanding Performance] and [Circular Economy Leadership Award] as individual performance awards in 2024. The company's total greenhouse gas emissions have decreased by a cumulative 136,690 tons (-18.4%) over the past three years. Heavy oil usage has been reduced by 44.28%, LPG by 77.45%, and purchased electricity by 39 million kWh (-8.1%). Factories collectively saved 6.67 million kWh of electricity. Both overall and individual performance have received widespread recognition.

Looking ahead, with AI applications, big data analytics, and automation technologies now in a phase of rapid growth, they are also critical for maintaining corporate competitiveness. We will continue to invest resources and accelerate our green transition, optimizing our business model to align with international standards, enhance production efficiency, and improve market responsiveness, ensuring we maintain a competitive edge in the global market. TGI will continue to uphold the principles of prudent operations to meet future challenges and opportunities.

Chairman of Taiwan Glass Industry Corporation

Lin, Por Fong

chapter 2

Climate governance

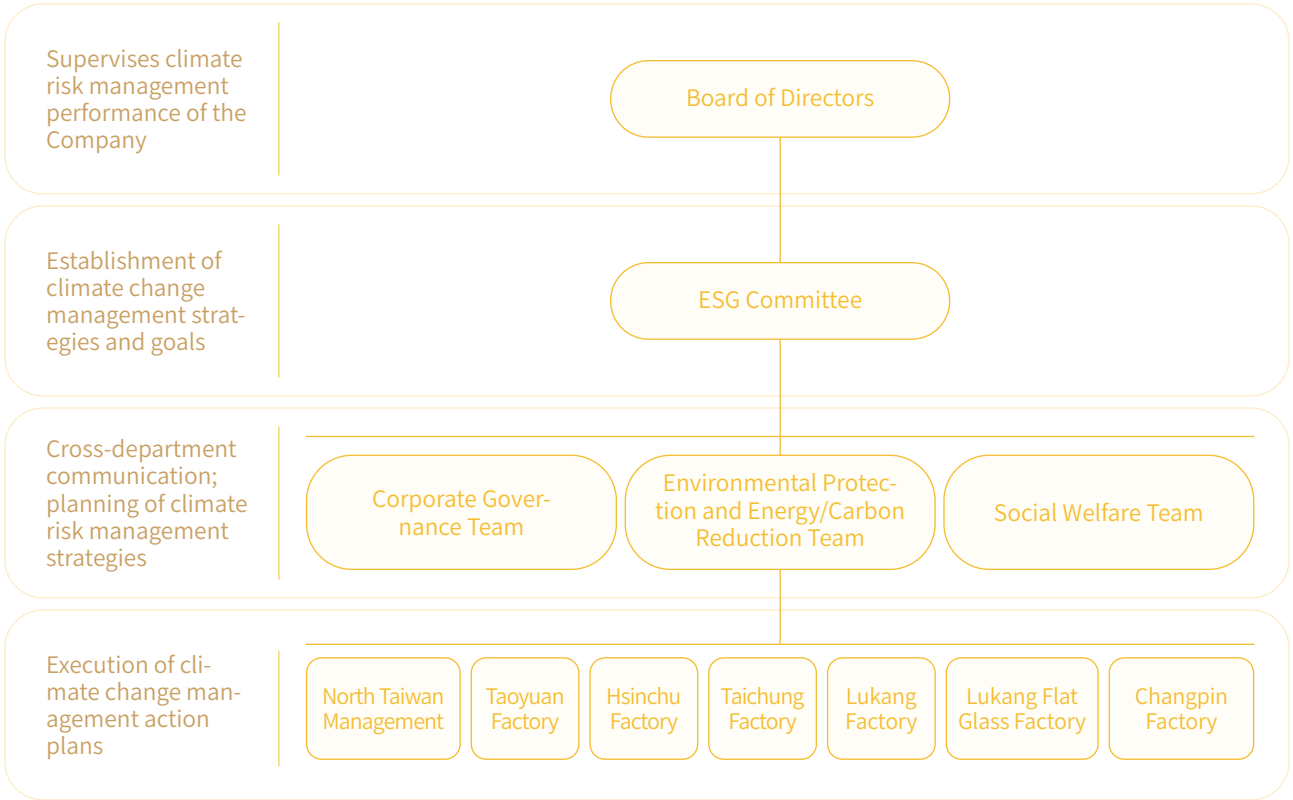
2.1 Climate governance and management framework

Governance system and framework

According to reports from the Global Economic Forum extreme weather events and climate action failure have remained among the top five global risks in recent years, and ranked as the first and second top risks in the past 4 years. This was why TGI introduced TCFD (Task Force on Climate-Related Financial Disclosures) framework with the four aspects of "governance," "strategy," "risk management," and "metrics and goals" to formulate strategies and actions for climate change, which will hopefully mitigate the impact of climate risks. TGI has assembled an "ESG Committee" to facilitate the enforcement and management of corporate social responsibilities. The committee comprises several executive members; the Chairman and CEO serve as conveners for the Committee, whereas independent directors assume the roles of advisory member. With regards to the supervision of climate-related risks and opportunities, the Board of Directors is the highest governance unit on climate issues within TGI as it is responsible for supervision and decision-making. An "ESG Committee" has been assembled under the board, which regularly reports progress on climate risks and opportunities to the Board of Directors. The "ESG Committee" formulates medium and long-term sustainable development goals of TGI, and is responsible for integrating the Company's cross-departmental resources, identifying climate issues related to the Company's operations, formulating climate strategies, tracking the achievement of targets, and making unscheduled reports to the Board of Directors.

The "ESG Committee" identifies climate-related risks and opportunities that are relevant to corporate operations and of concern to stakeholders in semi-annual meetings through various task forces that it has assembled for each issue. Climate change strategies and actions are being formulated in the four main aspects of "governance," "strategy," "risk management," and "metrics and goals" in an attempt to minimize climate risk impact and to ensure that management practices for climate-related risks and opportunities are duly enforced in group operations. With regards to the development of climate strategies, the ESG Committee identifies climate risks and opportunities on a regular basis, and works with the management of each factory to analyze the possible financial impact of major climate risks and formulate contingency as well as preventive measures to enhance climate resilience of the Company. In terms of risk management, the ESG Committee consolidates climate-related risks, opportunities, and management measures for regular review and tracking.

TGI's climate change governance organization



Reviews of the ESG Committee in 2024

The Board of Directors is the highest governance body on climate issues within TGI. The board authorizes members of the ESG Committee to review performance and assign responsibilities to subordinate departments for the execution of ESG plans. The ESG Committee makes quarterly reports to the board of directors regarding greenhouse gas management. TGI's Sustainability Committee meets semi-annually. The 2024 meeting agenda covers sustainability performance tracking for each site and climate change mitigation and adaptation measures, including energy and power conservation measures, exhaust gas treatment equipment upgrades, renewable energy deployment plans, and greenhouse gas inventory planning.

01 Discussions of the 1st meeting

- Report on the timeline for preparing the 2023 ESG sustainability report.
- Report on the ESG sustainability performance of TGI's Taiwan factories.
- Report on greenhouse gas control regulations and inventory reduction targets.
- TGI's greenhouse gas inventory report for the past three years.
- Report on the installation of renewable energy (solar power generation system) at TGI's Taiwan factories.

02 Discussions of the 2nd meeting

- Complete and report on the 2023 Sustainability Report and TCFD Climate-related Financial Disclosure Report.
- In accordance with the greenhouse gas information disclosure schedule planned by the Financial Supervisory Commission, the 2023 greenhouse gas inventory information of the parent company (Taiwan factory) was disclosed and had been verified by an external third-party SGS in accordance with ISO 14064-1:2018.
- Incorporate sustainability information management into the Company's internal control system and annual audit plan.
- In accordance with the "Taiwan's Blueprint for Adopting the IFRS Sustainability Disclosure Standards", we are implementing plans and making progress for the introduction of IFRS Sustainability Disclosure Standards.
- Report on the ESG sustainability performance of TGI's Taiwan factories.
- In accordance with the Climate Change Response Act and related sub-acts announced by the Ministry of Environment, the objectives of carbon fee collection and voluntary reduction plans will be discussed.
- Calculate the carbon costs of each TGI's Taiwan factories in 2023 and compare their own reduction targets.

2.2 Outcomes of climate governance and supervision

Key milestones of climate change governance

2013
- Published the Group's first "CSR Report"

2014
- Both Hsinchu Factory and Taichung Factory received 15-year ISO 14001 "Environmental Sustainability Award" from SGS, which affirmed TGI's contributions
- Taichung Factory passed certification for ISO 50001:2011 Energy Management System
- Collaborated with TECO Nanotech Co., Ltd. and the Material and Chemical Research Lab of Industrial Technology Research Institute (ITRI) for the development of low-energy vacuum glass and continuous production technology

2015
- TGI won Top 50 Corporate Sustainability Report Award - Silver in the [Conventional Manufacturing] category on its first attempt
- Lukang Factory and Lukang Flat Glass Factory were named Water Conservation Top Performer and won Award of Excellence in Top Water Conservation Performance - Industry Division
- Reported and filed the first greenhouse gas survey results to the Environmental Protection Administration

2016
- Won Corporate Sustainability Report Award - Silver in the [Conventional Manufacturing] category for 2 consecutive years
- Received 2 certifications for green building material from Ministry of the Interior
- Taoyuan Factory passed certification for ISO/TS 16949 Automotive Quality Management System
- Collaborated with the Material and Chemical Research Lab of ITRI for the development of PV-grade ultra-thin soda-lime glass

2017
- Won Corporate Sustainability Report Award - Silver in the [Conventional Manufacturing] category for 3 consecutive years
- Collaborated with ITRI for the development of low-K glass fabric, a high speed/high frequency substrate material
- Taoyuan Factory and Hsinchu Factory obtained certification for ISO 50001:2011 Energy Management System
- Taichung Factory and Lukang Flat Glass Factory implemented exhaust treatment systems for desulfurization, denitrification, and dust removal

2018
- Won Corporate Sustainability Report Award - Silver in the [Conventional Manufacturing] category for 4 consecutive years
- TGI joined the "Alliance for Sustainable Development Goals" and made the commitment to incorporate SDGs into business and development strategies
- Lukang Flat Glass Factory invested more than NT$100 million into the construction of exhaust prevention equipment
- Signed a technology licensing, manufacturing, and supply agreement with U.S. company - Owens Corning.

2019
- Selected as a composition of "FTSE4Good TIP Taiwan ESG Index" prepared by Taiwan Index Plus Corporation and FTSE Russell
- Lukang Factory and Taoyuan Factory received Certificate of Cleaner Production Assessment from the Industrial Development Bureau
- Won Corporate Sustainability Report Award - Silver in the [Conventional Manufacturing] category for 5 consecutive years
- Glass container products received Certificate of Green Recycled Product from Industrial Development Bureau

2020

- TGI was once again selected as a composition of TIP Taiwan ESG Index
- Won Corporate Sustainability Report Award - Silver in the [Conventional Manufacturing] category for 6 consecutive years
- TGI joined National United University's "Advanced Specialty Glass Technology and Manufacturing Alliance"
- Taoyuan Factory replaced all of its boilers and changed fuel from heavy oil to natural gas.
- Hsinchu Factory won "Award of Excellence in Water Conservation Improvement" from Water Resources Agency, Ministry of Economic Affairs
- Hsinchu Factory installed additional SCR (denitrification) equipment for TS-3, TS-6, TS-7, and TS-8

2021

- TGI was once again selected as a composition of TIP Taiwan ESG Index
- Won Corporate Sustainability Report Award - Silver in the [Conventional Manufacturing] category for 7 consecutive years
- Taoyuan Factory was named "2021 Excellent Firm for the Reduction of Industrial Greenhouse Gases" by the Industrial Development Bureau, Ministry of Economic Affairs, and received medal of accomplishment
- Taoyuan Factory acquired Green Building Label
- Hsinchu Factory won "Bronze Award" in the 3rd Annual Enterprises Environmental Protection Awards - Manufacturing Industry Category

2022

- Won Corporate Sustainability Report Award - Silver in the [Conventional Manufacturing] category for 8 consecutive years
- TGI was once again selected as a composition of TIP Taiwan ESG Index
- Chosen for "Taiwan Top 100 Sustainable Enterprises Award" for the first time, and received Growth through Innovation Leader Award and Circular Economy Leadership Award during the Taiwan Corporate Sustainability Awards (TCSA)
- Taoyuan Factory was once again named "2022 Excellent Firm for the Reduction of Industrial Greenhouse Gases" by the Industrial Development Bureau, Ministry of Economic Affairs, and received medal of accomplishment
- Taoyuan Factory was named "Taoyuan City Excellent Contributor to Air Pollution Prevention"
- Hsinchu Factory received Resource Cycling Foundation Label - "Non-plastic Waste Container"
- Taoyuan Factory passed review for Green Factory Label and was awarded certificate
- Each factory promotes the installation of solar renewable energy equipment, with a capacity of 8,769KWH
- Lukang Flat Glass Factory installed CF dust collector for exhaust treatment and air pollution control

2023

- Selected again for the 2023 TCSA Taiwan Corporate Sustainability Award "Taiwan Top 100 Sustainable Enterprises Award", Innovation Growth Leadership Award, Circular Economy Leadership Award
- Won Corporate Sustainability Report Award - Silver in the [Conventional Manufacturing] category for 9 consecutive years
- Completed construction of renewable energy equipment and commenced power generation across all factories. Annual power capacity reached 10.89 million kWh
- Hsinchu Factory installed natural gas/heavy oil fuel switch for furnace
- Lukang Flat Glass Factory invested NT$80 million into constructing a heat-recycling steam boiler

2024

- Won the TCSA Corporate Sustainability Report Award [Traditional Manufacturing Silver Award] for 10 consecutive years and
- Selected for the 2024 TCSA Circular Economy Leadership Award and Corporate Sustainability Award - Outstanding Performance Award
- Obtained the first external verification of carbon footprint for fiberglass product

Board supervision over the outcome of sustainability and climate change projects

The board of directors provides active supervision and guidance over TGI's sustainability strategies in such a way that gives stakeholders more insight into the Company's commitments and progress with respect to climate change responsibilities. In terms of operating strategy, TGI places sustainability focus on creating positive influence in the economy and the society. Through seamless coordination between the board of directors, the functional committees, and internal departments, TGI hopes to develop effective governance over climate change and sustainability issues, facilitate mutual growth with stakeholders, and secure TGI's stature as the sustainable leader in the glass industry.

TCSA award history

Performance of the Environmental Protection and Energy/Carbon Reduction Team

Members of the Environmental Protection and Energy/Carbon Reduction Team are responsible for energy and carbon management, reporting of greenhouse gas survey results, and the establishment and regular execution of carbon reduction projects. The team had been exceptionally fruitful in its energy and carbon reduction efforts in 2024:

Implementation Results

- Taoyuan Factory implemented the "Variable Frequency Control Soft Water Pump Project", saving a total of 712,704 kWh of electricity as of March 2025
- Taoyuan Factory installed "CSM cooling fan with inverter" in March of this year, which is expected to save 19,282 kWh of electricity annually
- Taoyuan Factory implemented "CR-1 Electricity Consumption Improvement Project". By reducing the output power of three-phase electric heater, the Company successfully reduced overall electricity consumption without affecting the required product temperature, achieving energy-saving goals
- Taoyuan Factory recycles wastewater from backwashing of the resin softening tank and reuses it for cleaning other equipment. The recycled water volume reached 93,000 tons, saving $1,319,062 in water costs
- Hsinchu Factory installed the "TS2 kiln dual-fuel system", successfully reducing energy costs, air pollution, and carbon emissions, and achieving a 66.91% reduction in TS2 carbon emissions
- Hsinchu Factory stopped using mobile air compressors in 2024 and switched to TS-6 combustion air supply to improve energy efficiency and reduce energy waste. It is estimated that this will save more than $1 million in electricity bills annually
- Hsinchu Factory upgraded its wastewater system's roots blower to air-floating turbine blower with variable frequency control, saving an estimated $231,264 in electricity costs annually
- Taichung Factory collaborated with the Industrial Technology Research Institute on "Dust Ash Purification and Reuse Project" to successfully purify Se (selenium) in 2024. After purification, it can be recycled and reused, which not only saves raw material costs and outsourced waste treatment costs, but also reduces pollution to the environment
- Taichung and Lukang Flat Panel Factories have already set natural gas as the main fuel for their glass kilns, with natural gas accounting for over 90% of the total annual consumption
- Lukang Factory implemented "UT1 Chilled Water and Cooling Water System Improvement and Energy Saving" plan, which is estimated to save $5,931,250 per year
- Lukang Factory and Lukang Flat Glass Factory implemented "TECO Energy and Resource Management System Installation Project" to improve energy efficiency within the factories
- Lukang Flat Glass Factory used high-temperature kiln exhaust gas to generate steam for use in TL boilers, reducing natural gas consumption in TL boilers. This is estimated to reduce carbon emissions by 208 metric tons per month
- Changpin Factory replaced its lighting equipment by the end of 2024, which is expected to reduce carbon dioxide emissions by 4,900 kilograms annually
- Changpin Factory replaced the rotary flip cleaning equipment with fixed sponges and manual wiping to save electricity and reduce carbon emissions. By March 2025, 166.15 kWh of electricity had been saved
- Changpin Factory collected and sold surplus PVB film raw materials, which is estimated to reduce waste by 10 tons
- Changpin Factory recycled color test strips, which is estimated to reduce paper consumption by 672 meters per year

chapter 3

Climate risk and opportunity management

3.1 Climate risk and opportunity identification

Identify Climate Change Risks and Opportunities

The "ESG Committee" identifies climate risks and opportunities on a regular basis. The committee examines the impact of changes in policies, regulations, technologies, markets, and goodwill on transition risks and opportunities every year; it regularly reviews the assessment of physical risks, transition risks, and opportunities through the identification of climate risks and opportunities, and works with each Factory to respond to risks and opportunities. The committee analyzes the potential financial impact of major climate risks and devises responses and preventive measures accordingly to strengthen climate resilience.

The Company will use the TCFD's physical risks, transition risks, and climate change opportunities as the direction of interviews, and meetings with external consultants and the directors of various Factories and departments of Taiwan Glass to jointly identify possible climate change risks and opportunities. The focus is then placed on the actual climate change risks that the Company will face and potential future opportunities during daily operations, and the design and distribution of surveys to analyze major climate change risks and opportunities to formulate an appropriate climate change management policy for the Company.

