3 Strategy

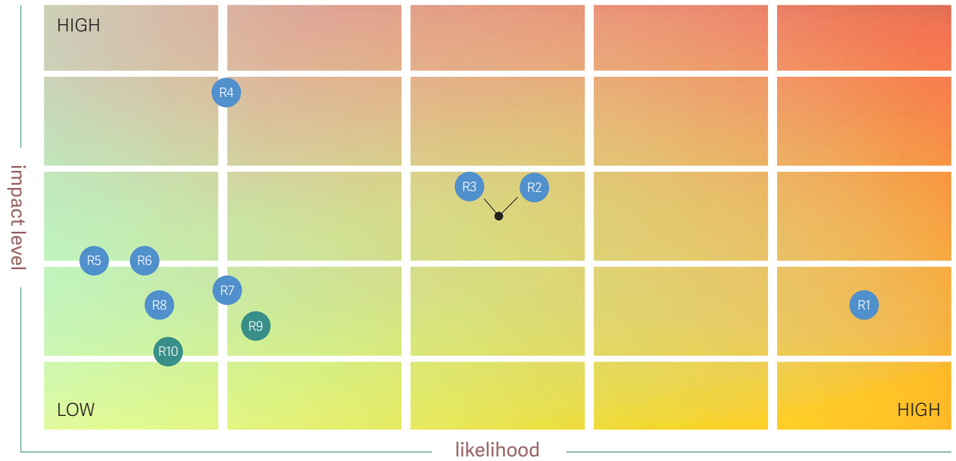
Climate change profoundly affects global economic and industrial development. To enhance corporate resilience and sustainable value, we incorporate climate risks and opportunities into our strategic planning. Through scenario analysis and transition planning, we adjust operations, innovate products and services, and actively develop roadmaps for green growth to meet the challenges of low-carbon transition.

3.1_ Climate Risks and Opportunities

Short-, Medium-, and Long-term Climate-related Risks and Opportunities

TCC has established a systematic identification and evaluation process to strengthen corporate resilience under the impact of extreme climate events, and the pressures of the net-zero transition. During the assessment, TCC adopts risk matrix tools to comprehensively assess the time scale of risk occurrence (short-term, medium-term, long-term), likelihood (low to high), and degree of financial impact (covering revenue, operating costs, capital expenditure, and asset value) to evaluate the overall impact of climate issues on operations and transition. Material risks are determined based on the post-assessment risk value (likelihood x impact level). The two highest-ranking transition risks and the physical risk with the highest risk value are identified as priority concerns, serving as the core basis for incorporation into strategic adjustments, operational deployment, and capital expenditure planning. By closely linking assessment results with decision-making processes, TCC transforms risk identification into action, effectively enhance responsiveness and resource allocation efficiency while capturing green growth opportunities arising from the climate transition.

Climate Risk Matrix



Transformation Risks

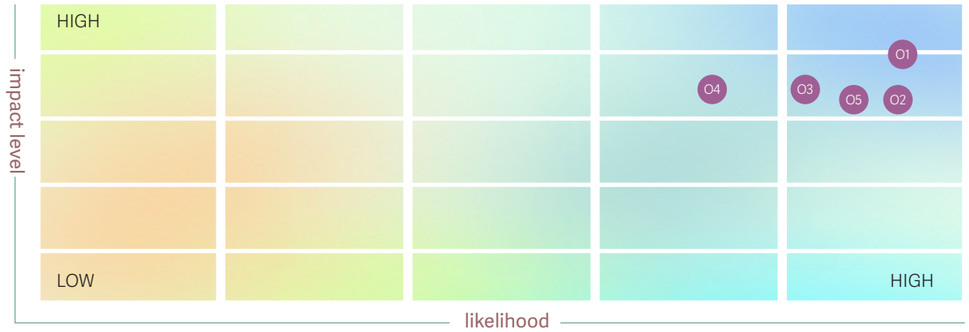
- R1 Carbon trading/carbon fee/carbon tax for Cap and Trade
- R2 Strength of Support from Insurance and Financial Institutions for Investment and Financing
- R3 Improper Use of Alternative Raw Materials/Fuels/Waste Resource Recycling
- R4 Reputational Damage Due to Insufficient Low-carbon Transition
- R5 Difficulty in Obtaining Renewable Energy
- R6 Poor Energy Efficiency Management
- R7 Poor Performance in Low-carbon Technology, Equipment and Management
- R8 Failure in Research and Development Investment for Low-carbon and Negative Carbon Technologies

Physical Risks

- R9 Frequency and Intensity of Extreme Precipitation Events
- R10 Lack of Water Resources

When assessing climate-related opportunities, TCC adopts practice-oriented evaluation criteria, identifying opportunities with the three highest-ranked opportunities (likelihood x impact level) as key items to recognize the Company's potential transition value. These key climate opportunities have been incorporated into the Company's strategic planning and resource allocation processes, serving as action guidelines for promoting green innovation and strengthening market deployment. This approach strengthens the Company's competitive advantage in the global net-zero transition while generating new momentum and market opportunities for sustainable growth.

Climate Opportunities Risk Matrix



- O1 Installation of New Energy Project
- O2 Smart Low-carbon Production and waste co-processing
- O3 Market Expansion of Low-carbon Products and Services
- O4 Securing investors' willingness for long-term investment
- O5 Involvement in the electricitytrading market

Material Risks and Opportunities

In response to the operational impacts that may arise from extreme weather events caused by climate change and the net-zero transition process

TCC follows its internal climate risk and opportunity identification process to identify three material risks, including:

- R1 Carbon trading/carbon fee/carbon tax for Cap and Trade
- R2 Strength of Support from Insurance and Financial Institutions for Investment and Financing
- R9 Frequency and Intensity of Extreme Precipitation Events

Meanwhile, three key climate opportunities have also been identified, including:

- O1 Installation of New Energy Project
- O2 Smart Low-carbon Production and waste co-processing
- O3 Market Expansion of Low-carbonProducts and Services

By reviewing current response strategies and adaptation practices, TCC has developed six major climate actions that are aligned with the scope and timeline of various risks and opportunities. These actions include low-carbon circular production, industry-leading low-carbon construction materials, low- carbon and carbon negative technical innovations, smart new energy business, low carbon supply chain, and climate &nature disaster adaptation. TCC strengthened its resilience by formulating a systematic action roadmap, laying a solid foundation for the transition towards net-zero.

Material Risk Analysis Table

Climate-related Risks	
R1 **Carbon trading/carbon fee/carbon tax for Cap and Trade**	R2 **Strength of Support from Insurance and Financial Institutions for Investment and Financing**
Risk Type	
Transformation Risks | Policies and Regulations	Transition Risks | Market Risks
Risk Description	
Construction Material | Traditional cement manufacturing processes emit large amounts of greenhouse gases. Without reducing greenhouse gas emissions, the Company will be impacted by increasingly stringent carbon regulation laws (such as carbon trading, carbon tax, or carbon fees). Furthermore, if countries do not implement carbon border taxes, imported goods will not be subject to carbon costs, resulting in unfair competition. **Social Aspect of Energy Transition** | Without strategic planning for greenhouse gas reduction, the Company may face regulatory pressure from carbon control measures such as carbon fees, leading to increased operating costs. If these costs cannot be fully passed on, there is a risk of declining profits.	**Construction Material** | As a high-carbon emission industry, the cement sector will face significantly reduced willingness from financial institutions to engage in business if low-carbon transition plans are not developed. This includes decreased investment interest from potential investors, difficulties in financing and insurance coverage. Additionally, since TCC issues green financial products linked to carbon reduction performance, failure to meet carbon reduction targets will lead to increased financing costs. **Social Aspect of Energy Transition** | Amid the global coal phase-out trend, financial institutions have ceased financing for coal-fired power plants, insurance companies refuse to provide insurance services for coal-fired projects, and potential investors show reduced interest, which will significantly impact organizational operations.
Expected Time Period	
Short-term to medium and long-term	Short-term to medium and long-term
Impact on Business Model and Value Chain	
Business model | cement production and energy generation **Value chain** | Downstream construction industry, ready-mixed concrete customers, and downstream power customers	**Business model** | financing activities and insurance
Expected Financial Impact	
⊙Short-term: NT$ 2.067 billion ⊙Medium-term: NT$ 7.349 billion ⊙Long-term: NT$ 11.608 billion	⊙Short-term: NT$ 4.074 billion ⊙Medium-term: NT$ 3.134 billion ⊙Long-term: NT$ 3.179 billion
Strategy and Decision-Making	
⊙Implementation strategies include alternative clinker, alternative raw materials, alternative fuels, Equipment and process enhancements, power generation by waste heat recovery, renewable energy, carbon capture, and carbon sinks ⊙Promote internal carbon pricing in cement business	⊙Continue to engage with financial institutions and respond to international sustainability ratings ⊙Align with IFRS Sustainability Disclosure Standards ⊙Issue green financial instruments to attract investors ⊙Plan for decommissioning Hoping Power Plant by 2040
Correspond to six major climate action plans	
Low-carbon Circular Production Low-Carbon and Carbon Negative Technical Innovation Low-carbon Supply Chain	Low-carbon Circular Production Leading the Industry in Low-carbon Construction Materials Low-Carbon and Carbon Negative Technical Innovation Smart New Energy Business
Response to cost estimation (including capital expenditure and expenses)	
Approximately NT$ 7.99 billion	Approximately NT$ 0.51 billion

