TCC 2022 | ESG INSIGHT REPORT

IN SERVICE OF LIFE

ENVIRONMENTAL

In Service for Life

TCC seeks to direct public attention more onto the balance of nature and the protection of the stable development of all life in the world. Based on the Science Based Targets (SBTs) and the targets of Global Cement and Concrete Association (GCCA), TCC Group rolled out our Roadmap to Net Zero by 2050 with "Low-carbon Cement," "Resource Recycling," and "Green Energy."

Three Core Businesses & 10 Industrial Services

Low Carbon Cement
- ECO-FRIENDLY CEMENT
- RMC TRACEABILITY
- ULTRA-HIGH PERFORMANCE CONCRETE (UHPC)

Resource Recycling
- CITY WASTE PURIFIER
- AI-DRIVEN RESOURCE RECYCLING
- FOOD WASTE

Green Energy
- RENEWABLE ENERGY
- SMART ENERGY STORAGE
- HIGH POWER CELLS
- CHARGING SERVICE

TCC adopts seven strategies such as carbon reduction for basic construction materials, new energy charging/storage optimization, and carbon negative technologies, together with an AI-powered carbon management platform for tracking, to offer optimal carbon reduction recommendations for all business entities.

Key Environmental Goals and Achievement Rates

Air and Carbon Emissions

GHG Management	PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
Taiwan	97% ACHIEVED	0.803	0.758 (SBT -11%)	0.585 (-31%)	Carbon Neutrality for Concrete
Mainland China	ACHIEVED	0.690	0.651 (-11%)	0.585 (-20%)	
Taiwan & Mainland China (Weighted Average)	NEW INDICATOR	0.707	0.663	0.585	

Base year 2016 | Unit metric tons of CO_2e/metric ton of cementitious materials

Air Pollution Management		PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
Taiwan	NOx	ACHIEVED	1,025 (-31%)	-50%	-70%	BACT[1] Minimum
	SOx	ACHIEVED	12 (-40%)	-30%	BACT[1] Minimum	
	TSP	ACHIEVED	30 (-63%)	-50%	BACT[1] Minimum	
Mainland China	NOx	ACHIEVED	320 (-45%)	-50%	-70%	
	SOx	ACHIEVED	43 (-54%)	-60%	-70%	
	TSP	ACHIEVED	12 (-74%)	-60%	BACT[1] Minimum	

Base year 2016 | Unit grams of emissions/metric ton of clinker

Water Management

GHG Management	PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
WWI Reduction | Taiwan	99% ACHIEVED	0.000293	0.000264	0.000240	0.000192
WWI Reduction | Mainland China	ACHIEVED	0.000308	0.000263	0.000245	0.000192

Base year 2016 | Formula million liters/metric ton of cementitious materials

Renewable Energy & Carbon Capture

Renewable Energy	PROGRESS	TARGETS 2025	2030	2050
Taiwan & Mainland China (MW)	198MW Under Constitution by End of 2024	500MW Under Management	700MW Under Management	1GW Under Management

Carbon Capture	PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
R&D Budget (Since 2011 | NT$)	ACHIEVED	Cum. investment of NT$165 mn	Cum. investment of NT$1.3 billion	-	-
Carbon Capture (Metric ton)		Planning for the scale up verification of carbon capture technology		100,000 metric tons/year	1.6 million metric tons/year

Alternate Fuels & Materials

Thermal Subsitution of Alternate Fuels	PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
Taiwan	NEW INDICATOR	4%	35%	45%	50%
Mainland China	NEW INDICATOR	8%	35%	45%	50%

Ratio of Alternative Raw Materials	PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
Taiwan	NEW INDICATOR	23%	28%	35%	40%
Mainland China	NEW INDICATOR	25%	30%	40%	45%

Biodiversity

	PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
Conservation of Plant Species (Endangered Plants included | Taxa)	ACHIEVED	34,154	≧ 35,000	≧ 40,000	≧ 45,000
Mine Restoration Biodiversity BMP (Biodiversity Management Plan) **Ratio of Indigenous Species of Taiwan Mines**	ACHIEVED	88.88%	-	90%	95%

Community Engagement

	PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
Community Engagement Management (CEM) (Since 2011 | NT$)	ACHIEVED	NT$215 million	Cum. investment of NT$800 million	Cum. investment of NT$1.8 billion	Cum. investment of NT$5.8 billion

Education & Employee Training

	PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
Education Investment (Since 2022 | NT$)	ACHIEVED	NT$9.5 million	Cum. investment of NT$33.5 million	Cum. investment of NT$73.5 million	Cum. investment of NT$230 million
Employee Education & Training (Since 2020 | NT$)	ACHIEVED	Cum. investment of NT$45 million	Cum. investment of NT$125 million	Cum. investment of NT$250 million	Cum. investment of NT$750 million

Supplier Carbon Inventory

Thermal Subsitution of Alternate Fuels	PROGRESS	2022 PERFORMANCE	TARGETS 2025	2030	2050
Valid Data of Carbon Emissions Collected from Critical Tier-1 Suppliers	NEW INDICATOR	64.6%	-	90%	-

Environmental Metrics

Carbon Emissions

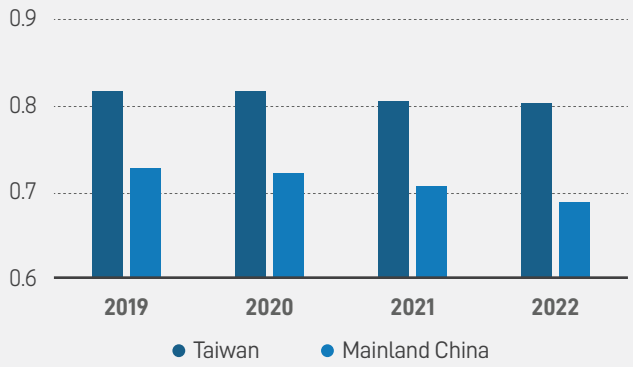
	UNIT	2019	2020	2021	2022
Taiwan Total	Metric ton CO_2e	4,519,991	4,647,231	5,048,912	4,532,792
Scope 1		4,268,620	4,413,285	4,798,945	4,314,312
Scope 2		229,346	210,612	220,032	218,480
Scope 3		22,025	23,334	29,575	17,428
Mainland China Total		32,676,037	32,513,515	26,962,075	21,571,181
Scope 1		31,362,071	31,255,633	25,867,678	20,718,120
Scope 2		1,313,966	1,257,882	1,094,397	853,061

GHG Intensity

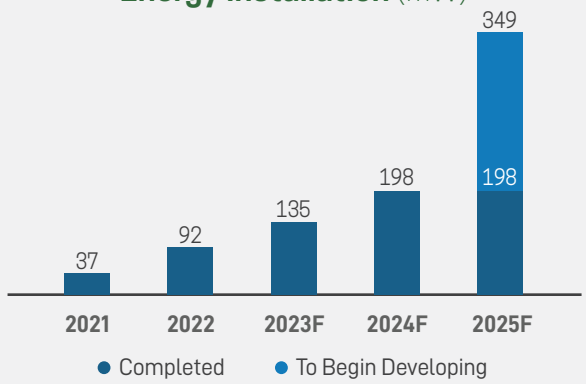
	UNIT	2019	2020	2021	2022
Taiwan	tCO_2/metric ton of cementitious materials	0.814	0.813	0.806	0.803
Mainland China		0.728	0.723	0.709	0.690

Note 1: The GHG emissions were inventoried in terms of operational control. The formula used is emissions = activity data × emissions factor (EF) × global warming potential (GWP). ((The EF used for Taiwan is subject to the EPA GHG Emissions Factor Management Table (v. 6.0.4); the GWP for the Cement Plants is derived from the IPCC Fourth Assessment Report (2007); the GWP for RMC Plants and Operation Headquarters is derived from the IPCC Sixth Assessment Report (2021). The EF for Mainland China is subject to "Guidelines for Accounting and Reporting Greenhouse Gas Emissions: China Cement Production Enterprises (Trial)", the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and the 2019 Refinement, and the GWP is derived from the IPCC Sixth Assessment Report (2021).)

