

We Believe:
"When people begin to understand
and care for each other, this is the
beginning of Civilization."
The same is true with enterprises.

Lookout Tower

Bridge Generations



Scan the Cover for 3D Cement Magic
Description on Page 2



 **CARBON NEUTRALITY**

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which has been offset by the 5 metric tons carbon credit the Company applied to the EPA.

 **MIX**
Paper from
responsible sources
FSC™ C006330

TOTAL
CLIMATE
COMMITMENT

TOTAL
CARE
COMMITMENT

Nature has no boundary,
Beautiful sunshine has no sound,
Strong wind has no shadow,
Every living thing has no flaw,
Sweet flower fragrance has no color,
life has no price.
Kindness has no words,
Love has no demands,
Cement has no limits.

NAC
June 2021



STEP-01
Download AR Tool
marq+ APP



STEP-02
Run marq+ APP
And Scan



STEP-03
Scan the Cover
for 3D Cement Magic
Nature-Sine Qua Non

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This is the story of an island in the southeastern part of the Western Pacific Ocean, but if you lift the huge 75-year-old tree rings, ring by ring, you will see the guardian gray color with the bricks, mortar and tiles, and you will find that this is also the story of the Taiwan Cement Company (TCC).

Looking back on human history, cement has always been the foundation of civilization - houses, bridges, ports, airports, dams, factories - of the structures of modern civilization. Cement is the substance used by humans second only to water and air in quantity. Just like air and water, cement is always present in our lives. Throughout the long years, concrete has been covered by brick walls, plants, wood grain, glass curtains, gorgeous decorations, rain, light and shadow, and clouds, but has still ultimately formed the trajectory of our daily life. For TCC, cement is only an interface, which binds TCC to human life.

Over the past 75 years, the Republic of China has made major economic and social developments in which TCC has always played a front-line role. One such example is The Ten Major Construction Projects which included reservoirs, dams, ports, roads, airports, and other major structures. Dam after dam stores water, the tide breakers protect the harbors and ports, bridge after bridge allow people to cross rivers and ditches, freeway after freeway reach the horizons, and they are literally touched and stepped on by everyone everyday, thus forming a solid foundation for daily life.

Looking back at this period of history, there are all kinds of major construction projects on the island, all of which witnessed the active participation of TCC. In other words, in the developmental history of Taiwan's transformation, TCC was present.

In Taiwan's transition from an agricultural to an industrial and commercial society, TCC was there;

TCC led the development of Taiwan's capital market;

TCC was the cornerstone of government's Ten Major Construction Projects;

When Taiwan leaped onto the international arena, as one of the Four Little Asian Dragons, TCC was there. In fact, in the vast current of Taiwan's history, TCC has never been absent.

Beginning with TCC's successive chairmen, Mr. Lin Boshou, Dr. CF. Koo, and his son Leslie Koo, TCC has considered the entire society from a gestalt cement point of view. In land, rocks, geology, air and water, we continue to explore the complex relationship between Man and Life, and between Man and Nature. We are a green environmental engineering company that deals with the complex relationship between human civilization and Mother Nature. Cement has always been a lonely traditional industry. People may not realize that cement is the lasting adhesive of civilization, In fact, cement is just like air. It is always there. Just as we do not feel the presence of air, we may not feel the presence of cement, either. This has been the case in the past, and it most likely will be the case in the future. Even with this sharp gap in understanding, TCC will continue to seek the future balance between Man and Nature.

//Humanity must move forward;
this problem can only be solved by industry
and our values of life facing it together.//

TCC Will Build a Bridge Leading to the Next 75 Years.



We must believe that the impact of greenhouse gases and carbon dioxide emissions on this beautiful blue planet will become more and more intense, making it harder to turn back the clock. 100 years from now, how would we want future generations to judge our time? 500 years from now, how would they evaluate our choices? Our current decisions will determine the outlook of Mankind in the future.

//Broaden thou heart to accept the worldly differences.
Settle thou heart to discuss worldly issues.
Humble thou heart to look for the worldly truth.
Calm thou heart to face worldly challenges.//

These four sentences were Chairman Dr. CF. Koo's expectations for TCC half a century ago. On the occasion of TCC's 75th anniversary, we still follow the expectations of the Chairman Dr. CF. Koo. We are still looking forward to the future of Mankind and the relationship between Mankind and Nature.

Today in 2021, all environmental destruction and climate change are no longer just a news item on TV, nor a legend in the books of children, or a prophecy that is still far away. The crisis of global warming has been thrust upon us. Global warming and climate change like viruses have no borders.



Over a third of the time between the Paris Agreement in 2015 to the critical year of 2050 has already passed. The next ten years will determine the direction of human progress. TCC is fully committed and is standing on the spur of time, advancing step by step. Today, if an industry does not have its own awareness of the importance of our environment, it will not be able to come up with interim solutions in 2025, will not be able to bear fruit in 2030; and not be able to reach the ultimate goal of carbon neutrality in 2050.

In 2018, TCC from Taiwan crossed the Maritime Silk Road and established a joint venture company with a Turkish partner, Oyak Cement Cimento Beton Kagit. We established our European headquarters in Amsterdam, and operate the largest cement company in Portugal, Cimpor Global Holdings B.V. TCC successfully entered Europe, the continent that had once changed the destiny of mankind, to deploy in the future carbon exchange market.

We continue to invest in the production facilities in Europe and Central Asia. In 2019, TCC entered Côte d'Ivoire (Ivory Coast in Africa) to build an environmentally friendly cement plant. We attach great importance to greenhouse gas management and actively carry out research and development of environmentally friendly raw materials for cement. We have recently put into production state-of-the-art low-carbon cement. Compared with the clinker of ordinary cement plants, the new raw materials have reduced carbon dioxide emissions by 70%. From the end of 2019, TCC took the initiative to formulate a carbon reduction path based on the methodology of the United Nations Climate Group IPCC scientists and the International Energy Agency, TCC took the initiative to propose a science-based carbon reduction target SBTi commitment by 2025 to reduce greenhouse gas emission intensity by 11%.

In 2020, TCC established environmental protection technology companies and resource recycling companies in Beijing, Hangzhou, and Guangxi, in Mainland China, to develop RDF/SRF waste-derived fuel technology. At the same time TCC assists in the disposal of local waste. The Guigang plant, which has the largest hazardous waste disposal capacity in the PRC was officially opened on April 5th, 2020. It has since become the city's waste purifier. Waste treatment and disposal is our 2030 Solution.

In April 2020, the Hualien Hoping Plant qualified and secured the first heavy industry tourism plant certification in the Republic of China. This was the result of the joint efforts made by our diligent colleagues, the Ministry of Economic Affairs, Hualien County, and local residents. We opened the doors of the once closed plant and established the "DAKA Ecological Cycle Park of TCC". In September 2020, after one and a half years of hard work and three environmental impact assessments, the "Renewable Resources Utilization Center" was launched to co-process 150 tons of waste per day in Hualien County using the high cement kiln temperature of 1,300°C. This is the TCC's deployment plan. It is like playing five games of chess with completely different strategies at the same time. Each game faces a different situation. There might be a gap in progress, but they are looking in the same direction. We should replace rivalry with dialogue, and continue to promote dialogue between industry and society. These are our most important topics.

TCC has clearly outlined our blueprint for 2025 and is now diligently advancing in this direction step by step. We are working hard to explore a possible blueprint for 2030 and look forward to completing the outline of carbon reduction and building new visions over the next two years.

The Paris Agreement objective to achieve carbon neutrality by 2050 concerns every one of us, and more importantly, our next generation. It depends on every inhabitant of this planet working together and continuing to advance in the same direction so that the final goal may be achieved.

The DAKA environmental recycling village project under the slogan of "Excellent Recycling, Beneficial Peace (Hoping)" that TCC has launched at the Hualien Hoping Plant is the first step of our 2021 action plan. TCC has always respected the close and complex relationship between Humans and Nature in the use of land, rocks, air and water, keeping Humans foremost in mind as we strive to return clean air, water, and soil, along with clear, blue skies to both Nature and to Mankind.

TCC believes in the value of being a people-oriented enterprise, a team which operates in good faith, with a sense of responsibility, and zeal to complete our mission. We are an organization that has dreams but is not daydreaming, achieving its goals systematically according to plan. In this way, we will have an opportunity to catch a glimpse of the yet unclear picture of 2050, and the preliminary qualifications to talk about the beautiful hopes for the future. TCC has always taken sure solid steps on its path. We start by thinking about the destiny of the Earth, and our impact on the world and on our industry over the next decade. What kind of future do we want? What should we do? Where are we going?