Material Risk Analysis Table

Climate-related Risks
R9 Frequency and Intensity of Extreme Precipitation Events
Risk Type
Physical Risks | Acute
Risk Description
Construction Material | Cement and concrete operational sites may experience revenue loss or increased operational costs due to business interruptions caused by extreme precipitation events or damage to owned equipment. Heavy rainfall and typhoons may lead to fluctuations in raw material quality and supply disruptions, which could also affect product transportation, resulting in delivery delays or failure to ship, thereby impacting overall operations.
Expected Time Period
Short-term to medium and long-term
Impact on Business Model and Value Chain
Business model | cement production and energy generation
Value chain | Upstream raw material supplies and downstream product transportation
Expected Financial Impact
⊙Long-term: NT$ 3.414 billion
Strategy and Decision-Making
⊙Construct detention and sedimentation ponds and build 2-meter-high earth embankments on the mining area slopes to mitigate the impact of flooding.
⊙All RMC Plants have established emergency response procedures; cement plants have formulated typhoon and flood response plans.
⊙Flood control teams are set up at the plants to conduct regular drills and enhance inspections.
⊙All high-risk critical equipment is insured against natural disaster-related damages.
Correspond to six major climate action plans
Climate and Natural Disaster Adaptation
Response to cost estimation (including capital expenditure and expenses)
Approximately NT$ 0.50 billion

Major Opportunity Analysis Table

Climate-related Opportunities
O1 Installation of New Energy Project
Opportunity Type
Products and Services
Opportunity Description
Green Energy and Energy Storage | Independently developing diverse renewable energy sources and establishing energy storage systems to meet Taiwan enterprises' green electricity and energy storage needs.
TCC Group's subsidiary NHOA ATLANTE joins European SPARK ALLIANCE to expand product market and business territory
Battery | By optimizing battery energy efficiency and charging/-discharging efficiency, combining self-developed energy management systems for battery health monitoring, and integrating renewable energy with charging equipment applications, the Company improves power generation efficiency, extends battery life, strengthens product competitiveness, and enhances customer loyalty.
Expected Time Period
Short-term to medium and long-term
Impact on Business Model and Value Chain
Business model | low-carbon new energy products and services sales
Value chain | Downstream customers with new energy demands.
Strategy and Decision-Making
⊙TCC Green Energy Corporation focuses on the development and management of renewable energy projects including solar power, wind power, and geothermal energy, as well as research, evaluation and cooperation in renewable energy
⊙NHOA.TCC is dedicated to building city-level microgrids. In addition to establishing large-scale EnergyArk energy storage facilities, it also develops and designs energy storage cabinets that are more suitable for indoor use, with plug-and-play integration of batteries and equipment for urban power grids
⊙Invest in Taiwan's first super battery factory, focusing on mass production of large power batteries
⊙Establish integrated green charging and energy storage charging services, as well as providing green energy matching services and aggregated power trading
⊙Expand into Taiwan, European and American energy storage and charging station markets
Correspond to six major climate action plans
Smart New Energy Business
Response to cost estimation (including capital expenditure and expenses)
Approximately NT$ 8.33 billion

Major Opportunity Analysis Table

Climate-related Opportunities	
O2 Smart Low-Carbon Production and Waste Co-Processing	O3 Market Expansion of Low-carbon Products and Services
Opportunity Type	
Resilience	Products and Services
Opportunity Description	
Construction Material | The government promotes climate-related regulations and offers carbon fee incentives, encouraging businesses to plan early for low-carbon transformation. This enables companies with low-carbon production to gain competitive advantages. TCC Group takes the lead in adopting alternative raw materials and fuels along with AI-smart manufacturing processes, improving energy efficiency and lowering costs. Meanwhile, through co-processing waste, the Group reduces coal usage, creating carbon reduction benefits and revenue streams, strengthening its overall carbon reduction competitiveness.	**Construction Material** | Global demand for low-carbon construction materials is increasing. TCC develops low-carbon products by utilizing alternative raw materials and fuels, improving process, and adopting energy-saving technologies, strengthening its competitiveness and driving profit growth. The launch of new domestic and international products, including UHPC, along with the implementation of regulations and carbon pricing, helps raise customers' carbon reduction awareness and drives market demand.
Expected Time Period	
Short-term to medium and long-term	Short-term to medium and long-term
Impact on Business Model and Value Chain	
Business model | cement production	**Business model** | low-carbon products and services sales
	Value chain | downstream construction industry and ready-mixed concrete manufacturers
Strategy and Decision-Making	
⊙Implementation of artificial intelligence for production efficiency	⊙Actively develop low-carbon cement and concrete and low-carbon products such as UHPC
⊙Co-processing of household waste and hazardous waste in cement kilns	
Correspond to six major climate action plans	
Low-carbon Circular Production	Low-carbon Circular Production
Low-Carbon and Carbon Negative Technical Innovation	Industry-leading Low-carbon construction Materials
	Low-carbon Supply Chain
Response to cost estimation (including capital expenditure and expenses)	
Approximately NT$ 0.03 billion	Approximately NT$ 0.04 billion

3.2_ Using scenario analysis for resilience assessment

To thoroughly assess the potential impacts of climate risks on corporate finances and operations, we focus on conducting scenario analysis for three climate risks highly relevant to TCC. The first two risks belong to the transition risk category: " Carbon Trading/Carbon Fees/Carbon Tax for Cap and Trade (R1)" and " Strength of Support from Insurance and Financial Institutions for Investment and Financing (R2)", which rank first and second among transition risks respectively. The other is the highest-ranked physical risk "Frequency and intensity of extreme precipitation events (R9)", to comprehensively understand the challenges to company operational resilience and financial stability under different climate scenarios.

For transition risk assessment, TCC adopts three representative policy scenarios proposed by the International Energy Agency (IEA): Stated Policies Scenario (STEPS), Announced Pledges Scenario (APS), and Net Zero Emissions by 2050 Scenario (NZE2050), to evaluate the impact of carbon price fluctuations on operating costs and investment decisions under different levels of climate policy tightening, serving as an important basis for formulating climate response strategies and financial planning. In addition to carbon pricing impacts, TCC also incorporates "Insurance and financial institutions' financing support intensity" as one of the key transition risks, evaluating changes in insurance coverage for the Hoping Power Plant under net-zero transition trends to understand the scale of financial exposure. On the other hand, failure to meet carbon reduction requirements may lead to financial risks such as increased financing costs and difficulties in obtaining funding. Through scenario analysis, TCC is able to grasp the degree of financial exposure early on and strengthen the efficiency of fund allocation and transition investment deployment.

For the climate physical risk of "extreme precipitation events", TCC adopts the SSP1-2.6 and SSP5-8.5 emission pathway scenarios proposed by the United Nations Intergovernmental Panel on Climate Change (IPCC) for simulation, evaluating the potential impacts of extreme weather events (such as heavy rainfall) on production bases, logistics transportation, and infrastructure resilience under continuing climate change deterioration. This high-risk scenario helps TCC quantify potential direct operational disruptions and financial losses caused by physical risks, serving as a basis for strengthening facility resilience and disaster response planning. Through a dual climate scenario analysis framework encompassing both transition risks and physical risks, TCC can systematically grasp potential financial risks and response opportunities under net-zero transition and climate impacts, further strengthening corporate strategic flexibility and enhancing overall transition resilience and sustainable competitiveness.

Risk Scenario Description

Risk Type	Scenario Description	Key Parameters	Impact Content	Estimated Temperature Rise	Scenario Source
Transformation Risks	**STEPS** | The climate change response measures in force and concrete policies enacted by governments around the world	Trading Price Changes in Different Regions1 Changes in Insurance Coverage Range	Additional Expenses Due to Carbon Fees or Carbon Trading Impact on Risk Exposure Due to Changes in Insurance Coverage	2.4°C	IEA[2]
	APS | The latest climate commitments of countries, including the NDCs and long-term net-zero goals.			1.7°C	
	NZE 2050 | Realization of net-zero CO_2 emissions of the global energy sector by 2050			1.5°C	
Physical Risks	**SSP1-2.6** | The low emissions scenario with a global effort to achieve sustainability goals, but in a slow progress	Changes in Precipitation Due to Extreme Weather	Business Interruption and Asset Impairment Due to Flooding	1.8°C	IPCC[4]
	SSP5-8.5 | The extremely high emissions scenario with ultra-high emissions brought by the extensive use of fossil fuels in the absence of climate policies globally			4.4°C	

Note1: Reference from the IEA WEO (2024) ; The 5th Carbon Fee Rate Review Committee of Ministry of Environment
Note2: Reference from the IEA World Energy Outlook 2024(WEO)