GHG Intensity Trend
(tCO_2/metric ton of cementitious materials)



TCC Group Renewable Energy Installation (MW)



Energy Management

	UNIT	2019	2020	2021	2022
Taiwan Total Energy Consumption	GJ	**18,186,026**	**18,318,033**	**19,827,319**	**18,415,845**
Coal		16,157,228	16,300,593	17,632,953	16,355,419
Diesel		56,612	38,468	50,458	66,246
Gasoline		5,159	5,877	5,028	6,366
Natural Gas		237	172	126	58
Purchased Electricity		1,605,600	1,544,400	1,641,600	1,602,000
Self-consumption Renewable Energy		166.59	329.97	982.22	1,107.66
Electricity from Waste Heat Recovery		360,206	428,400	496,800	388,800
Purchased/Used Electricity	%	79%	71%	69%	78%
Waste Heat Recovery/Used Electricity		21%	29%	31%	22%
Mainland China Total Energy Consumption	GJ	**141,842,369**	**139,437,578**	**114,868,992**	**86,776,955**
Coal		126,971,845	124,876,752	102,360,258	77,566,859
Diesel		508,027	625,222	598,640	466,042
Gasoline		10,252	9,240	11,493	8,555
Purchased Electricity		9,860,400	9,392,400	8,280,000	5,817,600
Electricity from Waste Heat Recovery	MW	4,600,800	4,618,800	3,722,400	2,919,600
Purchased/Used Electricity	%	62%	61%	63%	63%
Waste Heat Recovery/Used Electricity		38%	39%	37%	37%

Note 1: Heating values of coal for the cement plants in Taiwan are converted per the respective settings of the plants. The converted heating value of coal for the Suao Plant: 5,532.69 kcal/kg; the converted heating value of coal for the Hoping Plant: 5,570.14 kcal/kg; the converted heating value of coal for other plants: 5,500 kcal;/kg; The values for other items are converted based on the heating values in the Emissions Factor Management Table (v. 6.0.4) released on the Bureau of Energy's website. The values are 5,500 kcal/kg for coal, 8,400 kcal/l for diesel, 7,800 kcal/l for gasoline, 3,600 GJ/GWh for electricity, and 8,000 (kcal/m^3) for natural gas. The scope 2 draws reference from the electricity EF of 0.509 kg of CO_2e/kWh from the Bureau of Energy, MOEA in 2021. Note 2: The data of energy use is subject to the reported data to the Bureau of Energy. Note 3: The Cement plants in Taiwan started collecting data on gasoline use in 2022, which were used all by corporate cars. Note 4: The RMC plants in Taiwan started collecting data on gasoline use in 2018. Note 5: The Operation Headquarters in Taiwan started to collect data on natural gas use in 2019, estimated as the natural gas fee of the year/unit fee per kWh. Note6: Based on the cementitious materials yield of 5,629,943.3250 metric tons in Taiwan in 2022, the unit energy consumption in cementitious materials production is 3.1863 GJ/metric ton of cementitious materials. Note 7: The use of alternative fuels in Taiwan in 2022 increased by approximately 3.5 times compared to the 2021 levels due to the increase in diesel consumption by forklifts in short-barge transportation of feed. Note 8: Based on the concrete yield of 5,061,765 m^3 in Taiwan in 2022, the unit energy consumption in concrete production is 0.0140 GJ/m^3 of concrete. Note 9: Based on the 184 employees on the Operation Headquarters in Taiwan in 2022, the energy consumption per capita is 99.9630 GJ per capita. Note 10: The purchased electricity includes the electricity consumed by the mining system; nevertheless, now that the mining system is owned by the subsidiary, Ho Sheng Mining Co., Ltd., it is not included in the ISO 14064 GHG inventory data.

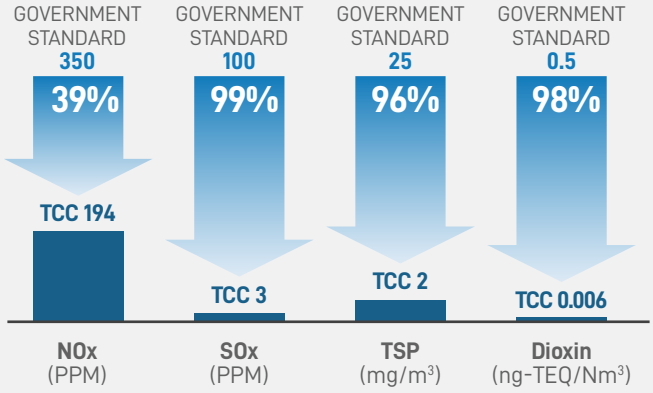
Toxic Emissions

	UNIT	2019	2020	2021	2022
Taiwan	Metric Tons				
NOx		6,388	6,164	6,473	5,427
SOx		79	106	113	65
TSP		305	249	214	158
Direct Mercury Emissions		0.22172	0.27546	0.27876	0.226347
VOC		0.00616	0.00457	0.00422	0.00428
Mainland China					
NOx		14,973	12,089	9,908	8,207
SOx		1,632	1,293	997	1,096
TSP		1,051	827	569	317
Direct Mercury Emissions		<0.0001	<0.0001	0.005	0.005

Toxic Emissions Intensity

	UNIT	2019	2020	2021	2022
Taiwan	ppm				
NOx		265	224	215	194
SOx		3	4	3	3
TSP		2	2	1	2
Mainland China					
NOx		209	170	143	138
SOx		30	26	16	15
TSP		9	7	5	4

Note 1: The emissions were calculated as the emission factors of the third-party testing multiply by the usage data. Note 2: Starting from Q3 of 2018, heavy metal monitoring data was added at the request of the Environmental Protection Administration. The heavy metals (lead, cadmium, mercury, arsenic, and hexavalent chromium) emitted in 2022 was 0.94517 metric ton. Note 3: Starting from Q4 of 2018, the cement plants reported mercury emissions in accordance with legal requirement. There was no mercury emitted by RMC plants. Note 4: The Hualien Plant did not operate in 2022 and thus had no air emissions. Note 5: The dioxin emissions at the cement plants in 2022 were 0.7576 g I-TEQ. Note 6: The business of our RMC plants was cement product ingredients mixing and transportation and thus had no air pollutant emission. Note7: Shaoguan Cement Plant in Mainland China was completed construction in November, 2021, thus Shaoguan Plant's air pollution data was included from 2022.



Water Usage Intensity

	UNIT	2019	2020	2021	2022
Taiwan	m^3/ Metric Ton of Cementitious Materials	0.38	0.36	0.30	0.29
Mainland China		0.33	0.33	0.32	0.31

Alternative Materials & Fuels

	UNIT	2019	2020	2021	2022
Taiwan	%				
Thermal Substitution Rate of Alternative Fuels		0.01	0.14	0.91	4
Alternative Raw Materials Used		19	22	24.3	23
Clinker Content in Cement		94	93	93	93
Mainland China					
Thermal Substitution Rate of Alternative Fuels		0.05	0.18	1.25	8
Alternative Raw Materials Used		17	22	23	25
Clinker Content in Cement		81	81	79.5	78.9

Waste Co-processing

	UNIT	2019	2020	2021	2022
Taiwan - Industrial Waste	Metric Tons	-	-	-	1,101,240
Mainland China - General & Hazardous Waste		83,686	7,955,442	8,239,132	8,129,651