By the next decade, what will be the next stage of human civilization? We have the responsibility to provide to the next generation a world they can look forward to.

Next, TCC will build a bridge leading to the next 75 years. As a cement manufacturer, TCC has always played the role of a bridge builder. As in prior times, Chairman Dr. CF. Koo was a pioneer standing in the forefront, carrying TCC on one shoulder and the mission of our country on the other. TCC has always been a bridge, in the continuous timeline of history, and bearing the responsibility of the times. It is a bridge that crosses many difficulties, a bridge that spans across transition processes, a bridge that allows all to move forward steadily, a bridge that allows one era to flow smoothly into the next, a bridge that encourages humanism and also a bridge that carries human civilization.

//Cement is the bond that
propels human civilization forward.

In the future,
TCC will continue to build the bridge
for the next 100 year cycle of prosperity.//



YEAR 2020

CO₂ Emissions Intensity
Cementitious Material
/Metric Tons

-4.2%

base year 2016
*Revised accordingly in June 2022
based on the SBT value

+129 Million
kWh

Renewable
Electricity
Generation
accumulated to 2021

1.025 Million
Metric
Tons

Waste
Treatment
Volume

Waste
Heat
Recovery
Efficiency

+60.64%

compared to 2018

NO_x -16%

SO_x -5%

TSP -43%

base year 2016

23.05%
/Metric Tons

Reused
Cement
(Alternative
Materials Used)

58.3
Million

Social Welfare
Contributions

100%

Retirees Enjoy
Three Insurance
Coverages
Medical
Accident
Life

60+

Near
200%
Company
Contribution
Ratio in Employee
Stock Trust

46%

Maternity
Allowance
Apply
Rate

33,963

Different Taxa of Plant DNA Stored
as of Dec. 31, 2020

-30.17%

Employee
Turnover Rate

DAKA

TCC DAKA
Social Impact
SROI
3.54_{NT}

ESG Sustainability Highlights and Targets				
		2025	2030	2050
Base Year 2016	GHG Management (Taiwan)	-11% Science-Based Target (SBT)	-31%	Carbon Neutral Concrete Products 13 17
	GHG Management (Mainland China)		-20%	Carbon Neutral Concrete Products 13 17
	Emissions Management (Taiwan)	NO _x -50%	-70%	BACT ¹ Minimum 13
		SO _x -30%	BACT ¹ Minimum	BACT ¹ Minimum 13
		TSP -50%	BACT ¹ Minimum	BACT ¹ Minimum 13
	Emissions Management (Mainland China)	NO _x -50%	-70%	BACT ¹ Minimum 13
		SO _x -60%	-70%	BACT ¹ Minimum 13
		TSP -60%	BACT ¹ Minimum	BACT ¹ Minimum 13
	Waste Recovery (Taiwan)	1.25 million metric tons	1.57 million metric tons	2.5 million metric tons 13 11 12
	Waste Recycling (Mainland China)	10 million metric tons	12.5 million metric tons	15 million metric tons 13 11 12
	Renewable Energy	Manage 500MW	Manage 700MW	Manage 1GW 7
	Carbon Capture		100,000 metric tons/year (accu.)	1.6 million metric tons/year (accu.) 13
	Conservation of Endangered Plant Species	More than 35,000 taxa	More than 40,000 taxa	More than 45,000 taxa 15
	Mine Restoration Biodiversity BMP ²		90% Indigenous tree species restored	95% Indigenous tree species restored 15
	TCC DAKA Community Engagement CEM ³	Recognition rate over 85% Coverage at 60% of operational points	Recognition rate over 95% 100% coverage of operational points	Recognition rate over 97% 100% coverage of operational points 8 10
	Cement Academy (Since 2012)	Estimate total fund of NT\$30 million	Estimate total fund of NT\$60 million	Accu. total fund of NT\$180 million 1 2 3 4
	Employee Training and Development (Avg. NT\$25 million per year)	Accu. total investment of NT\$125 million	Accu. total investment of NT\$250 million	Accu. total investment of NT\$750 million 4 8
	Supplier Management	■ Conduct on-site audits on 80% of Critical Tier 1 suppliers ■ Conduct GHG inventory on 100% Critical Tier 1 suppliers	■ Conduct on-site audits on 100% of Critical Tier 1 suppliers ■ 50% carbon reduction by Critical Tier 1 suppliers	■ 50% carbon reduction by all suppliers 13 17
¹ BACT : Best Available Control Technology ² BMP : Biodiversity Management Plan ³ CEM : Community Engagement Management				
<div>1 NO POVERTY 2 ZERO HUNGER 3 GOOD HEALTH AND WELL-BEING 4 QUALITY EDUCATION 5 GENDER EQUALITY 6 CLEAN WATER AND SANITATION 7 AFFORDABLE AND CLEAN ENERGY 8 DECENT WORK AND ECONOMIC GROWTH 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 10 REDUCED INEQUALITIES 11 SUSTAINABLE CITIES AND COMMUNITIES 12 RESPONSIBLE CONSUMPTION AND PRODUCTION 13 CLIMATE ACTION 14 LIFE BELOW WATER 15 LIFE ON LAND 16 PEACE, JUSTICE AND STRONG INSTITUTIONS 17 PARTNERSHIPS FOR THE GOALS</div>				

Sustainability Initiatives & Ratings — Sustainability Recognitions — Low-Carbon Products




<p>Leadership Status “A-” in CDP’s Climate Change; and Leadership Status “A” in CDP’s Supplier Engagement Rating (SER)</p> 	<p>S&P Global 2021 Sustainability Yearbook Member</p> 	<p>The first company in the East Asian cement industry that completed the Science-Based Targets setting</p> 	<p>Case study company in BlackRock Investment Stewardship Annual Report 2020, first in Taiwan</p> 
<p>An MSCI ACWI constituent with a MSCI ESG Rating of “BB”</p> 	<p>Initiating member of the 2050 Climate Ambition initiative of GCCA</p> 	<p>Investment Stewardship Annual Report September 2020</p> 	
<p>One of the FTSE4Good TIP Taiwan ESG Index Constituents</p> 	<p>ESG INDUSTRY TOP RATED Among the construction materials companies in Sustainalytics</p> 	<p>Member to Business for Nature</p> 	<p>The first Taiwanese company in the traditional industry to become a TCFD Supporter</p> 

<p>Excellence in Corporate Social Responsibility Top 9 in the Large Enterprises Top 1 among the Large Traditional Industry</p> 	<p>2020 TCSA Awards: Top 1 in the Traditional Manufacturing and Energy Industries Platinum Award for the Chinese Report Climate Leadership Award/Circular Economy Leadership Award/People Development Award/Creativity in Communication Award/Social Inclusion Award/Growth through Innovation Award</p> 	<p>Silver Award, Asia’s Best Workplace Reporting, ASRA</p> 	<p>Asia’s Greenest Company of The Year</p> 
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<p>2020 Global Views CSR Annual Survey, Global Views Monthly First Prize of “Traditional Industry”</p> 	<p>CSR Annual Sustainable Elite, SGS</p> 	<p>2020 Taiwan’s Top 25 Best International Brands</p> 
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<p>TCC DAKA Creating New Values of Society Inclusivity 5th Taipei Golden Eagle Micro-movie Festival Top 10 Sustainable Micro-movie Awards</p> 	<p>The first large manufacturer in Taiwan obtaining the Tourism Factory Label Popularity Awards from the 3rd Best Reviewed Online Awards Top 50 Five-Star Public Lavatories</p> 
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HONORS IN 2020

<p>TCC Suao Plant “2020 Outstanding Manufacturer for Industrial GHG Voluntary Reduction” TCC Headquarters, TCC Kaohsiung Plant, Xiaogang Branch, Luzhu Branch, Tainan Branch, Anping Branch, Shanhua Branch, and Chiayi Branch Excellence in Green Procurement of the Year 2019</p> 	<p>The first Carbon Footprint Label for cement products in Taiwan</p> 	<p>Gold-rated Cement Portland cement Type I (17%) passed the EPA review for Green Mark</p> 
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About the Report

This is the 2020 Corporate Sustainability Report (hereinafter as the “Report”) of the Taiwan Cement Corporation(hereinafter as “TCC” or the “Company”). Upholding the principle of openness, transparency, and good faith, it faithfully discloses TCC’s efforts in the communication with stakeholders and its engagements in sustainability issues. With this Report, we endeavor to live out the business philosophy “taking from society and giving back to society” to elevate the quality of life in the future hand in hand with our stakeholders.

