



Overview

Letter to Our Stakeholders

About TCC Group Holdings

Our 2025

Shaping the Future Civilization

Pillar I Financial Resilience

Pillar II Global Operations

Pillar III Climate Technology

Pillar IV R&D Integration

Pillar V ESG Advantages

Pillar VI Talent & Culture

Just Transition Plan

Special Feature – TCC 80th Anniversary

Risk Governance Enhancing

Operational Resilience

Stakeholder and Material

Topic Analysis

Sustainability Goals and Tracking

2025 Honors and Recognition

More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix

Shaping the Future Civilization

Cement Renaissance: From Commodity to Core Substance

An Engineered Portfolio of Capabilities:
TCC Fundamental Construction Materials and New Energy

“The world is changing the rules. Not only is the speed of change accelerating—the structure of the world itself is being rewritten. As we move toward 2050 Net-Zero, and toward a future of carbon borders, the market will no longer reward what is merely heavy and cheap. It will reward what is necessary, verifiable, circular, intelligent, and low-carbon.”

— Chairman Nelson An-ping Chang



Cement has evolved into the core substance supporting AI computing power, energy transition, and future urban resilience. This Cement Renaissance—driven by the integrated innovation of low-carbon construction materials, circular resources, energy storage systems, and smart energy.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025

Shaping the Future Civilization

Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix

TCC Sustainable Growth Engine

The Future is Worth It

Total Climate Commitment

Total Care Commitment

Shaping the Future Civilization

MATERIAL INNOVATION

ENERGY TRANSITION

1
GOAL

2
STRATEGIES

6
PILLARS



FINANCIAL
RESILIENCE



GLOBAL
OPERATIONS



CLIMATE
TECHNOLOGY



R&D
INTEGRATION



ESG
ADVANTAGES



TALENT
& CULTURE



+



Hope × (Action + Empathy)ⁿ



FUTURE MOMENTUM



Overview

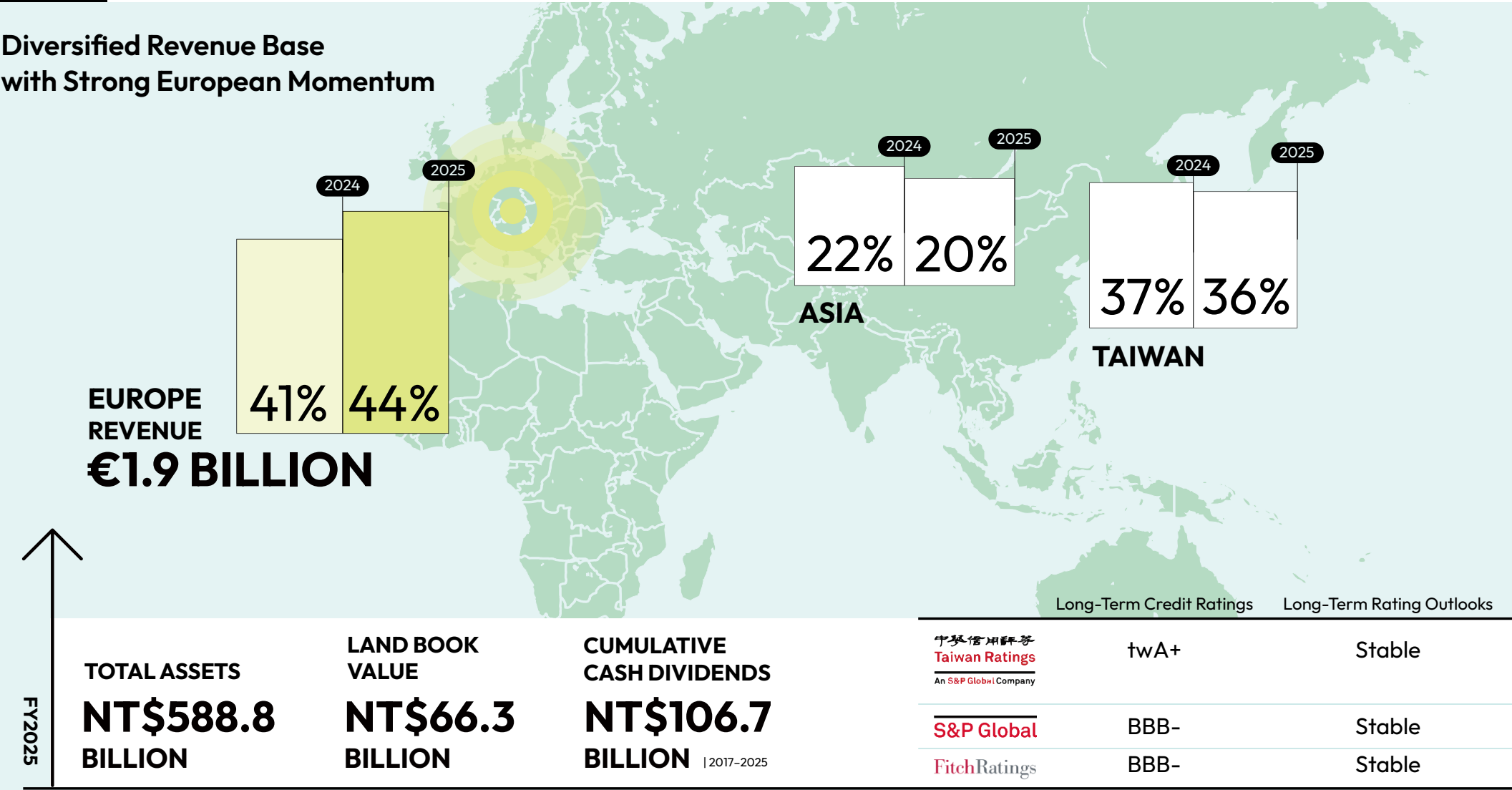
- Letter to Our Stakeholders
- About TCC Group Holdings
- Our 2025
- Shaping the Future Civilization
- Pillar I Financial Resilience**
- Pillar II Global Operations
- Pillar III Climate Technology
- Pillar IV R&D Integration
- Pillar V ESG Advantages
- Pillar VI Talent & Culture
- Just Transition Plan
- Special Feature – TCC 80th Anniversary
- Risk Governance Enhancing
- Operational Resilience
- Stakeholder and Material
- Topic Analysis
- Sustainability Goals and Tracking
- 2025 Honors and Recognition
- More About the Report

- Governance
- Carbon Reduction
- Energy Transition
- Employee
- Nature
- Social Inclusion
- Appendix



Pillar I – Financial Resilience

Diversified Revenue Base
with Strong European Momentum





Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix

Four Business Platforms Established

TCC's operational strategy aligns with Europe's four core long-term platforms. Delivering €1.9B in FY2025 revenue, this dual-engine framework connects low-carbon cement with new energy technologies. Production capacity and decarbonization are anchored by OYAK Cement (Türkiye) and CIMPOR (Portugal/Africa), while infrastructure growth is driven by NHOA Energy's battery storage and Atlante's charging-storage solutions.

Low-Carbon Building Materials Growth

Fueled by expanding infrastructure demands and building renovation initiatives, European construction output is projected to grow by 3%–5%, outperforming broader regional GDP growth by over 2x.

Robust Demand Capture & Logistics Excellence

Top-tier brand positioning: CIMPOR and OYAK Cement leverage Türkiye's strategic proximity to key post-conflict and earthquake reconstruction zones.

Logistics excellence: Strategic port & logistics infrastructure across UK & France unlock key EU corridors.



Accelerated Carbon Cost Internalization

Driven by an EU ETS market scale exceeding €600B in 2025, carbon prices are projected to rise from ~€75/ton today to €142/ton by 2030. This coincides with the gradual phase-out of free cement allowances starting in 2026, reaching zero by 2034.

Advanced Low-Carbon Technology & Early Carbon Credits

Strategic regulatory hedging: CIMPOR accumulates 2.4 million tons of early carbon credits.

Production flexibility & adaptability: Mastery of key decarbonization materials and processes including calcined clay and X-clinker.

High-quality product leadership: OYAK Cement supplies premium low-carbon white cement.

Advanced 3D printing: Applications shorten construction timelines and enhance structural strength.



E-Mobility & Electrification Policies

Anchored by targets of 30M electric vehicles and 3M charging points by 2030, Europe's green mobility transition remains at less than 30% of these goals as of late 2025.

Vertical Integration in Energy Products & Services

Prefabricated design: Enables 14-day rapid completion for solar-charging-storage stations.

Patented fireproof EnergyArk®: 331+ contracts across major commercial partners in France, Portugal, and Italy.

Global EV charging platform: Builds and operates EV charging platforms with 5,000+ points worldwide.

Utility-scale battery energy storage: NHOA Energy accumulates more than 5GWh online and under construction across 58 operational plants, driven by turnkey expertise in system design, engineering, and cross-regional delivery.

C&I battery energy services: Provides full-lifecycle O&M solutions for commercial and industrial BESS sites.

VPP operations: Manages VPP energy trading and aggregation services.

All-in-One Integration: Renewable Energy Generation + EV Charging + BESS + VPP Power Trading

For more information, please refer to [p.17](#).





Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix



Pillar II — Global Operations



Multi-Domestic Model Driving Market Leadership

Utilizing local expertise to scale operations across Europe, Türkiye, and Asia, validated by leading market shares and global strategic alliances.

Asia Market

#1 Cement Market Share
#1 Market Share in Cement Market **Taiwan 32.5%**

#6 Clinker Capacity
Leader of Clinker Capacity
#6 Top Producer in **Mainland China**

#1 Power Auxiliary Service

Top provider of power auxiliary service in **Taiwan**
Largest energy storage facility in **Mainland China's cement industry**
40.946 MWh energy storage capacity at **Yingde & Guigang Plants**

Europe, Africa & Türkiye Markets

#1 Cement Market Share
CIMPOR #1 **Portugal 52%**
OYAK Cement #1 **Türkiye 16%**

#1 EV Charging Alliance
Atlante Charging Service
Member of ChargeLeague (formerly Spark Alliance)
Europe's largest and most extensive EV charging network
GRESB SCORES
96/100
1st Peer Group Ranking (Sector Electric vehicle charging)

Tier1 Energy Storage Supplier

NHOA Energy
A vital global BESS Integrator
Supply chain mastery for client energy asset development



EPC Firm of the Year from Energy Storage Awards



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
→ **Pillar III Climate Technology**
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix



Pillar III — Climate Technology

Climate technology drives diversified revenue and core competitiveness. Spanning Asia, Europe, and Africa, TCC leverages vertical integration to combine material science with energy storage and charging networks, delivering innovative low-carbon products and integrated new energy services.