Environmental Investments

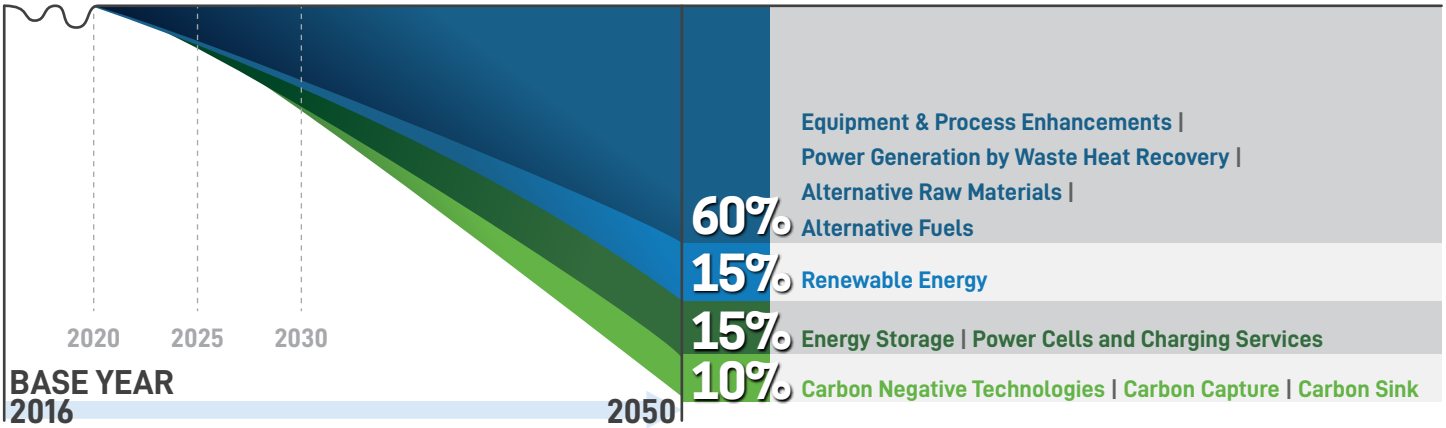
	UNIT	2019	2020	2021	2022
Taiwan	Million NT$	256	209	213	221

Note 1: The water use data on cement plants is the sum of the reported data. The municipal water use on RMC plants is the sum of water used on the water bills, and the groundwater data is the sum of the reported data, as the water use data is subject to the actual months of water use. The municipal water use data on Operation Headquarters is the sum of water used on the water bills. Note 2: The scope of disclosure is the water for which TCC holds water rights. Disclosure of groundwater began in 2019. The water use data for the water for which TCC holds no water rights in 2020 is estimated on the basis of sales. Note 3: All the sources of water are freshwater. Note 4: TCC employed WRI's Aqueduct Water Risk Atlas to conduct analysis with the distribution of water resources in Taiwan taken into account. The result revealed that all the operation sites in Taiwan are not located in the regions of high-water stress. Note 5: Since the Hualien Plant did not operate in 2022, the scope of data disclosure for 2022 covers Suao Plant and Hoping Plant. Note 6: Based on the cementitious materials yield of 5,629,943.3250 metric tons in 2022, the water withdrawal intensity per unit cementitious materials is 0.000293 million liters per metric ton of cementitious materials. Note 7: The increase in water use data in Taiwan's RMC Plants in 2022 compared to 2021 is attributed to the expansion of scope. Note 8: The water discharge from cement plants in Mainland China amounted to 2,125.67 million liters, while the water discharge from grinding plants amounted to 5.20 million liters.

Environmental Certifications

CERTIFICATION	CEMENT PLANTS	RMC PLANTS	OPERATION HEADQUARTERS
ISO 14001 - Environmental Management Systems	✓	✓	✓
ISO 14046 - Water Footprint Verification	✓	✓	
ISO 14064 - Greenhouse Gases	✓	✓	✓
ISO 14067 - Carbon footprint of products	✓	✓	
ISO 46001 - Water Efficiency	✓	✓	
ISO 50001 - Energy Management System	✓	✓	
BS8001 - Circular Economy	✓	✓	
Alliance For Water Stewardship	ONGOING		
Green Factory		ONGOING	

TCC's Roadmap to 2050 Net Zero



Note: Energy storage regulating grids can reduce the load of coal-fired power plant units and the use of diesel generators; extend equipment service life; and reduce overall carbon emissions. According to ENERGIES, take the scenario of Italy for 2030 for example, when the annual power supply from energy storage system reaches 10,000 GWh, the carbon footprints of electricity will be reduced by 53%.

Carbon Reduction Strategy

60%

Equipment & Process Enhancements
EP100 Member: Improve energy productivity by 50% by 2040

Power Generation by Waste Heat Recovery
100% cement plants installed: **20-30% reduction of purchased electricity**

Alternative Raw Materials
Calcium Fluoride Sludge | Coal ash | Desulfurization | Reducing Slag | Steel Slag etc.

Alternative Fuels
Waste textiles & used clothes | Discarded Tetra Pak and meal boxes, and waste paper | Waste plastics | Waste wood chips | Construction waste

15%

Renewable Energy Installation
Solar | Aquavoltaic | Wind | Geothermal energy | Ocean thermal energy

Support to SMEs on RE100

15%

Energy Storage | Power Cells and Charging Services

By 2025

Energy Creation
Renewable energy 500MW

Energy Storage
Global >2GWh

Charging Services
5,000-10,000 charging spots

Energy Transmission
Production capacity 3.3 GWh/year by 2024

10%

Carbon Negative Technologies

Carbon Capture
Oxy-fuel Combustion
In 2030
100,000 metric tons / year

Carbon Sink
Ho-Ping Ark Ecological Program

First semi-closed ecological system & Carbon sequestration experimental base

Low-carbon Building Materials Combined with New Energy

Cooperated with the Convenience Store Giant to Build Asia's 1st "Convenience Store on New Energy"

The first UHPC Energy Storage Cabinet in the world has been deployed in 7-11's 10,000th store in Asia—Yawan Store, Tainan.

The store can generate 5,500 kWh of green energy annually, which is equivalent to a carbon reduction of approximately 2,761 kg per year.

The First Low-carbon, Fire- and Explosion-resistant Energy Storage Cabinet in the World

TCC continues to focus on optimizing the UHPC Energy Storage Cabinet products and develops the integrated plug interface with our supplier, Busway. Outdoor and indoor energy storage cabinets are included in standardized products.

Green Energy

Energy Creation- Installed capacity of renewable energy by 2025: 500MW

Energy Storage- Global energy storage capacity by 2025: >2 GWh
Charging Service- 5,000 to 10,000 charging spots by 2025

Energy Transmission (Power Cells)- Production capacity by 2024: 3.3 GWh/year

CURRENT PERFORMANCES

198 MW By end of 2024	**>1,656.1 GHw Globally** **>1,311 charging spots** By end of 2023	**1.6 GHw / year** As end of 2022

Energy Solution Key to Energy Transition for SMEs

CURRENT PERFORMANCES

Green Energy Trading Platform Membership: 225	**Online Green Energy Consultant** Accesses 1,141	**Specialist of Energy Helper TCC** Complete planning by professionals

Waste, Alternative Raw Materials, and Recycling

TCC aims to increase resource use efficiency and promote sustainable use of Earth's resources by utilizing environmentally friendly recycled materials, minimize waste produced in manufacturing process and maximize the recycled waste volume to achieve the target of **"Zero Waste"**.

Waste Disposal

All wastes at TCC are not hazardous wastes and are conducted with off-site disposal.
A total of 978.05 metric tons of waste was disposed in 2022.

TCC cement plants have zero waste generation as all waste, including those from employee activities, maintenance waste lubricating oils and filters, etc., are recycled and turned into harmless reusable resources through high temperature in the rotary kiln process. Valuable industrial wastes like iron and metals are recovered by qualified third-party clearing agencies commissioned by TCC on a regular basis.