Procedures for identifying climate risks and opportunities

1 Identify potential climate risks

Discuss with heads of accountable departments about the daily operations of each factory and department, and help identify potential climate risks

2 Evaluate the impact and frequency of climate risk

Create TCFD risk and opportunity questionnaires and have them completed by ac-countable departments, including their assessments on the impact and frequency of climate risks and opportunities

3 Analyze climate risks and opportunities

Gather questionnaire responses and analyze major climate change-related risks and opportunities that are relevant to the Company; present findings in the form of a matrix for better understanding

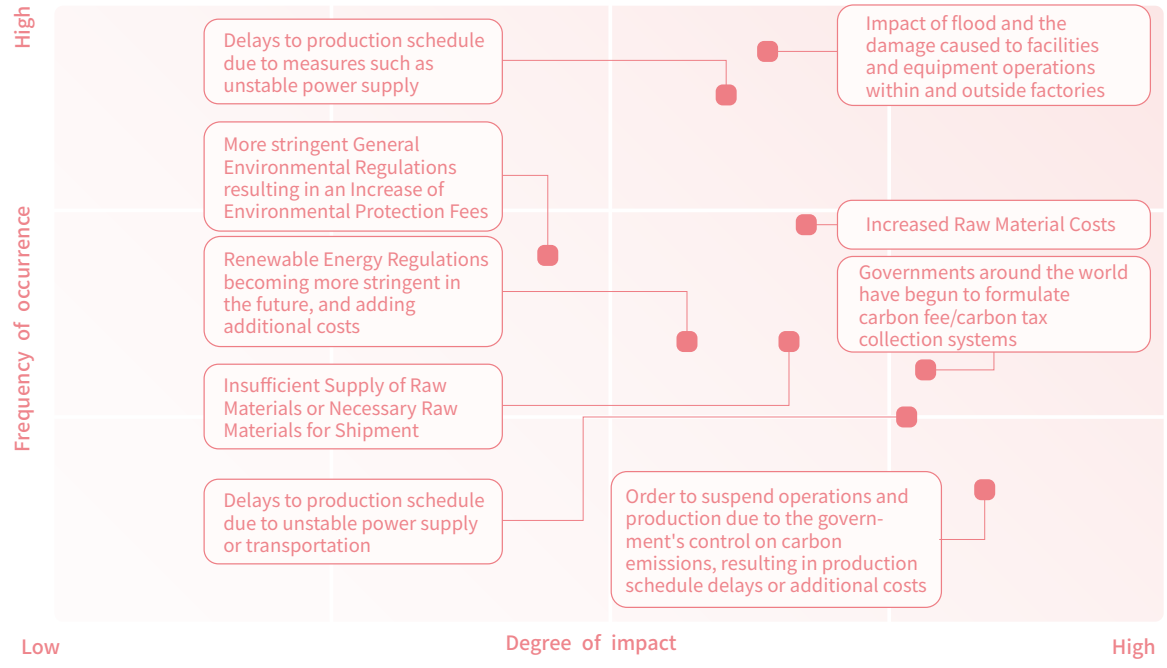
4 Respond to climate risks and opportunities

Raise suggestions for each major climate change-related risk and opportunity identified, and discuss with heads of accountable departments about climate indicators and targets for the year.

TGI uses a climate risks and opportunities matrix to measure the degree of impact and probability of occurrence for various risks and opportunities. To measure degree of impact, TGI introduces quantitative measurements into the questionnaire and evaluates the financial impact of each issue on a scale of five. As for probability of occurrence, TGI issues questionnaires to employees at various factories in order to gather their opinions on the likelihood of individual risks or opportunities. Rigorous analysis is then performed on the data gathered using two parameters, namely "frequency of occurrence" and "degree of impact," and a total of 9 major climate change risks and 7 high potential future climate opportunities were identified.

Degree of impact	Description of impact	Indicative quantitative measurements	Corresponding risk score				
Extreme (5 points)	Concern for factory shutdown or suspension	Financial losses exceeding NT$10 million	5	10	15	20	25
Major (4 points)	Major financial or operational impact (compensation)	Financial losses between NT$7.5 million and NT$10 million	4	8	12	16	20
High (3 points)	High financial or operational impact (compensation)	Financial losses between NT$2.5 million and NT$7.5 million	3	6	9	12	15
Moderate (2 points)	Moderate financial or operational impact	Financial losses between NT$0.5 million and NT$2.5 million	2	4	6	8	10
Minor (1 point)	No significant impact	Financial losses of NT$500,000 and below	1	2	3	4	5
Probability of occurrence			Occurs once every 5 years or longer	Occurs once every 3 to 5 years	Occurs once every 1 to 3 years	Occurs once every 3 months to 1 year	Occurs once every 1 to 3 months

TGI climate change risk matrix



Description of Climate Change Risk

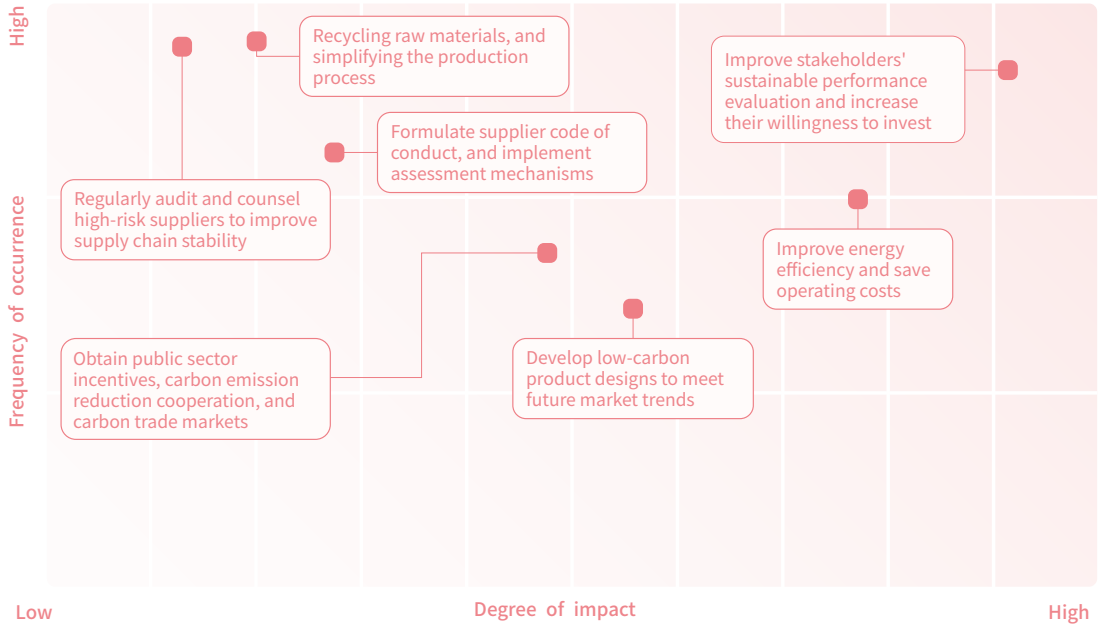
Climate Change Risk Events ▶ Impact of flood and the damage caused to facilities and equipment operations within and outside factories ‖ Stakeholders ▶ Taiwan Glass, Customers		
Description of Risk Impact	Increasingly severe extreme weather events have led to more frequent typhoons and short-term heavy rainfall, which may cause flooding around the factory, disrupt daily operations, and interrupt supply chain activities. The scope of impact may cover major operating sites	
Potential Financial and Operational Impact	Damaged equipment needs to be replaced or repaired, leading to increased capital expenditures	
Opportunities	Post-disaster reconstruction may drive demand for architectural glass, tempered glass, window systems, etc., promoting sales growth. It can also serve as a market opportunity to promote disaster-resistant building materials	
Response measures	Observe the impact of climate change and weather disasters, pay attention to current events to understand possible situations, and follow the emergency response methods specified in ISO 14001 (8-ES-B10)	
Indicators and Targets	Goals in 2024 ▶	1. Conduct regular checks on flood prevention equipment at factory sites, and make sure that they are usable when needed 2. Observe ISO 14001(8-ES-B10) for emergency response.
	Performance results in 2024 ▶	The flooding did not affect the operation of facilities or equipment inside or outside the factory and did not cause damage
Climate Change Risk Events ▶ Delays to production schedule due to measures such as unstable power supply ‖ Stakeholders ▶ Taiwan Glass, Supply Chain, Customers		
Description of Risk Impact	To address climate change, governments may implement electricity restrictions, peak load regulation, or power rationing due to grid instability. Furthermore, extreme high temperatures or natural disasters may also cause regional power outages, affecting scheduling, production efficiency and delivery time	
Potential Financial and Operational Impact	Operational disruptions create opportunity costs and delivery compensation risks, flooding may also affect material storage, warehousing, and logistics	
Opportunities	The crisis has prompted companies to accelerate energy transition and self-generation plans	
Response measures	Assess and establish self-contained power generation and energy storage system on site to reduce reliance on external power grids	
Indicators and Targets	Goals in 2024 ▶	Regular battery replacement for each factory's UPS system, regular maintenance of emergency generators, which are activated in the event of power instability or outages, and other unnecessary energy consumption is shut down to minimize risks
	Performance results in 2024 ▶	There is no risk of loss of finished products due to unstable power supply in the factory, and it is within the acceptable range
Climate Change Risk Events ▶ Increased Raw Material Costs ‖ Stakeholders ▶ Taiwan Glass, Supply Chain, Customers		
Description of Risk Impact	Raw material suppliers have increased carbon emission costs (carbon fees or carbon taxes), energy costs and logistics costs to meet low-carbon requirements, which is further reflected in the price of raw materials.	
Potential Financial and Operational Impact	1. Increased Safety Inventory and Reduced Funding Flexibility. 2. Increased Operating Costs and Decrease of Profit.	
Opportunities	If downstream customers are more willing to purchase circular economy glass containers while Taiwan Glass continues to increase the ratio of waste glass in its products, it will reduce the amount of purchased raw materials and the cost of raw materials. This contributes to the circular economy and reduces costs, and makes the supplier the preferred firm by downstream customers.	

Response measures	1. Conduct regular supplier assessments. Stipulate long-term contracts for important raw materials that require suppliers to make regular and quantitative deliveries. 2. Taichung Factory has recycled waste glass into the kiln to save raw materials 3. Provide a full range of products and maintain an appropriate inventory level to provide more stable source of domestic market demand 4. Each Factory's minimum inventory of raw materials: 2-3 months worth of foreign raw materials, and 2-4 weeks worth of domestic raw materials.		
Indicators and Targets	Goals in 2024 ▶	1. Raw material cost to increase by <10% by 2030. 2. Increase the percentage of waste glass used in production and reduce the amount of raw material used, provided that supply of externally sourced waste glass remains ample; aim to increase by 2% a year. 3. Conduct quarterly supplier evaluations to ensure a stable supply of raw materials, assess the carbon footprint of raw materials, and implement suppliers' carbon reduction plans.	
	Performance results in 2024 ▶	1. Implement quarterly supplier evaluation 2. We obtained external verification of product's carbon footprint in 2024 to effectively control the carbon emissions of raw materials 3. 26,958,782 kg of glass was recycled in 2024, saving a total of $27,448,387 in procurement costs	
Climate Change Risk Events ▶ Governments of Various Countries have begun to formulate the relevant Carbon Fee/Carbon Tax Collection Mechanisms ‖ Stakeholders ▶ Taiwan Glass, Supply Chain, Customers			
Description of Risk Impact	TGI's manufacturing process is energy-intensive and has high carbon emissions. It faces the risk of increased carbon tax costs in the future, which will affect its product competitiveness and operating cost structure		
Potential Financial and Operational Impact	Increase of Operating Costs, affecting the Competitiveness of Product Prices.		
Opportunities	1. Promote carbon emission reduction technologies and low-carbon energy use to strengthen competitive advantages 2. Improve corporate sustainability ratings through proactive carbon management		
Response measures	1. Improve carbon emission inventory and management systems to ensure the accuracy of carbon emission data 2. Promote energy efficiency and the introduction of renewable energy to reduce carbon emissions		
Indicators and Targets	Goals in 2024 ▶	Continue to implement the voluntary reduction plan to achieve target annual emissions of 93,339.172 (metric tons CO_2e)	
	Performance results in 2024 ▶	Taichung Factory's carbon emissions in 2024: 93,556.249 metric tons CO_2e. Although this exceeds the target annual emissions of 217.077 metric tons CO_2e, further carbon reduction measures and equipment are being implemented, and the target is expected to be achieved	
Climate Change Risk Events ▶ The impact of unstable supply/transportation (such as natural gas, diesel, heavy oil, LPG) caused by extreme weather may cause delays in production schedules ‖ Stakeholders ▶ Taiwan Glass, Customers			
Description of Risk Impact	Affected by climate change, unstable supply of important energy sources may cause process interruptions or scheduling delays, putting operational pressure on TGI's continuous process systems		
Potential Financial and Operational Impact	1. Production schedule delays lead to order fulfillment risk and compensation 2. Energy disruptions can damage furnaces or furnace equipment, leading to high repair costs		
Opportunities	1. Develop a diversified energy structure, including alternative options such as solar energy and biomass energy 2. Plan to become a high-quality supplier with low risk and sustainable operation in the supply chain		

Response measures	Establish the upper limit for the load of electric pallet trucks, and the number of glasses placed on the production platform shall not exceed the upper limit		
Indicators and Targets	Goals in 2024	▶	Plan energy reserves (heavy oil, diesel), and keep at least one month's supply in stock to avoid fuel shortages.
	Performance results in 2024	▶	There was no natural gas supply in the factory/unstable transportation, which led to delays in production schedules.
Climate Change Risk Events ▶ Insufficient Supply of Raw Materials or Necessary Raw Materials for Shipment ‖ Stakeholders ▶ Taiwan Glass, Supply Chain, Customers			
Description of Risk Impact	Shortage of stock for upstream suppliers due to climate change, resulting in no raw materials available for production. Those with minor shortages will reduce production, and those with severe shortages will suspend production. If the kiln is shut down and production resumes, it may take up to half a year		
Potential Financial and Operational Impact	1. Delays or interruptions in the supply of main raw materials cause production disruptions or scheduling delays 2. Delayed delivery may lead to breach of contract risk, customer loss, and loss of trust		
Opportunities	1. Develop a diversified supplier system and regional backup to improve supply chain flexibility 2. Strengthen shipment standardization and internal inventory scheduling processes to increase risk resistance		
Response measures	1. Assess the feasibility of backup suppliers, and add other sources of supply. 2. Adjust safety stock levels		
Indicators and Targets	Goals in 2024	▶	Domestic raw material inventory is more than 30 days, and foreign raw material inventory is more than 60 days. We strive to maintain a full raw material inventory in the factory and have plans for backup suppliers
	Performance results in 2024	▶	There was a risk of shortage of some raw materials in the factory, but the problem was subsequently resolved through backup suppliers, so there was no production interruption or scheduling delay
Climate Change Risk Events ▶ Order to Suspend Operations and Production due to the Government's Control on Carbon Emissions, resulting in Production Schedule Delays or Additional Costs ‖ Stakeholders ▶ Taiwan Glass, Supply Chain, Customers			
Description of Risk Impact	If a company's carbon emissions exceed its permitted amount, it may face fines, back payments for carbon rights, or even orders to suspend operations or limit production		
Potential Financial and Operational Impact	1. If carbon emissions exceed the standard, additional carbon rights must be purchased, increasing operating costs 2. Government-ordered production cuts or shutdowns can result in revenue losses and order defaults		
Opportunities	1. Early adoption of carbon emission monitoring and management systems to reduce risks and improve transparency 2. Enhance brand sustainability rating and attract sustainable funds and long-term investors		
Response measures	1. Reduce carbon emissions, switch to natural gas, and implement solar power 2. Build exhaust control equipment with higher specifications.		
Indicators and Targets	Goals in 2024	▶	1. Continue to promote process optimization and improvement 2. Continue to identify regulations and formulate corresponding measures
	Performance results in 2024	▶	Currently, the government does not have total carbon emission control policy. The factory has implemented its own reduction plan and can meet the standard by following the plan
Climate Change Risk Events ▶ Renewable Energy Regulations becoming more stringent in the future, and adding additional costs ‖ Stakeholders ▶ Taiwan Glass, customers, government authorities			
Description of Risk Impact	If Taiwan implements stricter quotas under the Renewable Energy Development Act, green power purchase obligations, or bulk purchase certificate systems (T-REC, etc.) in the future, it will result in additional operating costs		

Potential Financial and Operational Impact	The construction of green power increases operating costs	
Opportunities	Early deployment of green electricity and renewable energy certificates will provide opportunities to obtain necessary resources at a lower cost in the future	
Response measures	1. Cooperate with government energy policies to optimize electricity usage structure and implement long-term energy conservation plans 2. Committed to product innovation and the research and development of low-carbon products, and continuously improving energy efficiency within the factory	
Indicators and Targets	Goals in 2024 ▶	1. Complete installation of solar panels at factory premise and commence power generation 2. Government target: 424 kW
	Performance results in 2024 ▶	1. Actual installed capacity was 1,685.04 KW 2. The total power generation in 2024 was 2,344,546KW
Climate Change Risk Events ▶ More stringent General Environmental Regulations resulting in an Increase of Environmental Protection Fees ‖ Stakeholders ▶ TGI, government authorities		
Description of Risk Impact	After the implementation of the greenhouse gas total control regulations, orders and production will be restricted, leading to increased operating costs.	
Potential Financial and Operational Impact	1. Increase in investment and maintenance of air, water and waste treatment equipment as well as production costs 2. Failure to comply with regulations in a timely manner may result in fines, orders to improve, or even suspension of work	
Opportunities	Actively search for innovative technologies or production procedures such as recirculated water and recycled glass to reduce exhaust emissions and improve recycling rates.	
Response measures	1. Establish goals for water and electricity conservation, and continuously improve production yields to reduce waste glass output. 2. The factory has added air pollution prevention and control equipment to reduce the emission concentration of air pollutants and comply with regulatory requirements.	
Indicators and Targets	Goals in 2024 ▶	Compliance with the government's current environmental regulations and standards
	Performance results in 2024 ▶	No penalties were incurred for violations of environmental regulations