Reporting Period and Scope of Disclosure	The reporting period ranges from January 1 to December 31, 2020. Apart from the financial performance disclosed in the consolidated financial statement, the scope of disclosure covers TCC’s main operation sites in Taiwan. The subsidiaries thereof are not in the scope of disclosure. Nevertheless, in light of the Company’s sustainable development, part of the subsidiaries’ sustainability performances are to be presented in the Report. In addition, in consideration of information comparability, the data over the past four years will be disclosed for certain performances. The Report is published annually. Publication date of the previous issue: June 2020 Publication date of the current issue: June 2021 Publication date of the next issue: June 2022
Reference Guidelines	This Report was prepared in accordance with the Core option of the GRI Sustainability Reporting Standards (GRI Standards) released by Global Reporting Initiative (GRI) as well as GRI’s “Mining and Metals Sector Supplement” and the SASB Standards for construction materials companies.
Information Disclosure	Information of financial performance disclosed in this Report shall be subject to the published consolidated financial statements certified by a certified public accountant. All financial figures are indicated in New Taiwan Dollars (NT\$). All TWSE-listed and TPEX-listed companies are required to adopt the International Financial Reporting Standards (IFRSs) in financial statements preparation since 2013. All TCC’s financial data are thus disclosed in line with IFRSs. Other data are aggregated and calculated by TCC and are demonstrated in common values that are rounded. This Report is also available on the TCC website.
Audit and Verification	Internal Audits: The disclosed data or materials herein are provided by the respective responsible units, verified by the taskforce of Corporate Sustainable Development Committee, submitted to the executives of departments, and finally reviewed and approved by the Chairman. External Verification: A limited assurance is provided by the audit and consulting firm Deloitte in line with the Assurance Principle Communique No. 1 “Assurance Engagements Other than Audits or Reviews of Historical Financial Information” released by the Accounting Research and Development Foundation in Taiwan (with reference to ISAE 3000). Also, the verification was carried out by BSI Taiwan in accordance with the Core option of the GRI Standards and with the “Moderate” level of assurance, Type 1 assurance in the AA1000 Assurance Standard (AA1000AS). Please refer to the Appendix for relevant assurance/verification methodology and results.
Contact Information	Should you have any comment or suggestion regarding this Report, please contact us at: Yi-Chung Chen, Office of the President, Taiwan Cement Corporation

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Nature-Sine Qua Non

Nelson Wang

Vital to the Future of Humanity,
It Is the Balanced, Constant Nature and the Sine Qua Non,
i.e., the Necessary Condition, for Human Survival.

I am a cement industry person, but occasionally I remind myself that I am a person living together with the azure sea and blue sky, and return to the simple and delicate human instinct to appreciate the beauty of nature. This kind of feeling also gives me child-like curious eyes to look at nature again and see that there is a different relationship between human civilization and nature.

One day, when I was in Taitung, the Pacific Ocean appeared in front of me.

Wow!!! A sudden epiphany, a wonderful feeling of Nature’s awe surged in my heart. Have you ever experienced such a feeling when you see the vast and boundless skyline between the sea and the sky, when you suddenly feel your heart has opened up, forgetting all worries, irrelevant thoughts and desires? Have you ever smelled the faint fragrance of grass, looking from afar at the endless waves of the green prairie swaying in the breeze; or listened to the wind on the top of a mountain, and watched the endless, undulating heights? Have you ever enjoyed the moments of viewing the vista of mountains upon mountains; or moments in the forest, breathing the fresh air of the woods, watching the sun shine through the emerald-like translucent leaves, sprinkling light and shadow? Have you ever walked by a lake which reflects like a mirror yet has a clear bottom, the reflections of the mountains and waters, appearing part fantasy, part reality? At these times, we completely forget ourselves, only appreciating the beauty, seeing the truth, and looking into the depths of our souls. The heart is a vacuum, with no seven emotions and six desires of the mundane world, only pleasure and happiness and filled with contentment. One doesn’t want anything at that moment, except to be immersed in that brief but eternal moment forever.

Einstein once said: “Look deep into nature, and then you will understand everything better.”

I think this feeling is what the Greeks called “Eudaimonia”, an instinct that the deepest DNA of human beings is still connected to Mother Nature. It is telling us that the most important thing in life is our linkage to Nature. This ultimate happiness implies that there is a responsibility between Man and Nature. It is the beauty of harmony between Man and Man, and between Man and Nature. Famous contemporary natural biologist Ed Wilson thinks this feeling is “Biophilia”, the Greek word meaning “love of life”.

The two words, Eudaimonia and Biophilia are actually the innate "sense of oneness" between Man and Nature. They remind me of a slightly mysterious phrase: “Sine Qua Non”, Latin for "Required Condition". A sense of oneness with nature is a necessary condition for human survival and happiness. That is exactly the feeling of satisfaction in our hearts when we exclaim “wow”. The feeling of satisfaction in the heart. In fact, Nature is calling up the true feelings deep in our heart. Human life exists within the laws of Nature. The development of human civilization has brought about subtle changes in our understanding of Nature and our relationship with Nature to which human life has always been closely related. Birth, aging, sickness and death for human beings, turning back into soil, and nourishing other creatures, are in fact no different for a hummingbird or an ox. However, the development of human civilization along the way has alienated human emotions and attitudes toward Nature, as well as creating subtle changes in our relationship with Nature. Although Nature has always been closely related to human life, humans think they can exploit it, transcend it and exist independently.

Total Climate Commitment

TCC Stands as a Pioneer in Carbon Neutrality by 2050

//Carbon Dioxide Emission and the Balance of Nature Is the Challenge of Our Cement Industry. Taiwan Cement Will Do Our Best to Fulfill Our Responsibility and Obligation to Earth.//

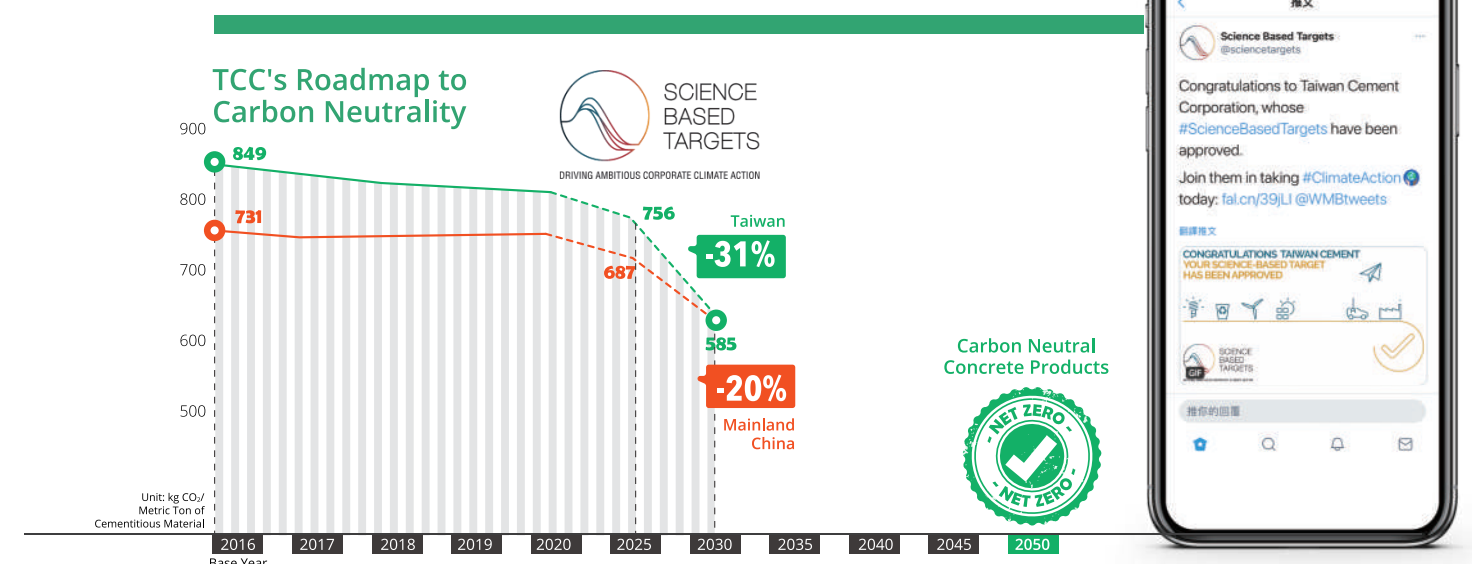
Nelson An-Ping Chang, Chairman
on "2050 Climate Ambition," GCCA
September 1, 2020

The year 2020 marked an unprecedented year. The abrupt pandemic outbreak that lingers has changed the political and economic orders worldwide while flipping the existing work and living patterns of mankind. On this temporary halt of the global flows, TCC constantly reflects on itself and examines the balance between industries and the environment, learning magnanimity and humility from Mother Nature in the face of all the unknowns and challenges.