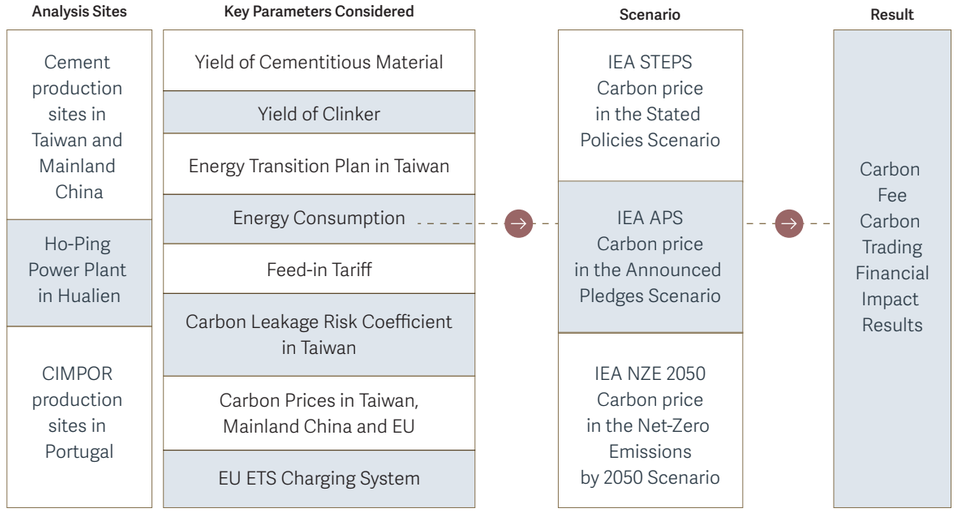
Transition Risks | Analyzing the impact of carbon prices resulting from domestic and international carbon-related regulations

As a high-carbon emission industry, TCC needs to pay close attention to greenhouse gas emission regulations at its operational locations during the operational process. Taiwan passed the Climate Change Response Act in 2023 and released the Regulations Governing the Collection of Carbon Fees in August 2024. TCC will pay carbon fees in 2026 based on its 2025 carbon emissions. However, if TCC's voluntary reduction plan is approved, it can apply the carbon leakage risk coefficient, which will help to reduce the financial impact of carbon fees. Furthermore, Mainland China established its national carbon trading market in 2021, which currently only mandates participation from the power sector. However, China's Ministry of Ecology and Environment plans to include the cement industry in the national carbon emissions trading market by 2025.

With the official implementation of the EU Carbon Border Adjustment Mechanism (CBAM) and increasingly stringent global carbon pricing systems, TCC expanded its overseas operational presence in 2024 by increasing its shareholding in Türkiye's OYAK CEMENT to 60% and Portugal's CIMPOR to 100%. This move not only strengthens the Group's operational foundation in European and African markets but also facilitates the introduction of advanced local low-carbon manufacturing processes and technologies in these regions. Considering that the European market has fully implemented the European Union Emissions Trading System (EU ETS), we will likewise use this mechanism as a core method to assess the potential carbon cost risks faced by CIMPOR's production sites during their transition process. The assessment content covers carbon allowance requirements and carbon price fluctuation trends. On the other hand, since there is no formal policy direction regarding carbon cost-related issues in Türkiye yet, OYAK CEMENT is temporarily excluded from the scope of this assessment.

To understand the impact of carbon pricing on TCC's operations, TCC estimates future carbon emissions by considering different Business as Usual (BAU) scenarios and company target scenarios. Through the IEA's Stated Policies Scenario (STEPS), Announced Pledges Scenario (APS), and Net Zero Emissions by 2050 Scenario (NZE 2050), TCC analyzes domestic and international carbon price scenarios to calculate the financial impact of carbon fees and carbon trading on each operational site.

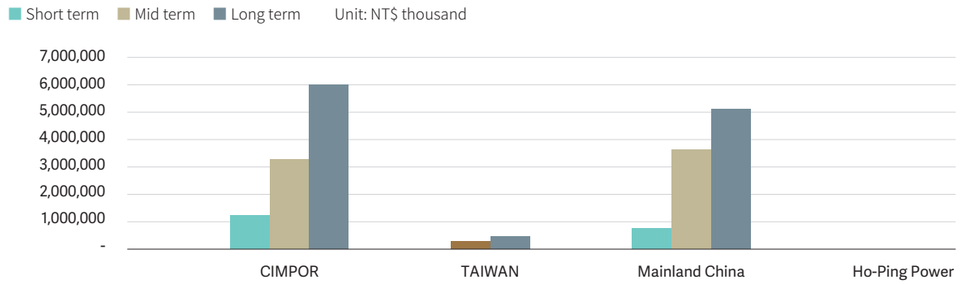
Key Analysis Points



Note[3]: Türkiye's current carbon fee policy is unclear. After evaluation, OYAK CEMENT has been temporarily excluded from this year's analysis

The analysis results indicate that, regardless of the climate scenario, the absence of transition measures would subject TCC sites to carbon costs exceeding the Company's set emission reduction targets. Based on a comprehensive assessment of TCC's operating model and decarbonization pathway, under the BAU scenario, the estimated short-term carbon price impact for domestic and overseas facilities could reach NT$2.067 billion, medium-term impact could reach NT$7.349 billion, and long-term impact NT$11.608 billion. Whether domestic or overseas, any facility will face significant financial impact in the future without implementing carbon reduction management measures.

Carbon Impact Analysis Table



	CIMPOR	TAIWAN	Mainland China	Ho-Ping Power
Short term	1,213,060	34,919	815,243	3,926
Mid term	3,363,010	278,044	3,692,610	15,703
Long term	6,060,324	416,577	5,115,186	15,703

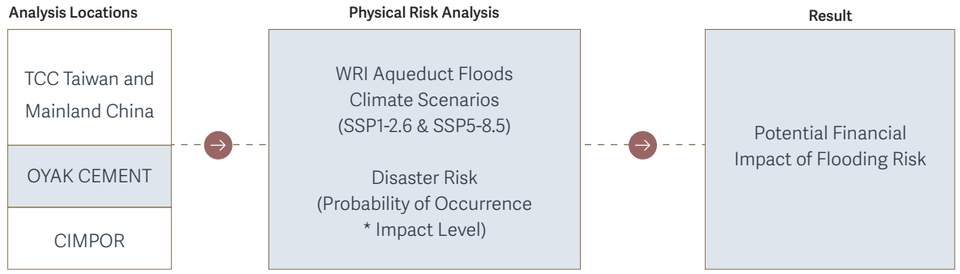
Transition Risks | Strength of Support from Insurance and Financial Institutions for Investment and Financing

Under increasingly stringent climate change policies and decarbonization trends across financial markets, "Insurance and financial institutions' financing support intensity" has become a key factor in assessing corporate transition risks. For cement industry and coal-fired power generation with highly concentrated carbon emissions, they may face future challenges such as reduced insurance coverage, increased capital costs, and decreased financing availability. Based on the above analysis, the "Strength of Support from Insurance and Financial Institutions for Investment and Financing" may have significant impacts on thermal coal power plants and cement industry under different climate policy and market scenarios. If carbon-intensive industries fail to effectively disclose their greenhouse gas emissions status, or lack concrete feasible decarbonization pathways and implementation progress, insurance companies may adjust their risk pricing models and underwriting standards and consider such companies as high-risk targets. Under this scenario, not only could insurance premiums increase significantly, but there could also be reduced coverage scope and difficulties in reinsurance arrangements. Taking Hoping Power Plant as an example, based on the projected trend of declining insurance coverage, the estimated short-term exposed asset value is NT$4.074 billion, the medium-term value is NT$3.134 billion , and the long-term value is NT$3.179 billion.

Physical Risks | Frequency and Intensity of Extreme Precipitation Events

To enhance climate resilience and operational stability, TCC Group systematically conducts physical risk assessments. For its major global operational sites, it uses the Aqueduct Floods tool and related databases developed by the World Resources Institute (WRI), supplemented by historical disaster records and geographical characteristics, to simulate extreme weather risks under different climate scenarios (such as IPCC's SSP1-2.6 and SSP5-8.5). For operational sites in Taiwan and Mainland China, the potential impacts of extreme precipitation on production facilities, logistics transportation, and operational interruptions are quantitatively assessed by simulating flood risks in 2030. Based on water depth indicators, risks are categorized into different levels, serving as important references for risk adaptation and resource allocation. Internationally, Türkiye's OYAK CEMENT and Portugal's CIMPOR plants are also included in the same analytical framework, assessing potential flood disasters under different emission scenarios to understand the exposure level of key facilities under climate change.

Analysis Process



Under the high-emission scenario (SSP5-8.5), TCC conducted extreme climate risk assessments for its operational locations in Taiwan and Mainland China, focusing on the impact of heavy rainfall during the plum rain and typhoon seasons from April to September each year. The results show that there are 10 locations at risk of flooding in Taiwan, located in Yilan County, Taichung City, Tainan City, and Kaohsiung City. In Mainland China, there are 5 locations at risk, distributed across Guangdong, Liaoning, and Hunan provinces. Additionally, for international operations, TCC also simulated the 2030 flood risk for OYAK CEMENT in Türkiye and CIMPOR plants in Portugal. Preliminary analysis shows that 15 locations are in flood-risk zones. Based on the comprehensive assessment analysis above, without effective adaptation measures, long-term climate impacts could lead to production equipment damage, operational interruption, and asset impairment for TCC, with estimated long-term potential financial impacts reaching NT$3.414 billion. To reduce the aforementioned risks, TCC will continue to conduct regular flood simulations and disaster adaptation assessments for high-risk locations across its global sites, optimize flood prevention facilities, and enhance backup mechanisms and response capabilities.