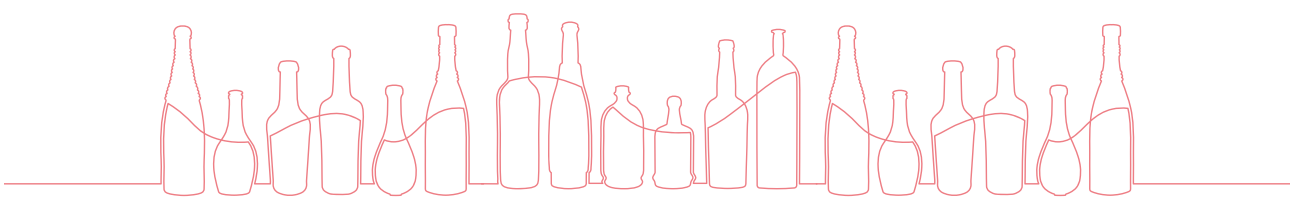
TGI's climate risks and opportunities matrix



Taiwan Glass Climate Opportunities and Promotion Strategies

Climate Change Opportunity Events ▶ Improve the sustainability evaluation results of stakeholders, and increase the willingness of stakeholders in making long-term investments	
Stakeholders	Taiwan Glass, Supply Chain, Customers
Opportunity Issues	Increase Willingness to Make Investments
Description of Opportunity Event	Disclose the net zero carbon emission schedule and strategy, which helps build investors' confidence in the sustainability operations of the Company, enhance the Company's image, and help obtain external funding.
Potential Financial and Operational Impact	1. Investor recognition of the Company's business model and objectives. 2. Improve the sustainability evaluation results. 3. The injection of external funding is beneficial for enterprises to expand their businesses and equipment.
Response measures	1. Establish carbon reduction plans and short, medium and long-term goals based on the government's net-zero emissions roadmap. 2. Establish supply chain ESG management assessment. 3. This year, TGI actively participated in the Carbon Disclosure Project (CDP) and Ecovadis global supply chain sustainability assessment platform to strengthen dialogue with stakeholders
Climate Change Opportunity Events ▶ Recycling raw materials, and simplifying the production process	
Stakeholders	Taiwan Glass
Opportunity Issues	Circular Economy
Description of Opportunity Event	Recycling cullet can reduce furnace energy consumption, reduce raw materials and carbon emissions, and improve resource efficiency.
Potential Financial and Operational Impact	Reduce raw material costs and carbon emissions while improving production stability and efficiency.
Response measures	Increase the utilization rate of recycled materials, improve the quality of cullet sorting, and optimize the formulation ratio
Climate Change Opportunity Events ▶ Regularly audit and counsel high-risk suppliers to improve supply chain stability	
Stakeholders	Supply chain, customers
Opportunity Issues	Improve supply chain stability
Description of Opportunity Event	If high-risk suppliers fail to understand climate issues, delivery stability and brand risks may be affected. Strengthening management will help improve overall supply chain resilience.
Potential Financial and Operational Impact	Reduce the risk of raw material interruption,Improve customer trust and corporate risk control capabilities.
Response measures	Annual ESG audit, risk classification management, coaching and improvement plan tracking.
Climate Change Opportunity Events ▶ Improve energy efficiency and save operating costs	
Stakeholders	Taiwan Glass
Opportunity Issues	Improve energy efficiency
Description of Opportunity Event	Energy prices are fluctuating significantly. The introduction of high-efficiency equipment and energy management systems can improve energy efficiency and reduce operational risks and costs.
Potential Financial and Operational Impact	Save electricity and fuel costs and increase product's profit margin.
Response measures	Establish an energy management system and continuously implement energy-saving improvement plans.

Climate Change Opportunity Events ▶ Formulate supplier code of conduct, and implement assessment mechanisms	
Stakeholders	Taiwan Glass, Supply Chain, Customers
Opportunity Issues	Carry out supplier assessments
Description of Opportunity Event	International customers require ESG compliance in the supply chain, and institutionalized management can reduce risks and gain cooperation opportunities.
Potential Financial and Operational Impact	Improve supply chain competitiveness, ensure the legal source of key raw materials, and avoid regulatory penalties
Response measures	Supplier evaluation norms have been included in the ISO procedure, and quarterly evaluations are carried out.
Climate Change Opportunity Events ▶ Obtain public sector incentives, carbon emission reduction cooperation, and carbon trade markets	
Stakeholders	Taiwan Glass, customers, government authorities
Opportunity Issues	Obtain public sector incentives
Description of Opportunity Event	Driven by climate policies, the government provides a number of incentives, offsets and carbon trading opportunities to help reduce transition costs and create additional revenue.
Potential Financial and Operational Impact	Reducing carbon taxes, applying for subsidies, and carbon rights trading income will help reduce financial pressure.
Response measures	1. Regularly update high energy-consuming and high carbon emission equipment. 2. Application for low-carbon technology subsidies.
Climate Change Opportunity Events ▶ Develop low-carbon product designs to meet future market trends	
Stakeholders	Taiwan Glass, Customers
Opportunity Issues	Develop low carbon products
Description of Opportunity Event	Driven by climate change and policies and regulations, customers are paying more and more attention to the carbon footprint of products throughout their life cycle. Developing low-carbon products will become a basic threshold for future procurement and bidding.
Potential Financial and Operational Impact	The launch of low-carbon glass products will help penetrate the supply chains of public works, green buildings, and major brand manufacturers, thereby increasing product added value and order visibility.
Response measures	1. Use natural gas to replace heavy oil, and continue to improve production procedure equipment. 2. We reduce carbon emissions in every manufacturing process, continue to research and develop energy-saving glass, and provide low-carbon products.



3.2 Climate scenario analysis

TGI faces significant risk when responding to the challenges brought by climate change. Due to Taiwan's large terrain differences and rapid climate changes, rainfall is unevenly distributed, making it prone to seasonal and regional water shortages and frequent floods during typhoon and plum rain seasons. Meanwhile, the tightening of environmental protection laws coupled with the additional costs and controls relating to carbon emission may pose additional burden to the Company in the future. This is why TGI carefully evaluates the impact of physical risks and transition risks and adopts a rigorous risk management strategy in response.

Through in-depth internal analysis, TGI has decided to perform scenario analysis on the two risks that are marked as "high impact and high frequency" on the Climate Change Risk Matrix, which are: "Delays to production schedule due to measures for flood or unstable power supply" and "Imposition of carbon fee/tax by governments around the world." This report also includes scenario analysis on risk of hillslope failure and droughts, as well as a prediction of climate change impacts from 2036 to 2065.

Scenario setting and analytical model

TGI conducted scenario analysis based on the physical risk of "flooding affecting the operation of facilities or equipment inside and outside the factory and causing damage" and the potential physical risks of slope and drought disaster risks. The analysis covered production sites across Taiwan (Taoyuan Factory, Taichung Factory, Hsinchu Factory, Changpin Factory, Lukang Flat Glass Factory, and Lukang Factory).

Based on the data sourced from National Science Council's "Taiwan Climate Change Projection Information and Adaptation Knowledge Platform" (TCCIP), the National Science and Technology Center for Disaster Reduction (NCDR) conducted an evaluation using scenario AR6 and analyzed rainfalls under a 1 ° C, 1.5 ° C, 2 ° C, and 4 ° C increase in global temperature. Based on the data obtained, the NCDR then plotted a flood and hillslope failure risk map for Taiwan and individual counties and cities that shows flood potentials and the affected population in detail. Using the map system, TGI is able to develop a general idea of the climate condition between the years 2041 and 2060, and perform climate risk assessments accordingly.

Scenario description

IPCC 6th Assessment Report: The worst global warming scenario (SSP5-8.5)	
Temperature	Under the most pessimistic global warming scenario (SSP5-8.5), temperatures throughout Taiwan are expected to rise more than 1.8° C and 3.4° C toward the middle and the end of the 21st century, respectively, and rise persistently thereafter.
Extreme high heat	Toward the middle and the end of the 21st century, the number of days with temperature exceeding 36° C in Taiwan is expected to increase by 8.5 days and 48.1 days, respectively.
Yearly rainfall	Under the most pessimistic scenario (SSP5-8.5), yearly rainfall in Taiwan the middle and the end of the 21st century is expected to increase by 15% and 31%, respectively, indicating continuous rise in rainfall.
Rain intensity	Toward the middle and the end of the 21st century, the intensity of the highest single-day rainfall in Taiwan is expected to increase by 20% and 41.3%, respectively.
Number of consecutive dry days	The number of consecutive dry days toward the middle and the end of the 21st century is expected to increase by 5.5% and 12.4%, respectively.
Typhoon	Under the most pessimistic scenario (SSP5-8.5), the number of Typhoons that affect Taiwan is expected to reduce by 15% and 55% toward the middle and the end of the 21st century, respectively. Furthermore, the percentage of severe Typhoons is expected to increase by 100% and 50%, whereas rainfall from Typhoons is also expected to increase by 20% and 35%, respectively.

Note: Scenario RCP 8.5 assumes an increase of radiative forcing to 8.5 watts per square meter by 2100 while the carbon reduction policy remains unchanged and the rate of greenhouse gas increase stays consistent, and the higher concentration of greenhouse gas in the atmosphere ultimately raises temperature by nearly 4° C, causing unavoidable damage to the global environment

Assessing indicators of flood and hillslope failure risks

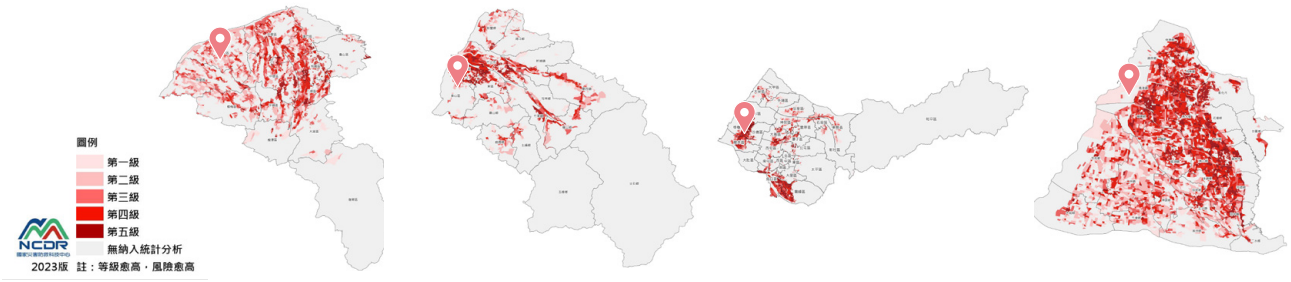
The map system takes a risk-based approach and produces analysis using a combination of hazard indicator, vulnerability indicator, and exposure indicator. This combination of indicators helps assess overall risks at different regions and provides important basis for disaster prevention efforts and resource allocation in the future.

Data sources for indicators of the flood and hillslope failure risk map

Climate risk scenario and indicator		The data used	Data source	Year of data
Flood hazard	Hazard indicator	Probability of 24-hour rainfall exceeding 600mm under the RCP 8.5 scenario	MRI-AGCM	2014
	Vulnerability indicator	Flood risk potential map following a rainfall exceeding 600mm over a 24-hour period	NCDR	2015
	Exposure indicator	Population density	Ministry of the Interior	2015
Hillslope failure	Hazard indicator	Probability of 24-hour rainfall exceeding 350mm under the RCP 8.5 scenario	MRI-AGCM	2014
	Vulnerability indicator	• Historical area of collapse • Size of sloped areas with gradient exceeding 55% • Geographical disasters potential (debris slide, rock slide, rock fall, and dip slope)	• Forestry Bureau • NCDR • Geological Survey and Mining Management Agency	• 2004-2013 • 2013 • 2014
	Exposure indicator	Population density	Ministry of the Interior	2015

Analysis on risk of flood at places of business

According to map data analysis, Taoyuan Factory was the only site located in a level 2 risk area, whereas Hsinchu Factory, Taichung Factory, Changpin Factory, and Lukang Factory were all located in a level 5 risk area, indicating high risk of flood. Based on the outcomes derived above, all of TGI's production sites are prone to high risk of flood, and the hazards will only escalate given the increasing prevalence of extreme weathers. For this reason, we will devise proper responses based on the outcomes of this analysis to prevent flooding of factory sites that may disrupt operations or affect employees' commute in the event of extreme weather. We will also take the initiative to evaluate potential hazards and devise management practices and actions in advance.



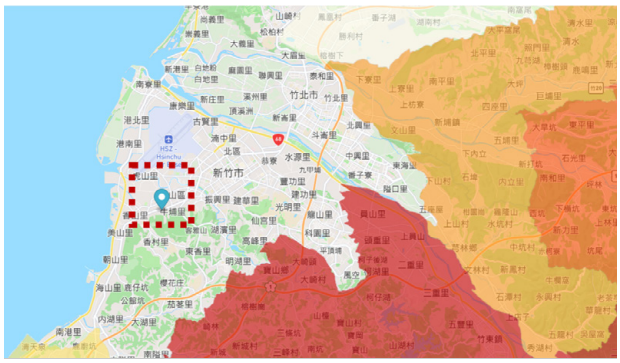
Taoyuan Factory | Hsinchu Factory | Taichung Factory | Changpin Factory, Lukang Factory, Lukang Flat Glass Factory

Note 1: Risk of flood is evaluated using three indicators on severity, vulnerability, and exposure; risk levels are determined using baseline period (1976-2005) and multi-GCM (2036-2065) approach under the RCP8.5 scenario
Note 2: Disaster risk is graded based on the base period. The future disaster risk map is derived from mode analysis of 33 future projection models
Note 3: A level-5 flood risk indicates highest "relative" risk for the given area, whereas a level-1 flood risk indicates relatively low risk, and not risk-free or disaster-free

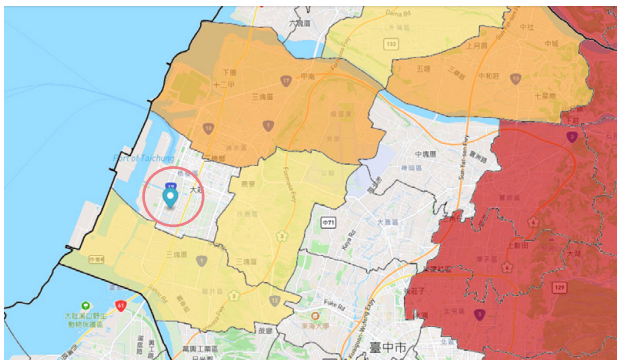
Hillslope risk analysis at business locations

According to the map data, there is no significant risk in areas where TGI's factories are located. However, given that Taichung Factory is close to areas of Level 2 and Level 3 risk, whereas Hsinchu Factory is near areas of Level 4 and Level 5 risk, it is necessary for TGI to take potential hillslope failure into careful consideration. Even though the factories are not within areas of direct hillslope failure, the increasing frequency of extreme weather events will nevertheless give rise to more severe hillslope failures. To prepare against potential hillslope slide caused by extreme weather event and the damage and disruption it causes to factory facilities and employees' commute, TGI must adopt a variety of measures to manage potential risks. Based on the outcomes of risk assessment, we will devise corresponding response strategies including detailed management solutions and action plans to prevent and address potential hillslope failure, and in doing so ensure the stability of business operations and employees' safety.

Taoyuan Factory



Hsinchu Factory



Taichung Factory

Changpin Factory, Lukang Factory,
Lukang Flat Glass Factory

Risk level Level 1 Level 2 Level 3 Level 4 Level 5

Management strategies for potential risks

Measures	Description
Construction and maintenance of infrastructure facilities	TGI should commit additional efforts into the construction and maintenance of infrastructure facilities to address potential risks in areas where Taichung Factory and Hsinchu Factory are located. For example, additional flood prevention facilities will be installed and drainage system will be improved to address potential flood risks. Furthermore, TGI will conduct regular inspection and maintenance of building structures within factory premise to ensure stability and safety under extreme weathers. These measures will help lessen the impact of natural disasters on production activities and ensure continuity of business operations.
Development of contingency plans and responses	TGI should develop comprehensive contingency plans and responses for effective response to potential risk of natural disasters. This includes a complete and detailed contingency plan that covers every stage of a disaster, from prevention, response to recovery. Meanwhile, a dedicated emergency response team will be assembled and tasked with the responsibility to quickly respond to disasters and carry out rescue operations. In addition to the above, TGI will organize response drills on a regular basis to improve employees' response awareness and capabilities, thereby ensuring that emergencies are resolved quickly and efficiently, and that business operations and employees' safety are assured in the event of a natural disaster.
Enhanced environmental monitoring and risk assessment	TGI should develop a robust environmental monitoring and risk assessment system and conduct regular monitoring of the environments near factory premises for timely discovery and alert of possible environmental risks. For example, monitoring equipment can be installed to gather real-time weather data and check key indicators such as water level; the data can then be analyzed to identify potential risks ahead of time and provide useful reference for decision-making.
Promotion of green production and sustainable development	TGI should develop a comprehensive environmental monitoring and risk assessment system and conduct regular monitoring of the environments near factory premises for timely discovery and alert of potential environmental risks. For example, advanced monitoring equipment can be installed to track real-time weather data and key indicators such as water level; the data can then be analyzed to identify potential risks ahead of time and provide useful reference for decisions, preventions, and responses against possible environmental threats.
Collaboration with the local government and communities	TGI should actively cooperate with the local government and communities to address risk of natural disasters. For example, TGI may take part in the disaster prevention and disaster mitigation plans of the local government, work with the local community to develop detailed contingency and rescue plans, and organize disaster prevention drills to ensure their effectiveness. Additionally, TGI should actively engage in community development and environmental protection activities, as doing so not only strengthens the organization's influence and reputation among locals, but also builds a robust social support network that contributes to overall disaster response and prepares for disasters.

By implementing the natural disaster risk management strategy mentioned above, TGI hopes to effectively respond to the potential risks at factory sites and minimize production disruptions and property losses caused by natural disaster, increase sense of security among employees, fulfill social responsibilities, and ultimately ensure stability of business operations. These risk management measures allow TGI to develop a more sustainable business model for improved market competitiveness and long-term growth. Through close collaboration with the local community and government agencies, TGI hopes to create a safer and more sustainable business environment, and adequately prepare itself for future challenges.

Drought risk analysis at business locations

The glass industry has strong demand for water in the production process; it is used mainly for cooling, washing, and specific processes. When used for cooling, the water helps reduce temperature of molten glass and equipment, and when used for washing, the water keeps equipment and products clean and therefore ensures product quality. Certain production processes, such as cutting, edging, and polishing, also require the use of water to reduce friction and prevent overheating. For this reason, TGI places great emphasis on the stability of industrial water supply, and has added drought risk analysis to the scenario analyses performed.