EnergyArk® energy storage system — exclusive patent

UHPC fire-resistant and extinguishing energy storage cabinet reduces carbon by 50% compared to metal cabinets



Energy-as-a-Service (EaaS) integrated charging services for mobile vehicles

Construction and operation of charge & storage integrated charging networks



Utility, commercial and industrial battery energy storage site energy services

Planning and construction of large-scale grid energy storage sites



Under development

X-Clinker
Next-Generation Clinker
Biochar
(see [CH 2.1](#))



Portland Limestone (IL) Cement

Replaces Portland cement, reducing carbon emissions by up to 24.6% (see [CH 2.1](#))



Ultra-High Performance Concrete (UHPC)

Reduces carbon emissions by 60% and has a lifecycle of up to 120 years (see [CH 2.1](#))



A-Fluire Mortar self-leveling concrete

Suitable for high-end facilities of semiconductor and AI computing centers



Permeable Concrete

Aggregates or construction and demolition waste recycled materials



deOHclay

Uses local raw materials and establishes low-energy production technologies to provide strong supply resilience



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
→ **Pillar III Climate Technology**
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix

Low-Carbon High-Value Products

A-Fluire Mortar

Targets Top-Tier Strength for Tech Plants to Define New Market Standards

Accelerated by semiconductor expansion and AI data center construction, tech clients require high-specification flooring to protect precision equipment. TCC launched **A-Fluire Mortar**, a flagship 10,000 psi self-leveling flooring that prevents cracking under heavy machinery. It matches top-tier material strength without relying on imports, balancing decarbonization targets with cost control.



10,000 psi Compressive Strength:

Equivalent to the steel structure of Taipei 101, its strength develops 3 to 4 times faster than competing products within 24 hours.

Ultra-Thin Application Thickness:

Only 3 to 5 mm is required to fully meet load-bearing requirements.

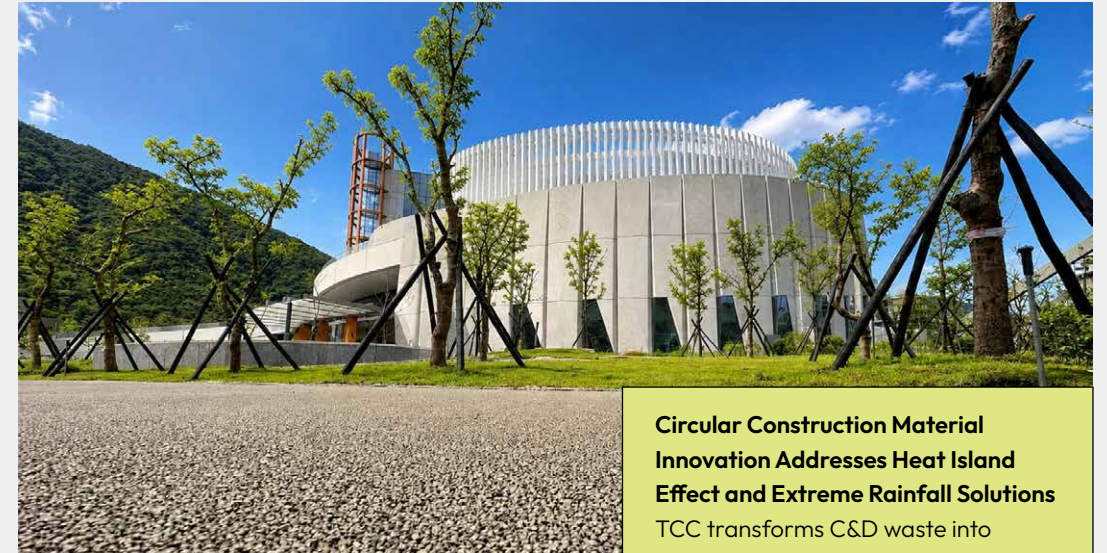
Excellent Load-Bearing Capacity:

Suitable for markets and applications requiring machinery with extremely high load-bearing capacity.

Permeable Concrete

Construction and Demolition (C&D) Waste Recycling to Build Urban Infrastructure Components

Global urban renewal turns building waste into resources. Ministry of Environment data shows Taiwan's C&D waste reached 2.3 million tons in 2024. TCC refines these materials into sustainable momentum. The Hualien Plant invested in a C&D waste treatment project in 2023 and obtained the permit in 2025, with a monthly treatment capacity of 12,000 tons. It uses the screened 20mm and 10mm crushed stones as concrete aggregates, and sends the fine powder to the cement plant as alternative raw materials. In addition, the Suao Plant plans to introduce related treatment equipment in the future (see CH [2.2](#)).



Permeable Concrete pavement at Hoping Cement Plant RRRC

TCC R&D Center Optimizes Mix Design, Achieving Drainage Capacity 5 Times That of Extreme Rainfall

Permeable concrete requires 15%–25% interconnected voids. To overcome rheological challenges, the paste mix must coat aggregates for strength while preventing drain-down from clogging voids.



Top Layer: Porosity 16%
Volume is 160 Liters

Middle Layer
Coarse Aggregate
Volume 592L, Density
1480 kg/m³

Bottom Layer
Cement Paste
Volume
is 247 Liters



Circular Construction Material Innovation Addresses Heat Island Effect and Extreme Rainfall Solutions

TCC transforms C&D waste into Recycled Concrete Aggregate (RCA) for permeable concrete pavement. This highly durable design enables rapid drainage to mitigate extreme rainfall and the urban heat island effect. TCC has signed cooperation agreements across Taiwan, implementing this at the RRRC, TCC Green Energy storage sites, and TCC's future headquarters, Tower Urban Oasis.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

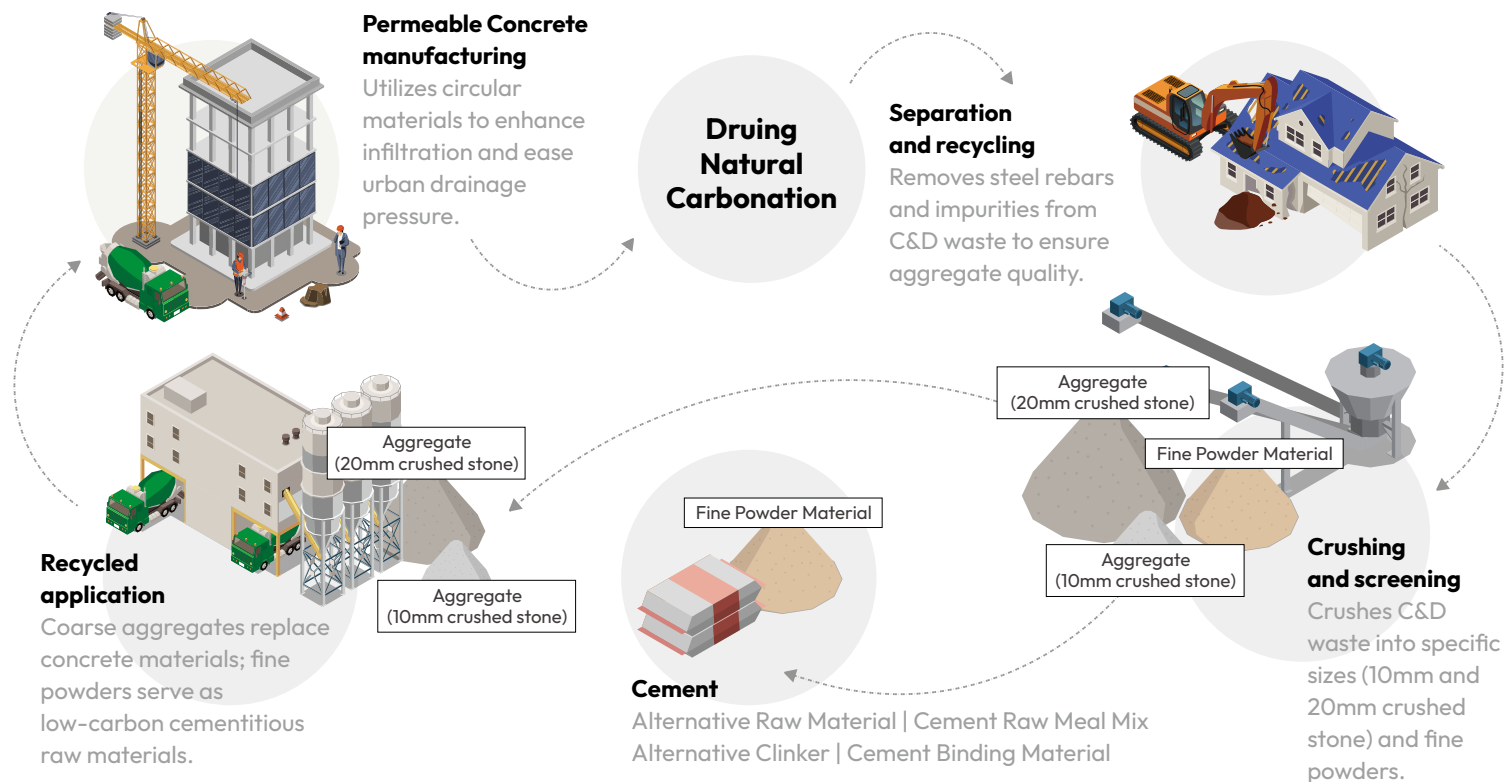
Employee

Nature

Social Inclusion

Appendix

C&D Waste Treatment Process



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CMP
GROUP

Sustainability Partner

TCC collaborates with PUJEN Construction to recycle urban renewal waste into new materials, targeting to jointly promote 5 sites to obtain sustainable building certifications.



OYAK Cement Builds a Circular Construction Material Value Chain to Accelerate Post-Disaster Reconstruction

In Türkiye, OYAK Cement is researching the use of recycled aggregates to accelerate post-disaster cleanup and reconstruction.

CIMPOR bets on construction and demolition materials to promote concrete recycling into its basic constituents.

CIMPOR is testing the extraction of recycled sand, aggregates, and fine cement paste powder from concrete waste. Sand and aggregates reduce natural resource extraction, while fine powder replaces clinker in traditional OPC and next-generation X-Clinker, cutting thermal energy and carbon emissions.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
→ **Pillar III Climate Technology**
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix

deOHclay

Low-Carbon Key Technology Enters Mass Production

The École Polytechnique Fédérale de Lausanne (EPFL) research shows Limestone Calcined Clay Cement (LC3) reduces CO₂ emissions by up to 40% with lower Capex and Opex than traditional pathways, making calcined clay vital for carbon reduction and profitability. TCC's subsidiary, CIMPOR, has mass-produced deOHclay calcined clay, with an annual installed capacity of 1.5 million tons supporting over 5 million tons of low-carbon composite cement. This process lowers production temperatures and replaces clinker incorporation, offering an annual carbon reduction potential of 1.2 million metric tons.