Mainland China Flood Risk Map

Taiwan Flood Risk Map

OYAK CEMENT Flood Risk Map

CIMPOR Flood Risk Map

3.3_ TCC Climate Commitments and Goals

With carbon reduction and green enhancement as its core focus, TCC promotes three key business transformations, adopting strategies such as carbon reduction in basic construction materials and optimization of new energy storage. These efforts advance sustainable products and services, strengthen the Company's resilience and drive operational growth, increase its green content, and seize green business opportunities arising from climate change. The Low-Carbon Construction Materials Business expands its markets presence through innovative low-carbon products. The Resource Recycling Business utilizes co-processing of cement kilns to treat industrial and domestic waste while increasing the construction waste reutilization. The Green Energy Business advances energy transition by developing new energy projects and participating in the electricity trading market.

According to the World Business Council for Sustainable Development (WBCSD), while corporate responsibility for reducing Scope 1, 2, and 3 emissions is now considered a basic obligation ("Do Less Harm"), companies can drive deep transformation by proposing concrete climate solutions and exerting greater decarbonization influence ("Do More Good"). In addition to continuously strengthening carbon reduction in its core business, TCC is committed to developing new products and services that can help customers and society reduce emissions, expanding the external positive impact of Avoided Emissions. According to United Nations Environment Programme (UNEP) statistics, basic construction materials such as steel and cement account for approximately 18% of global construction-related carbon emissions. The United Nations' Emissions Gap Report 2024 highlights that low-carbon cement technologies using alternative clinkers, such as limestone, could reduce global carbon emissions by approximately 400 million tonnes by 2035, making it a cost-effective solution with significant carbon reduction potential.

In response, TCC launched Portland Limestone (IL) cement and concrete products, enabling customers to reduce carbon emissions by 146,000 tonnes within one year of market introduction, demonstrating the substantial emission reduction benefits of low-carbon products. Additionally, TCC is actively promoting the adoption of global low-carbon construction materials, helping the construction industry reduce carbon emissions by approximately 1.16 million tonnes in 2024. Reduction is expected to reach 1.69 million tonnes by 2030. This initiative reflects the Company's significant influence in driving carbon reduction innovation and market promotion.

Overall Carbon Reduction Key Performance

2024 Carbon Reduction Performance	Carbon Reduction Amount (Base Year 2016)	Carbon Reduction Contribution
Alternative Raw Materials/Alternative Clinker	9.51 million	56%
Alternative Fuels/Equipment& Process Enhancements	6.73 million	39%
Renewable Energy/Power Generation by Waste Heat Recovery	0.86 million	5%
Total	**17.10 million**	**100%**

TCC Carbon Reduction Roadmap

TCC's Carbon Reduction Roadmap is focused on the overall goal of achieving net-zero emissions in cement and concrete operations by 2050. Guided by the International Energy Agency (IEA) Net Zero Emissions by 2050 (NZE) scenario, World Cement Association (WCA) and Global Cement and Concrete Association (GCCA) carbon reduction blueprints and considering the current status of TCC's operational sites and policy restrictions, the Company has developed a three-stage reduction strategy covering short-term, medium-term, and long-term phases.

Short-term until 2030

Strengthening Low-carbon Foundation

Reduce clinker-to-cement ratio: Promote high-proportion blended cement (using materials such as limestone, volcanic ash, kaolin, and slag powder) to replace traditional clinker, aiming to achieve a clinker ratio below international recommended standards by 2030.

Increase Thermal Substitution Rate (TSR) of alternative fuels: Accelerate the use of alternative fuels (such as SRF, waste tires, biomass fuels) to reduce fossil fuel dependency.

Increase the use of alternative raw materials: Reduce natural raw material extraction and decrease carbon emissions from raw materials during the manufacturing process.

Advance renewable energy self-generation and green electricity procurement: Install solar power and energy storage systems throughout plant areas and participate in green electricity market.

Introduce low-carbon product standards and ratings: Continuously research, develop and promote cement and concrete products that have obtained low-carbon certification.

Medium-term 2031–2040

Initiating Innovative Carbon Reduction Technology Transformation

Develop Carbon Capture, Utilization and Storage (CCUS) technology: Implement and verify preliminary CCUS demonstration systems in compliance with domestic and international regulations and carbon pricing trends.

Enhance smart manufacturing and energy efficiency: Reduce carbon emission intensity through AI-based equipment health prediction, anomaly detection, and real-time process optimization systems.

Increase the adoption of Ultra-High Performance Concrete (UHPC) and new construction materials: Drive the use of high-durability, low-carbon footprint advanced construction materials to enhance product value and expand market share by replacing traditional concrete.

Long-term 2041–2050

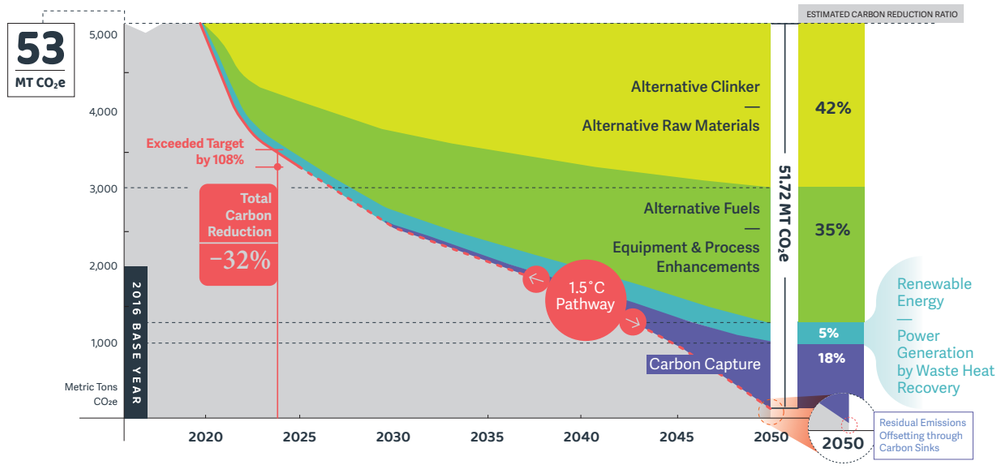
Advancing Net-Zero Transformation

Full deployment of commercial CCUS systems: Implement mature CCUS facilities at major cement plants to process unavoidable residual carbon emissions.

Adopt innovative alternative raw materials and processes (such as clinker-free cement technology and plasma calcination): Significantly reduce carbon emissions at the source.

Carbon removal and natural carbon sink investment: Remove residual carbon emissions and achieve ultimate net-zero through carbon capture alongside natural solutions.

The overall Carbon Reduction Roadmap is centered around three key axes: technological innovation, policy alignment, and business feasibility, ensuring that each phase is feasible and aligned with international goals. TCC reviews annual carbon reduction performance and technological progress, continuously adjusts pathway milestones, and strengthens its resilience and carbon competitiveness.



Note: The net-zero pathway scope covers all operational sites in Taiwan, Mainland China, CIMPOR, and OYAK CEMENT

Furthermore, to support the corporate-wide net-zero transformation goals, TCC also highly values carbon emission management throughout the supply chain, actively promoting Scope 3 greenhouse gas inventory and reduction initiatives. For Scope 3 greenhouse gas emissions, after identifying industry characteristics, emission hotspots, and reduction potentials, the Company focuses on four major categories: upstream transportation and distribution, downstream transportation and distribution, purchased goods and services, and fuel and energy-related activities, setting short-term carbon reduction targets for 2030. At the same time, following the SBTi 1.5°C methodology, TCC has developed a long-term carbon reduction pathway and targets for Scope 3 emissions throughout 2050. Through collaboration with suppliers and logistics partners, the Company is strengthening low-carbon transportation solutions and raw material procurement mechanisms, gradually increasing carbon reduction benefits to achieve coordinated climate action across the upstream and downstream value chain.

3.4_ TCC Climate Actions

In the face of increasingly severe physical and transition risks from climate change, TCC upholds its commitment to sustainable transformation from within and at the foundational level, viewing net-zero transformation as a core driver of long-term corporate competitiveness. In addition to regulatory compliance, the Group proactively engages in diverse climate actions, such as forward-looking technology research and development, process optimization, energy structure transformation, and supply chain carbon reduction. In combination, these efforts contribute to the global target of limiting temperature rise to 1.5°C through concrete actions. The Group implements localized, versatile carbon reduction solutions at its major operational sites in Taiwan, Mainland China, Türkiye, and Portugal based on local climate risks and policies. By tailoring approaches to local conditions and integrating efforts across regions, the Company demonstrates resilient climate governance.