Drought is an extreme condition when water in one or a combination of water stores (e.g. river, lake, reservoir, snowpack, soil water, or groundwater) or water fluxes (precipitation, evapotranspiration or runoff) drops for a prolonged period of time. Drought becomes a hazard when the level of water shortage breaches certain threshold of normal water volume and causes negative impact or disaster. Drought can be described as "the inability of water stores to meet water demands of a socioeconomic system due to low precipitation for a prolonged period of time." This means that drought is jointly affected by climate and people of the socioeconomic system. In other words, drought may still occur in areas where precipitation is abundant if the demand exceeds the volume of precipitation and capacity of water stores.

Rainfall in Taiwan exhibits significant seasonality, and most of the rainfall happens between May and October. This is why the dry season from November to April is prone to drought risk, and a water shortage may have a major impact on living and industrial activities. Given the pattern of future climate changes, Taiwan may expect to see rainfall increase during wet seasons and decrease during dry seasons.

Studies show that water fluxes in most rivers have stayed consistent, whereas annual average flux exhibits a rising trend. However, fluxes in wet and dry seasons have become more extreme, with increasing flux in wet seasons and decreasing flux in dry seasons. Aside from flux changes, the Water Resources Agency also studied how climate change affects water shortage and shortage risks in several aspects, and found that, in terms of industrial water supply, areas of high shortage risk are concentrated in Northern, Central, and Southern Taiwan.

When analyzing climate change data, TGI chose the worst scenario (RCP8.5) with the most drastic rise in temperature and highest degree of warming, and used SPI3 as a hazard indicator to measure drought intensity. Meanwhile, domestic water shortage potential and agricultural water shortage potential published by the Water Resources Agency were chosen as vulnerability indicators. This approach more precisely reflects the level of drought risks for different regions and water demands, which allows disaster prevention and mitigation strategies to be devised specifically for areas of weakness. The analysis is of significant importance to TGI for managing water resources and ensuring stability of business operations.

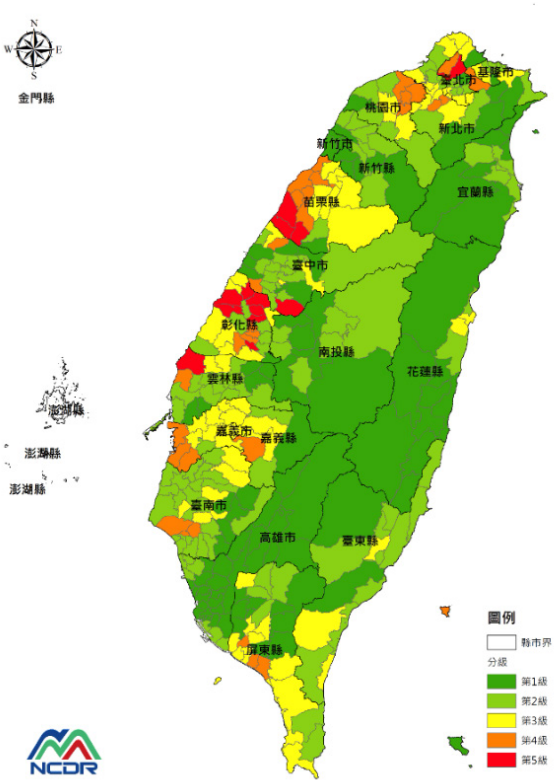
Climate change drought risk indicators

Risk map	Hazard	Vulnerability	Exposure
Drought risk map on public water usage (dry season)	Drought intensity by SPI3 indicator Source: NCDR	Domestic water shortage potential Source: Water Resources Agency (2010)	Population density, industrial production value Source: Ministry of the Interior (2015), Directorate-General of Budget, Accounting and Statistics, Executive Yuan (2006)

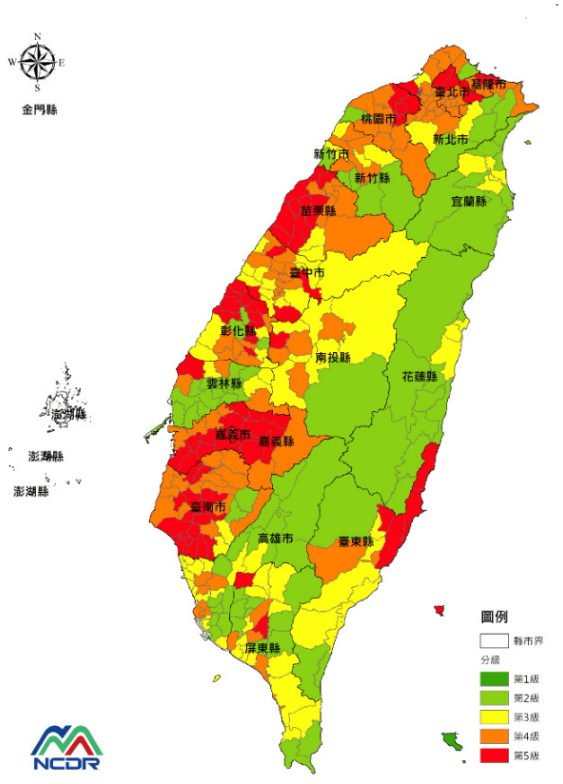
Note: NCDR adopts the "indicator approach," in which it chooses suitable indicators for key factors relating to different types of disasters to calculate value-at-risk as well as risk levels. NCDR then plots hotspots of climate change risk in Taiwan on a map. Due to the fact that water demand in the drought equation varies from region to region, some of the key factors will have to be adjusted accordingly, which makes choosing the appropriate drought risk indicator all the more important.

Climate change drought risk map for public water usage (dry season)

Public (dry season)_risk (base period)



Public (dry season)_risk (end of century)



Note1: The Water Resources Agency first determined the range of one standard deviation from the mean. Based on the predictions of several GCMs, it is expected that water flux will increase during wet seasons and decrease during dry seasons. The size of variation was then calculated at one standard deviation to provide basis for the worst scenario in Taiwan, which then allows subsequent impact assessments.

The risk map above provides an indication to overall drought risk in public water usage; by the end of the century, TGI's Taoyuan Factory and Taichung Factory will be located in level 4 risk areas, whereas Hsinchu Factory, Changpin Factory, Lukang Flat Glass Factory, and Lukang Factory will all be located in level 3 risk areas. Given how the climate is changing, drought risk in public water usage will become more prevalent during dry seasons toward the end of the century. Areas of high drought risk are expected to expand from Central Taiwan to many counties, cities, and towns in Western Taiwan, indicating broadened and more severe drought risk in the future. Outcomes of such risk assessment would provide useful reference to the planning and implementation of water resource management strategies. By establishing knowledge on drought intensity and vulnerability to different levels of water demand, government agencies can more effectively allocate resources, increase the efficiency of water usage, and strengthen response to drought risks. The overall risk analysis not only helps reduce negative impact of drought on agriculture and living activities, but also facilitates sustainable growth in separate regions while allowing TGI to prepare ahead and ensure continuity of social and economic activities in the occurrence of extreme climate event.

3.3 Estimation of Climate-related Financial Impact

Carbon fee risk analysis

TGI conducted scenario analysis on the transition risk - "Carbon credit/carbon tax systems imposed by governments around the world" considering that the Legislative Yuan had passed the "Climate Change Response Act" in early 2023 in support of the Taiwanese government's goal to achieve "net zero emission by 2050." In the foreseeable future, carbon taxes will be imposed on domestic emission sources. The Ministry of Environment has proposed three draft legislations including "Regulations on Collection of Carbon Fee," "Regulations Governing Voluntary Reduction Plan," and "Greenhouse Gas Reduction Targets for Carbon Fee Payers" based on the Climate Change Response Act, and introduced ordinary and privilege fee rates as a supporting measure for gradual introduction of carbon fees in the future.

The Company's carbon fee calculation model follows the Ministry of Environment's carbon fee design and assumes a general carbon fee rate of NT$300 per ton, with deduction for threshold of 25,000 metric tons before 2031. We also assume a 5% annual increase in the carbon fee rate to better align the model with current regulatory discussions.

TGI's greenhouse gas emissions (Scope 1 and Scope 2) in 2024 were 551,493.366 metric tons, making it a major carbon emitter in Taiwan. If the government imposes high carbon fees in the future, the Company's operating costs will rise sharply and have a certain impact on profits. For this reason, we have analyzed TGI's future emissions based on its carbon emission path using three scenarios proposed by International Energy Agency (IEA), namely the Stated Policies Scenario (STEPS), the Announced Pledges Scenario (APS), and the Net Zero Emissions by 2050 Scenario (NZE). We also adopted three carbon pricing scenarios to accommodate possible changes in carbon tax per unit of emission. These scenarios enabled us to analyze potential carbon fees up until 2050.

Carbon emission scenarios	The emission scenario proposed by the International Energy Agency (IEA) is adopted and applied to the greenhouse gas emissions changes of the credit customers. The scenario adopted is as follows: • Stated Policies Scenario (STEPS) • Announced Pledges Scenario (APS) • Net Zero Emissions by 2050 Scenario (NZE)
Carbon pricing scenarios	We adopted two carbon pricing scenarios to analyze possible changes in carbon tax. The scenarios adopted include the following: • NGFS_2050 Net Zero • Carbon price level - NGFS_below 2° C
Year of assessment	Baseline year: 2024 Years of carbon fee change analyzed: 2024 to 2050
Explanation to scenario calculations	Calculations were made to determine the additional operating costs (unit carbon price*emission volume) and their impact on operations in terms of "operating profit margin" that a business may encounter, after taking into consideration the possible changes in emission level and carbon pricing local and abroad using 3 emissions scenarios (as shown in the following figure) and 2 carbon pricing scenarios.

Scenario analysis and simulation

Carbon emission scenarios	Scenario description
STEPS	Assessment based on the government's current climate policies and carbon emission targets
APS	Estimation based on IEA's APS. It assumes that governments and industries around the world will meet, in full and on time, all the climate - related commitments that they have announced, including the nationally determined contributions (NDC), long-term net zero goals, as well as power and clean energy goals, before the end of August 2023.
NZE	Global energy sector to achieve net-zero CO2 emissions by 2050

Carbon pricing scenarios	Scenario description	℃ Policy ambition	Policy reflection	Technological change	Carbon dioxide removal	Regional policy differences
Net Zero 2050	To limit global warming within 1.5° C through implementation of rigorous climate policies, and to achieve net zero by 2050. This scenario presents relatively low physical risk but high transition risk.	1.4	Instant and smooth	Rapid changes	Mid-to-high utilization	Moderate changes
Below 2	Keeping global warming below 2° C would involve more stringent climate policies, but not as stringent as the 2050 Net Zero scenario.	1.6	Instant and smooth	Appropriate changes	Mid-to-high utilization	Low changes

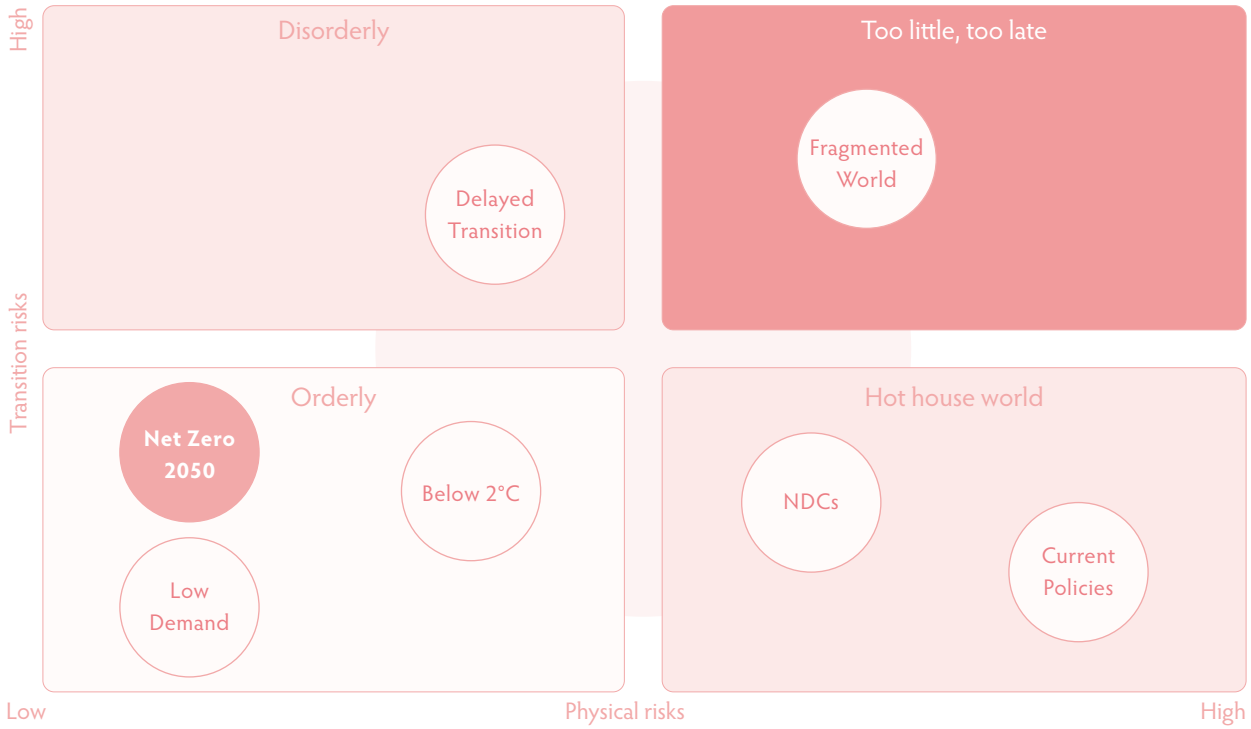
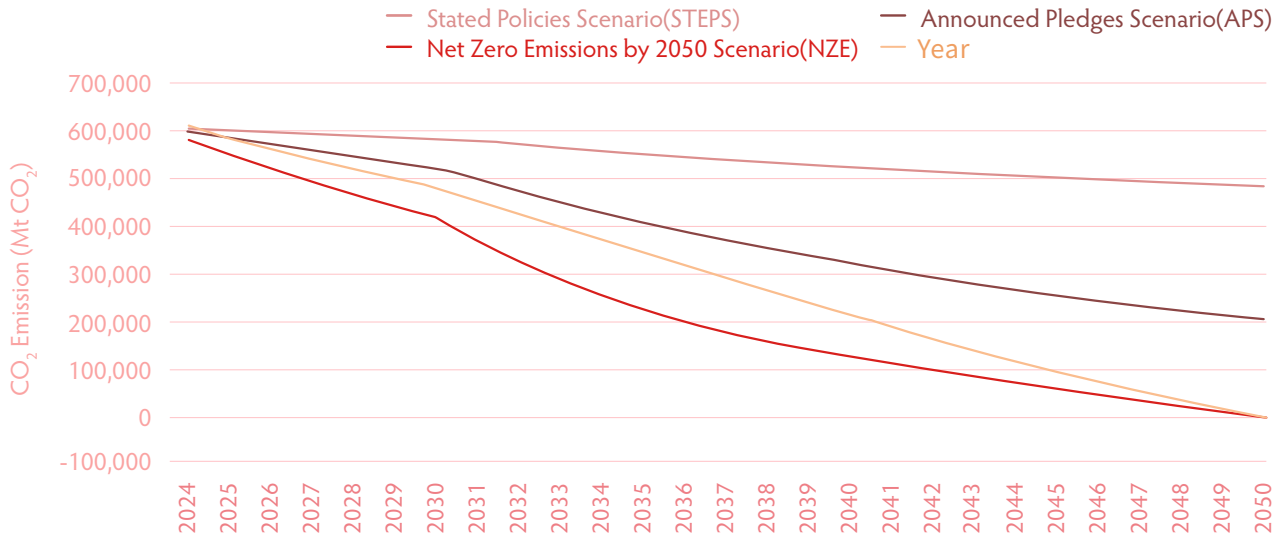
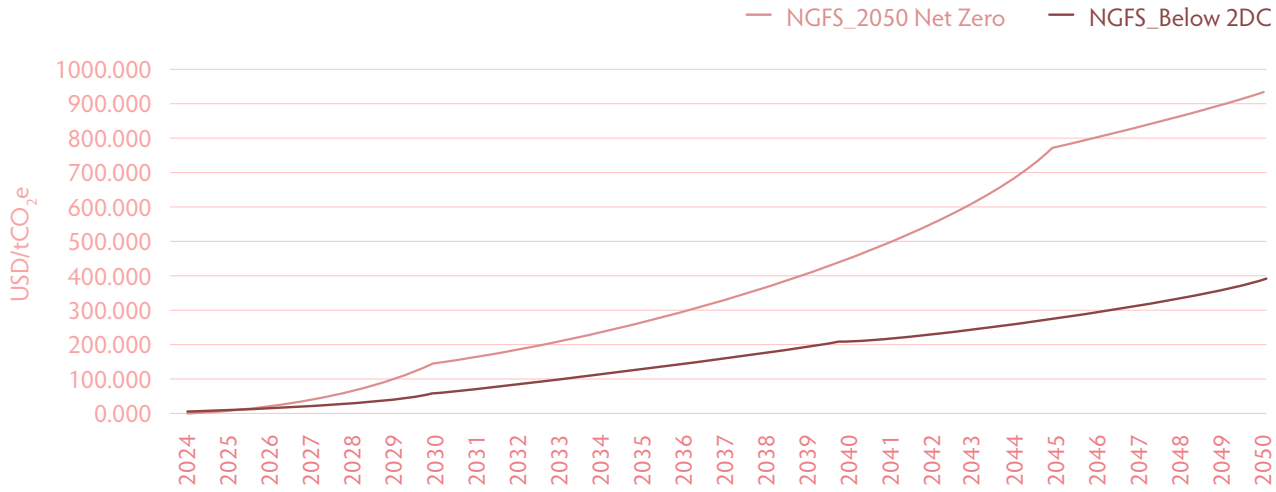


Illustration of TGI's carbon emission trends under different scenarios



Note 1: The data sources for STEPS, APS, and NZE carbon emission scenarios are IEA World Energy Outlook 2024.
Note 2: TGI's carbon reduction path has a short-term reduction target of "10% reduction by 2025 compared to the base year (2014)", medium-term reduction target of "25% reduction by 2030 compared to the base year (2014)", and long-term goal of achieving net zero greenhouse gas emissions by 2050.