-31% Reduced Energy Consumption

Reduction in Process Electricity Consumption **-63%**

40% Replacement of Cement Clinker



2020

Abidjan, Ivory Coast

Africa's first 300k tpa calcined clay plant features a rotary kiln directly connected to a dryer and is equipped with CIMPOR's self-designed innovative cooling system, helping to reduce carbon emissions by 31% to traditional OPC cements. This kiln uses local cashew shells and cocoa waste as biomass fuel to replace coal.

2023

Kribi, Cameroon

The world's first 250k tpa kiln-free plant uses flash calciner technology, helping to reduce carbon emissions by 23% to traditional OPC cements.



CIMPOR CAMEROON FIRST CALCINED CLAY PRODUCT

July 2026

Tema, Ghana

The world's largest 450k tpa vertical flash calciner technology significantly enhances the supply capacity of alternative raw materials such as calcined clay.

Souselas, Portugal

Europe's first 500k tpa calcined clay production line built from the retrofit of an existing clinker rotary kilns. Once commissioned, it will gradually integrate into the existing product portfolio to progressively replace high-carbon cement.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix

New Energy Products and Services

EnergyArk® Energy Storage System

Material Advantages and Energy Innovative Integration

In response to fluctuating AI data center power demands, energy storage and grid dispatching are now core infrastructure. TCC vertically integrates energy storage, charging, and power trading by transforming cement material advantages into competitive storage cabinets. Combining fire prevention technology with new

energy products, the system holds or has under review 57 patents across 14 markets, holds IEC 62443-3-3 info-security certification, and features black start and islanding capabilities. It maintains power during outages and supports virtual power plant (VPP) architecture via real-time load adjustment (see [CH 3.1](#)).

Flagship Product EnergyArk®418 Energy Storage System

TCC independently developed the EnergyArk®418 Energy Storage System, a plug-and-play solution integrating batteries, modules, and PCS within an UHPC cabinet.

This modular design lowers deployment barriers, making it ideal for power dispatch and peak shaving in charging stations,



commercial offices, and industrial sites, providing a safe, efficient infrastructure solution for distributed energy transition.



UHPC Precast Solar Carport

- **Reduced On-Site Engineering Costs:** Factory-manufactured precast concrete foundations significantly reduce on-site engineering requirements and site operation impacts.
- **Minimized Deployment Time:** Reduces excavation area and construction items, minimizing overall deployment time.

Energy Storage System (EnergyArk®)

- **All-in-One Integrated Design:** EnergyArk®418 is a plug-and-play energy storage system.
- **Ultimate Safety:** Adopts multi-level fireproof and explosion-proof designs, including gas suppression and immersion technology.
- **Century-Lifespan Cabinet Design:** Uses UHPC to build durable energy storage cabinets.

EV Charging Infrastructure

- **Fast Charging Configuration:** Paired with energy storage to meet high-power charging demands and enhance user experience.
- **Minimized Grid Demand:** Draws power from both grid and energy storage simultaneously, minimizing required grid capacity applications.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
→ **Pillar III Climate Technology**
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance
Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix

Energy-as-a-Service (EaaS)

Smile Strategy Creates Synergistic Value

TCC is one of the few global operators spanning charging, energy storage, and power trading. It flexibly allocates resources across business entities to formulate optimal business models for different regulatory environments. In the European market, TCC launched the Smile Strategy through its subsidiary Atlante in 2025: using an ultra-fast charging network as the foundation, it expands its user base via digital platforms and loyalty rewards, while participating in electricity trading and grid ancillary services through EnergyArk® storage

systems and smart energy management platforms to enhance efficiency, flexibility, and long-term resilience (see [CH 3.1](#)).

Sites, Demands, and Regulation: TCC and Clients Co-Create Business Models

Since entering French shopping malls in 2024, TCC has penetrated the European mobility ecosystem, accurately positioning itself in fast-growing charging and power trading markets to become a key participant in the European energy transition.

Large Retail Malls

TCC collaborates with European retail leaders, including Aldi, Pingo Doce, CCV, Groupe Duval, and Klépierre, to deploy ultra-fast charging at major hypermarkets and malls. TCC targets urban hubs, penetrating commercial districts, central markets, and core streets in metropolitan areas like Milan, while installing EnergyArk® storage systems to optimize electricity usage. Simultaneously, it partners with hypermarkets to launch a point ecosystem, allowing car owners to redeem charging discounts in the myAtlante App after spending. This mutually beneficial model drives traffic to hypermarkets and accurately attracts target customer groups.



Partner Feedback



David Carim,
Director of ALDI

Installing EV charging stations at supermarkets aligns with ALDI's commitment to sustainability and energy efficiency. Partnering with Atlante enables ALDI to provide customers with more convenient and efficient services.



Pauline Boucon,
General Manager of
Groupe Duval

Groupe Duval is pleased to partner with Atlante to launch an electrification project across its real estate portfolio. Both parties will deploy over 180 fast and ultra-fast charging points in France.



Raphaël Ventre,
Director of VINCI Autoroutes

The addition of Atlante charging stations significantly increases ultra-fast charging points in our service areas, meeting the growing demand of EV users.



Traffic Arteries

The Alpine cross-border corridor is Europe's busiest heavy truck route. Atlante has secured charging stations at three key nodes: Simplon Pass, Great St Bernard Pass, Ponte Chiasso border crossing in Northern Italy and Switzerland, transforming facilities into integrated nodes connecting logistics data, energy dispatch, and supply chain Scope 3 decarbonization management.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix

Low-Carbon Sustainable Construction – Practices and Innovations



Hangzhou C.F. Koo Building

Featuring a "water sleeves" design, the structure uses TCC Jurong Plant's low-carbon cement with washed fly ash. Integrated BIPV solar glass generates 172.6 MWh annually, saving 2.47% of energy and reducing 535 tCO₂e per year. A solar-storage-charging integrated system with a 6.18 MWh EnergyArk® and 54 fast chargers, meeting EV demand, optimizes power grid use, and capitalizes on peak-valley tariff differences.



DAKA Renewable Resource Recycling Center (RRRC)

Inspired by the "golden ratio" of local mountain valleys, the project features TCC low-carbon cement and UHPC exterior walls. Permeable concrete roads provide high load-bearing capacity while mitigating the heat island effect and extreme rainfall to enable a sponge city design. Rooftop solar, wind turbines, optimized HVAC, and efficient lighting together target a 60-year life-cycle carbon reduction of over 12,000 tCO₂e. The park integrates TCC's energy capabilities, featuring storage-and-charging parking lots planned by NHOA.TCC.



TCC Tower Urban Oasis (TUO)

Designed as an "Urban Green Valley," the project utilizes TCC's UHPC and low-carbon materials. To drive net-zero goals, solar PV capacity is scaled to 16 times and charging stations to 5 times regulatory standards, backed by large-scale energy storage. Additionally, an integrated vertical farm regulates the microclimate and cools indoor spaces through green barriers, effectively lowering HVAC energy use.

Bringing together TCC's low-carbon, new energy, and innovative technologies, TUO forms more than a building — a world-class, healthy, all-smart, and nearly zero-carbon sustainable icon is taking shape.





Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
→ **Pillar IV R&D Integration**
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix



Pillar IV — R&D Integration

“ *The AI era is not built on the cloud.
It is actually built on steel, energy, cables, and concrete.
And this is why I believe the cement industry is being
re-understood by the world.*

— Chairman Nelson An-ping Chang

TCC enters the industrial digital revolution, promoting Digital Twin and AI technology to leap from traditional automation to full-process AI autonomous optimization for unmanned smart factories. It drives human-machine collaboration with AI Agents, using AI as the core to trigger management innovation, reshaping work methods and organizational culture.



AI Smart Manufacturing

Hoping Plant builds a Digital Twin factory.

Mainland China cement plants connect smart mines and smart factories, integrating AI Agent into the decision-making flow.

Portugal's first 5G Industrial IoT smart cement plant promotes preventive maintenance through smart equipment operations.



Electric Transportation

Jurong Plant autonomous electric mine saves approximately RMB 6.12 million in fuel and labor costs annually, reducing carbon emissions by over 1,800 tCO₂e per year, and boosts transport efficiency by 40%.

Electric mining trucks at Hoping Cement Plant quarry reduce carbon footprint by 848 tCO₂e annually and lower power costs by 78%.

CIMPOR's first electric mixer truck will operate in Lisbon by May 2026; Taiwan expects rollout in 2026.



3D Printing Construction

CIMPOR supports 3D concrete printing for social housing in Portugal, implementing inclusive housing.

OYAK Cement aims to leverage new energy solutions to build fully solar-powered homes with 3D concrete printing, recognized as a COP31 green highlight.



Process Innovation

X-Clinker full electrification of novel clinker production.