Alternative Raw Materials

Ratio of Alternative Raw Materials

Taiwan **28%**

Mainland China **30%**

Thermal Subsitution of Alternate Fuels

Taiwan **35%**

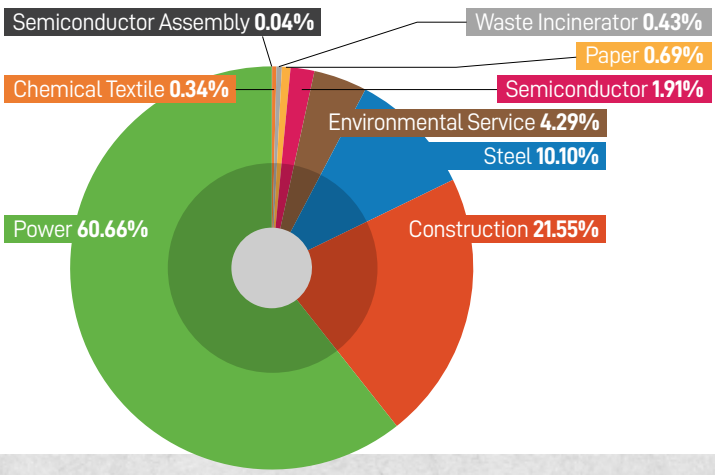
Mainland China **35%**

bsi.
BS 8001
Certified to the Highest Level of BS 8001 Circular Economy

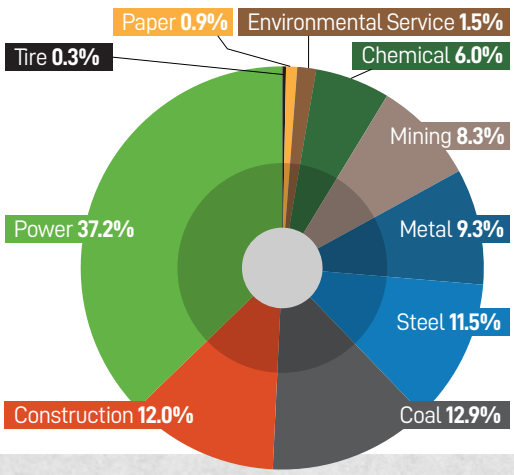
Resource Recycling

Using high temperature, high retention time, high turbulence of the cement kiln used to process and treat industrial waste to achieve a circular economy.

TAIWAN



MAINLAND CHINA



Milestone of Circular Economy: Co-processing of Domestic Waste with Cement Kilns, First in Taiwan

TCC DAKA Phase II Environmental Landmark Building–TCC DAKA Renewable Resource Recycling Center (hereinafter "RRRC") is to engage trial run in Q3 of 2023 and officially complete its construction in 2024. RRRC shall address Hualien City's waste crisis and handle 200 metric tons of waste daily.

The energy generated from processing the waste can also replace certain portion of fuels, leading to waste and carbon reduction benefits. RRRC will also become the first in Taiwan to use cement kilns for co-processing domestic waste at high temperatures, and achieve carbon reduction through recycling. TCC does not prioritize profit-making and has invested over NT$40 billion.

Water Management

TCC conducts internal and external water resource risk assessments, recycles 100% of cooling water, promotes 100% water recycling, and sets water usage standards and collect rainwater for usage. TCC utilized the WRI Aqueduct Water Risk Atlas to assess water supply at operation sites. The analysis shows that none of the sites in Taiwan face high water stress. However, TCC proactively implements water-saving solutions, including water use control, rainwater harvesting, and setting a target of 100% zero discharge of wastewater. Verification of ISO 14046 Water Footprint and ISO 46001 Water Efficiency Management System were introduced.

ALLIANCE FOR WATER STEWARDSHIP

ISO 14046
ISO 46001

100% ISO 14046 Water Footprint and ISO 46001 Water Efficiency Management System Coverage in All Cement Plants.

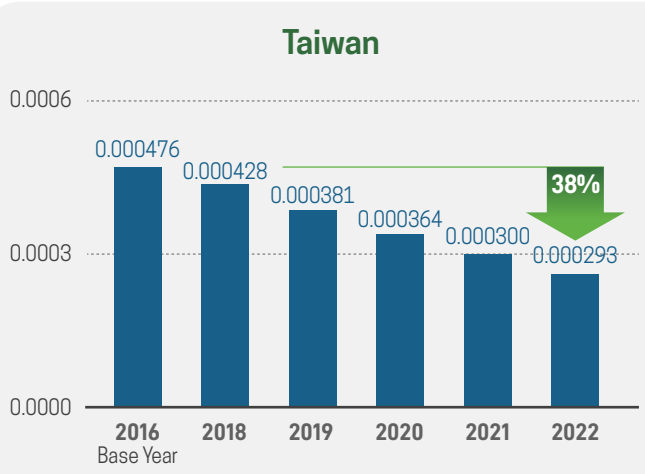
2023 TARGETS

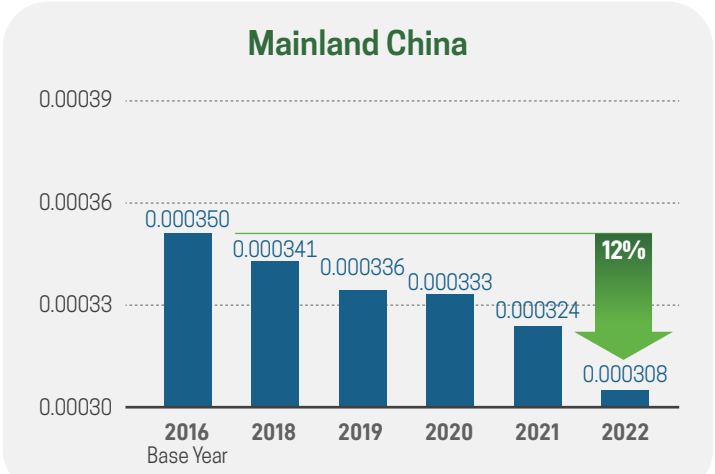
100%
Cement plants adopt AWS (Alliance for Water Stewardship) **standard**

100%
RMC plants to obtain ISO 14064 Water Footprint and **ISO 46001** Water Efficiency Management Systems

WATER WITHDRAWAL INTENSITY

Million Liters/Metric Ton of Cementitious Materials





Stakeholder Engagement Policy

Regular and consistent engagements with all stakeholders on ESG topics Including press conferences and bi-monthly press releases.

The purpose of the stakeholder engagement policy is to offer an overall framework for TCC to engage in communication and interaction with stakeholders across all the activities of TCC. Using frameworks and referencing standards such as: GRI Standards, AA1000 SES, SASB Standards, Dow Jones Sustainability Index.

1. **Respond and protect the legal rights and interests of stakeholders.**
2. **Encourage stakeholders to participate in the corporate businesses and the communities the Company operates in to bring about shared sustainable values for all.**
3. **Strengthen the bilateral communication with stakeholders, build the sense of trust, and establish long-term, stable, and firm relationships via various channels.**
4. **Improve stakeholders' level of identity with the sustainable development and ESG of the Company, including items pertaining to professional development diversity.**
5. **Maintain sustainable actions in different countries and industries through the above mentioned framework.**

Stakeholder Engagement & Quantified Communication Performance in 2022

Government Agencies	3	Employees	725
Clients	325	Shareholders/Investors	12
Local Communities	1,544	Environmental Groups/NGOs	177
Media	768	Industry Associations / Industrial & Academic Organizations	3
Suppliers / Contractors	1,173	Sustainability Associations	31

Employee Environmental Training and Awareness System

As talent is the bedrock for a sustainable corporate operation, TCC aims to develop our employees' potentials through diverse training programs and evaluate the effectiveness through performance assessments.

SUSTAINABLE LEARNING PASSPORT PROGRAM

	Sustainability	Management
EXECUTIVES	Environmental Management	Management Courses for Executives
MID-LEVEL MANAGERS		Management Courses for Mid-level Managers
LOW-LEVEL MANAGERS		Management Courses for Low-level / New Managers
TALENTS	Newcomer Training	Management Associate Program
EMPLOYEES	ISO, Important Policies	Energy Management Talent
NEW RECRUITS	Sustainable Learning Action Program	Industry-Academia Seminar Cross-Industry Forum

The Sustainable Learning Action Program began in 2023 and offers ESG programs, volunteering services, sustainable action proposal competitions, Earth Day, and diversity and inclusion certification actions. These actions are compulsory or elective with corresponding points available. Employees must obtain a minimum number of points per year, and certification badges are awarded based on the points earned. The badges are tied to annual appraisal indicators, and those with a golden badge or above are presented with an honorary certificate "TCC Sustainability Ambassador" at Town Hall Meeting.