3.4.1_ Low-carbon Circular Production

Climate Risks Addressed

- R1 Carbon Trading/Carbon Fees/Carbon Tax for Cap and Trade
- R2 Strength of Support from Insurance and Financial Institutions for Investment and Financing
- R4 Reputational Damage Due to Insufficient Low-carbon Transition

Climate Opportunities Addressed

- O2 Smart Low-Carbon Production and Waste Co-Processing
- O3 Market Expansion of Low-carbon Products and Services

TCC Circular Economy Model

In response to the dual challenges of resource depletion and climate change, TCC actively embraces circular economy principles by transforming the traditional linear production model of extraction-manufacturing-disposal into a circular framework of reduction-reuse-resourceization. By implementing cement production processes categorized by high temperature, high turbulence, and long retention time, TCC has developed a system for the co-processing of cement kilns to achieve the dual objectives of maximizing resource utilization while minimizing pollution emissions.

TCC's circular economy strategy focuses on the following three core aspects:

Alternative Raw Materials

TCC utilizes industrial waste (such as calcium fluoride sludge, reduced slag, fly ash, etc.) to replace natural limestone and clay as cement raw materials, balancing resource reuse and reduction in natural raw material extraction.

Alternative Fuel

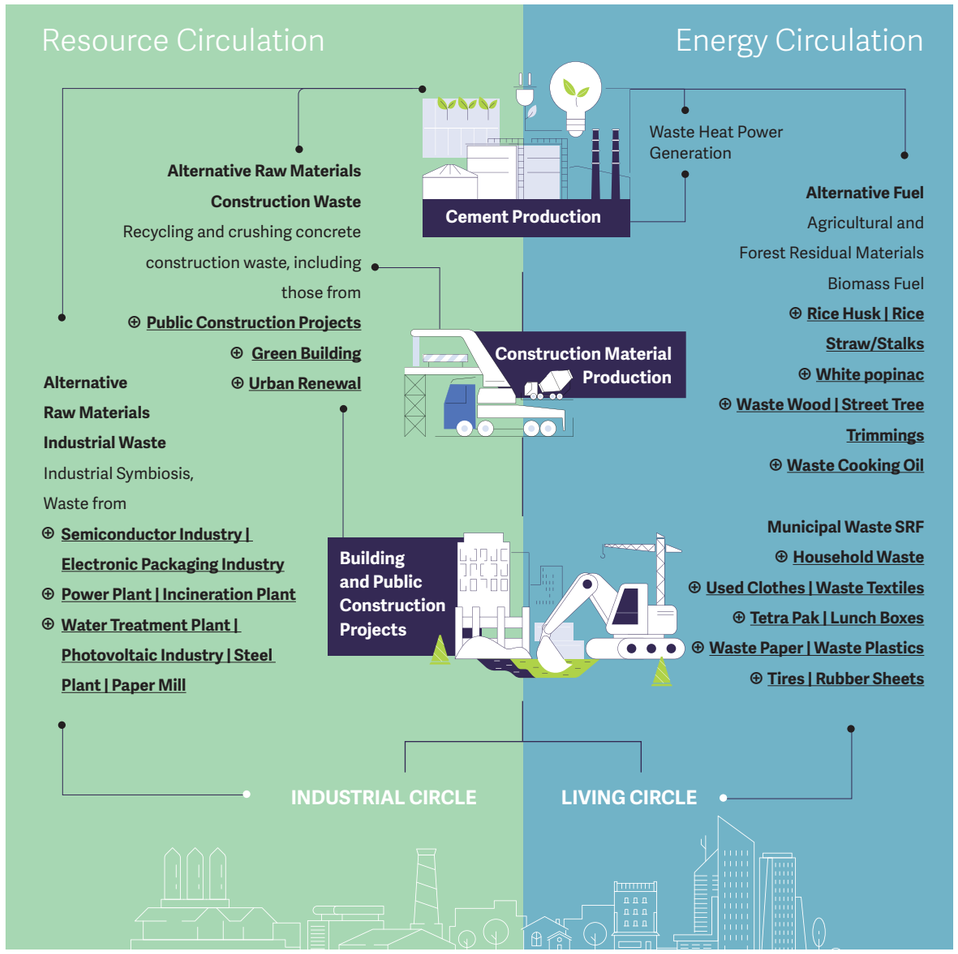
Promoting the use of Alternative Fuels (AF) is one of the most crucial carbon reduction measures in the cement manufacturing process. TCC actively introduces high-calorific alternatives such as Solid Recovered Fuel (SRF), waste wood, waste plastics, and waste rubber to gradually replace traditional fossil fuels like coal. This initiative reduces greenhouse gas emissions and decreases waste incineration and landfill volumes, producing advantageous results.

Alternative Clinker

Following the carbon reduction recommendations from the International Energy Agency (IEA) and World Business Council for Sustainable Development (WBCSD) on reducing the Clinker-to-Cement Ratio, TCC incorporates more limestone, volcanic ash, and kaolinite as clinker alternatives within regulatory limits and market acceptance. These production for these blended cements produce less carbon dioxide due to their reduced clinker content. For example, in Ivory Coast and Cameroon, TCC uses calcined clay as a clinker substitute, which, when blended, reduces clinker usage and produces low-carbon cement products.

By leveraging its R&D capabilities and process advantages to collaborate with local industries, TCC has developed a flexible and expandable co-processing platform capable of handling various waste types, including waste solvents, waste liquids, household waste, sludge, and old clothing. This approach simultaneously addresses waste reduction, carbon reduction, and pollution control, while improving overall resource circulation efficiency.

Process Flow Diagram



3.4.2_Leading the Industry in Low-carbon Construction Materials

Climate Risks Addressed

- R2 Strength of Support from Insurance and Financial Institutions for Investment and Financing
- R4 Reputational Damage Due to Insufficient Low-carbon Transition

Climate Opportunities Addressed

- O3 Market Expansion of Low-carbon Products and Services

Low-Carbon Products

In April 2025, the Global Cement and Concrete Association (GCCA) released the world's first Low Carbon Rating (LCR) standard for cement and concrete, providing a consistent carbon intensity benchmark for the global construction materials industry. TCC's Portland Limestone Type IL Cement and concrete products launched in Taiwan make it the only company in Taiwan's construction materials industry to meet both GCCA's cement and concrete low carbon rating standards. Beyond Taiwan, TCC's low-carbon products manufactured in Mainland China, Türkiye, Portugal, and West Africa have also undergone the Company's carbon footprint assessment and fully comply with GCCA's newly issued rating standards. However, compared to the EU's progressive regulations, where the clinker ratio can be reduced to 20% and alternative materials can reach up to 80%, Taiwan's current cement regulations, which have remained unchanged for nearly fifty years, still impose higher limits on clinker content. In view of this, TCC continues to engage with government departments, recommending that domestic regulations align more closely with the EU framework by relaxing regulations that hinder cement decarbonization, while encouraging and supporting the development and application of alternative raw materials, fuels, and carbon reduction technologies domestically. By prioritizing the use of low-carbon construction materials in public works and other large procurement projects, the substantial procurement volume can drive market demand and promote carbon reduction within the construction industry, ultimately accelerating the green transformation of the domestic cement industry.

Low-carbon Product Sales, Management Indicators, and Targets

TCC

Enhance decarbonization efforts and increase the production and sales of low-carbon cement and concrete

CIMPOR

Sales proportion in the Portuguese market will increase to +90% with export share reaching 30%

TCC will reduce the clinker ratio in cement production to below 65% by 2030

OYAK ÇİMENTO

The proportion of high-carbon CEM-I in gray cement sales decreased from 23.4% to 12.2%

The clinker ratio in cement production will decrease to 73%

According to the 2050 Global Building Net Zero Pathway published by the United Nations, embodied carbon in construction materials used in new construction must be reduced by more than 40% by 2030 compared to the 2020 baseline, as a crucial step in achieving net-zero emissions in the building sector. The United Nations' Emissions Gap Report 2024 also indicates that the global adoption of limestone and other materials as clinker alternatives to produce low-carbon cement could reduce global carbon emissions by 400 million tonnes CO_2e by 2035. The report underscores that these technologies are feasible and highly effective key decarbonization solutions.