Souselas Plant plans hydrogen energy for petcoke reduction.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

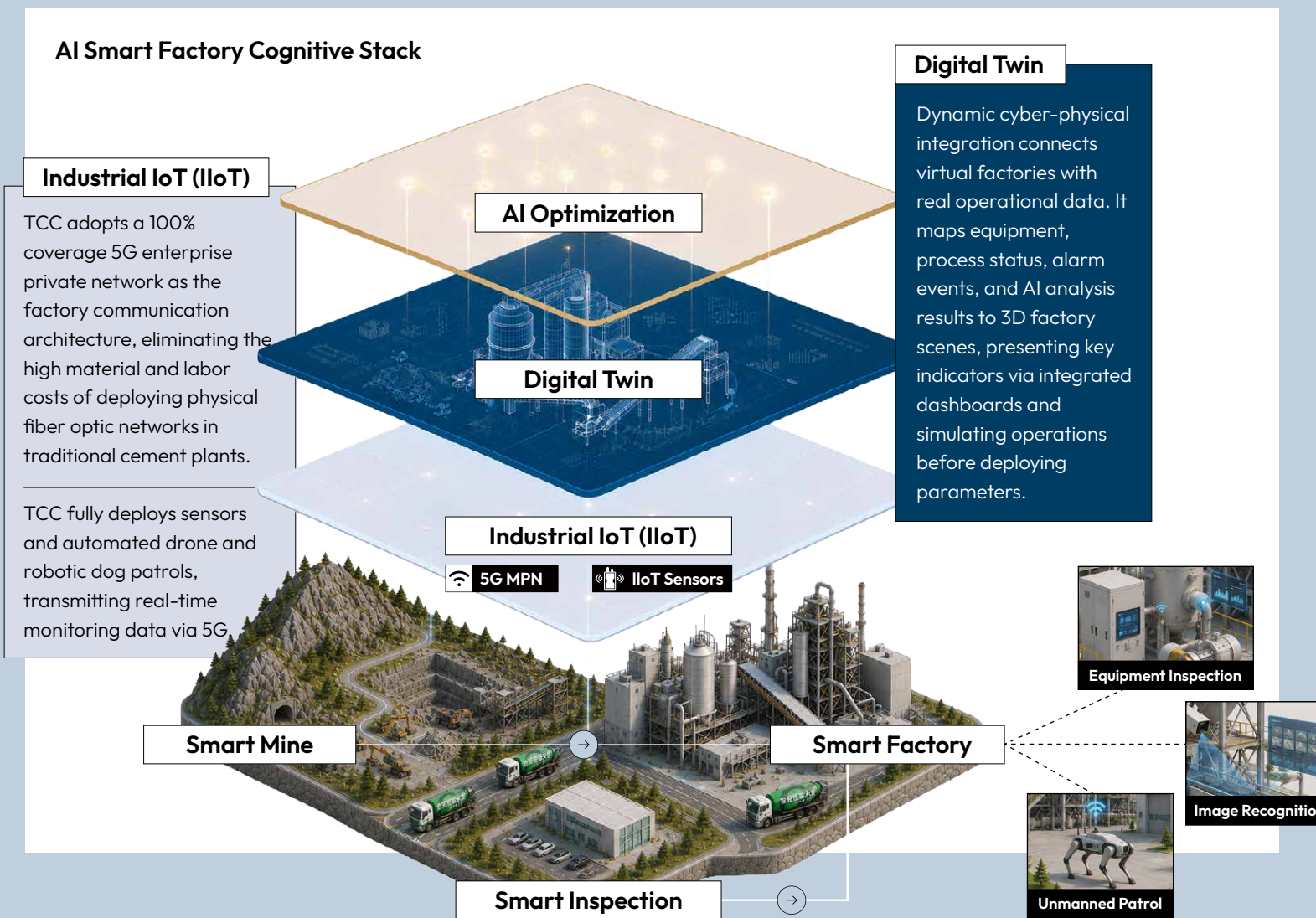
Governance

Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix

AI Smart Manufacturing

Cement manufacturing is a continuous, complex operation spanning quarrying, raw material proportioning, rotary kiln calcination, cooling, and grinding. It involves real-time quality control, alternative material/fuel feeding tests, and occupational safety across plants and quarries.

Traditionally, each process stage used independent management platforms, creating data silos with high integration costs, lack of visualization, and heavy reliance on manual experience. To address these pain points, TCC established a 5G private network to drive Industrial IoT, deploying wireless sensors, drones, and robotic dogs for real-time data and image collection. By combining massive historical parameters with senior frontline experience, TCC built a cyber-physical digital twin factory that drives AI-optimized predictions and AI Agent automated execution. Rather than pursuing quick fixes, TCC transforms big data into high-resilience corporate digital assets to reshape internal decision-making and operational processes.





Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
→ **Pillar IV R&D Integration**
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix

Unmanned Smart Factory

The Cement and Environmental Protection Business (Asia) builds a comprehensive smart management mechanism. TCC introduced the advanced process control (APC) system as an AI Agent to coordinate information integration across units. Jurong Plant and Yingde Plant leverage years of smart mining experience as priority implementation sites. Meanwhile, other plants install individual smart equipment systems in batches, resolving previous information barriers between smart mining and smart factories that prevented generative AI optimization suggestions from executing in real-time underlying controls.

TCC monitors key processes and occupational health and safety equipment 24/7,

detecting potential risks early and issuing real-time alerts!

Smart inspections by drones or robotic dogs!



Smart Mine

Connects data across the entire raw material quarrying process, presenting 3D visualizations of mine topography and ore distribution to optimize quarrying areas, ore ratios, and autonomous truck routes, precisely controlling materials from the source.

Optimized Raw Material Transportation

Routes: Reduces power costs for mining trucks by 78%.

Reduced Raw Meal Fluctuations: Adds an online analyzer to instantly inspect and transmit ore quality, automatically calculating the optimal ore ratio and adjusting the quarrying area.

Precise Control of Ore Resources: Drones regularly conduct point cloud scanning and mapping, reducing traditional manual mapping errors.

Smart Laboratory

Automates sampling and analysis across the entire production line from raw materials to finished products, requiring no manual intervention, fully digitizing quality control data for subsequent big data analysis.

Enhancing Quality Control Reliability:

Eliminates manual sampling data fluctuations; automated robotic transmission significantly improves sample quality.

Shortening Inspection Cycles: Conducts high-frequency, fully automated inspections for raw meal from the mill, raw meal to the kiln, pulverized coal, and clinker.

Breaking Data Silos: Quality control data automatically uploads to the cloud for efficient multi-system collaboration.



Smart Factory

Integrates sensing data across the production line to optimize process control and preventive maintenance, driving smart manufacturing.

Optimized Operations: Advanced Process Control simulates production results in real-time at millisecond speeds to maintain safe, stable lines, proactively adjusting based on optimal Real-Time Optimization (RTO) recommendations.

Preventive Maintenance: AI identifies key component status via sensors and wireless cameras, enabling early maintenance or precise lubrication. On-site personnel wearing smart glasses can project technical drawings via voice commands and connect to experts for remote support.



Overview

- Letter to Our Stakeholders
- About TCC Group Holdings
- Our 2025
- Shaping the Future Civilization
- Pillar I Financial Resilience
- Pillar II Global Operations
- Pillar III Climate Technology
- Pillar IV R&D Integration**
- Pillar V ESG Advantages
- Pillar VI Talent & Culture
- Just Transition Plan
- Special Feature – TCC 80th Anniversary
- Risk Governance Enhancing
- Operational Resilience
- Stakeholder and Material
- Topic Analysis
- Sustainability Goals and Tracking
- 2025 Honors and Recognition
- More About the Report

Governance

- Carbon Reduction
- Energy Transition
- Employee
- Nature
- Social Inclusion
- Appendix

Human-Machine Collaboration

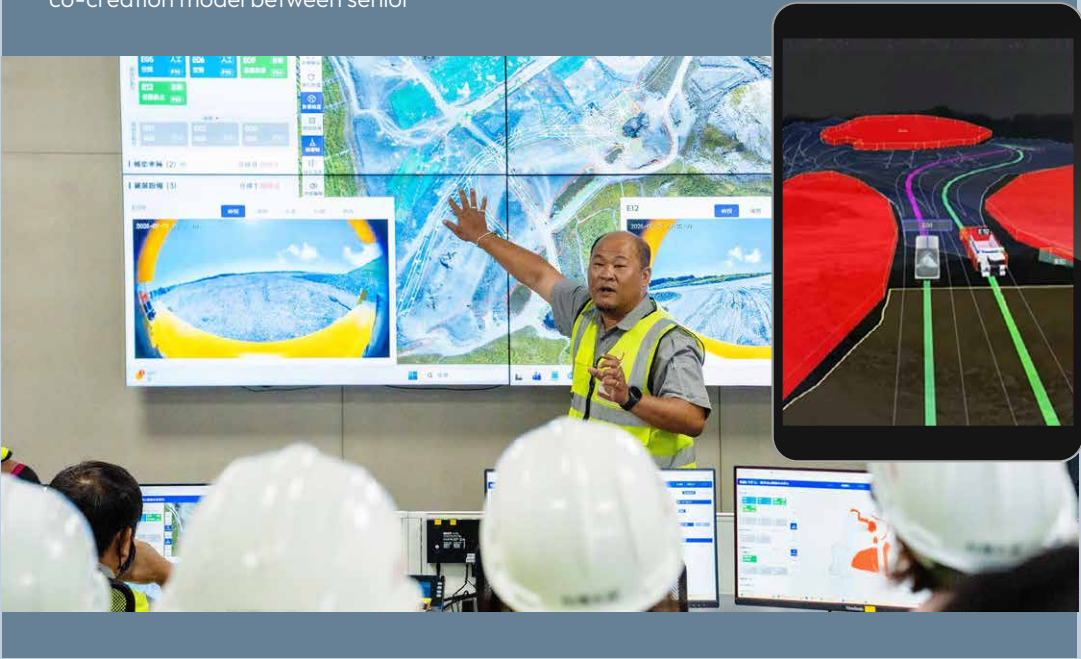
Master Craftsmen and Engineers at the Jurong Plant Jointly Build a Digital Mine

The Jurong Plant built TCC's first smart autonomous mine using V2X technology. Mining trucks operate fully autonomously via "one-click dispatch" for automatic tracking, unloading, and charging, achieving centimeter-level positioning and smart obstacle avoidance, with remote manual takeover for emergencies.

To capture decades of frontline tacit knowledge, the plant adopted a co-creation model between senior

employees and the AI team. Senior drivers initially served as safety officers, helping the technical team observe intervention timing to build operation and fault prediction models. Through agile development, path sensors and routes were rapidly refined.

High participation from frontline employees transformed technological anxiety into a driving force for change. This allowed the AI model to calibrate based on human judgment, transforming it into a dedicated "machine apprentice" and ensuring core on-site experiences are fully inherited across generations.



Human-Machine Collaboration

Robotic Dog Afu Smart Inspection

TCC's 2025 work partner, "Afu the robot dog," operates at the Hangzhou Gongliang Building.



Using AI visual analysis and terrain mapping, Afu navigates autonomously, uses stairs or elevators, and conducts smart inspections across offices, equipment rooms, and remote corners. It performs scheduled

nighttime inspections, shifting corporate monitoring from heavy manual reliance to real-time, precise smart tracking. TCC plans to deploy Afu to plant areas, equipped with HD cameras, infrared thermal imaging, laser rangefinders, and gas sensors to penetrate high-temperature, high-noise, and high-dust narrow spaces, allowing remote central control in real time.