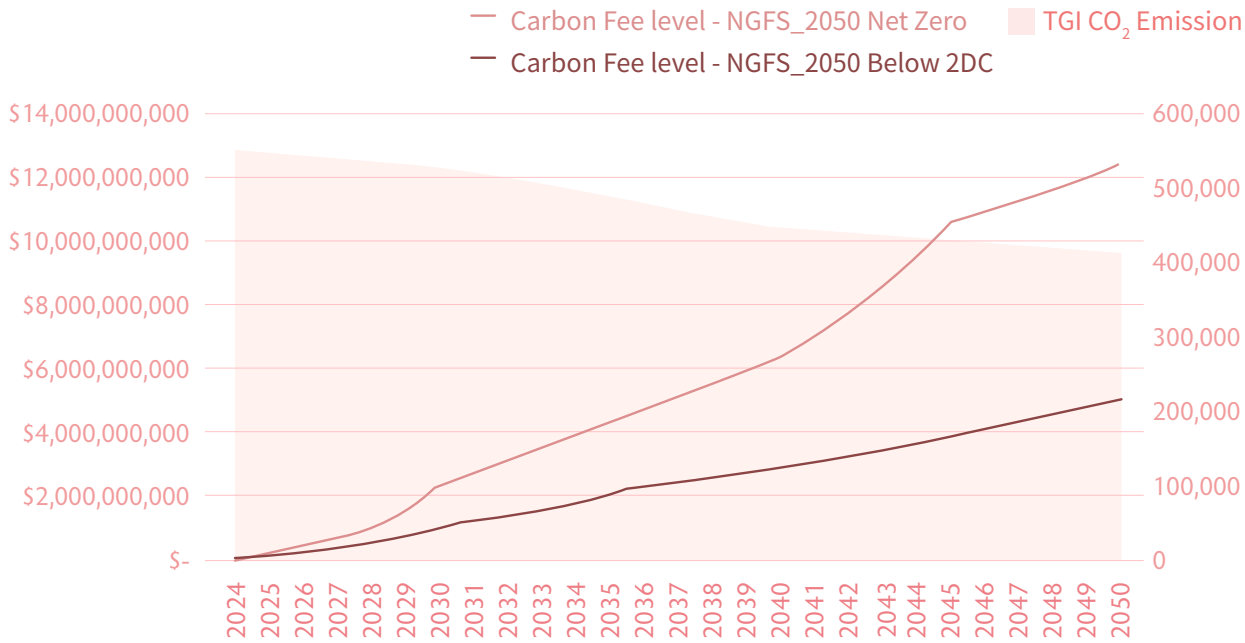
Carbon pricing trends by scenario



Note 1: Data sources for NGFS Below 2DC and NGFS 2050 Net Zero carbon pricing are from the NGFS Scenario Explorer, 2024.

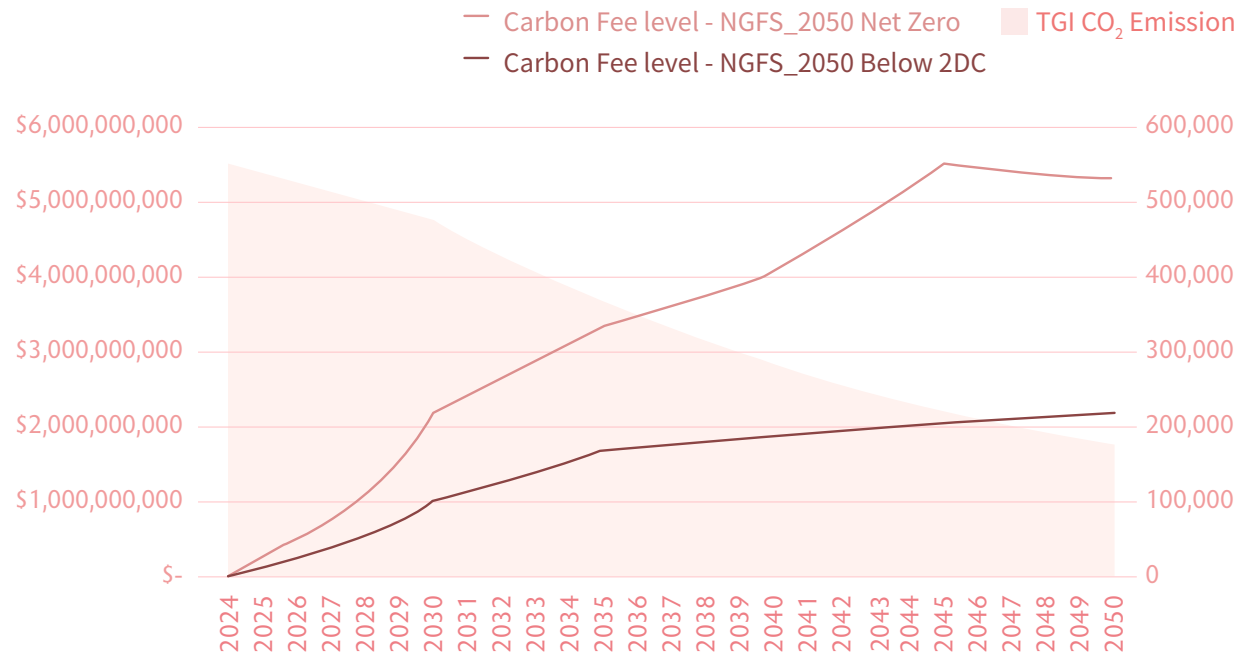
TGI has evaluated the possible financial impacts associated with climate change by focusing on net zero with less than 2° C warming and by simulating legal, market, and reputation risks. Using the three scenarios proposed by IEA, the two carbon price predictions: "NGFS 2050 Net Zero" and "NGFS Below 2DC," and carbon fee estimates from the Ministry of Environment, we performed simulations to determine the possible risk exposures between 2024 and 2050 under different scenarios. International or local cost factors were then taken into consideration to estimate possible financial impacts over the medium and long term.

TGI carbon fee analysis - Based on NGFS carbon pricing scenario trends and STEPS as carbon emission scenario

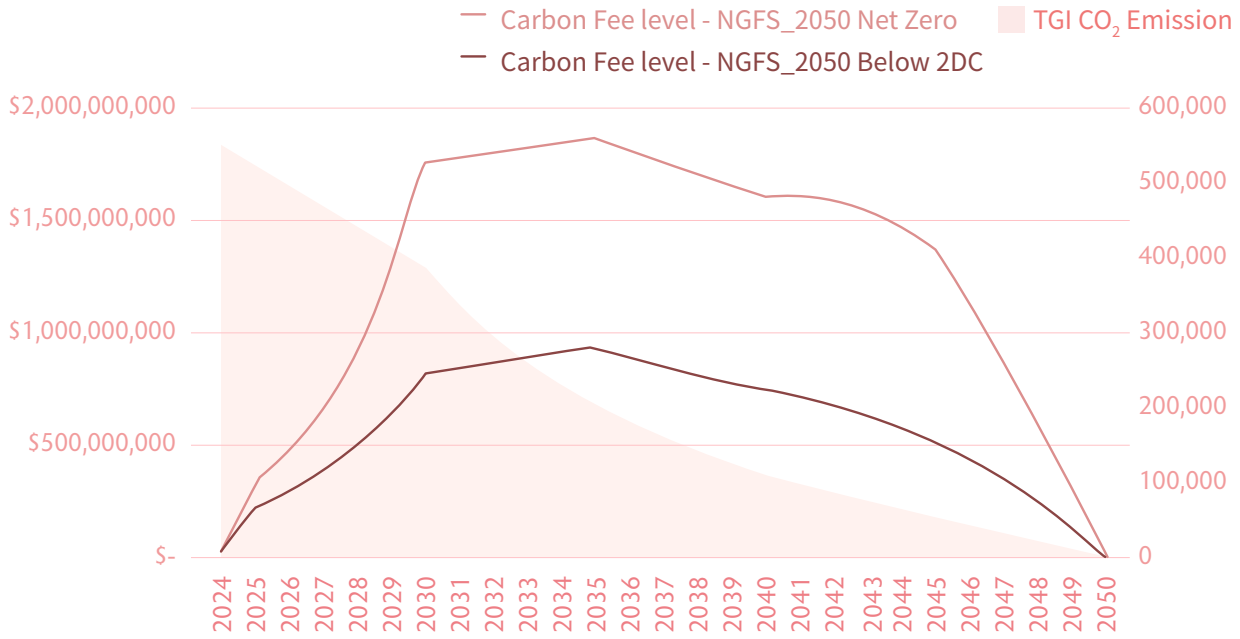


Note 1: The data sources for STEPS, APS, and NZE carbon emission scenarios are IEA World Energy Outlook 2024.
Note 2: The Ministry of Environment's carbon pricing estimation method assumes a general rate of NT$300 and an annual increase of 5%.
Note 3: Data sources for NGFS Below 2DC and NGFS 2050 Net Zero carbon pricing are from the NGFS Scenario Explorer, 2024.
Note 4: TGI's carbon fee analysis already considers the deduction of 25,000-ton threshold for fee applicability.

TGI carbon fee analysis - Based on NGFS carbon pricing scenario trends and APS as carbon emission scenario



TGI carbon fee analysis - Based on NGFS carbon pricing scenario trends and NZE as carbon emission scenario



Note 1: The data sources for STEPS, APS, and NZE carbon emission scenarios are IEA World Energy Outlook 2024.
Note 2: Data sources for NGFS Below 2DC and NGFS 2050 Net Zero carbon pricing are from the NGFS Scenario Explorer, 2024.
Note 3: TGI's carbon fee analysis already considers the deduction of 25,000-ton threshold for fee applicability.

Since the future carbon prices predicted by "NGFS 2050 Net Zero Carbon Emissions" and "NGFS Below 2° C" scenarios are higher, according to the scenario analysis results, even if TGI's total carbon emissions decrease year by year from 2030, the carbon fee required to pay per ton of carbon emissions will continue to rise. This also shows that international community is relatively optimistic about the future growth rate of carbon prices.

Regardless of the carbon price scenario assumed, it is shown that carbon fee will have a significant financial impact on TGI. In addition to actively introducing renewable energy equipment and optimizing in-plant processes and equipment, TGI is reducing carbon emissions at every stage of its product life cycle through technological advancements. The Company is actively evaluating participation in Taiwan's Ministry of Environment voluntary reduction program to secure preferential rates, mitigate carbon fee expenditures, and strengthen overall carbon management and financial resilience. According to Taiwan's carbon fee review system, If a company achieves its own reduction targets, it can not only obtain carbon fee discounts but also convert its carbon reduction results into tradable carbon credits by applying for voluntary reduction plans.

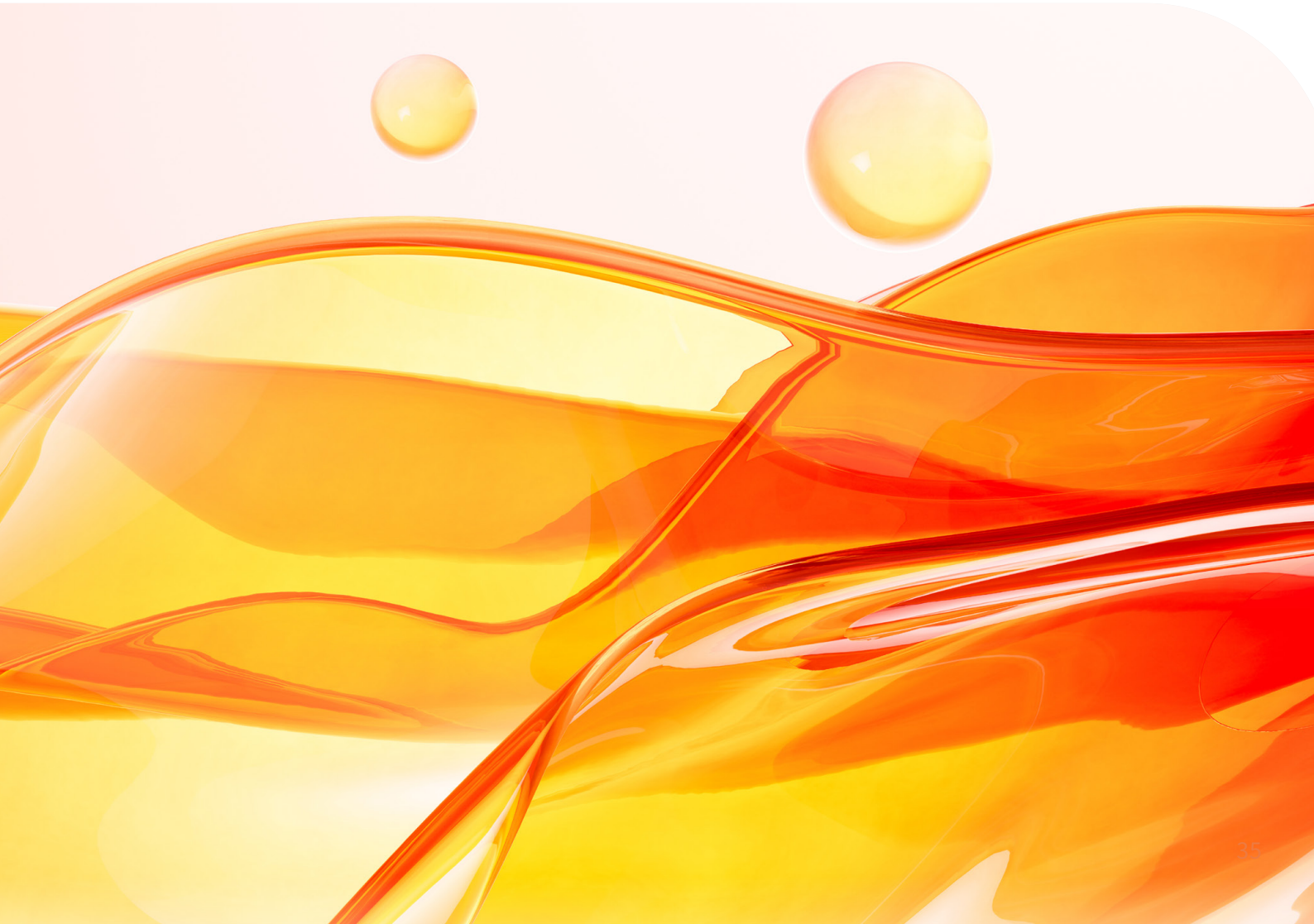
Based on TGI's current carbon emissions, if calculated based on the general rate of $300/ton, the annual carbon fee would be approximately $126 million. If preferential rate A ($50/ton) was applied, the cost would be reduced to $21.13 million, resulting in savings of $106 million. If preferential rate B ($100/ton) was applied, the cost would be approximately $42.26 million, with savings of $84.52 million. By applying for a voluntary reduction plan, TGI can reduce its direct carbon fee burden, strengthen carbon asset management and further enhance overall operational and financial resilience.

Factories listed by the Ministry of Environment	Taoyuan Factory	Hsinchu Factory	Taichung Factory	Lukang Factory	Lukang Flat Glass Factory	Total
Unverified carbon emissions (metric tons of CO_2e) for 2024	86,041.996	143,102.475	93,556.249	96,417.853	119,347.459	538,466.032
Scenario 1 ▶ No application for voluntary reduction plan						
Carbon fee is calculated based on general rate of $300/ton	$18,312,599	$35,430,743	$20,566,875	$21,425,356	$28,304,238	$124,039,810
Scenario 2 ▶ Application for preferential rate A of the voluntary reduction plan						
Carbon fee is calculated based on preferential rate A of $50/ton	$3,052,100	$5,905,124	$3,427,812	$3,570,893	$4,717,373	$20,673,302
Scenario 3 ▶ Application for preferential rate B of the voluntary reduction plan						
Carbon fee is calculated based on preferential rate B of $100/ton	$6,104,200	$11,810,248	$6,855,625	$7,141,785	$9,434,746	$41,346,603

Note: This table is an internal estimate by TGI and is not final content of the review. It is for reference only by stakeholders.

chapter 4

Climate strategies and actions



Energy-saving plans and green energy have emerged to become unmissable trends for businesses as the world undergoes energy transformation. TGI actively commits into energy conservation and energy transformation. Driven by an unwaivering pursuit for optimal energy management, the organization has implemented energy and carbon reduction solutions and made strong commitments to protecting the environment across all production sites. From Taoyuan, Hsinchu, Taichung to Lukang, each of TGI's production sites responds to the global energy challenge through action, and constantly explores innovative solutions to increase production efficiency while at the same time reduce energy consumption.

Four main strategies

01

Adopt heat recycling technology

Recycling and reusing heat from production process improves energy efficiency, lowers energy and production cost, and caters for both environmental and economic benefits.

02

Increase use of alternative fuel

Switching production fuel source from heavy oil to natural gas effectively reduces greenhouse gas emission. The Company will continue exploring new technologies and alternative fuel sources in the future.

04

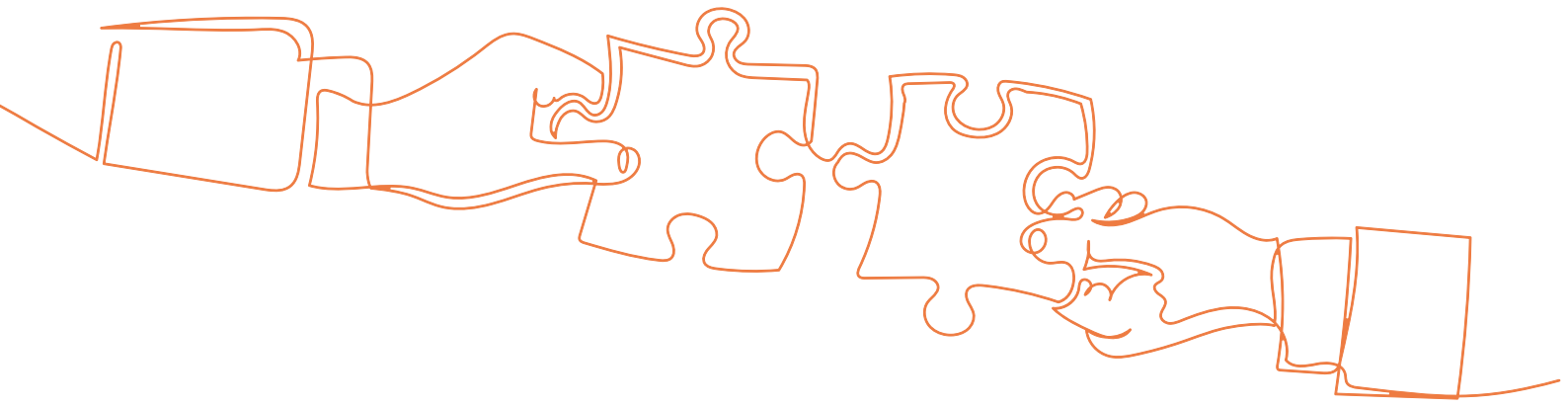
Ongoing improvement to air pollution prevention

Ongoing investments into air pollution prevention measures helps enhance air pollutant filtering and emission control technology across factories, reduce emission of pollutants from production process, ensure compliance with the emission standards imposed by environmental laws, and improve air quality in nearby communities.