Hsien-Te Lin, Professor from the Department of Architecture, National Cheng Kung University, shared on the trends of low-carbon architecture domestically and internationally.

Environmental (ESG) Audits

In 2022, TCC implemented the remote audit mechanism, which resulted in a higher number of units audited while reducing carbon emissions and travel costs associated with on-site audits. A total of 117 units were audited in 2022, an increase of 77 units compared to 2021. Especially, the number of units in the cement business went up from 8 units audited in 2021 to 22 units. Aside from the aspect of ethical management, the formats and data were optimized in 2022 as well, and quantified targets for ESG audits were introduced to facilitate internal sustainability management at TCC.

KEY AUDIT ITEMS

ITEM	CORRECTIVE MEASURES
Air Pollution	Electrostatic precipitators added; air purifiers improved; maintenance conducted regularly
Water Pollution	Regular checks of water meters; pipeline redesigned; wastewater reduced; wastewater flow redirected
Noise Pollution	Regular items for inspection
Renewable Energy	Inspection mechanism redesigned; SOPs and personnel training reenacted

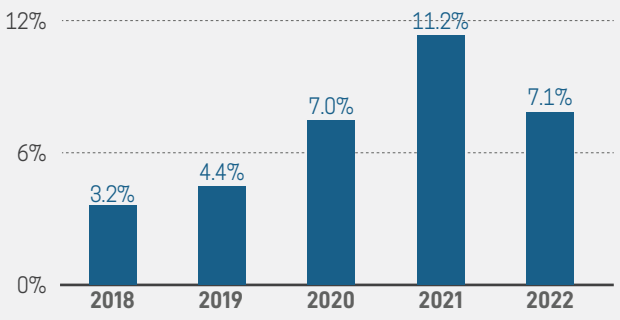
Sustainable Buildings

TCC cares deeply about environmental balance and sustainable development. Therefore, the company has encouraged RMC clients to apply for green building certifications to promote the symbiosis of buildings and the environment to achieve a sustainable environment.

TARGETS

Achieve a revenue share of concrete used in green buildings that accounts for over 5% of the overall concrete revenue by 2025. By 2030, strive to surpass 6% revenue share.

RESULTS



GREEN BUILDING CERTIFICATION STATUS OF TCC OPERATION HEADQUARTERS & PLANTS

TCC Operation Headquarters Building:
EEWH Diamond-Level Green Building

TCC DAKA Renewable Resource Recyling Center (RRRC):
EEWH Green Building and Low-Carbon Building (verifying)

TCC. C.F. Koo Building (Hangzhou):
Leadership in Energy and Environmental Design (LEED) Gold and WELL Precertified

Note: The percentage of green building applications returned to normal because the huge construction projects came to their ends and that some clients from the tech sector postponed the progress of plants under construction in 2022.

SOCIAL

TCC puts people first and believes in the value of being a people-oriented enterprise, employees are the cornerstone of corporate sustainable development. TCC complies with relevant regulations and holds quarterly labor-management meetings, strengthening employee identification towards the company.

100% of employees are covered by collective bargaining agreements.

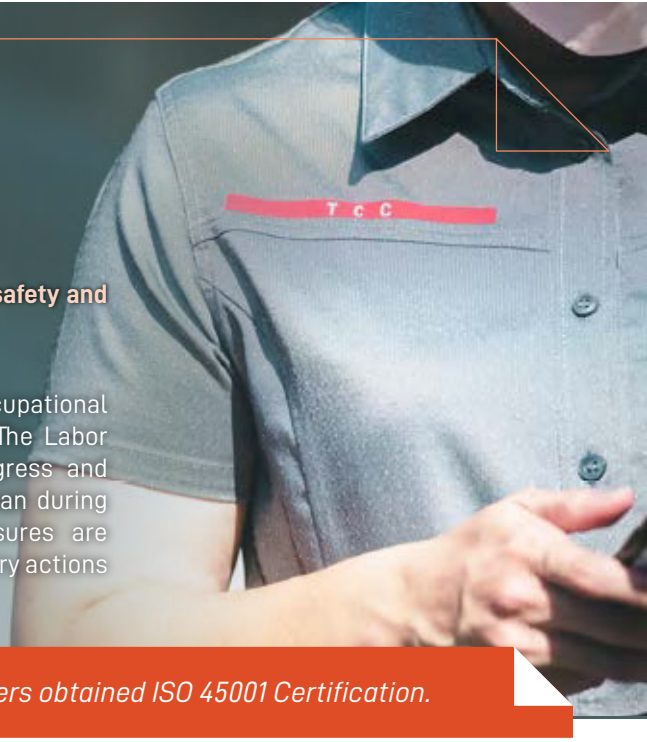
Social Metrics

Diversified Workforce	UNIT	2019	2020	2021	2022
Taiwan					
Share of Employees with Disabilities	%	1.10	1.50	1.70	1.50
Share of Employees with Indigenous Background	%	5.20	6.10	6.40	7.50
Gender Equality – Female Employees	%	17.2	17.5	18.9	19.65
All Management Positions	%	23.22	23.49	29.12	26.98
Junior Management Positions	%	23.02	23.35	26.88	27.98
Top Management Positions	%	25.00	25.00	20.00	18.18
Management in Revenue-Generating Functions	%	4.52	3.83	4.37	4.65
Women in STEM-Related Positions	%	33.87	34.41	35.20	36.55
Mainland China					
Gender Equality - Female Employees	%	-	23.35	23.54	23.54

Employment	UNIT	2019	2020	2021	2022
Taiwan					
Turnover Rate	%	9.28	6.48	8.20	8.05
Open Positions Filled by Internal Candidates	%	18.40	18.85	22.90	18.30
Employee Engagement Rate	%	93.10	94.30	94.30	98.20
Mainland China					
Employee Engagement Rate	%	-	97.50	97.50	97.30

Training & Education	UNIT	2019	2020	2021	2022
Taiwan					
Average Hours of Trainings	Hours	115.97	81.04	70.90	73.10
Amount Spent on Training	NT Mn	28.0	20.6	23.4	21.8
Mainland China					
Total Training Hours	Hours	42,967	67,844	168,812.5	84,425

Health & Safety	UNIT	2019	2020	2021	2022
Taiwan					
Lost Time Incident Rate (LTIR)	%	0.18	0.14	0.11	0.23
Total Recordable Incident Rate (TRIR)	%	0.20	0.16	0.11	0.39
Mainland China					
Lost Time Incident Rate (LTIR)	%	0.28	0.15	0.11	0.16
Total Recordable Incident Rate (TRIR)	%	0.30	0.16	0.12	0.16



Occupational Health and Safety

In 2022, 1,651 participants received education and training on environmental safety and health for a total of 5,753 training hours.
There were no reported cases of occupational disease in 2022.

TCC strives for a best healthy workplace by enforcing a comprehensive occupational health and safety policy, 100% applied to all employees and contractors. The Labor Safety and Health Office (LSH Office) monitors occupational safety progress and outcomes at TCC, presenting quarterly reports to the President and Chairman during Occupational Safety and Health Committee meetings. Corrective measures are implemented and reviewed in cases of critical accidents, along with disciplinary actions in line with respective responsibilities.

100% Cement plants, RMC plants and Operation Headquarters obtained ISO 45001 Certification.