AI Model Validation

Tail Coal Chute Temperature Control

Manual control

Temperature fluctuation ±30°C, adjustment lag 1-2 minutes, up to 10 adjustments per hour

VS

AI control

After comprehensively analyzing 26 parameters such as chute temperature, coal feed limits, coal injection pressure, and air temperature, it predicts and adjusts tail coal usage in advance, making rolling adjustments by the second, with temperature fluctuation of only ±10°C

COMPREHENSIVE COMPARISON

Temperature stability improved ~29%	fluctuation improved ~43%
Physical coal consumption reduced ~5.6 kg/t	



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
→ **Pillar IV R&D Integration**
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix

Constructs Digital Twin Management Framework

📍 Hoping Plant, Taiwan

In February 2026, Hoping Cement Plant launched the Digital Twin project, introducing NVIDIA Omniverse for virtual-real integration, transitioning from manual to technical defense and evolving from passive monitoring to active judgment. The project focuses on equipment preventive maintenance and alternative material/fuel optimization as the core, implemented in phases, deconstructing the massive site onto a 3D digital model and visual platform.

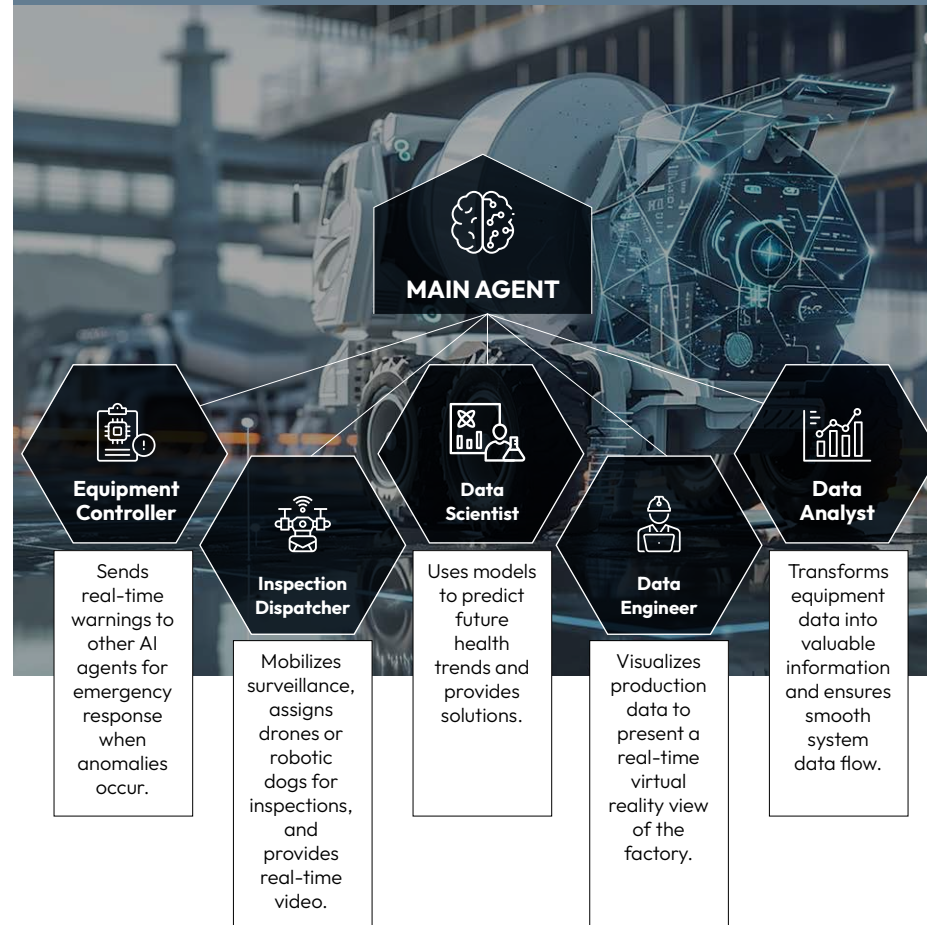
AI Model Validation

🟢 Ongoing

To verify if AI can identify the most stable, energy-efficient parameters, the team focused on raw material elevator speed and feed valve angles for PID simulation tests, allowing machine learning to capture senior technicians' intuition. The team first simulated the AI-generated speed and valve combinations in a Digital Twin to test response and predictive capabilities. After confirming AI decision data is reliable, future plans involve reverse-assisting on-site equipment control, upgrading automation while digitally inheriting industrial craftsmen's wisdom.

Establishing AI Agent Ecosystem

The system uses the AI hub "IoTClaw" as its core to connect and direct the following five dedicated AI agents to automatically execute tasks:



Phase 1

Equipment Health and Early Warning Mechanism |

Rotary Kiln, Preheater Tower, and Cement Mill
AI analyzes real-time images and data from 469+ sensor data points, shedding past case-by-case system baggage. When anomalies are detected, AI proactively pushes categorized early warnings and streams real-time 3D visualizations of anomaly locations and alert statuses to assist quick human judgment.

2026/02–2026/05

Achieved Benefits:

- Data integration setup time reduced from 3 days to 1 hour, improving efficiency by 95%.
- Monitoring rule establishment reduced from 2 days to 1 hour, improving efficiency by 93%.
- Anomaly response time reduced from 60 minutes to 5 minutes, improving efficiency by 91%.
- Anomaly localization time reduced by 80%.
- Cross-departmental communication time reduced by 80%.

Phase 2

UNDER PLANNING

Optimization of Alternative Raw Materials and Fuels Ratio

In the past, quality control was mostly "post-inspection," preventing real-time production parameter adjustments. TCC plans to predict combustion efficiency and optimize calorific value during alternative fuel sampling to help increase alternative fuel usage rates.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

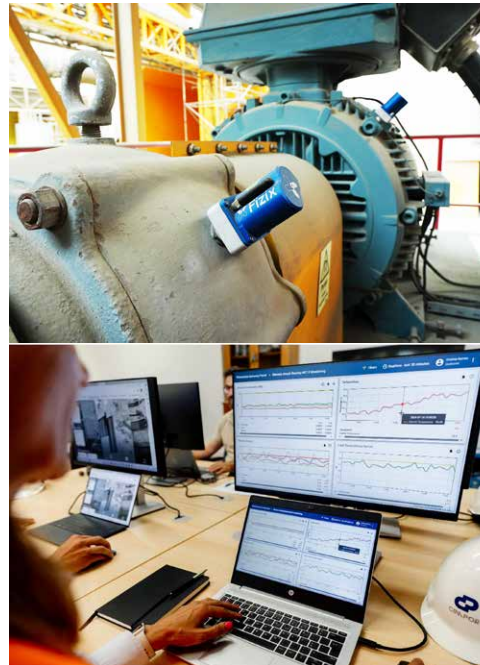
Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix

AI Smart Equipment Inspection Portugal's First 5G IIoT Factory

Alhandra Plant, Portugal

In 2024, CIMPOR collaborated with Vodafone, Ericsson, and SAP to deploy Portugal's first site-wide 5G private network at the Alhandra Plant. Connecting all facilities, this network cuts traditional fiber cable and labor costs while offering exceptional deployment flexibility. Backed by tens of thousands of plug-and-play, long-battery FIZIX smart sensors, the plant transmits real-time vibration, temperature, noise, and magnetic flux data 24/7. Combined with smart glasses and drone inspections, AI analyzes facility conditions for preventive maintenance weeks in advance, avoiding unplanned downtime.

FIZIX sensors are active in 25 plants across six countries (Europe and Africa). As of December 2025, they have collected 1.4 trillion pieces of information across 120,000 different I/O nodes, anchoring future Digital Twin models and AI predictions.



FIZIX Smart Sensors

Sensors are wirelessly connected to collect real-time data like vibration and temperature, uploaded to a cloud system for edge computing and real-time AI analysis. This accurately identifies equipment wear and confirms anomalies for early warnings.

Smart Glasses

CIMPOR introduced the world's top three RealWear Navigator 500 AI glasses, deeply integrated with the SAP equipment maintenance system. On-site personnel use voice control to access maintenance records, operating procedures, or videos on-screen, completely freeing their hands from paper checklists. The system superimposes real-time data (e.g., temperature, vibration) on-screen, monitoring status without physical equipment checks. Connected to TeamViewer, the glasses enable remote expert connections or AI-driven operational guidance, acting as a technical assistant to improve maintenance accuracy and safety.



Drone Inspection & Wireless Cameras

CIMPOR deployed Elios 3 confined space drones and DJI Mavic 3T outdoor thermal imaging drones to inspect and measure thicknesses of rotary kilns, preheater towers, cyclones, and silos. These drones automatically cruise according to set routes and schedules.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix

Electric Transportation

Mainland China, Portugal, and Taiwan

The cement and environmental protection business advances toward low-carbon transportation by replacing oil with electricity.

Plants in Mainland China and Taiwan's Hoping mine introduced autonomous electric mining trucks for raw material transportation with

significant benefits. In April 2024, TCC and its subsidiary Taiwan Transport deployed electric tractors for cement transport, expected to reduce transportation carbon emissions by 32%.

TCC plans to leverage this experience to create a replicable global model, expanding from Asia to Europe. TCC also leads frontline employees into

the AI era. Through job redesign and training, the mining truck driving team transitioned to dispatchers, entering a new stage of human-machine collaboration.

This reduces exposure to high-risk environments, upgrading workplace safety and digital capabilities (see [Pillar VI Talent and Culture](#)).

Introduction of Electric Mining Trucks



CIMPOR Launches Portugal's First Electric Ready-Mix Truck, Reducing Carbon by 63%

In May 2026, CIMPOR launched Portugal's first fully electric ready-mix truck in Lisbon, featuring zero tailpipe emissions to improve metropolitan air quality.

Operating with significantly lower noise than diesel vehicles, it overcomes historic city center restrictions and can operate in residential areas at night. Electric vehicles eliminate engine vibration and exhaust emissions, reducing driver fatigue and improving road safety.

CIMPOR will pair the vehicle with a digital fleet management system to improve energy cost predictions. TCC will also introduce the VOLVO FM 64RE to Taiwan; it reduces carbon emissions by 63% compared to diesel trucks and is expected to hit the road in 2026 (see [Reels](#)).



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
→ **Pillar IV R&D Integration**
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix

3D-Printed Buildings

Portugal and Türkiye



In December 2025, the EU announced the European Affordable Housing Plan, requiring member states to implement inclusive housing. Faced with labor shortages and stricter environmental regulations, reducing labor reliance, shortening construction periods, and lowering costs have

become global issues. Highly efficient 3D-printed construction methods have emerged as a new solution.

CIMPOR began developing low-carbon 3D printing materials in 2024, forming a strategic partnership with Portuguese startup Havelar to lead the industry's low-carbon transition.