03

Construct in-plant renewable energy equipment

Installing solar panels at factories not only reduces energy cost, but also increases use of green energy and lessens dependency on external sources.



Key performance drivers in 2024

Taoyuan Factory

reuses wastewater for cleaning other equipment, recycling **93,000 tons** of water and saving **$1,319,062** in water costs

Hsinchu Factory

TS-3 started using **dual-fuel system** in March 2025

Lukang Flat Glass Factory

Fuel substitution rate reached **90%**

Taichung Factory

Increased the proportion of natural gas combustion, and reduced carbon emissions by **25,396.049 tons** from March 2023 to March 2025

Lukang Flat Glass Factory

Invested **NT$80 million** into the implementation of heat-recycling steam boiler

The renewable energy generation capacity of each factory is approximately **11.48 million degrees**

Solar power generation reduces carbon emissions by **5,446 tons** annually

Capital expenditure and related expenses in the last 3 years

Unit: NTD thousands

Strategy	Amount committed in the last 3 years
Heat recycling	80,000
Use of alternative fuel	6,707
Construct in-plant renewable energy equipment	560,700
Air pollution prevention	32,000
Other energy/carbon reduction projects	500
Other water conservation projects	1,936
Total	681,843

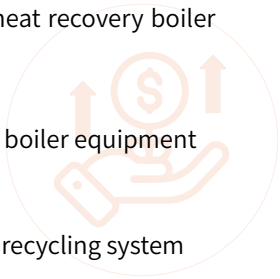
4.1 Energy Conservation Plan and Energy Transition

Heat recycling

TGI is committed to making substantial contributions to sustainable development, and views the energy transition as a necessity. In addition to continuously promoting energy source expansion, energy conservation measures are indispensable. According to studies by ITRI, a breakdown of Taiwan's energy consumption structure shows the energy sector and the industrial sector having accounted for 43.60%, or nearly half, of energy consumed nationwide. About 40% of the energy was used in applications relating to cooling and heating, and about 20%-50% of the energy was dissipated into the environment in the form of waste heat. Based on the above, reusing the heat generated from production activities and turning it into a viable energy source would reduce the need for external energy sources. In addition to saving energy costs, this solution also helps lower emission of carbon and mitigate adverse impacts on the environment. In summary, recycling of industrial waste heat is the direction that the organization must strive toward.

Performance of key projects

2023	Taichung Factory	Investment of $9.7 million was made for the design of a heat recycling system
2023	Lukang Flat Glass Factory	Investment of $80 million to install waste heat recovery boiler equipment
2024	Lukang Flat Glass Factory	Began operation of the waste heat recovery boiler equipment
2027	Taichung Factory	Planning for the commissioning of the heat recycling system



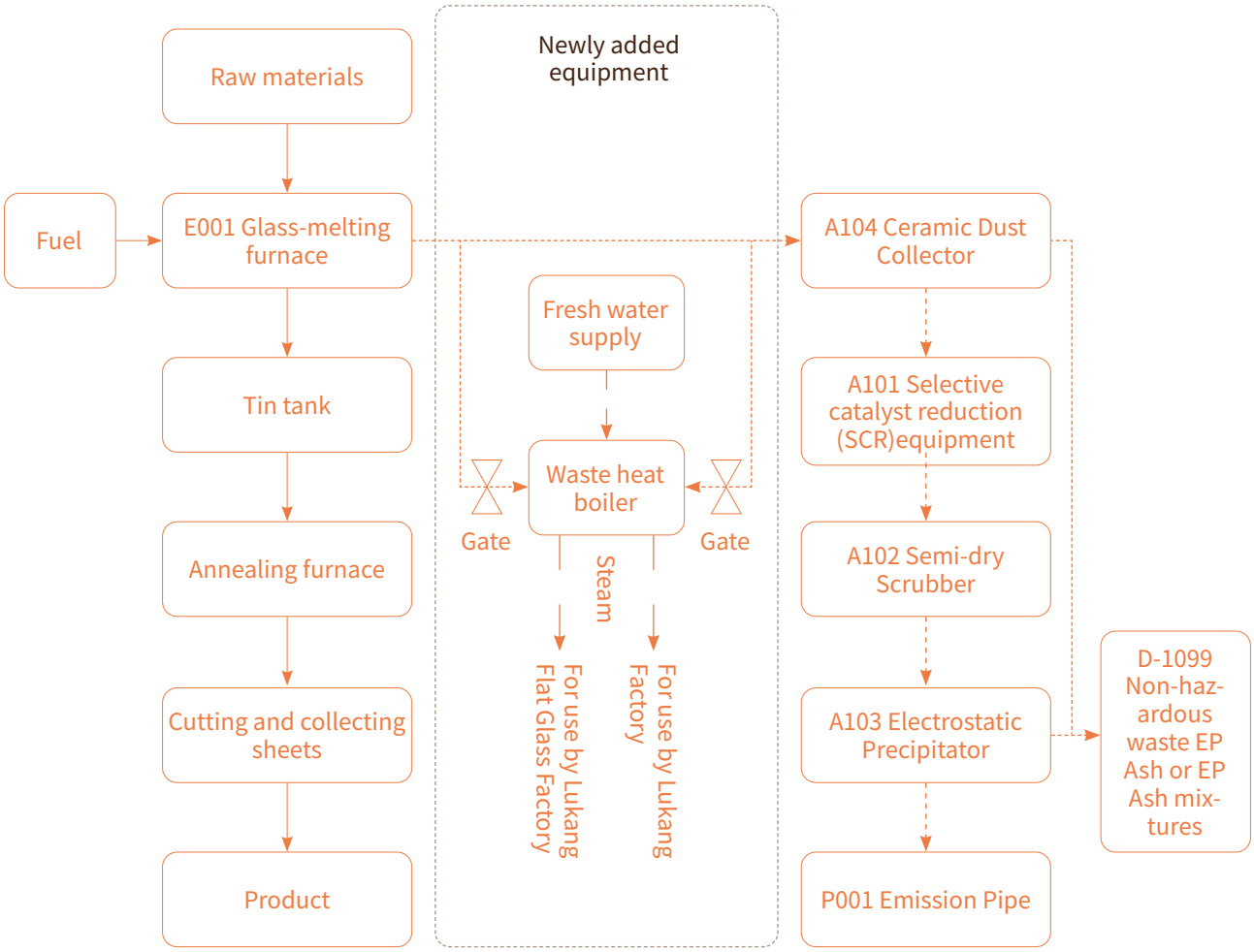
Capital expenditure and related expenses

Factory	Amount	Benefit assessment
Lukang Flat Glass Factory	NT$80 million	An investment of $80 million in waste heat recovery boiler equipment is expected to save 1,200,000 m^3 of natural gas annually and reduce carbon emissions by 2,496 tons annually.
Taichung Factory	NT$9.7 million	Execution of the heat recycling system design.
Total	NT$89.7 million	

Lukang Flat Glass Factory - heat-recycling steam boiler

In order to effectively utilize the excess heat from the exhaust gas of its glass melting kiln, Lukang Flat Glass Factory invested $80 million in 2023 to install a heat recovery boiler system, which was put into operation in 2024. Currently, the main purpose is self-use, with the goal of reducing TL natural gas consumption. The steam boiler uses exhaust gas from the kiln as its heat source. After heat exchange, it produces hot water and steam supplied to the production lines at both the Lukang Flat Glass Factory and the Lukang Factory. By supplying the steam directly to the factories, the system eliminates energy loss that would occur during transportation. This allows for highly efficient energy recovery and reuse, which reduces overall energy consumption.

Flowchart for the new heat-recycling boiler



Note: The timing of activation for waste heat boiler and the amount of steam it produces are determined by waste gas temperature at that time.

Production procedure
Direction of exhaust
Direction of waste
Direction of water

Benefit assessment

Estimated energy reduction

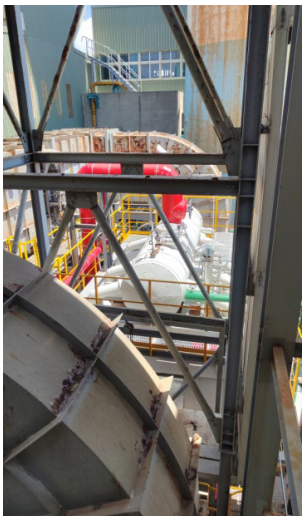
The new heat-recycling boiler is estimated to save natural gas usage by **1,200,000 m^3** a year and carbon emission by **2,496 tons** a year.

Estimated cost saving

Given the market price of natural gas at NT$12 per cubic meter and estimated natural gas reduction of **1,200,000 m^3**, total savings is estimated at 1,200,000*12=NT$**14,400,000**.

Future plans

In the future, priority will be given to ensuring the stable use of steam boilers at Lukang Flat Glass Factory, and gradually optimizing the gas supply efficiency



Installation of heat-recycling steam boiler

Use of alternative fuel

As a response to the authority's support for low-carbon transformation strategies of the manufacturing sector, we continue to transition into sustainable production process by adopting carbon reduction measures such as alternative low-carbon fuel, switch of boiler fuel etc. Taoyuan Factory was the first to initiate a full switch of boiler fuel to natural gas in 2020, and after producing prominent results in greenhouse gas reduction, the solution was implemented across all other factory sites. Lukang Flat Glass Factory adopted the strategy of using natural gas as the primary fuel and heavy oil as backup fuel for glass furnace, and continued to increase the substitution rate. As for Hsinchu Factory, a natural gas/heavy fuel switch system has been installed for the furnace, and this hybrid energy system supports TGI's goals toward clean energy factory.

Performance of key projects

2020	Taoyuan Factory	Made total revamp of natural gas system for boilers, and replaced heavy oil boilers with natural gas once-through boilers
2021	Taoyuan Factory	Named "2021 Excellent Firm for the Reduction of Industrial Greenhouse Gases" by Industrial Development Bureau, Ministry of Economic Affairs

2021 Excellent Firm for the Reduction of Industrial Greenhouse Gases

2021	Lukang Flat Glass Factory	Added natural gas system for furnace
2021	Taoyuan Factory	Switched furnace fuel from heavy oil to natural gas
2022	Taoyuan Factory	Named "2022 Excellent Firm for the Reduction of Industrial Greenhouse Gases" by Industrial Development Bureau, Ministry of Economic Affairs

2022 Excellent Firm for the Reduction of Industrial Greenhouse Gases

2023	Lukang Flat Glass Factory	Substitution rate for primary furnace fuel reached 90% and is moving toward 100%
2023	Hsinchu Factory	Initiated the dual-fuel replacement for the TS-2 furnace.
2024	Hsinchu Factory	TS7 and TS6 adopted dual-fuel combustion system, with natural gas as the main fuel

Capital expenditure and related expenses

Factory	Amount	Benefit assessment
Hsinchu Factory	NT$67 million	TS2, TS3, TS6, TS7 and TS8 adopted dual-fuel combustion system, with natural gas as the main fuel. TS7's actual carbon reduction from April to the end of September 2024 was 2,380 tons of CO_2e
Lukang Flat Glass Factory	NT$70,000 (2021-2023)	Lukang Flat Glass Factory partially converted its kiln fuel from heavy oil to natural gas (accounting for 90%), with completion expected in October 2025. This is estimated to reduce carbon emissions by 23,198.67 tons per year
Total	NT$67.07 million	

Hsinchu Factory: Installation of natural gas/heavy fuel composite combustion system for furnace

Driven by the motivation to deliver economic and environmental benefits, Hsinchu Factory has proposed and implemented a dual-fuel solution that takes advantage of stable gas supply to achieve energy and carbon reduction, while taking into consideration the stability of existing production processes and layout of factory equipment.

Having considered the reality that Hsinchu Factory is unable to install its own LNG tank, there is concern about the continuity of using gas as the only source of fuel, and TGI's glass container furnace has to be heated non-stop 24 hours a day while other furnaces cannot be cooled for extended period of time. However, having the flexibility to switch between gas and heavy oil helps overcome this challenge, as the solution not only gives the factory access to natural gas as a form of clean energy, but also allows heavy oil to be used as backup for the stability of the production process.

Characteristics of gas	Characteristics of heavy oil
Burns cleaner and more efficiently; produces lower emission	Relatively low-cost, stable, and suitable for production procedures that involve high-temperature

The flexibility to use two fuel sources delivers ✓ economic ✓ environmental benefits

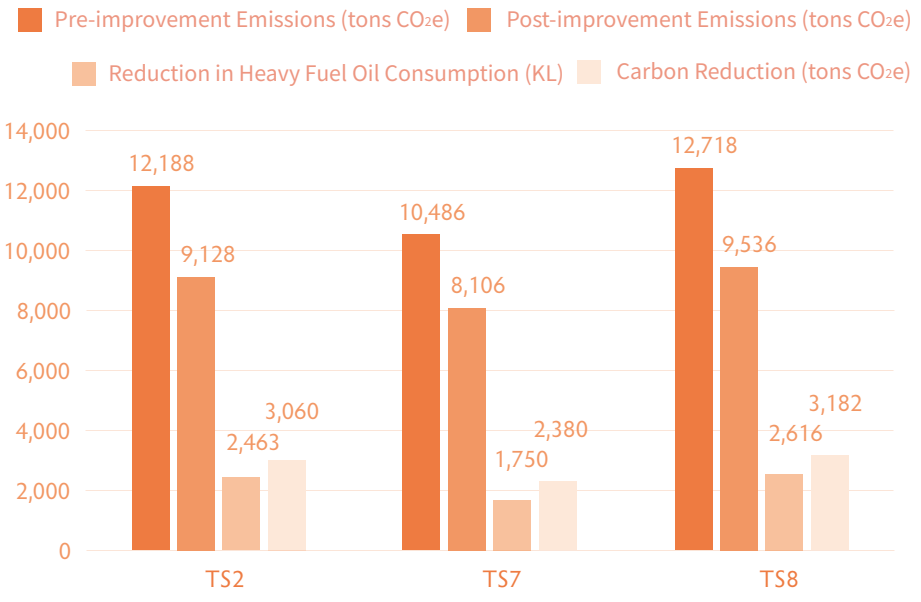
Actions and measures

1. Additional natural gas stations, burners, and heavy oil/gas switches were installed to lessen emission from heavy oil.
2. The ratio between heavy oil and natural gas is being adjusted flexibly depending on the attributes of each furnace to maximize gas usage. By making dynamic adjustments to the type of fuel used, the factory is able to maintain combustion efficiency at the optimal level and ensure the reliability of furnace operations.

Future plans

At the Hsinchu Plant, the dual-fuel combustion systems for TS2 and TS8 were initiated in 2023, followed by the systems for TS6 and TS7 in 2024. Natural gas serves as the primary fuel for these systems. TS3 activated its dual-fuel combustion system and began formal operation in March 2025.

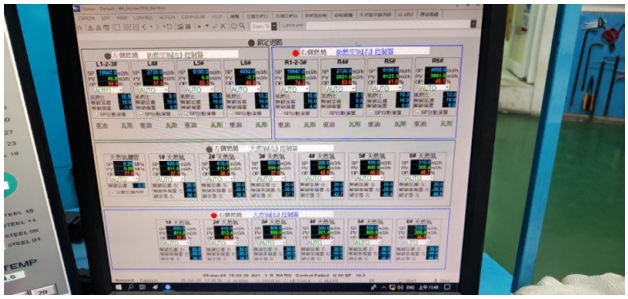
Heavy oil/natural gas composite combustion system for TS-2 furnace



The primary benefit following the commissioning of TS2, TS7, and TS8 has been a reduction in carbon emissions, achieved by replacing heavy fuel oil with natural gas.

Lukang Flat Glass Factory: 90% of kiln fuel has been replaced with clean energy

Lukang Flat Glass Factory has made capital expenditures to improving equipment and production procedures in an attempt to reduce emission of air pollutants and carbon. The factory now uses natural gas as primary fuel for glass furnace and heavy oil as backup fuel; this increases energy efficiency in glass production and lessens impact on the external environment. The plan continued in 2024, with progress reported to the Sustainability Committee every six months. 90% of the kiln fuel has been converted from heavy oil to natural gas. Subject to changes in environmental protection permits, the long-term goal of future plans is to achieve 100% fuel replacement rate.



Lukang Flat Glass Factory will switch to natural gas as the primary fuel for glass furnaces

Construct in-plant renewable energy equipment

In recent years, net zero and carbon reduction have become the inevitable path for sustainable corporate development. The development and investment of renewable energy are the primary strategies for TGI's future decarbonization transformation.

To achieve net zero, increasing green power capacity is a must. TGI's environmental sustainability policy actively promotes energy conservation, carbon reduction, and the use of renewable energy. The Company also complies with the Ministry of Economic Affairs' "Regulations for the Management of Setting up Renewable Energy Power Generation Equipment of Power Users above a Certain Contract Capacity," which stipulates that power users with a contracted capacity above 5000KWH are obligated to implement renewable energy equivalent to 10% of their contracted capacity. TGI is committed to promoting the implementation of solar panels in the factories, and has established management regulations for renewable energy power generation equipment in response to the announcement of the Ministry of Economic Affairs for power users with a certain contracted capacity, and maximize energy conservation.

In 2024, TGI completed its NT$380 million solar panel installation project for a total capacity of 8,784 KW. In 2024, the total electricity generated by solar panels at all plants reached 11.48 million kWh, saving NT$40.42 million in electricity costs. This replaced purchased electricity, reduced carbon emissions from energy use, and contributed to environmental sustainability.