According to the latest data from the UNEP, despite a 7% reduction of global emissions in 2020 thanks to the lockdowns, it is estimated that the global warming will still rise above 3°C by the end of this century, which is far from the 2°C in the Paris Agreement, not

to mention the 1.5°C threshold strictly adhered to by the Intergovernmental Panel on Climate Change (IPCC). The IPCC has further pointed out that only by achieving Net-Zero globally by 2050 can humanity secure a livable, sustainable future. "Carbon neutrality" thus became a universal keyword.

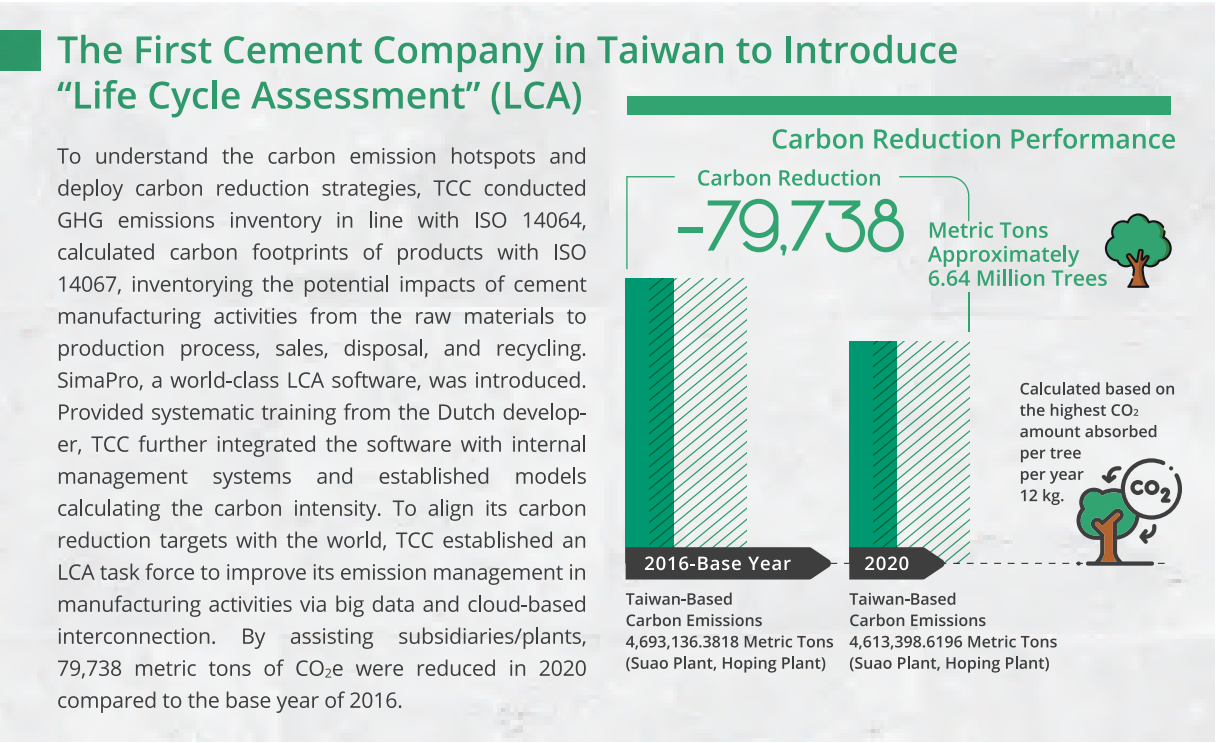
Carbon Neutrality for TCC Concrete Products by 2050, Offering GCCA a Viable Decarbonization Pathway for The Cement Industry in Taiwan.





In conformity to the UN’s climate action, TCC as a member of the global industrial community, has been proactively partaking in the Global Cement and Concrete Association (GCCA). In September 2020, TCC joined 40 pioneering cement companies world-wide in committing to deliver carbon-neutral concrete by 2050. Moreover, TCC is tasked with the mission to provide an integrated viability assessment of the decarbonization for the cement industry in Taiwan and the direction for its transition to a low-carbon development for the 30 years to come. TCC has committed itself to aggressive carbon-reducing actions and submitted the credible and rigorous Science Based Target (SBT) in 2019. Following the methodology of the IPCC and the International Energy Agency (IEA), TCC set the carbon reduction targets and pathway with the scenario of a well below 2 degrees Celsius temperature increase.

Passing the scientific review in June 2020, TCC became the first cement company in East Asia that completed its target setting while being ahead of the rest of the companies by around one years. With 2016 as the base year, the Scope 1 emissions intensity (Direct Emissions) shall be reduced by 11%, and the Scope 2 (Indirect Emissions) by 32% by the target year 2025. To fulfill its SBT by 2025 and carbon neutrality by 2050, TCC has accelerated its progress of AI smart technology. With the AI module, TCC calculates and tracks the products’ carbon intensity, inventories the local resources for carbon reduction, conducts benefit evaluations, consolidates optimal strategies, and constantly adjusts and optimizes solutions, ushering in opportunities via conceptual and technological advancements.





Strategy 7-
Installation of
Renewable Energy

Electricity accounts for 3-4% of the energy consumed in the cement manufacturing process. TCC has planned to install solar power and energy storage systems on the rooftops of Suao and Heping Plant with a total capacity of 6,848 kW, which will be completed in phases in 3 years to fulfill our renewable energy obligation.

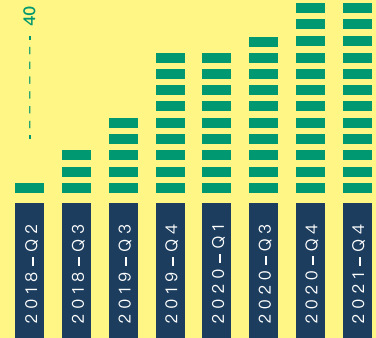
In addition, TCC Green Energy Corporation, a subsidiary of TCC, takes it further by investing more in solar energy and onshore wind power installations. It engaged in diversified renewable energy development like Taiwan's first joint fishery-solar power plant in Taiwan and geothermal energy. By the end of 2020, the installed capacity in operation was 35.7 MW, with 43.43 MW under construction and 109.2MW in planning. The projected installed capacity by 2021 Q4 is approximately 79.88 MW, with over 129 million kWh of power generated, reducing about 65,815 metric tons of CO₂e, equivalent to the annual power consumption of 36,901 households.²

²Based on the latest figure of an average monthly energy consumption of 292 kWh per household in Taiwan in 2018 according to the website of Taipower.

Over 129 Million kWh
of Power Generated

65,815

Metric Tons of
Carbon Emissions
Reduced



As of 2021 Q4

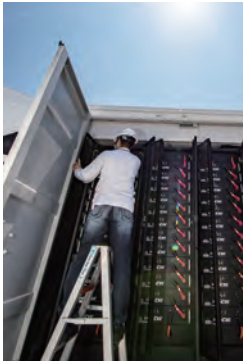
Unit: MWh (1,000kWh)