In this complementary model, CIMPOR provides material, engineering, market, and global resources, while Havelar focuses on R&D and product innovation. While most market equipment relies on costly proprietary ink containing only 10%-15% cement, CIMPOR optimized its formulas to develop concrete suitable for direct 3D printing. This breakthrough slashed material costs by approximately 83%, enabling commercialization.

Furthermore, the team embeds Circular Construction at the design stage to ensure 100% future recyclability. Integrating the Group's clean energy expertise, buildings are equipped with solar panels for green energy self-sufficiency.

Material selection is localized, utilizing regional resources and recycled urban renewal aggregates to develop optimized, custom building materials.





Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
→ **Pillar IV R&D Integration**
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix



Technological Foundation

The central laboratory collaborated with academic institutions to develop 3D concrete printing, completing a standard mortar formula that complies with the European standard EN 1015 Methods of Test for Mortar for Masonry.

The Alhandra Plant installed large-scale 3D printing equipment to develop low-carbon slurry combining calcined clay, slag, white cement, and recycled construction materials.

Natural cork is an iconic, local resource of Portugal. CIMPOR has incorporated it into 3D printing materials as a bio-based filler, balancing lightweighting, thermal insulation, and acoustic performance, while reducing mineral consumption and lowering carbon footprints. Because harvesting cork requires no tree felling—as the bark regenerates naturally and cork oak forests

continuously sequester carbon—this initiative demonstrates a development model that

drives low-carbon innovation through local natural capital.



Comprehensive Promotion

Supplying 3D-Printed Low-Carbon Concrete

—
32 Social Housing Units
in Portugal

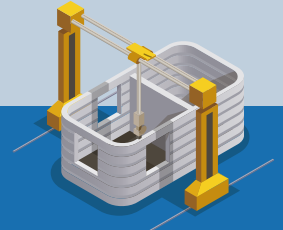
Participating in Europe's Largest 3D Printing Construction Project

—
53 Buildings
in Alfena, Portugal

Building Smart Green Housing with 3D Printing

—
Post-Disaster Reconstruction
in Hatay Türkiye

Türkiye COP31 **Green Key Project**



OYAK Cement 3D Printing Next-Generation Low-Carbon Construction Method

Key Project for the COP 31
Climate Summit



To assist Hatay Province's reconstruction following the 2023 Türkiye earthquake, OYAK Cement partnered with the provincial government to build 20 resettlement apartments and a community library using 3D printing. The project creates smart green housing with self-generated solar power and self-sufficient water, utilizing recycled materials from C&D waste and employing efficient, zero-waste methods to assist the green living transition. As one of the key green projects of COP 31, this initiative highlights TCC's global contributions to sustainability through low-carbon technologies.



Overview

- Letter to Our Stakeholders
- About TCC Group Holdings
- Our 2025
- Shaping the Future Civilization
- Pillar I Financial Resilience
- Pillar II Global Operations
- Pillar III Climate Technology
- Pillar IV R&D Integration**
- Pillar V ESG Advantages
- Pillar VI Talent & Culture
- Just Transition Plan
- Special Feature – TCC 80th Anniversary
- Risk Governance Enhancing
- Operational Resilience
- Stakeholder and Material
- Topic Analysis
- Sustainability Goals and Tracking
- 2025 Honors and Recognition
- More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix

Alternative Fuel Process Improvement

Portugal and Taiwan

The cement and environmental protection business uses alternative fuels as one of its main net zero strategies. TCC implements process improvements across plants to expand the use of alternative fuels, enhance combustion efficiency, and reduce rotary kiln operational fluctuations.

Suao Plant Introduced Oxygen Enriched Combustion

Reducing Annual Carbon Emissions by 5,358 tCO₂e

Alternative fuels are prone to incomplete combustion, generating carbon monoxide, which causes kiln fluctuations and increases heat consumption. Suao Plant invested in an oxygen-enriched combustion system in 2025, increasing combustion efficiency by 22% and reducing carbon monoxide to stabilize kilns and increase alternative fuel usage. In 2025, this system reduced carbon emissions by 5,358 tCO₂e and cut average daily coal consumption by approximately 11.8 tons.



Alhandra Decarbonization Upgrade One of the Representative Industry Cases in the EU

CIMPOR secured Next Generation EU funding, investing 87.68 million euros for a large-scale technical upgrade of Kiln 7 at the Alhandra Plant. The thermal substitution rate (TSR) increased from 40% to 80%, carbon emission intensity dropped from 790 to 698 kg/ton of clinker, and production capacity rose from 3,100 to 3,600 ton/day.

Upgraded raw mills to VRM (vertical raw mill) to efficiently process high-moisture, complex alternative raw materials, stabilizing raw meal quality.	Reconfigured kiln gas circuits and expanded calciner volume to extend alternative fuel residence and combustion times.	Optimized cooler systems to recover high-temperature gas for the kiln and calciner, reducing energy use.
Added pre-combustion space to extend burning time, ensuring complete combustion of large alternative fuel particles to maximize thermal energy.	Installed chlorine bypass systems to discharge salts, preventing process interference with kiln operations.	Added indoor alternative fuel storage silos to minimize spontaneous combustion risks.

For more information on alternative fuels, please refer to [CH 2.2](#).

Thermal Substitution Rate (TSR)
Reach Over **80%**

Improves Thermal Energy Efficiency by **2%**
Reduces Power Consumption by **10%**



Reduces **carbon emissions**
by up to (annually)
200,000 tCO₂e



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix

X-Clinker Full Electrification of Novel Clinker Production

Alhandra Plant, Portugal

Operating in the EU's competitive low-carbon materials market under strict carbon regulations, CIMPOR directly joins multinational peer R&D projects. It serves as TCC's model plant for deploying next-gen technologies across Europe, Asia, and Africa, pioneering hydrogen energy and green electricity calcination for net-zero transition.



X-Clinker
Reduces CO₂ Emissions **~48%**
Compared to Traditional OPC Clinker



CIMPOR's new-generation low-carbon material, X-Clinker, adopts an Electrified Process, reducing carbon emissions by nearly 400 kg/ton of clinker. Engineering design for the semi-industrial demonstration plant is complete.

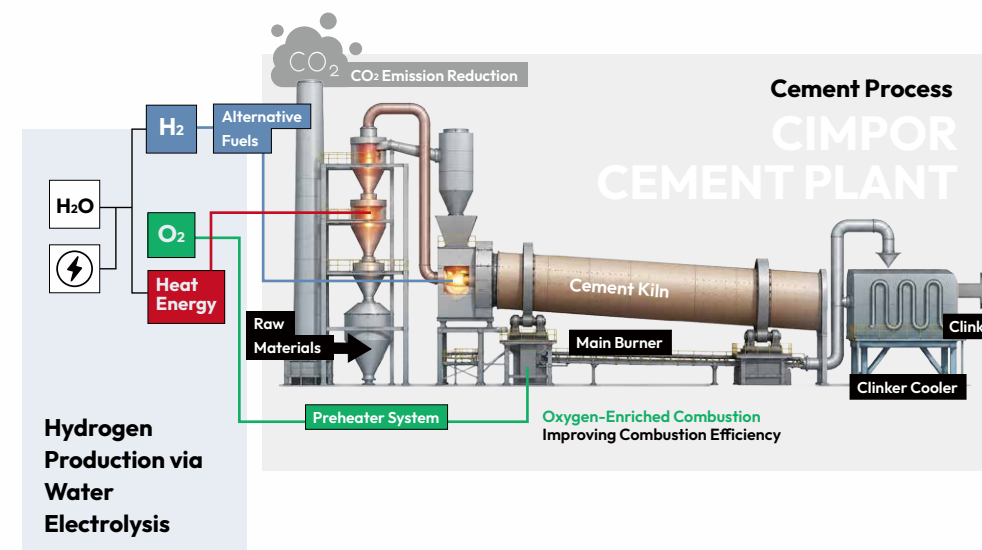
It has potential to produce low-carbon white clinker and cement for high-end materials like UHPC. TCC is currently applying for the EU Innovation Fund to support technical verification. The melting process of raw materials to produce the new clinker type will be fully electrified (100% green electricity). The calcination process plans to introduce 100% green electricity. The gas released during high-temperature calcination has a CO₂ purity over 90%, significantly eliminating preliminary carbon capture costs and reducing traditional chemical scrubbing.

Introducing Hydrogen to Reduce Petcoke Consumption

Souselas Plant, Portugal

CIMPOR plans to introduce water electrolysis for green hydrogen production for cement manufacturing, utilizing hydrogen as an energy vector and alternative fuels. Oxygen from electrolysis can be used, in the future, for oxygen-enriched combustion to improve kiln efficiency. The Souselas Plant starting the installation of a 10 MW electrolyzer in 2025 to produce green hydrogen. Considering global energy fluctuations and high electricity prices, TCC plans to have the flexibility to quickly switch from one fuel to

another and co-fire some amounts of natural gas and hydrogen together with other alternative fuels, whenever feasible, profiting from gradual decarbonization of natural gas grid. It completed the natural gas pipeline connection in 2025 and expects operations in 2026. Additionally, this green hydrogen can be used as raw material to be combined with manufacturing carbon emissions to produce e-fuels (e.g., aviation fuel, methanol) for transportation and chemical industries, forming a cross-industry carbon cycle.





Overview

- Letter to Our Stakeholders
- About TCC Group Holdings
- Our 2025
- Shaping the Future Civilization
- Pillar I Financial Resilience
- Pillar II Global Operations
- Pillar III Climate Technology
- Pillar IV R&D Integration
- Pillar V ESG Advantages**
- Pillar VI Talent & Culture
- Just Transition Plan
- Special Feature – TCC 80th Anniversary
- Risk Governance Enhancing
- Operational Resilience
- Stakeholder and Material
- Topic Analysis
- Sustainability Goals and Tracking
- 2025 Honors and Recognition
- More About the Report

Governance

- Carbon Reduction
- Energy Transition
- Employee
- Nature
- Social Inclusion
- Appendix



Pillar V — ESG Advantages



SBT
Carbon Reduction
Targets Towards
2050 Net Zero

TCC set its SBT in 2020 as East Asia's first SBTi- validated cement company. In January 2025, Cement and Environmental Protection Business passed the 1.5°C validation and committed to 2050 Net-Zero. In March 2026, TCC submitted group-wide, consolidated net zero targets for SBTi validation, while Charging and Storage Business (Europe) completed near-term 1.5°C target setting.