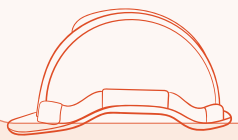
Occupational Safety and Health Committee

	OPERATION HEADQUARTERS	CEMENT PLANTS	RMC PLANTS
Chairperson	1	2	3
Number of Executives and Professionals	5	21	28
Number of Labor Representatives	3	15	17
Percentage of Labor Representatives	**33%**	**39%**	**35%**

OCCUPATIONAL SAFETY-RELATED RISK ASSESSMENT PROCESS INCIDENT INVESTIGATION AND IMPROVEMENT PROCESS

01 INCIDENT OCCURANCE

An immediate report is submitted to the LSH Office and superiors after a significant occupational accident occurred. Contractors must also notify the supervising unit via phone within 30 minutes and inform firefighting and medical services as required by regulations. The local labor inspection institution must be notified within 8 hours of a major occupational accident.



02 INCIDENT CAUSE INVESTIGATION

The LSH Office is to set up "Occupational Disaster Investigation and Handling Taskforce" after a major occupational accident. Together with department supervisors, it goes to the site for investigation and inspection. After compiling the "Incident Prevention Report" to the President, a major occupational accident investigation report review meeting is called within 1 week. The LSH Office shall brief on the process and handling of the major occupational accident.

03 INCIDENT REVIEW AND IMPROVEMENTS

All units at TCC are required to track improvement progress until completion based on proposals from the "Occupational Disaster Investigation and Handling Taskforce." A thorough review is conducted to prevent similar incidents from recurring.

Photos of major occupational accident scenes are taken and submitted, along with investigation reports, to the LSH Office as case study materials for education and training, aimed at preventing similar incidents from recurring.

SAFETY MANAGEMENT OF CONTRACTORS

TCC has established "Contractor OSH and Environmental Management Rules and Punishment Guidelines" to strengthen contractor management, requiring compliance with relevant labor safety and health regulations. Contractors must complete OSH education and training, fill out Workplace Environmental Hazards Notice and the Workplace Environmental Hazards Advice, and sign a Letter of Undertaking for Health, Safety, and Environment (HSE) before entering TCC plants, to ensure adherence to OSH rules.

The target of zero occupational injuries among contractors is set at TCC.

Employee Diversity

TCC promotes inclusivity, diversity, and equality in our culture for corporate sustainability. This is achieved through three pillars: Diverse Communication Channels, Career Women Empowerment, and Cultural Exchange Activities.

QUARTERLY TOWN HALL MEETINGS	CAREER WOMEN EMPOWERMENT THEMATIC LECTURES	CULTURAL EXCHANGE ACTIVITIES	OVERSEAS EMPLOYEE PARTIES AND EXCHANGES
The Chairman presents a keynote speech and answers questions from employees on site and through anonymous online channels, responding to their needs and recommendations in a timely manner.	On International Women's Day 2023, senior female managers are invited to share their career experiences and talk about how to strike a balance among life, work, and family, with over 300 TCC employees participating in the event.	Festivals, technical exchanges, and cultural tours are organized for employees to experience Taiwanese cuisine and traditional arts, and to exchange cultural ideas.	TCC organizes events such as parties and technical exchanges to bring our employees from different countries closer together.

FEMALE REPRESENTATION 2025 GOALS

ITEM	2022 PROGRESS	2025 TARGETS
Total Workforce	19.65%	22%
All Management Positions	26.98%	30%
Junior Management Positions	27.98%	28%
Top Management Positions	18.18%	25%
Management Positions in Revenue-Generating Functions	4.65%	5%
STEM-Related Positions	36.55%	38%

Talent Recruiting

As talent is the bedrock for a sustainable corporate operation, TCC aims to develop our employees' potentials through diverse training programs and evaluate the effectiveness through performance assessments. Through diversified on-campus talent acquisition activities, e.g. on-campus talent recruitments, matchmaking events, job fairs, briefing sessions, and topical lectures, etc.; TCC helps students understand the three core businesses of TCC. Through bilateral communication, TCC achieves cultivation of future talents with potential, in-depth school relations management, and outreach to brilliant students, benefiting the future recruitment.

IN 2023, TCC TARGETS PROFESSIONALS IN 9 AREAS

- ELECTRICITY TRADING
- RENEWABLE ENERGY
- LITHIUM BATTERY
- ENERGY STORAGE
- EV CHARGING
- CARBON MANAGEMENT
- LOW-CARBON CONSTRUCTION MATERIALS
- GREEN RESOURCES CYCLING
- ESG STRATEGIES

DIVERSIFIED GLOBAL RECRUITING

TCC recruits talents globally and has established the Foreign Employee Life and Work Support program to help foreign employees adapt to life in Taiwan, while fostering emotional bonds between foreign and Taiwanese employees.

14 *Overseas Elites Employed in Taiwan*

Human Development Metrics

TCC employed the four levels of Response, Learning, Behavior, and Results proposed by Donald L. Kirkpatrick to assess the performance of talent development. In 2022, 100% of employees underwent appraisal, excluding those onboard for less than 3 months during probation.

DEVELOPMENT PROGRAM	MEANS OF EDUCATION/TRAININGS
New Generation Energy Management Program	• Enhancing and reaching collective consensus on energy development via mutual exchanges among supervisors and employees
Core Management Competency Program	• Establish team accountability • Drive objective-management awareness

TALENT DEVELOPMENT (TRAINING) INDICATORS

HR Training Performance-Donald L. Kirkpatrick Assessment Model

LEVEL	CRITERIA	PERFORMANCE
L1.Response	INDICATOR | The average satisfaction level of the training contents	
	The average value of satisfaction survey results for the conducted courses	94.45%
	INDICATOR | The average satisfaction level of the trainers	
	The average value of satisfaction survey results for the trainers	95.02%
L2. Learning	INDICATOR | Professional certification training completion rate for 6 plants	
	The actual record of professional certification training for 6 plants	97.01%
	INDICATOR | Annual training plan achievement rate	
	Based on the annual training plan: Actual course offerings/Planned course offerings	89.29%
	INDICATOR | Employee attendance rate	
	Annual training plan: Actual course attendance/Planned course attendance	98.13%
L3. Behavior	INDICATOR | Employee engagement	
	Statistics on employee engagement - Level of identification with the work development aspect	87.80%
L4. Results	INDICATOR | High-performance employee retention rate	
	Retention rate = 1 — Employee turnover rate	91.95%
	INDICATOR | Employee turnover rate	
	Number of employee departures (voluntary + involuntary) in 2022 / Number of employees in service as of the end of 2022	8.05%

HUMAN RIGHTS POLICY EDUCATION AND TRAININGS

Annual sign-off for significant policies are implemented by mandatory annual education and training for all employees; these include significant policies such as Human Rights Policy, Statement of Integrity and Ethical Conduct, and Sexual Harassment Prevention Policy. These policies are included in the mandatory courses and all personnel must complete the tests after reading the policy documents. 100% of all new recruits sign the Statement of Integrity and Ethical Conduct.

2022, the online reading rate of employees reached 98.14%, and a total of 3,005 hours of training were delivered.
(based on the reading time of 15 minutes per document)

Salary and Bonus

TCC's governance and company management objectives do not only focus on operational results but also take into account of top management's visions, department goals and personal KPIs. They are also linked with sustainability goals and social responsibility.

100% of Employees in TCC Group Enjoy Quarterly and Performance Bonuses

PERFORMANCE BONUSES

KPIs include work objectives and behavior. KPIs also include items such as risk management, sustainability management, and information security control and other items aligned with company goals. The KPI assessment results are completely linked with corporate governance, overall operational performances, and sustainability development.

QUARTERLY BONUS

TCC started the quarterly bonus program in 2018 to share the fruits of labor with those outperforming employees. Quarterly bonuses are based on quarterly EPS targets and other key performance indicators. To achieve the goal of carbon neutrality by 2050, all plants set their carbon intensity targets in 2021, with the performance of which counted in the quarterly bonuses for an ongoing incorporation of social responsibility in corporate operation for a sustainable business.