Performance of key projects

Taoyuan Factory	Hsinchu Factory	Taichung Factory	Lukang Factory	Lukang Flat Glass Factory	Total
Built power generation capacity (KW)	Built power generation capacity (KW)	Built power generation capacity (KW)	Built power generation capacity (KW)	Built power generation capacity (KW)	Built power generation capacity (KW)
1,993	1,328	1,685	3,063	715	8,784

Renewable energy generated	2023 Reached **7.2** million degrees	2024 Reached **11.48** million kWh	An increase of **59.44%**
Emissions reduction benefits	2023 Reducing **3,481** tons of CO_2 equivalent	2024 Reducing **5,446** tons of CO_2 equivalent	**56.45%** increase in efficiency

Capital expenditure and related expenses

Unit: NTD

Factory	Amount
Taoyuan Factory	102.12 million
Hsinchu Factory	65.01 million
Taichung Factory	109.51 million
Lukang Factory	143.39 million
Lukang Flat Glass Factory	36 million
Total	NT$560.7 million

Factory	2023			2024		
	Total power generation (kWh)	Electricity costs saved (NTD)	Carbon reduction (tons)	Total power generation (kWh)	Electricity costs saved (NTD)	Carbon reduction (tons)
Taoyuan Factory	2,233,168	6,353,359	1,105.4182	2,322,796	7,316,807.40	1,101.0053
Hsinchu Factory	1,592,298	4,474,357	788.1875	1,530,399	4,728,932.91	725.4091
Taichung Factory	1,849,734	5,234,747	915.6183	2,344,546	6,635,065.18	1,111.3148
Lukang Factory	4,230,683	11,972,833	2,094.1881	4,284,374	13,924,215.50	2,030.7932
Lukang Flat Glass Factory	984,998	2,787,544	487.5740	1,007,736	3,275,142.00	477.6668
Total	10,890,881	30,822,841	5,391	11,489,851	35,880,163	5,446

Implementation of Solar Panels in Taiwan Glass Factories

Ongoing improvement to air pollution prevention

Nitrogen oxides (NOx) in the air are one of the major causes of acid rain, ozone depletion, particulate matters (PM2.5), and respiratory disease. Air pollution not only has severe impact on the environment, but may also give rise to substantial social costs. From health problems to economic losses, air pollution has had profound negative impacts on many aspects of the society. To effectively resolve the problems associated with exhaust from production activities, TGI has implemented air pollution controls throughout factory sites that are intended to control and reduce emission of air pollutants for the health of the nearby environment as well as residents.

Performance of key projects

2020~2022	Hsinchu Factory	Installed additional SCR denitrification equipment for TS3, TS6, TS7, and TS8
2021	Taoyuan Factory	named "2021 Excellent Contributor to Air Pollution Prevention" by the Industrial Development Bureau, Ministry of Economic Affairs
2021	Lukang Flat Glass Factory	Added CF (ceramic filter) dust collection equipment, which was connected to existing electrostatic precipitator (EP) the following year
2022	Hsinchu Factory	Installed additional SCR denitrification equipment (including electrostatic precipitator) to TS2
2024	Lukang Flat Glass Factory	Added washing system for vehicles and equipment

Capital expenditure and related expenses

Factory	Amount	Benefit assessment
Lukang Flat Glass Factory	NT$2 million	Effectively remove pollutants from vehicles and equipment, thereby significantly reducing the amount of air pollution particles entering the atmosphere.
Hsinchu Factory	NT$30 million	In 2024, SCR denitrification equipment was installed to reduce pollution concentration, lowering the nitrogen oxide emission standard from 180 ppm to 66.5 ppm
Total	NT$32 million	

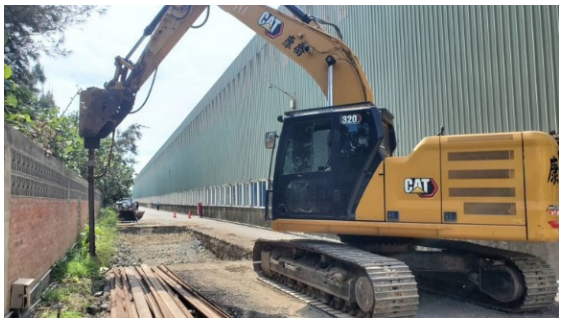
Lukang Flat Glass Factory: Addition of CF dust collector for exhaust treatment

In an attempt to achieve more efficient removal of particulate matters and protect SCR denitrification equipment, Lukang Flat Glass Factory added CF (ceramic filter) dust collection equipment to the front end of the emission pipeline, which works in conjunction with existing electrostatic precipitator (EP) to remove particulate matters at greater efficiency. In order to reduce the emission of particulate pollutants and improve the stability of air pollution control equipment, two sets of equipment were tested and used in series.

CF dust collector

Lukang Flat Glass Factory: Addition of washing system to contain spread of air pollutant

To improve air pollution caused by the drift of particulate matter, Lukang Flat Glass Factory invested $2 million to build a car wash platform. The platform is equipped with advanced cleaning machines that effectively remove pollutants from vehicles and equipment, significantly reducing the amount of particulate matter released into the atmosphere, improving air quality within the factory, and mitigating the environmental impact of industrial production.



Establishment of car-washing platform for improvement of air pollution caused by spread of particles

Hsinchu Factory: Added SCR denitrification equipment for reduction of pollution concentration

As a response to the world's rising awareness toward global warming and the tightening of environmental regulations including a downward adjustment off NOx emission standards from 300ppm to 180ppm, Hsinchu Factory made plans to acquire additional SCR denitrification equipment in 2020, and had invested approximately NT$147 million onto pollution prevention equipment by 2022. These equipment were fully acquired, installed, operational as of May 2022. In 2024, nitrogen oxide emissions were reduced from the regulatory standard of 180ppm to 66.5ppm, with significant results.

NOx control technology

The addition of denitrification equipment injects ammonia (NH_3) into the exhaust gas. When the mixed gas passes through the catalyst layer of the exhaust denitrification equipment (SCR), it reacts to form harmless nitrogen and water through the selective catalytic reduction effect, which can effectively reduce the content of nitrogen oxides (NOx) and achieve the purpose of purifying exhaust gas.

Item \ Year	2022	2023	2024
Average NOx value measured	59 ppm	62ppm	66.5ppm

TS-3 SCR denitrification equipment

TS-7 SCR denitrification equipment

Taichung Factory: Dust ash purification and recycling plan

Dust ash is the waste gas generated during high-temperature smelting. The particulate pollutants collected by the dust collection equipment during air pollution treatment contain toxic substances (selenium), which have serious impacts on the environment and human body. TGI is currently exploring the possibilities of turning precipitator ash into resource for reuse.

Collaboration between Taichung Factory and ITRI - Ash purification and reuse

In 2022, Taichung Factory and ITRI jointly initiated a precipitator ash purification and reuse project that aims to remove toxic substances and recycle precipitator ash as materials, and thereby lessen the amount of waste generated.

By 2023, the project had completed experiments for the purification stage, and was able to remove heavy metals from precipitator ash, purify, recycle, and reuse it as raw materials. After testing the recycled ash in trial production, the project executors found no melting issue and no significant change in the color of glass produced. The results were consistent with project goals, which proved that this approach is feasible in practice. If this approach is proven viable for factory application, it not only saves raw material costs and waste treatment expenses but would also reduce pollution to the environment.

Results for 2024

In 2024, Taichung Factory successfully purified selenium (Se) as pigments. After purification, this chemical element can be recycled and reused in glass manufacturing or pigments, making it 100% recyclable. Although the selenium (Se) purification method is feasible, it is costly. Currently, TGI and the Industrial Technology Research Institute are actively searching for the most efficient process and equipment configuration.

Other energy/carbon reduction performance

The main types of energy used by TGI include electricity, heavy oil, natural gas, and diesel; no energy source (electricity, heat, cold, steam etc.) was sold. Use of energy sources in 2024 is explained bellow:

Heavy oil (kiloliters)	Diesel (liters)	Natural gas (M^3)	LPG (KG)	Electricity (kWh)
Reduced **49.23%** compared to the previous year	Increased **3.39%** compared to the previous year	Increased **11.74%** compared to the previous year	Reduced **91.98%** compared to the previous year	Reduced **0.04%** compared to the previous year

Capital expenditure and related expenses

Factory	Project	Type of energy saved	Energy saving (kWh)	Carbon reduction (tons)
Taoyuan Factory	Improved power consumption of finished fabric CR-1 IR	Electricity (KWH)	72,680	34.5
	HVAC electricity savings through fabric inspection	Electricity (KWH)	295,798	140.2
Hsinchu Factory	The three mobile air compressors used for the discharge port were stopped and replaced with the combustion air from TS-6	Electricity (KWH)	70,810	33.6
	The roots blower used in the effluent discharge wastewater system was upgraded to an air flotation turbo blower with variable frequency control	Electricity (KWH)	226,008	107.1
Taichung Factory	Strengthen the sealing of tin bath and reduce the use of protective gas (hydrogen)	Electricity (KWH)	234,200	111
Changpin Factory	Increase the number of large ceiling fans and reduce the number of small fans	Electricity (KWH)	106,068	50.3
	Replacement of factory lighting, changing the overhead lighting to LED lighting	Electricity (KWH)	27,000	12.8
	The multilayer film washing machine heater is turned off when not in production	Electricity (KWH)	23,670	11.1
Total			1,056,246	500.7

Introduction of energy/resource management system

To improve energy efficiency and reduce operating costs, Lukang Flat Glass Factory purchased and implemented the TECO Energy Resource Management System to enhance energy efficiency within the factory. Air compressors with coefficients above those required by regulations will be equipped for energy consumption testing. Through this energy/resource management system, factories are able to monitor and analyze energy consumption in real time, so that any abnormal or wasteful use of energy can be identified early to reduce carbon emissions and improve environmental protection performance.

Dashboard interface of the energy/resource management system

Installation of natural gas hydrogen production equipment

Taichung Factory currently uses water electrolysis to produce hydrogen, but due to the long service life of the equipment and the large amount of carbon emissions generated during the manufacturing process, it is planned to install natural gas hydrogen production equipment to improve production efficiency while also reducing hydrogen production costs and carbon emissions. Taichung Factory plans to complete the construction of the hydrogen manufacturing system in March 2026 and complete the system verification before June of the same year. This plan is expected to achieve a carbon reduction of 1,176.5 metric tons (CO_2e/year).

4.2 Water resource management

Given the prevalence of extreme weather, water management has become a critical issue to all industry participants. TGI has been promoting water conservation measures across all factories for many years. By improving the water resource system, reducing water usage per unit of product made, and conveying change of water usage behavior among employees, TGI has made significant progress. Increase water efficiency, prioritize purchase of water-saving equipment, enhance green production awareness, and circulate use of water resources.

All TGI factories were able to achieve water resource recycling efficiency of more than 99% in 2024, indicating extraordinary performance in terms of water resource management. TGI will continually improve its water recycling and reuse technology, promote internal water conservation awareness, and explore more sustainable and effective water management solutions in the future.

Water resource recycle rate

Taoyuan Factory	Hsinchu Factory	Taichung Factory	Changpin Factory	Lukang Factory	Lukang Flat Glass Factory
99.19%	99.10%	99.27%	99.52%	99.25%	99.57%

Key water usage performance

2020	Changpin Factory	Automation of water recycling and installation of automated fresh water replenishment systems to reduce the frequency of manual control
2021	Taoyuan Factory	Recycled wastewater discharged from backwashing of resin softening tank and used it for washing
2022	Lukang Factory	Modification of storage equipment for fabric washing liquid
2022	Hsinchu Factory	Recycling and reuse of backwashing liquid
2023	Taoyuan Factory	Recycled wastewater from backwashing of resin softening tank
2023	Hsinchu Factory	The water used in waste gas treatment system was switched to effluent water
2024	Lukang Factory	Steam condensate recovery

Capital expenditure and related expenses

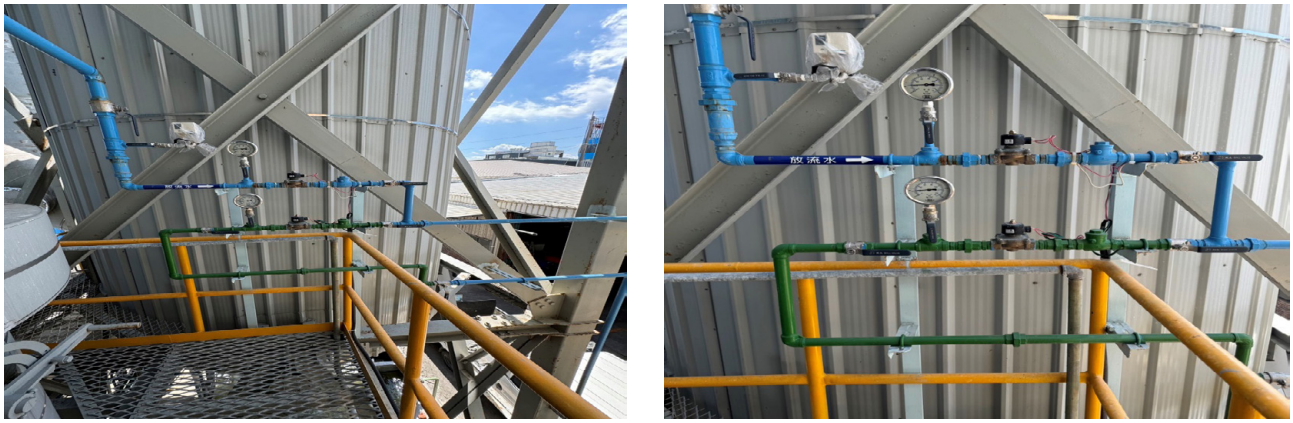
Factory	Amount	Benefit assessment
Hsinchu Factory	$1 million	TS-3 and TS-8 used effluent water instead of waste gas treatment system. TS-3 has been installed, tested, and started operation. It is expected to reduce groundwater extraction by 1,500 tons/month and effluent discharge by 1,500 tons/month
Lukang Factory	NT$ 936,290	1. Steam condensate recovery from air-conditioning boxes in the weaving area, with a recovery volume of 5,636 m^3 from March 2024 to March 2025 2. Based on the unit price of public materials in 2024, the soft water fee was \$19.09/M^3 and the wastewater fee was \$42.23/M^3 3. Annual recycling benefits (excluding boiler wastewater reduction benefits): $345,600
Total	1,936,290	

Water resource management measures

All TGI factories have installed wastewater treatment equipment to reduce the amount of pollutants contained in industrial wastewater below the local wastewater discharge standards, and thereby prevent production pollutants from entering the water body. Wastewater from living activities is also treated and discharged into the water body only if it meets the legal standards. All TGI factories actively enforce the water conservation policy and are committed to circulating and reusing wastewater as a solution to water shortage and environmental pollution.

Hsinchu Factory: Use of effluents for exhaust treatment system

To increase the utilization rate of wastewater recycling, Hsinchu Factory switched the water used in TS3 and TS8 exhaust gas treatment system to effluent water. This investment has reached $1 million and the installation and testing have been completed. TS-8 began operation in February 2024 and TS-2 began operation in March 2025. This will reduce groundwater extraction and stream discharge by 1,500 tons per month.



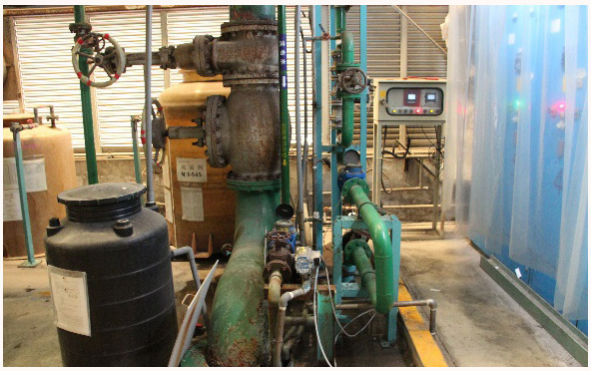
Use of effluents for exhaust treatment system

Lukang Factory: Storage equipment for fabric washing liquid

The water source for U/T(1) COND.W pool is primarily cleaning water, followed by soft water. The FRP 12-ton RO water storage tank used for fabric replacement was moved to U/T(1) for use as a temporary storage pool for cleaning water. The wastewater treatment system recycled a total of 145,408 tons of water in 2024.

The concept of fabric washing liquid storage is explained below:

1. If the volume of fabric washing liquid is greater than the volume of water used at U/T(1)COND.W, the excess fabric washing liquid is stored inside the 12 M^3 buffer tank for fabric washing liquid.
2. During the acid wash process when no fabric washing liquid is available, the excess fabric washing liquid can be drawn from the buffer tank to replenish the U/T(1) COND.W pool.



Taoyuan Factory

Other water conservation performance

Wastewater discharged from backwashing of the TT1,7 resin softening tank was recycled and used for washing TT1 E/S SYS.

Performance results in 2024

In 2024, the total recycled water amounted to 92,977 tons

4.3 Circular economy

Commitment of critical resources to circular economy

TGI implements total circulation and recycling policy for waste, packaging materials, and waste glass. TGI continues to refine its raw material recycling technology and invests significant resources in the recycling model. The use of recycled materials can reduce the demand for raw materials and minimize waste generation.

Waste recycling lessens dependency on landfill and reduces risk of pollution to the environment. Waste glass is recycled through melting and reprocessing, saving raw materials while also reducing energy consumption and carbon emissions. TGI demands effective control and management over the use and recycling of packaging materials for glass, and encourages reduction in the use of packaging materials. TGI promotes implementation of a recycling system to ensure that glass packaging materials are properly recycled and reused. This effectively reduces environmental impact, minimizes resource wastage, and promotes circular economy.

Circulation of glass

The addition rate of recycled glass will increase, and the recycling and reuse rates of flat glass and container glass reached 16.12% and 54.69% in 2024, respectively. The economic benefits of waste glass recycling are approximately $660,042,942

Circulation of packaging materials

In 2024, TGI's total recycling volume of packaging materials and pallets reached 3,461 tons, with pallet recycling rate of 91.9%

Waste recycling

The total amount of general industrial waste in 2024 was 16,702.17 tons, a decrease of 16.68 tons compared to the previous year. In 2024, the proportion of waste recycling and reuse reached more than 80%.

The results of glass recycling for TGI's factories in 2024

Factory	Amount of recycled glass	Amount of savings on procurement	Amount of plan investment
Hsinchu Factory	70,426,270KG	NT$ 52,045,000	NT$ 82,585,901
Taichung Factory	26,958,782KG	27,448,387	NT$ 5,441,064

Circulation and reuse gives glass new life

Glass is a material that helps reduce pollution to the environment. It is widely used by the general public and even international organizations and governments around the world have recognized the recyclability and reusability of glass. Furthermore, waste glass is not considered waste in the glass industry, but rather a necessary raw material in the glassmaking process. Therefore, TGI has established a glass recycling center to clean and reuse recycled glass. Samples are regularly sent to SGS for lead content verification, and recycled waste glass from the production process is reused extensively across various factories. For example: the flat glass factory accepts recycled scrap glass as reusable materials, whereas the glass container factory recycles defective and waste products and smelts them along with other raw materials to reduce the use of silica sand and minerals for lower environmental impact.