TCC's Energy Business
Development



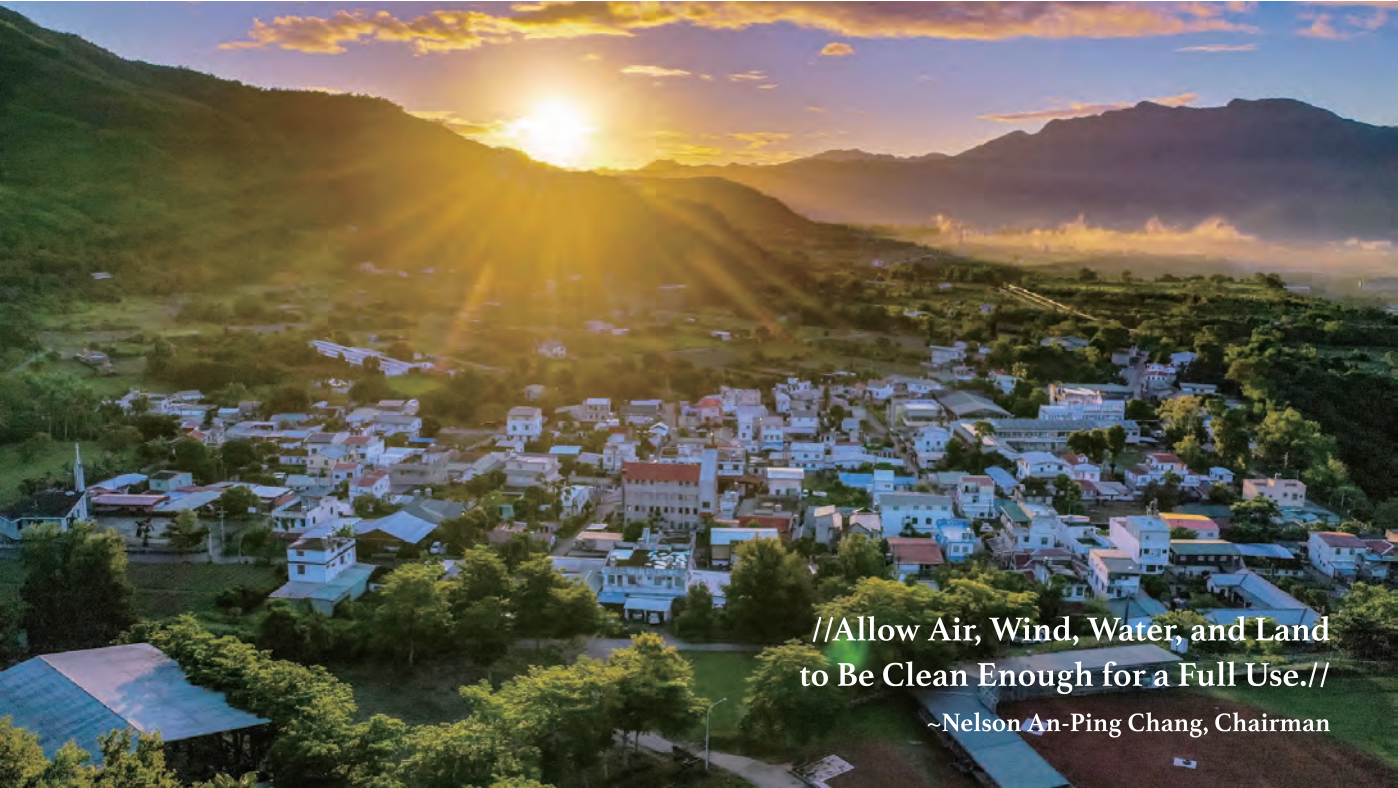
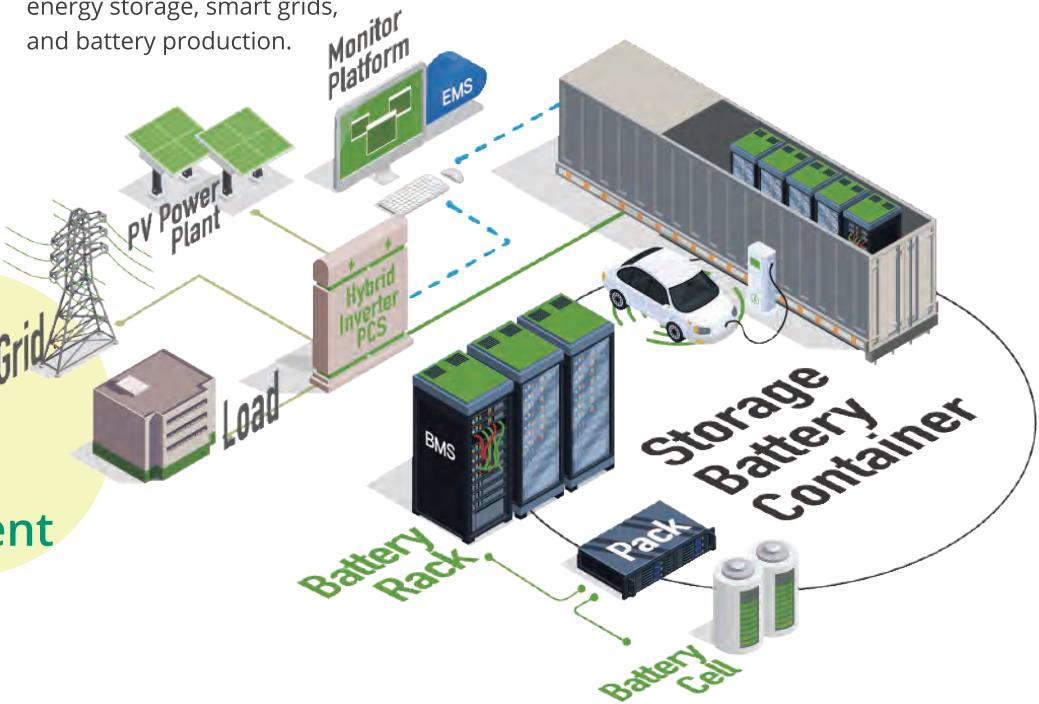
Fishery & Solar Symbiosis in Budai, Chiayi

TCC proactively invests in the new energy industry. In terms of energy generation, TCC completed a power plant at Changhua Coastal Industrial Park integrating wind and solar energy and started developing a joint fishery-solar power plant in Chiayi and a geothermal power plant in Hongye, Taitung. In Hongye Village, we plan to build a geothermal power plant with an installed capacity of 1 MW (i.e., 1,000 kW), which will incorporate the local features to offer a multi-purpose tourism leisure park with hot springs, water activities, and F&B combined. In terms of renewable energy, TCC experiments with all possibilities while assessing investments in the development of oceanic energy unique to the geography of Taiwan.



In terms of energy storage, TCC Green Energy and E-One Moli continue to develop our capacity in energy storage, smart grids, and battery production.

Energy
Management
System



//Allow Air, Wind, Water, and Land
to Be Clean Enough for a Full Use.//

~Nelson An-Ping Chang, Chairman

TCC participated in Taiwan's first large-scale AFC Smart Storage System with 5 MW of installed capacity, which achieved grid connection in April 2021. By modulating power in a second, the system can resolve the intermittency issue of renewable energy, improving the stability and effectiveness of renewable energy utilization in Taiwan.

As for the R&D and investment in large power cells, the Board of TCC passed a resolution allocating NT\$10 billion, planning to establish the first super battery factory in Kaohsiung. With the focus of advanced nickel ternary batteries high in capacity and cycling performance, its annual production capacity is expected to be 1.8 GW, equivalent to the volume of long-distance batteries needed for the annual production of 24,000 electric vehicles. Moreover, we have also invested in the electric bus improvement programs in Taiwan.



TCC Supports Ocean Waste Removal Projects

"AZURE" is a team of Taiwanese youth, dedicated to building the "vacuum cleaner" that can remove 70 kg of ocean wastes per day. E-One Moli Energy Corp. sponsored the team with the state-of-the-art lithium batteries often seen on sports cars to jointly bring the vision of zero ocean waste to life.



Total Care Commitment

Human Civilization Starts with Caring for Each Other

//People May Take Clean Air for Granted When They Live in It;
Likewise, Fish May Take Water for Granted When Swimming Freely.
Now That We Wear All the Time Face Masks Blocking Our Emotions
of Happiness, Fury, Sorrows, and Joy,
We Have Suddenly Realized That Openness Is Such a Treasure.//
Facing COVID-19 Is the Fate Common to the Entire World,
With No Exceptions.

—
Nelson An-Ping Chang, Chairman



Phase I: Emergency Response Plan with the Highest Standards for Pandemic Prevention Efforts

TCC initiated the COVID-19 Business Continuity Planning (BCP), whereas the pandemic impacted out of nowhere. Regarding the health and safety of TCC’s employees and their families as the utmost mission, we adjusted management strategies in phases in response to the pandemic.

Organizational Chart of TCC Pandemic Response Command Center



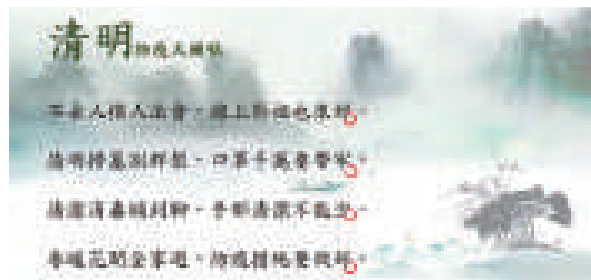
TCC kicked off the Group-wide epidemic care project, gently asking employees with any sign of physical discomfort to remain home on paid leave to avoid clustering. The Headquarters implemented the level access control measure, forbidding any visitor to access the office levels. All interviews were conducted online instead. Where entries are necessary, the visitors could only access certain levels to minimize the risks for the personnel on the office levels.