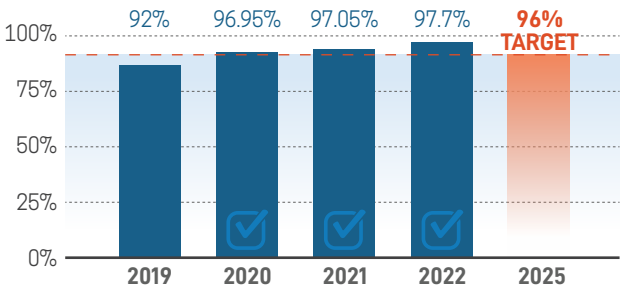
Criteria include topics such as:

- Work safety
- Environmental protection
- Carbon emissions reduction
- Quality, information security
- Anti-corruption, anti-bribery, etc.

Employee Stock Option Program (ESOP)

ESOP PARTICIPATION TCC GROUP (TAIWAN)

100% of the employees at are eligible for ESOP.



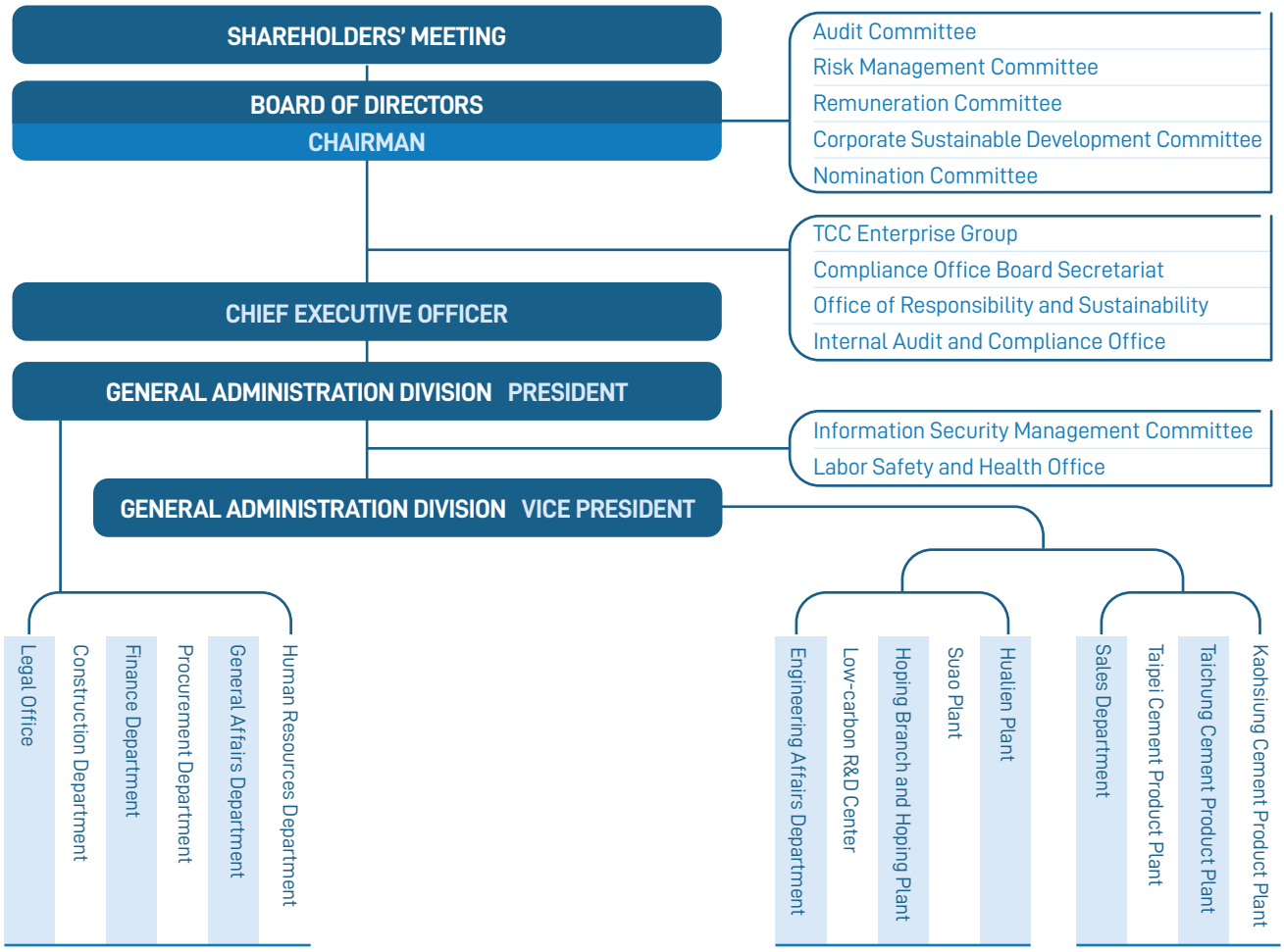
TREASURY SHARES PROGRAM

55.3% of employees of Taiwan-based operations with outstanding performance are entitled to Treasury Shares Program.

The program is to encourage the long-term development of management-level employees. Employees in Taiwan and overseas subsidiaries are all eligible to participate in this program. Also, performance indicators to appraisal are tied the sustainable development goals. Examples of the indicators to appraisal include the performance on the strategic development execution of carbon capture, microalgae cultivation, and renewable energy development. In 2022, the average participant rate of Group is 36.9%.

GOVERNANCE

Organizational Framework



Note 1 : The Taipei, Taichung, and Kaohsiung RMC Plants include 19 branches and 3 distribution stations.
Note 2 : The Hualien Plant includes an RMC plant.
Note 3 : Research & Development Department is renamed as Low-carbon R&D Center on June 1, 2023.

Governance Performance Highlights

FEMALE BOARD REPRESENTATION	REDUCTION OF BOARD SEATS	BOARD INDEPENDENCE
26.66%	**-21%** (19 to 15)	**21% → 33%**

CORPORATE GOVERNANCE EVALUATION	TOTAL HOURS OF INTEGRITY & ETHICS TRAININGS (All TCC Employees)	INFORMATION SECURITY TRAININGS
Top 5%	**2,129.8 Hours**	**1,200 Hours** (219 Participants)

Board of Directors

*The 24th Board of Directors of the Company Consists of **15 Directors** (5 Independent Directors Included) with a **100% Attendance** (Presence by Proxy included).*

	NAME	GENDER	AGE 31-50	AGE >50	FUNCTIONAL COMMITTEES AUDIT	REM.	RMC	CSDC	NOM.
Directors	An-ping (Nelson) CHANG Chairman	MALE		●				**CONVENER**	**CONVENER**
	Kung-Yi KOO	MALE	●						
	Eric CHEN Sun Te[Note1]	MALE		●					
	Por-Yuan WANG	MALE		●					
	Kenneth C.M. LO	MALE		●					MEMBER
	Kang-Lung (Jason) CHANG	MALE		●					
	Chi-Chia HSIEH	MALE		●					
	Chien WEN	MALE		●					
	Chi-Te CHEN	MALE		●					
	Chun-Ying LIU	FEMALE	●						
Independent Directors	Victor WANG	MALE		●	**CONVENER**	MEMBER	MEMBER	MEMBER	
	Yu-Cheng CHIAO	MALE		●	MEMBER	**CONVENER**			MEMBER
	Lynette Ling-Tai CHOU	FEMALE		●	MEMBER	MEMBER	MEMBER		MEMBER
	Mei-Hua LIN	FEMALE		●	MEMBER	MEMBER			
	Sherry S. L. LIN	FEMALE		●	MEMBER	MEMBER	**CONVENER**		MEMBER

Note 1 : The Representative was changed from Mr. Jong-Peir Li to Mr. Eric Chen Sun Te under the notification of C. F. Koo Foundation made on August 12, 2022.
Note 2 : Mr. Jong-Peir Li resigned from the Corporate Sustainable Development Committee on August 12, 2022, which was assumed by Mr. Roman Cheng on December 13, 2022.

Functional Committees and Responsibilities

AUDIT COMMITTEE

100% Attendance

Stipulation and amendment to the internal control system and protocols for significant financial and business activities, auditing of marketable securities, financial statements, and matters involving Director's conflict of interest, etc.