TCC Branded Cement Performance

		carbon reduction
Portland Type I	Can be used for general construction and engineering	**10.3%**
Portland Limestone Type IL Cement	Higher early strength, can be used for general construction and engineering The carbon footprint is 754.82 $kgCO_2e$ per metric ton of cement	**23.8%**
Portland Type II (MH)	Low heat of hydration	**6.2%**
	Resistant to sulfates, suitable for bridge piers and large dams	

Key Performance for Cement Plants in Mainland China

Most PII, PO, and PC type cement produced in Mainland China plants have obtained **low-carbon product certification**

Sales revenue in 2024 was NT$15,289,834 thousand, **accounting for** 84% **of total sales revenue in the Chinese market**

Shipment volume in 2024 was 15,742,205 tonnes, **accounting for** 83% **of total shipment volume in the Chinese market**

TCC Low-Carbon Concrete Features

- Consistent slump and excellent workability
- Higher early strength
- Strong workability and better carbon reduction
- Excellent durability
- Used for general construction and engineering

Ultra-High Performance Concrete

Ultra-High Performance Concrete (UHPC) is an advanced new construction material developed over recent decades. It features a discontinuous pore structure that effectively blocks the penetration of harmful substances such as chlorides, exhibiting superior mechanical strength and durability that comprehensively surpass that of traditional concrete. UHPC has a lifecycle of over 100 years. Compared to traditional concrete, it can significantly reduce material consumption, decrease component thickness, and reduce the quantity and weight of construction materials, further reducing overall carbon emissions. For example, UHPC can reduce the thickness of exterior walls by 75% and lower carbon emissions by 60% compared to traditional concrete. TCC's UHPC R&D team has overcome the limitations of traditional precast methods, successfully developing formulations for cast-in-place construction. 3D printing technology has been further integrated to broaden applications in architecture and infrastructure, delivering an innovative and sustainable material transformation solution.

- TCC DAKA RRRC Curtain Wall
- UHPC EnergyArk
- Waterproofing Improvement Project for Radio Room Roof at Zhongli Maintenance Section of the Freeway Bureau, MOTC

Internal Carbon Pricing

In response to the implementation of the EU's Carbon Border Adjustment Mechanism (CBAM) and Taiwan's upcoming carbon fee system, TCC has proactively established an internal carbon pricing system, incorporating carbon costs into operational and investment evaluations as a key economic incentive tool for driving low-carbon transformation. Through this system, TCC can systematically analyze the potential impacts of carbon emissions on operating costs, capital expenditure, and financial risks, while strengthening climate risk awareness when making investment decisions and planning operations across facilities. In 2024, TCC further launched an internal carbon trading simulation platform to calculate emission allowances and reduction results for each operational unit. Through this trading simulation mechanism, the Company reinforces carbon reduction accountability and promote resource collaboration across departments, encourages technological innovation and low-carbon investments, and gradually establishes an internal carbon governance mechanism.

Starting from 2025, TCC's cement business will set its internal carbon pricing to NT$500 per ton, with plans for annual increases to reach NT$1,800 per ton by 2030. For Mainland China operations, the price will be adjusted to RMB 105 per ton, with plans for annual increases to reach RMB 302 per ton. For international operational sites, Portugal and Türkiye have set a benchmark of 150 euros per ton of carbon dioxide by 2030, based on carbon price forecasts from the European Cement Association (CEMBUREAU), International Energy Agency (IEA), and Bloomberg New Energy Finance (BNEF). This benchmark serves as a basis for internal investment sensitivity analysis, enabling early assessment of long-term impact of global carbon costs on capital expenditures and operational strategies. TCC utilizes comprehensive carbon pricing and trading system simulations, aiming to build an economically driven low-carbon transformation framework, enhance carbon risk management effectiveness, and capture transition opportunities while strengthening operational resilience amid climate change.

3.4.3_ Low-Carbon and Negative Carbon Technology Innovation

High-Calorific Solid Recovered Fuel (SRF) Co-firing and Clean Integration System for Cement Kilns

Regarding fuel substitution, significant differences in calorific value, moisture content, and composition among different alternative fuels require extensive testing to verify their stability and suitability. In 2023, TCC collaborated with the Industrial Technology Research Institute to establish a High-Calorific Solid Recovered Fuel (SRF) Co-firing and Clean Integration System for Cement Kilns to improve the efficiency of alternative fuels. System performance verification is ongoing. SRF and wood chip co-firing tests completed in March 2025, yielding an optimal mixing ratio to further increase the usable volume and stability of alternative fuels in cement kilns.

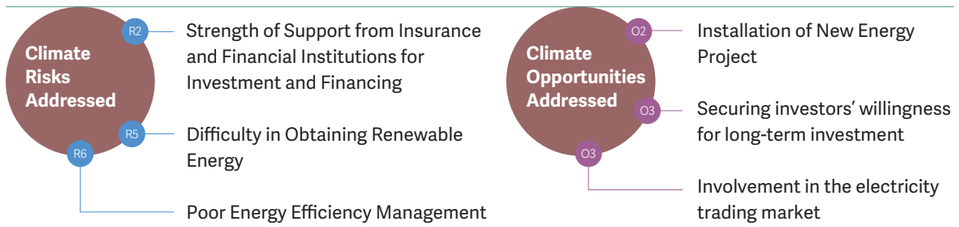
Negative Carbon Technology - Carbon Capture, Utilization and Storage (CCUS)

CIMPOR subsidiary collaborates with the European Cement Research Academy (ECRA) and the German Cement Industry Association (VDZ) to continuously promote CCUS technology development at its Alhandra and Souselas plants in Portugal. From 2019 to 2022, it also participated in the EU-funded Strategy CCUS project, actively promoting CCUS development plans and business models for operational sites in Southern and Eastern Europe. Due to shifts in the international landscape, uncertainty surrounding storage locations, and unclear supporting measures, implementation in Taiwan has been temporarily suspended. Priority is now given to oxygen-enriched combustion technology, which can reduce carbon emissions in the short term, while we continue to monitor the latest advances in storage technology.

Oxygen-Enriched Combustion

To enhance carbon reduction in the cement manufacturing process, TCC actively promotes the application and optimization of Oxygen-enriched Combustion technology. Oxygen-enriched combustion involves increasing the oxygen content in combustion air (usually above the natural level of 21%) to raise flame temperature and thermal efficiency while reducing fuel consumption and carbon emission intensity. This technology reduces unburned carbon content in the kiln, improves combustion stability, and shortens reaction time, enhancing overall process efficiency. Since 2023, TCC has introduced oxygen-enriched combustion trials at the Suao Plant to verify the optimal oxygen concentration, energy-saving, and carbon reduction effectiveness under different fuel combination conditions. Preliminary results indicate that oxygen-enriched combustion can effectively increase clinker production capacity and reduce energy consumption and carbon emissions per unit of clinker.

3.4.4_ Smart New Energy Business



TCC does not rely on purchasing renewable energy certificates as its main carbon reduction strategy but instead adopts a parallel approach of "self-generation and consumption" and "external green power procurement." TCC's global operational sites, including headquarters, cement plants, RMC plants, and subsidiaries, are actively installing solar power generation systems on plant rooftops and idle spaces. This initiative promotes self-built, self-generated, and self-consumed renewable energy, advancing energy independence and the use of green electricity. Meanwhile, TCC actively participates in the green electricity market, strategically increasing its annual proportion of green electricity usage through green power procurement. In 2024, Taiwan's cement business locations self-generated and self-consumed a total of 5,741,522 kWh renewable energy. The Hoping Plant and Suao Plant, as mandatory renewable energy users, achieved their large electricity user obligation targets ahead of schedule in 2023.

Operational sites in Mainland China have generated and consumed 20,520,259 kWh electricity through their self-built solar power systems. Additionally, TCC promotes the installation of energy storage systems to regulate peak and off-peak power loads, participate in Taiwan Power Company's electricity trading market, and enhance energy dispatch flexibility. During natural disasters or sudden power outages, energy storage equipment can discharge immediately to ensure stable, uninterrupted production. Cement plants in Mainland China and CIMPOR sites in Portugal have taken the lead in implementing the integrated "solar power + energy storage" strategy to reduce electricity costs and enhance operational resilience. Among them, Yingde Plant and Guigang Plant have installed a combined energy storage capacity of 140.8MWh, achieving annual electricity savings of 100 million dollars, demonstrating the effectiveness of energy transition.

Green Power Procurement Targets Starting from 2025

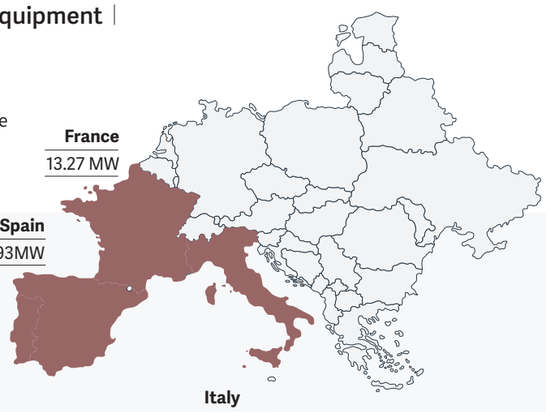
Taiwan: Additional
100,000kWh
annually

Mainland China: Additional
10millionkWh
annually

Establishment of Energy Storage Equipment

Global Sites Energy Storage Capacity

Collaboration with European subsidiary Atlante
Expected to go online between 2025 and 2026
Enter the European power trading market