Additionally, to provide a more relaxing, comfortable working environment, the Care Platform was established for employees to report their health conditions to allow the Company can stay on top of their situation and for better communication. TCC also offered quarantine hotels, free of charge, to employees stationed or assigned abroad upon their homecoming requiring quarantine. Meanwhile, care packages containing supplies like snacks and milk were available for the duration of quarantine to care for the employees subject to quarantine, physically and mentally.



Phase II: Physical/Mental Care for Employees, Vaccination, and the Care Platform

In light of the ever-worsening pandemic, TCC pushed for systematic management. Apart from the existing Care Platform, the Pandemic Reporting System was set up, requiring all employees to timely report back. Only with the reporting rate 95% or above would the plant's information be deemed valid; this allows Headquarters to assess the work resumption statuses across plants and dynamically planning pandemic response strategies.



Moreover, TCC kept a close watch on the potential impacts of COVID-19 on its employees physically and mentally. In terms of physical health, we promptly set up the reporting mechanism and implemented measures like alternating working schedules, teleconferencing, and reassigning employees stationed abroad. In addition, we installed infrared thermal imagers, conducted regular disinfection, distributed supplies like masks, and provided flu vaccinations available free of charge to all employees. The regular Town Hall Meeting and year-end banquets also turned online accordingly.



In terms of mental health, TCC organized spiritual enlightenment courses and provided traveling subsidies, encouraging employees to properly relieve their stresses, physically and mentally alike.



Group-Wide Flu Vaccination Free of Charge

Benefits of Pandemic Reporting System

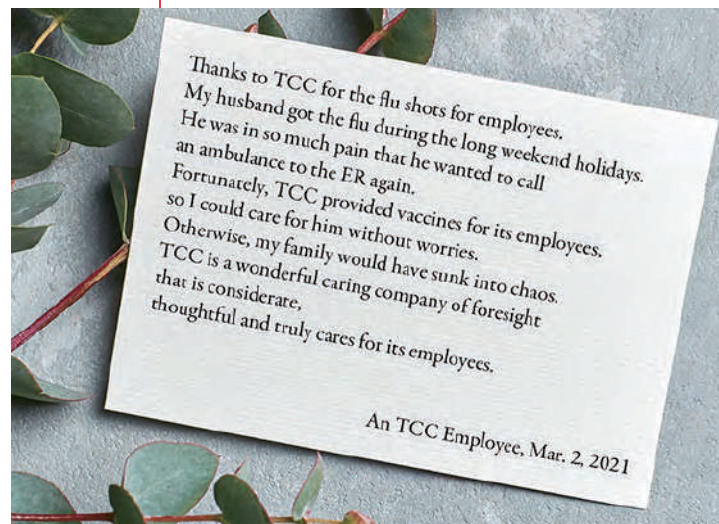
Corporate Management Perspective

The HR Department could understand the health conditions of those under “home quarantine” and under “home isolation” and check the work resumption statuses at the plants based on the reports submitted. Important information could also be circulated via the System.



Employee Perspective

Timely communication with employees over LINE or WeChat allowed employees to report and apply for leaves, which elevated the time efficiency.



Phase III: Assessment of Potential Risks for Preemptive Measures

TCC carried out COVID-19 impact assessments. It identified three high potential risk factors, i.e., risks of exposure to confirmed cases, manpower shortages, and operation suspensions, as well as three mid-to-low risk factors, i.e., risks of shortages in supplies, environment safety, and work efficiency. Preventive measures and promotional mechanisms were enacted in line with the risk levels to enhance the resilience at TCC.

Preventive Measures Against the Three High Risk Factors

☑ Exposure to Confirmed Cases

- ▲ Reporting groups established and drills for response SOPs conducted
- ▲ A complete reporting system to track employees' footprints upon the contact tracing information released by the government
- ▲ Pandemic response team meeting organized on a regular basis

☑ Manpower Shortage

- ▲ Assigning of staff on duty during legal holidays in advance
- ▲ Assigning extra manpower to key posts
- ▲ Reminders for avoiding traveling or clustering during longer holidays
- ▲ Pre-survey on plans of homecoming and return to work for the ease of manpower arrangements

☑ Operation Suspensions

- ▲ Assign emergency staff in every plant in compliance with the government policies and regulations for resumption of operations as soon as possible
- ▲ Plants required to proactively report regulations of local governments daily during the pandemic

Proactive Care for Clients & Enhanced Communication Platform

TCC prudently managed the pandemic's impacts on our clients' operations continuity, health, and safety prudently. According to the Pandemic Response Command Center at the Headquarters, we took the initiative in response to the pandemic and industry dynamics. Furthermore, we proactively interacted with our clients via Facebook, the WeChat public account, and the TCC e-commerce app, informing TCC's pandemic response as well as pandemic prevention and medical knowledge at any time.

Ensuring Operation Stability of Suppliers/Contractors by Providing Necessary Support

At the outbreak of the pandemic, TCC closely monitored the key suppliers' potential risks, maintained smooth and timely exchanges, and grasped supply and production progress. In addition, TCC collaborated with its employment agencies to care for migrant workers to safeguard the health of employees and contractors.

Helping the Communities in Pandemic Prevention & Empowering the Disadvantaged

TCC proactively assists the neighboring communities in elevating their pandemic prevention capacity, including disinfection service provision and face mask distribution. Meanwhile, TCC paid attention to

the impacts of COVID-19 on the economy and launched the Hualien Cement Workshop to provide training on the production of cement handcrafts. A total of 10 enrolled, two of whom were recruited by TCC in 2021, producing cement handcrafts with the skills acquired previously.

Due to the pandemic, social welfare groups experienced more difficulties in raising funds and supplies. TCC contributed NT\$200,000 to the Taiwan Fund for Children and Families Yilan Branch to help the poor and disadvantaged families. Meanwhile, TCC called upon its employees to raise care supplies for Huashan Social Welfare Foundation, contributing supplies the elderly needed, that worth NT\$170,000.

Care for Each Other through the Tough Time of Pandemic

TCC values its stakeholders, including employees and families, clients, partners, and community dwellers nearby. We proactively contributed resources while pondering over all the viable responses in the new norm of the pandemic to reduce the infection risks and facilitate effective medical resource utilization. Furthermore, we considered the potential impacts on the stakeholders to address socio-economic risks, enhancing the stakeholders' resilience and capacity and exploring new opportunities.

A Heartwarming Mission on Mother's Day – Special Delivery of Flowers and Cakes

For employees assigned overseas who could not come home for Mother's Day due to the pandemic, TCC launched a “Heartwarming Mission on Mother's Day.” The Headquarters prepared carnations and cakes to the employees' homes to appreciate the beloved wives and mothers on behalf of those who could not make it back to Taiwan. Moreover, it gathered nearly 50 employees working in Mainland China to sing together and sent words via the Internet to express their love.



*Aristotle once said:
“Human life is governed by Nature and Law.”*

Most people understand that human life is dependent on Nature. However, while garbage and pollution created by oneself harms the ecology, as long as it's not now, it doesn't affect me; as long as it's not next to my house, then no need to worry about it now.

Up to now, we know that the only beautiful blue planet with life in the universe is the Earth we inhabit, a biosphere on which all life depends. If Earth is damaged beyond repair, all life will be affected, whether it is human beings, animals, plants, bacteria, single-celled organisms, or even viruses.

In the history of the development of the Earth, geologists and archaeologists have told us that the creatures on the Earth have experienced at least three near-total mass extinctions, causing what is known as, “punctuated equilibrium”. Of course, there are various theories or reasons. It may be because of a certain force or event, such as a large meteorite hitting the Earth, a huge volcanic eruption, or a rapid change in climate disrupted the Earth's rhythm or balance at the time, nearly causing the destruction of global life. Then life slowly re-emerged in the prehistoric cosmos, from single-celled ocean organisms that barely survived, eventually evolving into a world full of diversified life. Life is a process of constant interaction, adjustment, and trying to find a state of balance. Imbalance, that is, the inability to adjust, and disaster are actually the same thing.

2020 was already the hottest year for the Earth on human record, and it was also the year when the New Corona virus broke out on a large scale. No corner of the world was spared by the onslaught, from Antarctica to the Equator to the Gobi Desert to the Amazon River Valley. The Nobel Laureate, Albert Camus, wrote “The Plague” in 1947. The story of his book is remarkably similar to what happened during the 2020 Covid-19 pandemic, except that the story was about a plague that happened in the French Alger city, Oran. The story starts with denial, then blaming others, refusing to help others, quarantining, city lock-down and so on.