TCC Group Holdings

Currently submitting for official validation in 2026/03

2050 Net Zero Target

-90%

Total Scope
1, 2, and 3
Emissions

Total Emissions
of 15 Scope 3
Categories

Cement and Environmental Protection Business¹

Scope	Unit	Base Year Value	2024	2025	2030
Cement and Environmental Protection (Asia)					
Scope 1²	kg CO₂e/t Cementitious Materials	2016: 724	642	637	-23.9%
Scope 2²	kg CO₂e/t Cementitious Materials	2016: 30	25	26	-64.4%
Scope 3³	tCO₂e	NA	NA	2,457,018	NA
CIMPOR					
Scope 1	kg CO₂e/t Cementitious Materials	2022: 659	659	632	-19.5%
Scope 2	kg CO₂e/t Cementitious Materials	2022: 28	24	15	-55.7%
Scope 3⁴	tCO₂e	NA	482,490	1,068,531	NA
OYAK Cement					
Scope 1	kg CO₂e/t Cementitious Materials	2021: 740	672	640	-20.5%
Scope 2	kg CO₂e/t Cementitious Materials	2021: 49	42	41	-56.3%
Scope 3⁴	tCO₂e	2021: 3,059,619	1,802,816	1,884,152	NA

Charging and Storage Business (Europe)

Scope	Unit	Base Year Value	2025	2030
NHOA Energy				
Scope 1 + 2	tCO ₂ e	2024: 253	122	Absolute emissions reduced by 42%
Scope 3 ⁵	tCO ₂ e / per battery cell installed	2024: 0.05	0.10	C11 Use of Sold Products carbon emission intensity reduced by 51.6% per battery cell installed
Scope 3	-	84%	87%	C1 Purchased Goods and Services 86% of suppliers by emissions to set SBT by 2029
Atlante (Under the SME pathway)				
Scope 1+2	tCO ₂ e	2024: 159	120	Absolute emissions reduced by 42%

Note 1: Targets are set via SBTi methodology as gross GHG emissions per ton of cementitious product. Scope 2 uses market-based method.

Note 2: Scope 1 & 2 targets for Cement and Environmental Protection (Asia) cover Taiwan and Mainland China plants, excluding Longshan and Liaoning plants, RMC plants, and grinding stations due to operational factors.

Note 3: 2025 Scope 3 emission boundary for Cement and Environmental Protection (Asia) covers Taiwan and Mainland China cement plants (including Longshan and Liaoning plants), RMC plants, and grinding stations; submitted for SBTi validation in March 2026.

Note 4: CIMPOR's SBT target boundary covers cement plants and grinding plants in Portugal. Its 2024 Scope 3 inventory covered Portugal cement plants, expanding in 2025 to RMC, aggregate, dry mortar, and paper bag plants. OYAK Cement's Scope 3 emissions increased as its Denizli limestone plant (commissioned in 2024) reached full operation in 2025.

Note 5: Scope 2 emissions are calculated using the market-based method.

Note 6: Driven by global energy storage expansion and evolving project configurations, Scope 3 Category 11 emissions increased in 2025. Associated emissions are primarily dictated by the technology of procured battery cells; anticipated improvements in supplier cell efficiency in the coming years will support progress toward the 2030 decarbonization target.



Overview

- Letter to Our Stakeholders
- About TCC Group Holdings
- Our 2025
- Shaping the Future Civilization
- Pillar I Financial Resilience
- Pillar II Global Operations
- Pillar III Climate Technology
- Pillar IV R&D Integration
- Pillar V ESG Advantages**
- Pillar VI Talent & Culture
- Just Transition Plan
- Special Feature – TCC 80th Anniversary
- Risk Governance Enhancing
- Operational Resilience
- Stakeholder and Material
- Topic Analysis
- Sustainability Goals and Tracking
- 2025 Honors and Recognition
- More About the Report

Governance

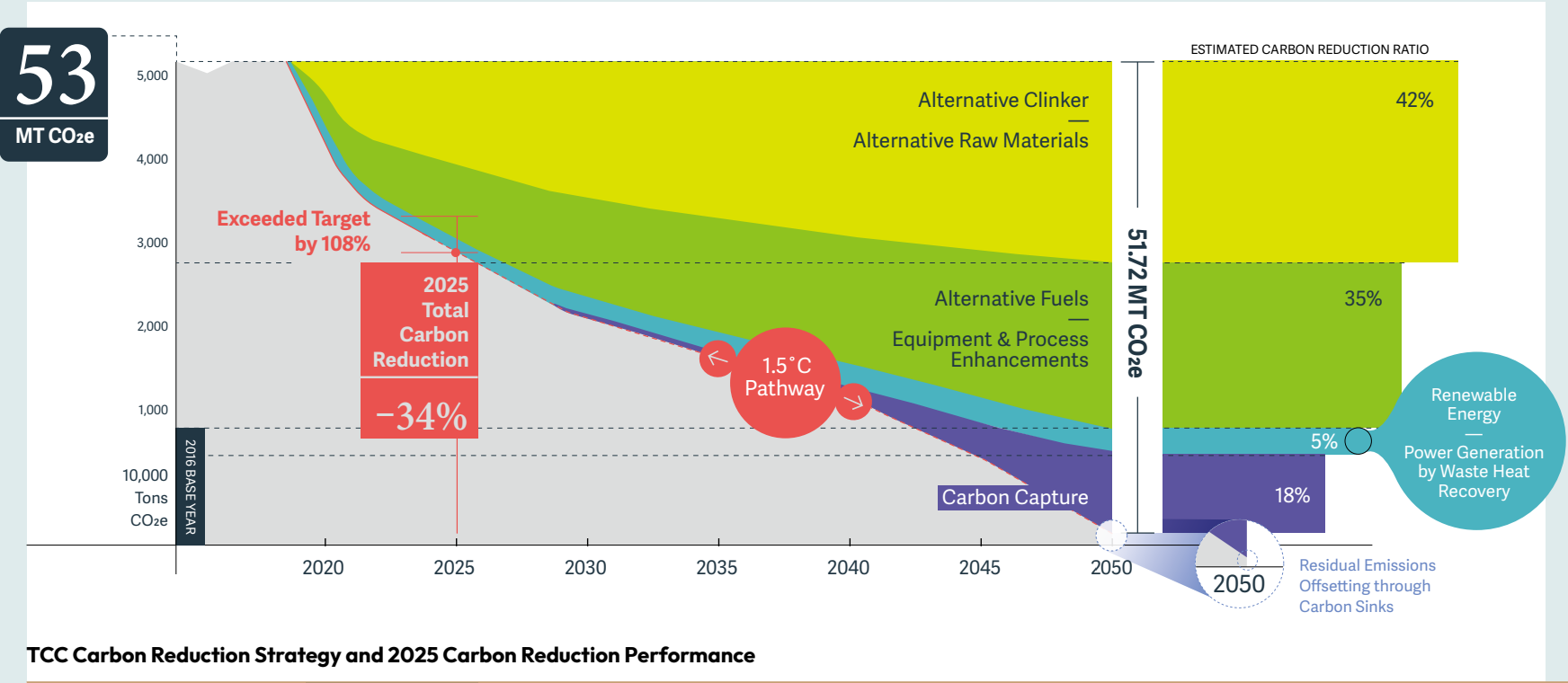
- Carbon Reduction
- Energy Transition
- Employee
- Nature
- Social Inclusion
- Appendix

Cement and Environmental Protection Business Net Zero Pathway

Contributing over 80% of emissions and 70% of revenue, Cement and Environmental Protection Business is TCC's decarbonization core. In 2024, TCC launched "2050 Cement and Environmental Protection Business Net Zero Pathway," covering

all sites in Taiwan, Mainland China, CIMPOR, and OYAK Cement. Aligned with SBTi 1.5°C methodology, ISO IWA 42 Net Zero Guidelines, and IEA's Net Zero Pathway and World Energy Outlook report, key strategies include alternative

clinker/raw materials/fuels, waste heat recovery, process enhancements, renewable energy and carbon capture, with natural carbon sinks for carbon removal. TCC will extend this net-zero planning group-wide in 2026.



Carbon Reduction Strategy	Corresponding Scope	Carbon Reduction Amount (Unit: tCO ₂ e)	Contribution to Carbon Reduction
Alternative Raw Materials & Alternative Clinker	Scope 1	10.47 million	58%
Alternative Fuels	Scope 1 & Process Enhancements Scope 2	6.75 million	37%
Renewable Energy & Power Generation by Waste Heat Recovery & Other Energy-Saving Measures	Scope 2	0.97 million	5%
Total		18.19 million	100%

Hoping & Suao: Taiwan's Only Two Cement Plants Obtaining Best Rates of Carbon Fees

With Taiwan launching carbon fees in May 2026, Hoping and Suao Plants formulated voluntary reduction plans based on SBT, which were approved under Option A by the Ministry of Environment—the only cement industry in Taiwan to qualify. This enables the application of a high carbon leakage risk factor of 0.2. The carbon fee is calculated at the most favorable rate of NT\$10/ton, saving significant costs compared to the general rate of NT\$300/ton.

Meanwhile, E-One Moli Corporation passed voluntary reduction Plan B at NT\$100/ton.

Note 7: Carbon offset feasibility will be evaluated based on net zero progress and domestic/international technological developments. This includes applying future captured CO₂ for carbon credits per government policies, or purchasing certified high-quality external carbon credits.



Overview

- Letter to Our Stakeholders
- About TCC Group Holdings
- Our 2025
- Shaping the Future Civilization
- Pillar I Financial Resilience
- Pillar II Global Operations
- Pillar III Climate Technology
- Pillar IV R&D Integration
- Pillar V ESG Advantages**
- Pillar VI Talent & Culture
- Just Transition Plan
- Special Feature – TCC 80th Anniversary
- Risk Governance Enhancing
- Operational Resilience
- Stakeholder and Material
- Topic Analysis
- Sustainability Goals and Tracking
- 2025 Honors and Recognition
- More About the Report

Governance

- Carbon Reduction
- Energy Transition
- Employee
- Nature
- Social Inclusion
- Appendix

External Carbon Reduction Impact

The WBCSD states that absolute carbon reduction in Scope 1, 2, and 3 is the top priority for enterprises.

Beyond "Do Less Harm," businesses must offer climate solutions to "Do More Good." TCC pairs decarbonization with sustainable products and services, driving business growth while generating avoided emissions for external clients and society.