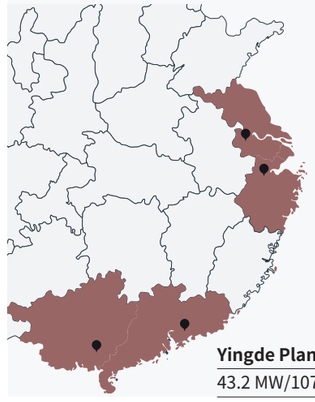


France
13.27 MW

Spain
4.93MW

Cimpor Alhandra and Souselas Cement Plants
2MWh
expected to be online in 2025

Italy
6.44 MW



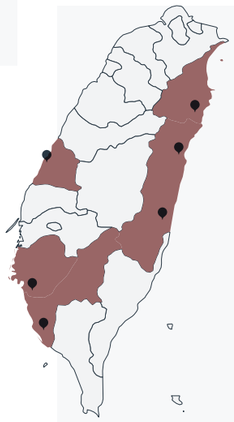
Jurong Plant, Jiangsu
8.3MW/16.6MWh
to launch in 2025

NHOA.TCC Jurong UHPC Plant 836kW/1672kW
to launch in 2025

Hangzhou Operational Headquarters
3.6MW/7MWh to launch in 2025
The first case in Mainland China
to install EnergyArk energy storage system
to supply power for
charging piles and buildings

Yingde Plant, Guangdong
43.2 MW/107.3MWh

Guigang Plant, Guangxi
5.6 MW/33.546MWh



Suao Plant (Yilan)
35 MW/123.6MWh
11MW/13MWh
to launch in 2025
serves as backup power
with black start capability

Hoping Plant (Hualien)
2.2 MW/2.3MWh
10 MW/32.8MWh
13MW/28MWh
launch in 2025
serves as backup power
with black start capability
100 MW/311.4MWh
The largest E-dReg site
in Taiwan

Changbin AFC Phase
5 MW/5.2MWh
Changbin AFC Phase II
4.9 MW/6.8MWh

MOLICEL
Xiaogang Plant Phase I 5 MW/6.2MWh
Xiaogang Plant Phase II 4 MW/5.3MWh
STSP Plant 1.2 1.2 MW/1.7MWh

Hualien Plant 50
50 MW/160.042MWh

Note: MW refers to power, MWh refers to electrical energy

Cumulative Installed Capacity of Large Energy Storage Projects:
Taiwan & Mainland China covered

2021	2022	2023	2024	2025
Operational	Operational	Operational	Operational	Installed (operational included)
5.2MWh	8.8MWh	507.2MWh	796.6MWh	955.3MWh

Energy storage technology is one of the key pillars in the advancement of energy transition. According to the International Energy Agency (IEA), at least 1,500 GW of energy storage capacity must be added globally by 2030 to effectively manage green power fluctuations and ensure a stable power supply. Recent major power outages in Spain and Portugal have further highlighted the critical importance of energy storage systems in modern power infrastructure. TCC proactively established NHOA.TCC in 2020 and acquired Engie EPS, an European energy storage leader, in 2021. Following the merger, the company was renamed to NHΩA and has been actively integrating global energy storage technologies. NHΩA positions itself as a Virtual Power Plant (VPP) operator at its core, focusing on city-level small-scale energy storage applications, promoting distributed power system construction, supporting energy infrastructure modernization across multiple countries, and significantly accelerating the global energy transition.

Key Performance

As of May 2025
Global energy storage site installation capacity
(including under construction)
3,463.63MWh

NHOA.TCC
energy storage capacity reaches
1,030.63MWh

NHOA Energy
installation capacity reaches
2,433MWh

Objective | Global energy storage installation capacity of 2.5GWh in 2025

Energy Helper TCC Corporation

Energy Helper TCC Corporation focuses on delivering one-stop integrated energy services to major electricity consumers. Its offerings include green power supply and energy storage dispatch, providing a convenient energy trading experience akin to that of convenience stores. The platform enables power generators to easily list green energy resources and uses AI algorithms to optimize green energy matching, planning low-surplus, low-cost green energy arrangements for corporate users. It also activates idle power resources and acts as an agent in Taiwan Power Company's electricity trading market, helping stabilize electricity costs and generate additional revenue. To enhance green energy procurement efficiency, Energy Helper TCC Corporation has developed the Online Green Energy Consultant platform to match diverse green energy sources with the aim to introduce integrated Green Energy + Carbon Management services. Through medium and long-term PPAs (Power Purchase Agreements), it helps enterprises lock in green electricity prices and effectively control energy expenditure and future carbon cost risks.

The platform integrates green energy and energy storage resources from TCC's subsidiaries and clients, building an aggregated energy trading platform that encompasses all current power trading programs of Taiwan Power Company. Leveraging AI algorithms and a cloud-based Energy Management System (EMS), we analyze market price trends through big data to optimize bidding strategies. In addition, we dynamically adjust power allocation of energy storage systems to ensure stable power supply and economic benefits. As of December 2024, Energy Helper TCC Corporation's registered resource capacity has reached 226.1 MW, with E-dReg participation capacity reaching 170 MW, capturing a 39.4% market share and firmly maintaining its position as the market leader. The Company will continue aligning with policy directions, assisting enterprises in integrating diverse energy resources, such as demand response, power generation units, and energy storage systems, jointly promoting smart power and low-carbon transformation.

Super Battery Installation

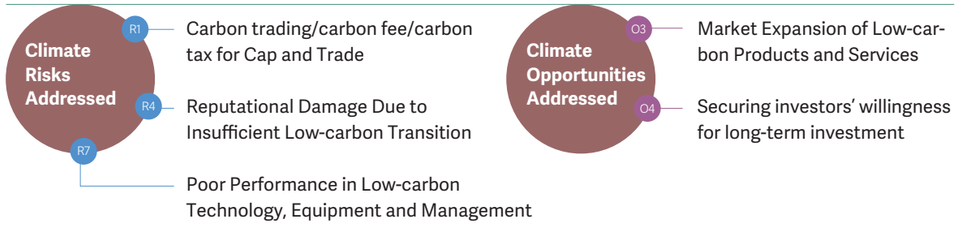
Molicel is continuously expanding its high-performance lithium battery application, successfully supporting multiple innovative projects characterized by high power output, lightweight design, and automotive safety certifications. The Spéirling PURE high-performance electric vehicle, developed in collaboration with McMurtry Automotive, has repeatedly set international track speed records, fully demonstrating Molicel's leading advantages in battery energy density and instantaneous output. Meanwhile, the VARG electric off-road motorcycle, developed with Molicel's assistance by Stark Future, defeated traditional gasoline motorcycles in the British Indoor Championship, garnering significant market attention. With pre-orders exceeding 18,500 units, this achievement demonstrates that electric off-road vehicles have reached breakthrough milestones in both performance and consumer acceptance. Molicel also offers specialized battery solutions for European drone manufacturer FlyingBasket, helping their heavy-duty cargo drones achieve a 9% increase in flight range and an effective payload of 100 kilograms, thereby expanding practical applications in offshore operations and last-mile logistics.

In the electric aviation sector, Molicel's specialized lithium battery products are currently the only commercialized solution simultaneously offering high-rate charging and discharging capabilities that meet aviation regulatory safety certifications. Their long cycle life effectively improves operational efficiency and boosts aviation electronics revenue. Molicel collaborates with multiple international electric aviation startups, among which Archer Aviation obtained FAA airworthiness certification in 2024 and become the exclusive air taxi supplier for the 2028 Los Angeles Olympics. Vertical Aerospace received the Shaping the Future Award by the British Aviation Technology Institute, reflecting rapid international market validation and adoption of their technical market solutions.

Ocean Thermal Energy Conversion

Marine energy is stable resource that is capable of operating year-round, around the clock, offering a more reliable power source compared to intermittent renewable energies. It holds the potential to become a key technological breakthrough in energy transition. TCC has designated the three-in-one production park at Hoping Industrial Port Power Plant in Hualien as its marine energy development base. Located just 1.8 kilometers offshore, the area reaches a depth of 600 meters and is therefore geographically suited to deep seawater power generation. TCC is actively investing in Ocean Thermal Energy Conversion (OTEC) technology, aiming to generate power by utilizing temperature differences between the existing cooling water from the power plant and deep seawater through turbine-driven heat exchange. The first phase plans to establish demonstration units with an installed capacity of 1 to 2MW, estimated to provide a stable daily power supply of approximately 24,000 kWh, sufficient to meet the daily electricity needs of about 2,000 households. The project completed its underwater cultural heritage review in 2024, and the Environmental Impact Assessment (EIA) for terrestrial and marine ecosystems has been submitted to the Ministry of Environment for review. Phase 1 aims to achieve grid-connected operation of the first megawatt-class Ocean Thermal Energy Conversion (OTEC) facility by 2029, with Phase 2 targeting full commercial operation by the end of 2034. This project is poised to become a milestone as Taiwan's first commercial application of marine energy, opening new prospects for developing a diverse and stable green energy portfolio.

3.4.5_ Low-carbon Supply Chain



Green Transportation

According to the latest statistics from the Ministry of Environment, the transportation sector is Taiwan's second-largest source of carbon emissions, with road transportation accounting for the highest proportion. To reduce greenhouse gas emissions and air pollution from transportation, TCC is actively promoting green transportation and enhancing the environmental performance of its own logistics system. Utilizing its subsidiary Taiwan Transport & Storage's operational resources, TCC officially introduced electric tractor units for cement product transportation in April 2024, which is estimated to reduce per-trip transportation carbon emissions by approximately 32%. The RMC plants operated by TCC and Feng Sheng Industrial are simultaneously upgrading their fleets, gradually replacing diesel mixer trucks with more fuel-efficient and lower-emission Euro V and Euro VI environmental protection vehicles.