Humans have national boundaries, but temperatures, climate, and viruses do not. Remarkably, global warming issues are very similar to Camus' Plague or the Covid 19 Pandemic in 2020: the denial and refusal to work together. Actually, the ultimate result of a change in Nature will not benefit a single country alone, if other nations collapse. This is not like a zero-sum game in economics. There are no winners or losers in global climate change; only losers. When the natural environment is damaged and totally destroyed, all the world will be ruined.

01

CHAPTER

TCC Key Issues SASB & GRI Sustainability Indicators

1.1 Sustainability Dialogues with Stakeholders 30






1.2 Identifying Sustainability Issues 35

▼

Management of Sustainability Topics

Interaction and communication with stakeholders are the bedrock for the sustainable development of enterprises. TCC values the opinions of its stakeholders, actively communicating and engaging with regard to material sustainability issues, and incorporating these issues in the corporate sustainable development vision. In line with the industry's nature and with reference to the GRI Standards, Sustainability Accounting Standards Board (SASB) Standards, and Dow Jones Sustainability Index (DJSI), TCC systematically designed sustainability issue survey questionnaires, with which it collects and analyzes feedbacks of stakeholders, while evaluating the impacts and risk levels of sustainability issues on the corporate operation. As such, it identifies material issues and prioritizes responses and reactions to meet the stakeholders' expectations toward TCC.


Assessment Process for Stakeholders and Material Issues

<div>01</div> <div>Identifying Stakeholders</div>	<div></div> <div>Action Managers of each department in the Company fill in the stakeholder identification questionnaire to determine importance of stakeholders to the Company and identify key stakeholders.</div> <div>Performance Indicators 10 categories of stakeholders identified</div>
<div>02</div> <div>Determining Areas of Concern</div>	<div></div> <div>Action Based on the result of stakeholder identification, the opinions and areas of concern of the stakeholders are captured via questionnaires and interviews, so as to analyze the levels of concern with the respective issues.</div> <div>Performance Indicators 204 valid questionnaires / one discussion forum</div>
<div>03</div> <div>Evaluating Impacts on Business Operations</div>	<div></div> <div>Action The executives of the Company evaluate the impact levels and risks of various sustainability issues on the business operation in order to determine the impact levels of these issues on the Company.</div> <div>Performance Indicators Opinions of 4 executives/ Resolution of Corporate Sustainable Development Committee</div>
<div>04</div> <div>Establishing Material Issues</div>	<div></div> <div>Action Based on the areas of concern of stakeholders and their impacts on the Company, the outcomes of issue assessments are demonstrated in a material issue matrix as a reference to determine the significance thereof.</div> <div>Performance Indicators 13 material issues identified</div>
<div>05</div> <div>Analyzing Material Issues</div>	<div></div> <div>Action The results of material issue identification are examined and compared to the material issues of the previous year to confirm that they are in line with the sustainability context and comprehensiveness.</div> <div>Performance Indicators A 100% conformity to the sustainability and comprehensiveness principles</div>


1.1_Sustainability Dialogues with Stakeholders

Pursuant to the AA1000 Stakeholder Engagement Standard (SES), TCC employs the five principles, i.e. Responsibility, Influence, Tension, Diverse Perspectives, and Dependency in identifying and ordering the significance of stakeholders. To effectively track and manage the results in implementing the sustainability strategies, TCC conducts stakeholder identification once every two years. In 2020, it reviewed the 2019 results, verifying the ordering of impacts in stakeholder relationships as follows: government agencies, clients, employees, shareholders & investors, local communities, industry associations & industrial and academic organizations, media, suppliers & contractors, environmental groups & non-governmental organizations (NGOs),


and sustainability associations. Upholding the spirit of open transparency, TCC discloses information through diverse communication channels, ensuring effective and quality communication results with its stakeholders. In addition, TCC values stakeholders' expectations and incorporates their concerns to optimize TCC's operations and fulfill its sustainable development vision and corporate social responsibilities. TCC believes that only by establishing smooth and effective communication with stakeholders can TCC keep up with the trends in the markets regarding the economy, society, and environment, and ultimately put TCC's sustainability missions of "Nature First" and "Benefit to Society" into action.

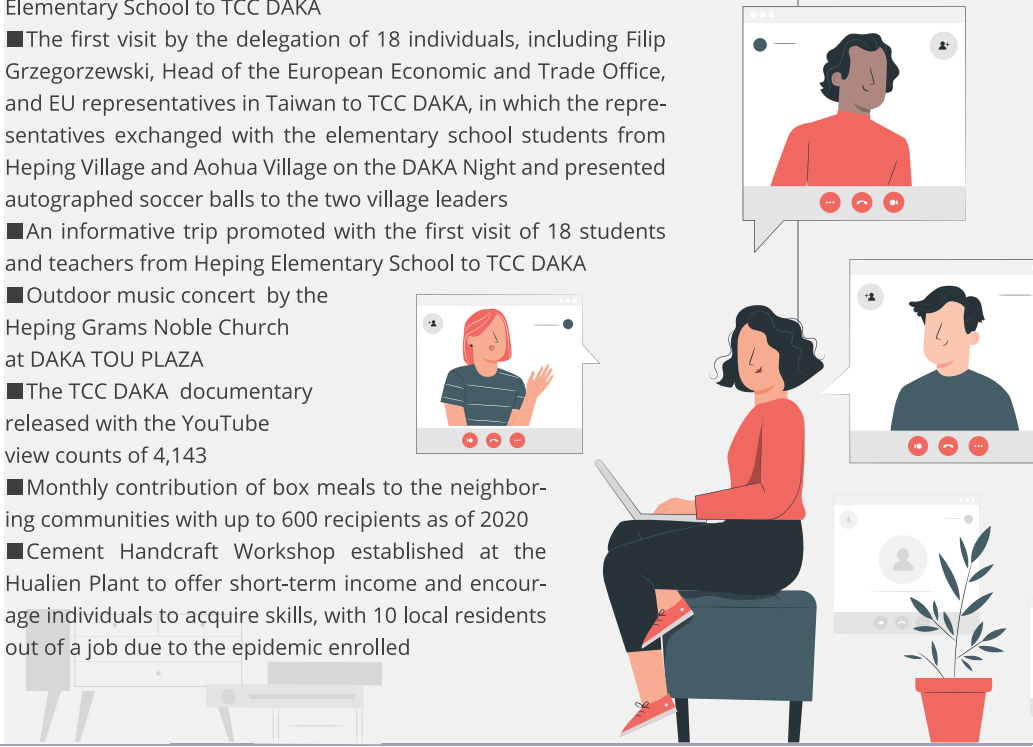
<div>Stakeholder</div> <div>Government Agencies</div> <div></div>	<div>Significance to TCC</div> <div>A significant stakeholder that focuses on TCC's legal compliance results in economy, environment, and society which also has influences on the industry's development and policy implementation</div>	<div>Areas of Concern</div> <div>■ Legal Compliance ■ Management of Raw Materials and Water Resources ■ Corporate Governance and Ethical Management ■ Pollution Control and Management ■ Ecological Restoration</div>	<div>Communication Methods and Frequency</div> <div>■ Updates of information on the corporate website and the Market Observation Post System (MOPS) on a regular basis ■ Participation in interviews, seminars, conferences from time to time ■ Communication via official document and correspondence</div>
<div>Communications Performance in 2020</div> <div>■ Participation in the symposium on improving regulations for climate change adaptation organized by Environmental Protection Administration (EPA) ■ Response to the evaluation form on listed companies' financial statement compilation capability issued by Taiwan Stock Exchange (TWSE) ■ Participation in the training session on the Recommendations for Climate-related Financial Disclosures organized by TWSE ■ Participation in the seminar on promoting the adoption of International Financial Reporting Standards in Taiwan ■ Participation in the training session on Office Document Exchange Center of Financial Supervisory Commission ■ Close communication with TWSE for inquiries and confirmations on material information and announcements. ■ Participation in EPA' recent seminars and public hearings on the amendments to Greenhouse Gas Reduction and Management Act and the phase II control targets ■ Participation in the 2020 working sessions of MOEA's CCS R&D Alliance ■ Visit to the Suao Plant by the Industrial Waste Management Division, Environmental Protection Department of New Taipei City, Bali Refuse Incineration Plant, and Onyx Ta-Ho Environmental Services Co., Ltd. for waste treatment process.</div>			<div>Reflections and Responses</div> <div>Keep tabs on public policies, laws and regulations while leveraging TCC's status as an industry leader to promote legal compliance and support policy implementation</div>
			<div>Relevant Section</div> <div>2.2 A Robust Governance Framework</div>