In addition to recycling waste glass from factory facilities, TGI also purchases used glass containers from the market, gathers waste glass at the recycling station, and engages recyclers to transport the recycled goods to Hsinchu Factory where they are selected, washed, broken, and remade into raw materials, and thereby reduce the amount of minerals used. TGI cooperates with Spring Pool Glass for the recovery of cullet from flat glass sold to the middle and downstream glass plants; the cullet is cleaned and inspected using metal detectors to remove most of the metal pollutants such as stainless steel, aluminum, copper, and tin to improve production quality.

Implementation budget and results of TGI's waste recycling in 2024

Factory	Implementation budget	Economic benefits from recycling (NTD)	Description
Hsinchu Factory	26,144,673	3,636,942	Amount of recycled scraps sold
Taichung Factory	180,000	2,669,054	4 internal staff members and 2 outsourced environmental staff members are responsible for the annual waste product statistics, with an implementation budget of $30,000 per person
Lukang Flat Glass Factory + Lukang Fiber Glass Factory	113,300	17,924,271	Waste recycling at Lugang Flat Panel Factory is combined with that at Lukang Factory. Sales of scrap iron, waste paper, waste wood boards and valuable waste to buyers
Changpin Factory	144,000	3,496,115	In 2024, the total amount of recycled materials sold, including plastic, iron, paper, PVB film, and waste target materials was $3,496,115

Management of packaging materials

The United Nations Environment Programme released a report stating that global waste generation was 2.1 billion tons in 2023 and will increase 1.7 times to 3.8 billion tons in 2050. The world generates more than 2 billion tons of municipal solid waste each year. Effective recycling of packaging materials may lessen the burden and extend the lifespan of landfill sites, while at the same time reduce risk of land contamination. TGI is dedicated to creating its own management strategies for packaging materials. By combining technological innovation with corporate responsibilities, TGI is able to incorporate environmental protection measures into the production process and adopt sustainable practices that not only help reduce environmental footprint of the business, but also create a cleaner, healthier living environment.

TGI's packaging material achievements at each factory in 2024

Factory	Packaging material	Recyclable/ Non-recyclable	Recycled quantity (tons)	Total amount of packaging materials used (tons)
Taoyuan Factory	Pallets	Recyclable	232	537
	PE fabric	Recyclable	4	4
Hsinchu Factory	Pallets	Recyclable	3,230	3,230
Taichung Factory	Waste plastic (bulk bags, etc.)	Recyclable	8.9	8.9
	PE fabric	Recyclable	0.01	0.01
Lukang Fiber Glass Factory	Pallets	Recyclable	2,090	2,986
	Paper tube	Recyclable	3,156	21,786
Total			8,721	36,234

Mutual benefit with suppliers

The value chain of TGI covers five major categories of upstream raw materials such as silica sand, limestone, dolomite, soda ash, and recycled cullet; the midstream covers the processing and manufacturing, and the downstream covers products and diverse applications. Taiwan Glass is committed to examining the impact and effects of the product value chain on the environment and society, and is working towards sustainable development by working closely with its suppliers. Meanwhile, TGI expects to continue offering high-quality products that meet market demands through the R&D and innovation of products and technology, and long-term cooperation with its partners in the upstream and downstream value chain to drive sustainable competitiveness of TGI's manufacturing industry chain.

chapter 5

Indicators and targets

5.1 Carbon reduction commitments and goals

Being the leader in Taiwan's glass industry, TGI observes the nation's net zero roadmap and strategies, and has set its own Scope 1 and Scope 2 greenhouse gas emission goals for the short, medium, and long term based on Nationally Determined Contributions (NDCs):

Short-term reduction goal

To achieve **10% reduction** by 2025 compared to the baseline year (2014)

Medium-term reduction goal

To achieve **25% reduction** by 2030 compared to the baseline year (2014)

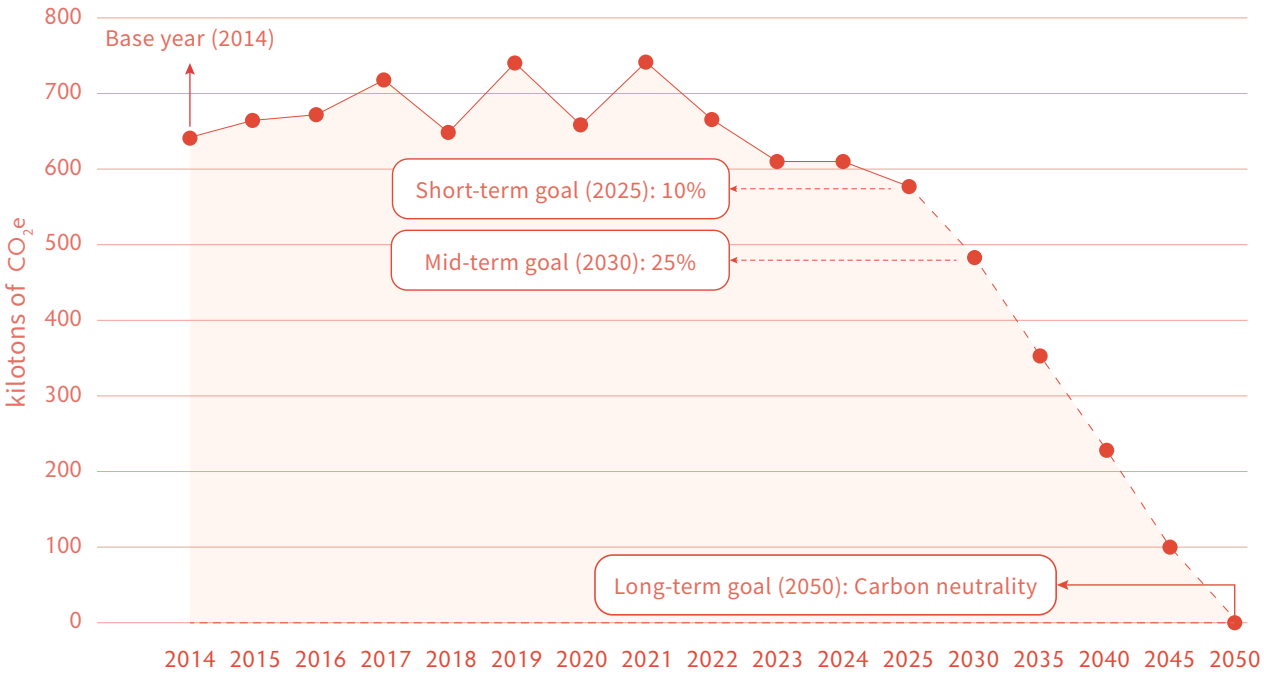
Long-term reduction goal

To achieve **carbon neutrality** by 2050.

TGI strives to reduce energy consumption per unit of production by **3%** a year

Carbon emission in 2014 (baseline year)	Carbon emission in 2024	Carbon reduction volume compared to the baseline year	Carbon reduction percentage compared to the baseline year
714,000 tCO_2e	**551,000** tCO_2e	**-163,000** tCO_2e	**-22.83%**

TGI's carbon emission path



5.2 Disclosure of greenhouse gas emissions

The Company was named by the Environmental Protection Administration as "The First Wave of Entities to Register Source of Greenhouse Gas Emission" in 2016. Since then, TGI has been conducting greenhouse gas emission surveys and validations in accordance with ISO 14064-1 standard on a regular basis, and engaging SGS Taiwan, an independent third-party, to report greenhouse gas emissions over the national platform. In the future, TGI will continue observing the nation's sustainability development roadmap for TWSE/TPEX listed companies, implement greenhouse gas survey across all business locations locally and abroad, and make quarterly reports to the board of directors regarding the progress of its greenhouse gas survey and carbon reduction plan.

In 2024, TGI's greenhouse gas emissions were 551,000 tons, direct carbon emissions were 338,000 tons, a decrease of 12.59% from 2023, and indirect carbon emissions were 213,000 tons, a decrease of 4.02% from 2023. In the future, TGI will continue taking progressive steps toward achieving net zero by 2050 through the adoption of energy conservation plans, energy transformations, and circular economy practices.

Carbon emission by product in previous years

Unit: tons CO_2e

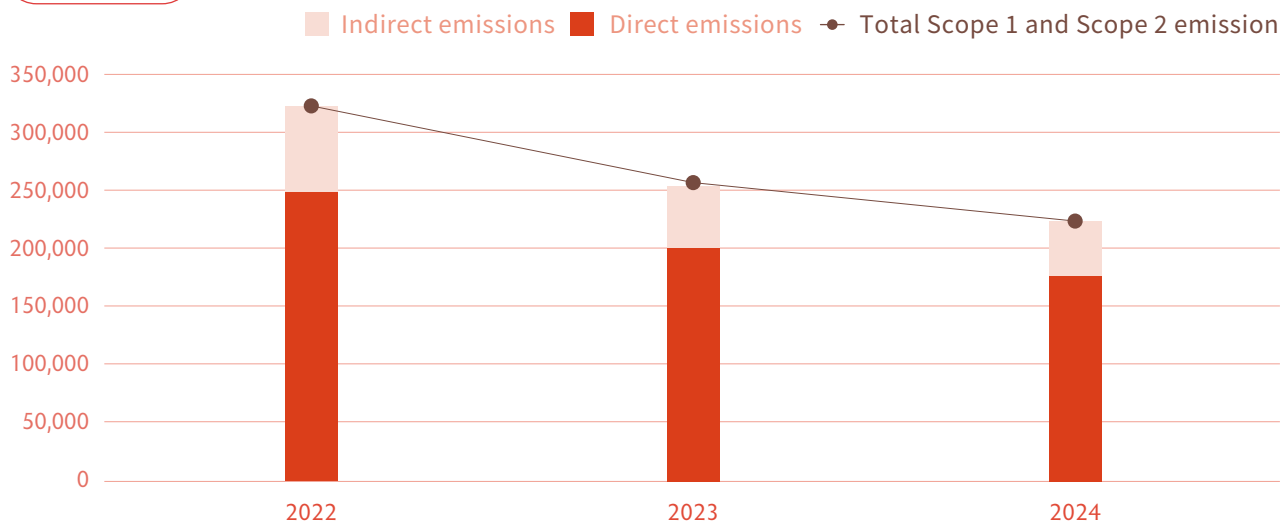
Year / Product	2022		2023		2024	
	Direct emissions	Indirect emissions	Direct emissions	Indirect emissions	Direct emissions	Indirect emissions
Flat Glass	249,223.08	73,973.99	201,574.6133	54,253.0200	178,325.8447	47,238.8019
Fiber Glass	69,687.79	132,387.64	65,123.5403	124,836.3579	58,159.1767	124,300.6726
Glass Containers	113,533.80	41,909.43	120,304.4049	42,695.8272	101,767.7789	41,334.6960
Subtotal	432,444.67	248,271.06	387,212.59	221,785.21	338,237.73	212,874.17
Total	680,715.73		608,979.42		551,493.366	

Note 1: Greenhouse gas emissions are calculated using the operational control method, using activity data * emission factor * GWP value (calorific value calculation this year has been changed to supplier calorific value in accordance with the Ministry of Environment's regulations, and GWP value is based on the IPCC Fifth Assessment Report (2013)). Greenhouse gases include CO_2, CH_4, N_2O, and HFCs. There was no emission of PFCs, SF_6, and NF_3

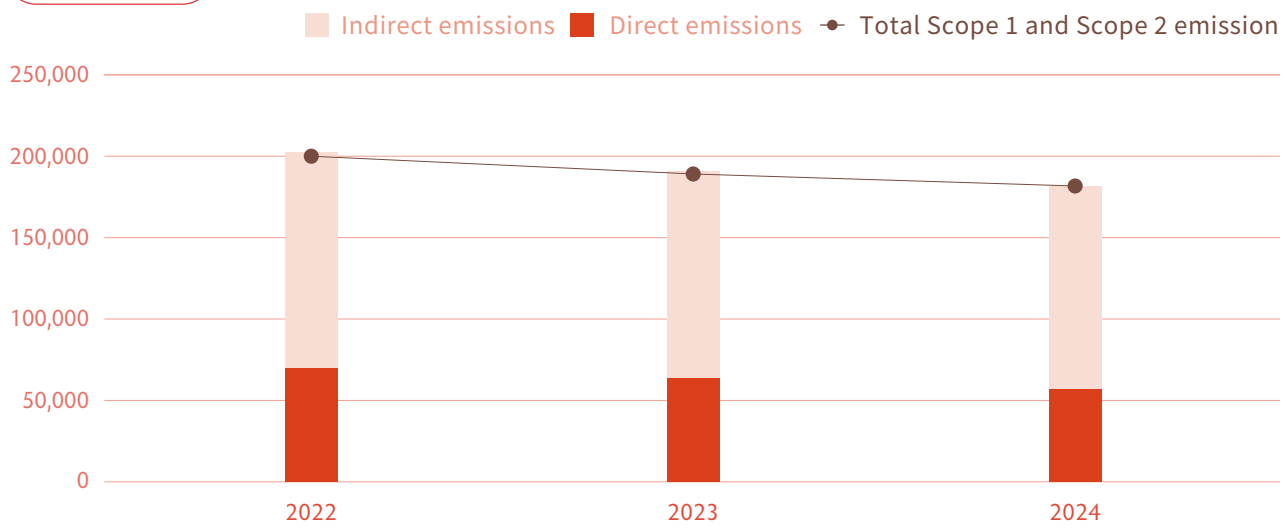
Note 2: Flat glass calculations cover Taichung Factory, Changpin Factory, and Lukang Flat Glass Factory; fiber glass calculations cover Taoyuan Factory and Lukang Factory; glass container calculations cover Hsinchu Factory.

Note 3: TGI engages a 3rd-party institution to conduct annual surveys on greenhouse gas emissions for the previous year. Survey data is uploaded onto the Environmental Protection Administration's National GHG Platform and onto the Market Observation Post System as required by laws.

Flat Glass



Fiber Glass



Glass Containers

To fulfill our net-zero commitment, in 2022 we included our headquarters building and Changpin Factory in the annual greenhouse gas inventory, and gradually carried out Scope 3 greenhouse gas emission audits to better understand the greenhouse gas emissions of TGI's entire value chain. In 2024, TGI's parent company completed the Scope 1, 2, and 3 audits of Taipei Headquarters and its various production sites, and passed a third-party verification. It also completed the Scope 1 and 2 audits of greenhouse gas emissions for its subsidiaries in the consolidated financial statements in 2024.

TGI's scope 3 greenhouse gas emissions

Unit: metric tons CO_2e

Category		2023	2024	Changes in carbon emissions
Category 3 - Indirect GHG emission from transportation	Upstream transportation and distribution	6,802.9420	5,051.4719	-25.75%
	Downstream transportation and distribution	10,336.3250	10,055.9739	-2.71%
Category 4 - Indirect GHG emission from products used by the organization	Procurement of products and services	217,713.6930	113,356.6928	-47.93%
	Fuel- and energy-related activities	119,412.6820	111,476.3579	-6.65%
	Waste generated during operations (waste disposal)	747.5052	2,538.4271	239.59% note 3
	Waste generated during operations (waste from transportation)	198.5350	159.4673	-19.68%
Category 5 - GHG emission relating to the use of products offered by the organization	Downstream leased assets	112.7875	117.9943	4.62%
Total		355,324.4697	242,756.3852	-31.68%

Note 1: The scope of Category 3 emissions inventory includes Taipei Headquarters, Taoyuan Factory, Hsinchu Factory, Taichung Factory, Flat Glass Factory No. 3, Lukang Factory, Lukang Flat Panel Factory, and Changpin Factory.
Note 2: Scope 3 greenhouse gas inventory adopted the new version of ISO 14064-1:2018 standard and commissioned SGS to conduct a third-party external inspection.
Note 3: The increase in emissions from this plan in 2024 was due to the inclusion of wastewater treatment in this year's calculation.

Other environmental indicators and goals

1 Implementation of ISO 14067 product carbon footprint

To strengthen carbon management, the Company introduced product carbon footprint in 2024, which was verified by a third party.


SGS

碳足跡查證意見書

台灣玻璃工業股份有限公司

ISO 14067:2018

SGS CARBON FOOTPRINT

2 Complete the first to third rounds of inspections of all factory areas by 2024

1. All of our factories completed ISO 14064-1 Scope 1, 2, and 3 audits in 2024, and we plan to have SGS conduct third-party verification of our greenhouse gas emission audits in 2025.
2. Since 2025, we have regularly reviewed the greenhouse gas emissions of our individual and consolidated subsidiaries annually to fully understand the use and emissions of greenhouse gases and verify the effectiveness of our reduction efforts.

Appendix

About the report

Report management

- This report covers the period from January 1, 2024 to December 31, 2024. The report is published on a yearly basis.
- Basis of preparation: The report has been prepared in accordance with the TCFD framework; it discloses climate-related governance practices, strategies, risk management, indicators, and goals. Scope of the report covers the Taipei Headquarters and all factory sites in Taiwan (Taoyuan Factory, Hsinchu Factory, Taichung Factory, Lukang Factory, Lukang Flat Glass Factory, and Changpin Factory)

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TCFD Disclosure Index

Aspect	Disclosure recommendations of TCFD	Corresponding chapter in the report	Page
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	• Describe management's role in assessing and managing climate-related risks and opportunities	2.1 Climate governance and management framework 3.1 Identification of climate risks and opportunities and matrix analysis	9 15
Strategy	• Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	3.1 Identification of climate risks and opportunities and matrix analysis	17-22
	• Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	3.1 Identification of climate risks and opportunities and matrix analysis 4.1 Energy conservation plan and energy transformation	17-22 38
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Aspect	Disclosure recommendations of TCFD	Corresponding chapter in the report	Page
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	• Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management	2.1 Climate governance and management framework 3.1 Identification of climate risks and opportunities and matrix analysis	9 15
Indicators 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	5.1 Carbon reduction commitments and goals	56
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	• Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets	5.1 Carbon reduction commitments and goals	56

TGI's sustainability- and climate-related policies, reports, and publications

- TGI 2024 ESG Report
- TGI 2024 Annual Report
- TGI ESG Committee Charter
- TGI Sustainability Code of Conduct

References

1. IPCC (2021), Sixth Assessment Report of Intergovernmental Panel on Climate Change 2021: The Physical
2. Science abstract of the IPCC 6th Assessment Report and updated report of TCCIP
3. Taiwan Net Zero 2050 roadmap and strategies
4. Disaster Risk Adaptation