As of 2024, the proportion of environmentally friendly vehicles has reached 92% for TCC and 57% for Feng Sheng Industrial, respectively. Additionally, TCC continues to expand its green logistics fleet, which currently includes 2 electric tractor units, 2 electric heavy-duty trucks, and 1 self-developed, patented electric compressor truck. In 2025, TCC plans to add 10 more electric tractor units and 4 electric heavy-duty trucks to its fleet, further strengthening its low-carbon transportation capabilities and moving towards a comprehensive green supply chain deployment.

Guigang Terminal to Fully Adopt Electric Tractor Units by 2025

TCC's Guigang Terminal has introduced a Priority Dispatch Rights mechanism, encouraging suppliers to invest in fleet electrification transformation and actively building a low-carbon logistics ecosystem. Along the main transportation route spanning 38 kilometers from the plant to the terminal, 60 electric tractor units have been deployed for cement and product transportation, reducing overall transportation costs by 15% and achieving an 87% annual carbon reduction per vehicle. This initiative not only strengthens the resilience of green transportation in the plant area but also serves as a concrete example for regional supply chains advancing towards net-zero transformation.

Key Performance Achievements

Over >2,300 **tonnes of carbon reduction for cement vessels** compared to traditional vessel types

Installation of Propeller Boss Cap Fins (PBCF) and optimized hull design, combined with optimized route planning achieve fuel savings of over +2%

2 bulk carriers retrofitted with high-power LED lighting facilities, **saving over** >208,000 kilowatt-hours of electricity

Regular dry-dock maintenance for 6 vessels, with hulls fully coated using 11,304 liters of the latest energy-saving and environmentally friendly paint that complies with the International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS). This paint contains no harmful substances like organic tin, effectively prevents marine organism adhesion, reduces navigation resistance and achieves 3% fuel savings

Supplier Carbon Management

TCC follows two core strategies for supply chain management: Sustainable Supplier Management and Localization and Greening of Procurement, with the Board of Directors serving as the highest decision-making body. The Supply Chain Management Department is responsible for integrating the execution results of the parent company and its subsidiaries, while the Chief Sustainability Officer regularly reports and discusses these outcomes in operational meetings chaired by the Chairman. The highest-ranking officer of the Supply Chain Management Department regularly reports to the Board of Directors on overall management progress and results, ensuring sustained high-level attention and engagement in sustainable supply chain issues within corporate governance. Currently, the sustainable supply chain management mechanism primarily covers self-owned factories in the cement business in Taiwan and Mainland China, Hong Kong shipping terminals, and major mining subsidiaries. It adopts a project manag＝ement approach, with the Supply Chain Management Department periodically submitting relevant plans to the Sustainability Development Committee for review. This process ensures that all procurement operations and management mechanisms align with the Company's sustainability goals and risk control principles. Starting in 2025, TCC plans to gradually expand its sustainable supply chain management mechanism to key subsidiaries, including Universal Cement, E.G.C. Cement Corp., Ho-Ping Power Company. The Company will also evaluate extending this framework to European operations, including joint venture partner OYAK CEMENT Group and Portuguese subsidiary CIMPOR's supply chains. Through this expansion, the Group aims to comprehensively strengthen sustainable governance and risk identification capabilities across its global suppliers.

Environmental and Climate Action Commitment

TCC encourages suppliers to actively support sustainable transformation, particularly in carbon management, and aims for them to adopt Science Based Targets (SBT) to collaboratively advance toward a low-carbon economy. At the same time, we also expect our partners to proactively provide carbon footprint-related data, enhancing transparency and management efficiency across the overall supply chain. Partner vendors who do not align with TCC's sustainability principles or fail to provide necessary carbon information and reduction measures may jeopardize their partnership opportunities within the supply chain. In response to global carbon reduction trends, TCC will continue to optimize its supply chain structure and collaborate with partners who share the same vision to promote sustainable development.

3.4.6_Climate Adaptation

Climate Risks Addressed
- R9 Frequency and Intensity of Extreme Precipitation Events
- R10 Lack of Water Resources

TCC's cement and concrete operations are increasingly exposed to extreme weather driven by climate change, posing unprecedented challenges to operational continuity and cost control. Extreme rainfall and typhoons may cause damage to production equipment, road disruptions, and logistics system paralysis, leading to delays in raw material deliveries and finished product shipments. This subsequently affects customer delivery schedules and revenue performance. Additionally, heavy rainfall may affect raw material quality stability, adversely impacting process proportions and product strength.

In addition to flood risks, operational sites must also address challenges brought by drought. Cement and concrete production heavily relies on industrial and cooling water resources. Prolonged periods of below-average rainfall and tight water resource allocation can lead to restricted water access, increased water costs, or production interruptions. These risks are particularly significant in regions facing intense competition for water, such as areas with high agricultural irrigation and domestic water pressure. Drought also limits the stability of recycled water and wastewater reuse systems, increasing corporate dependence on external water resources and further amplifying operational uncertainties. To mitigate the aforementioned physical climate risks, TCC has initiated multiple adaptation actions, including strengthening raw material supply chain resilience, establishing emergency shipment dispatch routes, implementing smart water monitoring systems, and increasing water storage and recycling rates in plant areas. These measures help enhance factory operational flexibility and business continuity under extreme weather conditions, ensuring stable delivery and corporate sustainable competitiveness.

Business Continuity Plan (BCP)

To strengthen emergency response and enable quick recovery, TCC has set up a Business Continuity Management Plan with clear goals and procedures for risk prevention and response. This protects staff, maintains customer service, and reduces disruption impacts. In 2024, For its core business of cement manufacturing and sales, TCC established the Business Operations Continuity Management Guidelines in 2024, adopted the ISO 22301 framework for cement operations, establishing clear responsibilities, objectives, and regular drills to improve resilience. TCC also plans to obtain ISO 22301 certification in the future.

In the event of a disaster, TCC's Chairman serves as the Chief Commander and appoints senior executives as Deputy Commanders to swiftly form a Command Team composed of first-level managers to activate the response plan. Based on the degree of operational impact, the team determines the Maximum Tolerable Period of Disruption (MTPD), Recovery Point Objective (RPO), and Recovery Time Objective (RTO). Meanwhile, an Operations Team composed of managers from various plants and business units is responsible for executing tasks such as damage assessment, on-site response, activation of disaster prevention measures, equipment recovery, and coordination with external service units. Each plant and enterprise must establish their own business continuity plans in line with the guidelines, assess their equipment risks and post-disaster recovery capabilities, propose enhancement measures and specific disaster response solutions to ensure production and operational stability during unexpected events.

Mitigation and Adaption Measures

Physical Risks **Flood**	**Risk Description**
	Equipment damage leading to production process delays and interruptions
	Response Measures
	⊙ **RMC Plants establish climate disaster emergency response guidelines:** For extreme weather events such as typhoons and heavy rains, the RMC Plants should clearly define pre-disaster prevention, during-disaster response, and post-disaster recovery mechanisms to ensure personnel safety and uninterrupted operations. ⊙ **Cement plants establish typhoon and flood prevention contingency plans:** Drawing on historical disaster experiences and regional climate risks, they develop tiered response operation procedures to enhance real-time response capabilities during emergencies. ⊙ **Comprehensively strengthen flood prevention system facilities in plant areas:** Including raising drainage ditches, installing flood gates and temporary water containment facilities to reduce the risk of plant flooding and equipment damage. ⊙ **Complete safety inventory checking and dispatch arrangement of raw materials and finished products before flood season:** Ensure minimum operational requirements and stable customer delivery are maintained during disasters. ⊙ **Arrange natural disaster insurance coverage for high-risk and critical equipment:** Incorporate natural disasters into the risk transfer mechanism to reduce the financial impact of potential asset losses on operations.
Physical Risks **Drought**	**Risk Description**
	Production delay and disruption due to water shortage in production
	Response Measures
	⊙ **Continuously optimize process water efficiency:** Through technical upgrades and process adjustments, gradually reduce the water withdrawal intensity required per unit of cement product to decrease dependence on natural water resources. ⊙ **For plants located in medium- to high-water-risk areas, establish water storage and regulation facilities:** Enhance operational resilience and water supply stability during drought or water restriction periods. ⊙ **Fully implement ISO 14046 Water Footprint standard and ISO 46001 Water Efficiency Management System:** Strengthen water resource use performance evaluation, target setting and continuous improvement mechanisms to align with international best practices in water resource management. ⊙ **Install rainwater harvesting and process water recycling/purification equipment at each RMC plant:** Increase recycled water usage, reduce freshwater withdrawal, and minimize the environmental impact of wastewater discharge. ⊙ **Develop a digital water footprint management platform:** Collect and monitor water usage at each operational site in real-time, improve water use transparency and decision-making efficiency to support resource allocation and water risk management.