Beyond self-reduction, TCC drives its value chain toward net zero to offer climate solutions with high carbon reduction impact. Prioritizing Cement and

Environmental Protection Business (Asia), cement plants, product plants, grinding stations, and offices in Taiwan and Mainland China completed 15 Scope 3

verifications across 2023–2024. TCC also empowers suppliers, successfully engaging Guigang Plant transportation to switch to electric trucks. (See [CH 2.3](#))

Business Group									
Cement and Environmental Protection Business		Battery Energy Business		Charging and Storage Business					
Category									
Low-carbon Construction Materials		Resource Recycling		<u>GREEN ENERGY</u> Renewable Energy Generation					
						2025	2025	2025	2025
						-1.002 million	-95,000	-61,000	-2,930
						2030 TARGETS	2030 TARGETS	2030 TARGETS	2030 TARGETS
-1.69 million		-530,000	-320,000	-117,673	-53,351				
									
GREEN ENERGY Battery		GREEN ENERGY Battery Energy Storage		<u>GREEN ENERGY</u> Charging Service (incl. ALL-IN-1)					
						2025	2025	2025	2025
						-2,930	-117,673	-53,351	
						2030 TARGETS	2030 TARGETS	2030 TARGETS	2030 TARGETS
-320,000	-160,000								
									

Note 8: The unit of carbon emissions is tCO₂e.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
→ **Pillar V ESG Advantages**
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction
Energy Transition
Employee
Nature
Social Inclusion
Appendix

Biodiversity

“
Biodiversity considerations need to be better integrated into public and business decision-making at all levels.

— European Commission, "EU Biodiversity Strategy for 2030"

Climate change and biodiversity loss are already a dual crisis for global. TCC integrates nature into net zero strategy. Through natural capital management, ecological surveys, quarry restoration, habitat conservation, and soil research, TCC aligns with Kunming-Montreal Global Biodiversity Framework and global "30x30 target".

Multi-Source Satellite Data Integration: Forest Observation from Space

TCC launched the "Global Quarry Carbon Stock Project" in 2026, partnering with CoCoTree Technology, the project establishes a multi-source satellite data foundation by pairing primary Sentinel-2 optical data with cloud-penetrating ESA Biomass radar to characterize forest structure.



ESA Sentinel-2 Multispectral Satellite Imagery

Sentinel-2's 10-meter resolution and 13 spectral bands enable forest canopy monitoring and support scalable, cross-continental applications.

ESA Biomass Radar Satellite Data

The Biomass satellite penetrates clouds and canopies to map forest structure and biomass, enhancing carbon stock estimation reliability.



NASA GEDI:

A globally adopted spaceborne LiDAR dataset providing a high-precision reference for global forest aboveground biomass estimation.

AI Deep Learning Modeling

The core model is based on Convolutional Neural Networks (CNN), transforming images into carbon stock estimates through four stages:

1

Forest structural feature extraction:

Extracts forest structural features, including canopy height, variability, and vegetation index from Sentinel-2 images to build a canopy height model.

2

AI model training:

Combines forest structural features with the NASA Global Ecosystem Dynamics Investigation (GEDI) dataset for training, developing a model that infers above-ground carbon stock density from Sentinel-2 optical data.

3

Carbon stock estimation:

Uses 2026 satellite imagery to extract forest structural features from quarry and applies the trained model to estimate carbon stock.

4

Using Hualien's Hoping Cement Plant plot data as ground truth:

This project calibrates satellite estimates with field measurements. TCC plans third-party carbon credit verification in 2027, aiming to scale this method to all quarries for more efficient global carbon sink monitoring.

Cross-Continental Terrain and Climate Challenges

TCC's operations span highly diverse landscapes, from rainforests to deserts and steep mountains to limestone plateaus. To adapt, the AI model integrates geographic encoding, multi-satellite data, and ground calibration during preprocessing, building a robust carbon stock estimation system for any environment.



CIMPOR Areeiro do Camarnal (Alhandra) Quarry

The purple area represents carbon stock within the quarry.



Overview

Letter to Our Stakeholders
About TCC Group Holdings
Our 2025
Shaping the Future Civilization
Pillar I Financial Resilience
Pillar II Global Operations
Pillar III Climate Technology
Pillar IV R&D Integration
Pillar V ESG Advantages
Pillar VI Talent & Culture
Just Transition Plan
Special Feature – TCC 80th Anniversary
Risk Governance Enhancing
Operational Resilience
Stakeholder and Material
Topic Analysis
Sustainability Goals and Tracking
2025 Honors and Recognition
More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix

TCC Nature Action

Taiwan's First Marine OECMs Wild Coral Ecological Habitat at Hoping EcoPort

“When people think of industrial zones, they think of cement and cargo ships; but we see corals, fish, and restoration.”

Located within Hoping 3-in-1 of Port, Power, Cement Plant, Hoping EcoPort uses strict controls and rock revetments to keep harbor waters clear. To accelerate coral growth, TCC deploys low-carbon cement Bio-cubes to anchor fragments and seedlings, fostering a thriving marine ecosystem and proving that 'atypical conservation' can successfully balance industry with biodiversity.

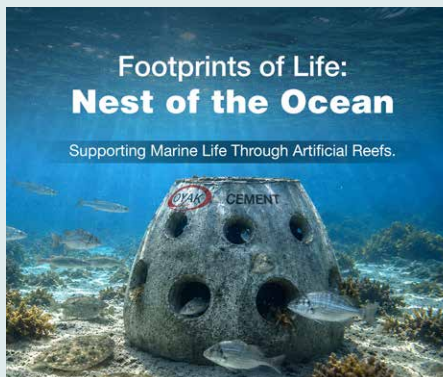
Leave a Safe Home for the Guest from the South — Little Tern! TCC Little Tern Conservation and Incubation Project

Migrating from the Southern Hemisphere, Little Terns first nested outside Hoping Power Plant, the northernmost estuary of the Hoping Low-carbon Green Energy Park in 2024. By 2025, active nests on this beach surpassed 100 with hatching chicks. To safeguard this habitat, TCC and its suppliers established the 'Little Tern Conservation Patrol' for autonomous management.



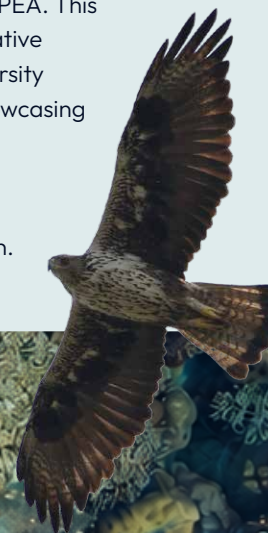
OYAK Cement Artificial Reef Project

Located by the scenic Sea of Marmara in Türkiye, OYAK Cement's Aslan Plant utilizes artificial reefs to restore marine ecology. These reefs provide vital spaces for marine organisms to inhabit, breed, and shelter from predators.



CIMPOR Quarry Bonelli's Eagle Conservation

To protect threatened Bonelli's Eagles nesting in its Alhandra Plant quarry in Lisbon, CIMPOR joined the EU LIFE LxAquila project in 2025, partnering with SPEA. This cross-sector initiative advances biodiversity conservation, showcasing CIMPOR's active dedication to endangered species protection.



Hoping Ark Ecological Program 2.0 — Soil Remediation Experimental Research

Although soil nurtures 95% of global food, 75% of global land is already degraded, with this figure projected to reach 90% by 2050 (EU). To address this, TCC partnered with the Dr. Cecilia Koo Botanic Conservation Center (KBCC), academia, and schools on the Hoping Ark Ecological Program 2.0. Through native ethnobotanical restoration and soil experimental zones, the initiative researches acidification solutions to enhance land resilience and ecological value.

For more information, see [CH.5](#)



Overview

- Letter to Our Stakeholders
- About TCC Group Holdings
- Our 2025
- Shaping the Future Civilization
- Pillar I Financial Resilience
- Pillar II Global Operations
- Pillar III Climate Technology
- Pillar IV R&D Integration
- Pillar V ESG Advantages
- Pillar VI Talent & Culture**
- Just Transition Plan
- Special Feature – TCC 80th Anniversary
- Risk Governance Enhancing
- Operational Resilience
- Stakeholder and Material
- Topic Analysis
- Sustainability Goals and Tracking
- 2025 Honors and Recognition
- More About the Report

Governance

Carbon Reduction

Energy Transition

Employee

Nature

Social Inclusion

Appendix



Pillar VI — Talent & Culture

All-Staff AI Action Year

Spanning diverse industries across Asia, Europe, and Africa, TCC faces a profound transition. Chairman Chang emphasizes three essential anchors for industrial pioneers: a clear mind, a conscience prioritizing integrity over efficiency, and courage in uncertainty.

In 2026, TCC launches the "All-Staff AI Action Year: AI Pilot Program," encouraging employees to integrate AI into daily workflows, operations, and customer service, building a shared resource pool for collective transformation.

Interactive Learning

To drive synergies in a volatile market, TCC bridges European advancements in AI, low-carbon technologies, and regulations with Asian practices in biodiversity and community engagement. These regular cross-border exchanges expand global perspectives, serving as a powerful catalyst for internal innovation.

AI Empowerment Courses

In 2026, TCC Carbon Academy becomes the Institute of NextGen Sustainability, introducing AI empowerment courses. Renowned generative AI experts will conduct on-site classes at the plants. This training is being rolled out across production sites in Taiwan and Mainland China, ensuring frontline teams keep pace with digital transformation. Details in [CH 4.2](#).

AI Internal Proposal Competition

Departments propose tailored AI solutions, personally evaluated and prioritized by the Chairman and the TCCI team. Replicable projects are upgraded to cross-departmental initiatives. Upon approval, the TCCI AI team provides technical support for collaborative or autonomous development. System-integrated projects undergo strict internal controls and cybersecurity checks to ensure safe, rapid deployment.

CIMMY and Regulation Navigator

TCC's Regulation Navigator AI chatbot provides instant guidance on leave, travel, or overtime. Following beta testing, the tool will launch

in June 2026 to simplify administrative tasks and foster a smarter workplace. To boost decision-making, CIMPOR's Cimmy chatbot, powered by Aura (Autonomous Understanding Rapid Analytics), analyzes massive internal data in seconds to generate real-time insights, charts, and predictions:

Smart Scheduling & Material Management:

Generates sales charts, Tracks sales, receipts, and license plates to optimize supply chain flow.

Smart Transportation Efficiency:
Calculates fleet efficiency and trip counts while sending proactive anomaly alerts for highly efficient logistics.

Data-Driven Capacity Prediction:
Uses gradient boosting algorithms to predict delivery volumes for strategic planning.