Committee Charter

REMUNERATION

100% Attendance

Formulation and review of policies concerning the performance assessments of the Directors and managers as well as their compensation; evaluation and stipulation of the compensation for the Directors and managers on a regular basis.

Committee Charter

RISK MANAGEMENT

100% Attendance

Execution of the risk management decisions approved by the Board of Directors and supervision of the establishment of TCC's risk management mechanisms; oversight of the execution and coordination of the overall risk management.

Committee Charter

CORPORATE SUSTAINABLE DEVELOPMENT Note1

100% Attendance

A decision-making and supervisory body over the Company's relevant efforts in the sustainable development, including Governance (G), Environmental (E), and Social (S), to strengthen the Company's management system, contribute to environmental conservation, and exercise our social responsibilities for the Board of Directors to fulfill its responsibilities in the protection of the interests of the Company as well as our employees, shareholders, and stakeholders.

Committee Charter

NOMINATION

100% Attendance

Stipulation of the election of the Directors (Independent Directors included) and the senior management; formulation and review of the ESG Professional Development Program for Directors, the management performance of Directors, the evaluation of members of the Board of Directors, and the succession plan of senior management a regular basis.

Note : Attendance rates include presence by proxy.
Note 1 : Committee member includes President Roman Cheng; Mr. Jong-Peir Li resigned from the committee on August 12, 2022, which was assumed by Mr. Roman Cheng on December 13, 2022.

External Evaluation of the Board of Directors – **Excellent**

"Rules of Performance Evaluation of Board of Directors" has been stipulated at TCC to evaluate the Board of Directors and the Functional Committees on a regular basis. The areas covered in the evaluation include the involvement in the corporate operation, improvement of the decision-making quality of the Board, composition and structure of the Board, election of Board Members and their continuing knowledge development, and internal controls.

KPMG Advisory Services Co., Ltd. was commissioned by TCC to conduct the evaluation with the 2022 Board Performance Evaluation Report submitted on February 10, 2023.

Performance Evaluation Report

Ethical Management

Ethical Management Governance

The implementation of the Ethical Management system is reported to the Board of Directors at least once a year.

The Audit Committee oversees the achievement of management system goals at TCC. An "Anti-Corruption and Anti-Bribery Operation Team" has been established. The Legal Office leads and supervises the promotion, planning, and consultation of the management system in different departments, as well as audits the assessment of management system design and implementation effectiveness. The President takes overall responsibility for the operation and compliance of the management system, delegates tasks to relevant parties, and maintains effective communication with personnel at all levels within the organization. Department managers are responsible for managing and monitoring corruption or bribery risks in their respective departments' daily operations.

Board-level Audit Committee responsible for overseeing ethical management system goals.

ISO 37001 Anti-bribery Management Systems – Annually Reviewed

To ensure a better alignment of the practical operations of the Company with the ISO 37001 systems, the directions and forms related to ISO 37001 systems were amended respectively in 2022. For instance, TCC added "Integrity Code" to differentiate the contents of the code; to perform due diligence prior to any employee transfer or promotion; and added "Business Partner Corruption Risk Assessment and Due Diligence Procedures" as the necessary procedures for ongoing improvement of ethical management.

ISO 37001

All-round Ethical Management & Trainings

DIRECTORS

Directors regularly receive anti-corruption and anti-bribery training materials via mail or hardcopy and are required to sign the "Letter of Commitment for Compliance with Ethical Management, Anti-corruption, and Anti-Bribery." In 2022, all Directors received the necessary education and training and signed the Letter of Commitment.

BUSINESS PARTNERS

Suppliers | TCC requires all suppliers to sign the Supplier Code of Conduct, in which items related to ethical management are included.

Contractors | The contractors to the cement business (e.g., outsourced personnel like security guards, cleaning services, etc.) were prioritized for introduction, and promotions to all the sites of cement business in Taiwan were completed in 2022.

Clients | Credit evaluation is conducted to cement clients, in which provisions of ethical management are included.

ACTIVE EMPLOYEES

Active employees are required to participate in the anti-corruption and anti-bribery training courses at least once a year with records kept to fully understand related regulations and the possible risks and consequences of any violations.

NEW RECRUITS & INTERNS

Required to sign the Statement of Integrity and Ethical Conduct on the date of employment and receive promotion of the anti-corruption and anti-bribery policies within 90 days thereafter with records kept.

*New recruits: part-time and casual employees included.

Reporting System & Whistleblower Protection Mechanism

Possibility for anonymous reporting,
TCC is committed to ensuring the confidentiality protection for whistleblowers.

TCC encourages individuals both within and outside the company to report any corruption, bribery, unethical behavior, or misconduct. TCC has established a "Reporting Mechanism for Violation of Code of Conduct" to facilitate such reporting.

TCC has enhanced our reporting system by adding a channel for reporting senior management. In cases of misconduct involving senior management, whistleblowers have the option to report directly to the Audit Committee. Furthermore, TCC has established an independent reporting mailbox and hotline for individuals within and outside the Company to report any concerns.

Reports and Grievances in 2022

REPORTING AND GRIEVANCE CHANNEL	NO. OF CASES
Reporting Mailbox	9
Audit Committee Mailbox	6
Employee Grievance Mailbox	15
Cases involving ethical management violation	12
Cases involving discrimination or harassment	1

Expenditures on Public Participation (Past 4Years)

TOTAL AMOUNT ALLOCATED (NT$)	2019	2020	2021	2022
Political Lobbying, Interest Representation	0	0	0	0
Local, Regional, or National Political Campaigns, Organizations, and Candidates	0	0	0	0
Chambers of Commerce or Tax-Exempt Organizations (e.g. thinktank)	10,936,559	11,832,811	12,286,514	14,340,841
Matters Related to Election or Referendum	0	0	0	0
Total	**10,936,559**	**11,832,811**	**12,286,514**	**14,340,841**
Information Coverage	100%	100%	100%	100%

Risk Management

TCC sets risk management policies and principles through the meeting of the Board of Directors in August 11st, 2020 to strengthen corporate governance and establish a comprehensive procedure to mitigate various risks. The Company sets goals according to various controllable risks and links performance to pay and bonuses.

BOARD OF DIRECTORS

RISK MANAGEMENT COMMITTEE

3 Independent Directors
2 Female Directors

EXECUTIVE SECRETARY

- **Financial Risks |** Finance Department
- **Legal Risks |** Legal Office
- **Operation Risks |** Engineering Affairs Department, Sales Department, Research & Low-carbon R&D Center
- **Personnel Risks |** Human Resources Department
- **National Security Risks |** Office of Responsibility and Sustainability, Finance Department
- **Information Security Risks |** Information Security Management Committee
- **ESG Risks |** Office of Responsibility and Sustainability

TCC Group listed seven major risks for analysis; various departments then draft strategies to mitigate related risks based on the analysis. The Risk Management Executive Committee reports progress and results to the Board of Directors every year.

Data Protection and Privacy

TCC Group aims to protect important information systems and the privacy, comprehensiveness and usability of data. The Information Security Management Committee was established following the ISO 27001 Information Security Management to set up data security standards and assessments. The administrative review and examination of the information security policy and relevant regulations in every December ensure an effective implementation of information security protection. TCC Group Information Security Policy was stipulated in 2022.

TCC GROUP INFORMATION SECURITY POLICY

ISO 27001 Information Security Management System obtained in January, 2021
Passed external recertification audits continually (2021/12 & 2023/01).

TCC established the Information Security Management Committee in 2020. Within the Board of Directors, there is one director with information security experience. In 2022, a Chief Information Security Officer (CISO) was appointed and a dedicated information security team were instituted for the implementation and promotion of information security of the Group. The CISO serves as the committee chair and reports to the Board of Directors on a regular basis. The Committee convened 4 sessions, with a special focus on the improvement of the information security of energy business.

BOARD OF DIRECTORS CHAIRMAN — **Information Security Management Committee**

CISO

Dedicated Information Security Team