<div>▼</div> <div>Stakeholder</div> <div>Clients</div> <div></div>	<div>Significance to TCC</div> <div>A stakeholder that cares about the quality of TCC's products and services as well as its operations, compliance, and environmental protection efforts</div>	<div>Areas of Concern</div> <div><div>■Corporate Governance and Ethical Management</div><div>■Client Relationship Management</div><div>■Sustainable Products</div><div>■Supplier Management</div><div>■Risk Management</div></div>	<div>Communication Methods and Frequency</div> <div><div>■Annual client satisfaction surveys on a regular basis</div><div>■Communication with clients by telephone and the external mailbox from time to time</div></div>
	<div>Communications Performance in 2020</div> <div><div>■1 annual client satisfaction survey concerning cement plants with a high level of satisfaction maintained.</div><div>■1 annual client satisfaction survey concerning product plants with a high level of satisfaction maintained.</div><div>■A concrete product traceability system completed for clients to access information of product quality and trace sources of materials with 555 clients in Taiwan having accessed the system in 2020 and a coverage rate of 100%</div></div>	<div>Reflections and Responses</div> <div>Continue to provide products and services consistent in quality and in line with safety standards while implementing environmental protection with ethical management to meet clients' expectations</div>	
<div>Relevant Section</div> <div>2.3 Optimizing the Client Experience</div>			


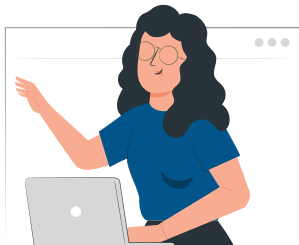

<div>Stakeholder</div> <div>Employees</div> <div></div>	<div>Significance to TCC</div> <div>A key stakeholder and TCC's crucial human capital for its ongoing breakthroughs and innovations</div>	<div>Areas of Concern</div> <div><div>■ Human Rights Guarantee and Employee Care</div><div>■ Workplace Health and Safety</div><div>■ Circular Economy</div><div>■ Waste Co-Processing</div><div>■ Operational Performance</div></div>	<div>Communication Methods and Frequency</div> <div><div>■ Annual performance appraisals and interviews</div><div>■ Quarterly labor-management meetings, union meetings, employee welfare meetings, and Town Hall Meetings</div><div>■ Monthly departmental meetings</div><div>■ Explanation and signing of the Code of Ethics</div><div>■ Employee feedbacks (employee mailbox)</div><div>■ Promotion of human rights policies – internal announcements and disclosure on the corporate website</div></div>
	<div>Communications Performance in 2020</div> <div><div>■ Fitness classes organized upon renovation of employee gyms to meet employees' physical and mental needs, with up to 4,500 visits in 2020</div><div>■ Headquarters building certified with ISO 14001 and ISO 45001, offering a quality work environment in terms of environment, safety, and health</div><div>■ “Core Muscle Training Club” established, encouraging fellow staff to train regularly to promote physical and mental health, with 24 members onboard at present</div></div>		
<div>Relevant Section</div> <div>6.2 Cultivating a Sustainable Workforce</div>			


<div>Stakeholder</div> <div>Shareholders /Investors</div> <div></div>	<div>Significance to TCC</div> <div>The stakeholder that is the main financing source of TCC and that cares the most for the operational performance and sustainable development of the Company</div>	<div>Areas of Concern</div> <div><div>■Operational Performance</div><div>■Corporate Governance and Ethical Management</div><div>■Legal Compliance</div><div>■Workplace Health and Safety</div><div>■Human Rights Guarantees and Employee Care</div></div>	<div>Communication Methods and Frequency</div> <div><div>■Annual general meeting (AGM)</div><div>■Updates of information on the corporate website and the MOPS on a regular basis</div><div>■Replies to shareholders' questions by phone or mail</div></div>
	<div>Communications Performance in 2020</div> <div><div>■1 AGM held</div><div>■9 Board of Directors meetings held</div><div>■6 Institutional Investor Conference held</div><div>■Monthly updates of information on the corporate website and the MOPS</div><div>■Replies to all inquiries on material topics raised by shareholders via phone or email</div></div>	<div>Reflections and Responses</div> <div>Continue to maintain a steady operation in the cement industry while develop new opportunities in the environmental aspect in order to constantly produce excellent results for its operation</div>	
<div>Relevant Section</div> <div>2.2 A Robust Governance Framework</div>			


<div>Stakeholder</div> <div>Local Communities</div> <div></div>	<div>Significance to TCC</div> <div>The most concerned stakeholder that lives close to TCC operation sites and thus is most affected by TCC's operations</div>	<div>Areas of Concern</div> <div><div>■Social Participation</div><div>■Ecological Restoration</div><div>■Legal Compliance</div><div>■Management of Raw Materials and Water Resources</div><div>■Waste Co-Processing</div></div>	<div>Communication Methods and Frequency</div> <div><div>■Visits to local communities and schools every year</div><div>■Publicizing special cases</div><div>■Communication by phone and email from time to time</div><div>■Corporate website</div><div>■Industrial park meetings</div></div>
	<div>Communications Performance in 2020</div> <div><div>■1 tour of TCC mine operations and tree planting initiatives arranged for the Heping residents</div><div>■Ecological restoration photo-shooting and environmental education at the mine of the Suao Plant arranged for the students and teachers of Shih Min Elementary School</div><div>■A tour to the Suao Plant arranged for the 50 students and teachers of Yilan Yuan Shan Junior High School</div><div>■Warm winter solstice activity co-organized by the Suao Plant and Chang An Community</div><div>■Hoping Christmas event with 24 groups of performers singing up and 100 groups of kids and parents for the parade activities</div><div>■DAKA Music Village, including the Opening Party, 22 sessions of Indigenous Music Stage, 7 Mid-autumn Singing events, and TCC DAKA “Beauty of Hoping Theme Song Competition”</div><div>■2-days-and-1-night community rejuvenation traveling project, “Summer Excursion to Hoping”, organized by TCC for 10 females in the tribe to receive trainings on guided tour, reception, and accommodation for travelers</div><div>■Charity sale event “Cement Handcrafts for Soccer Dreams” organized by TCC to facilitate 25 soccer players at Heping Elementary School to produce 70 cement pots during intermissions at school to raise 20% of the funds for summer practice and to a friendly match in Taipei with the rest subsidized by TCC</div><div>■An informative trip designed for the 97 students and teachers from Xiulin Elementary School to TCC DAKA</div><div>■The first visit by the delegation of 18 individuals, including Filip Grzegorzewski, Head of the European Economic and Trade Office, and EU representatives in Taiwan to TCC DAKA, in which the representatives exchanged with the elementary school students from Heping Village and Aohua Village on the DAKA Night and presented autographed soccer balls to the two village leaders</div><div>■An informative trip promoted with the first visit of 18 students and teachers from Heping Elementary School to TCC DAKA</div><div>■Outdoor music concert by the Heping Grams Noble Church at DAKA TOU PLAZA</div><div>■The TCC DAKA documentary released with the YouTube view counts of 4,143</div><div>■Monthly contribution of box meals to the neighboring communities with up to 600 recipients as of 2020</div><div>■Cement Handcraft Workshop established at the Hualien Plant to offer short-term income and encourage individuals to acquire skills, with 10 local residents out of a job due to the epidemic enrolled</div></div>		
<div>Relevant Section</div> <div>5.1 Initiate Social Dialogue</div>			



<div>▼</div> <div>Stakeholder</div> <div>Industry Associations /Industrial & Academic Organizations</div> <div></div>	<div>Significance to TCC</div> <div>A stakeholder that is a fellow partner to jointly promote the industry's development and offer advices and exchange ideas on business operations</div>	<div>Areas of Concern</div> <div><ul style="list-style-type: none">■ Innovation and Intelligent Optimization■ Sustainable Products■ Circular Economy■ Waste Co-Processing■ Climate Actions and Science Based Targets</div>	<div>Communication Methods and Frequency</div> <div><ul style="list-style-type: none">■ Communication via phone, official document, and email from time to time■ Regular attendance in the meetings of the CNS Technical Committee annually■ Corporate website</div>	
	<div>Communications Performance in 2020</div> <div><ul style="list-style-type: none">■ Participation in the “2020 Energy Efficiency Elevation and Improvement Project – Assistance in promoting voluntary energy-saving and carbon reduction in the cement industry” organized by the Taiwan Green Productivity Foundation■ Participation in “2020 Manufacturing Sector Low-carbon Production Promotion Project – Assistance in promoting low-carbon production technology application” organized by the Taiwan Green Productivity Foundation■ Participation in “2020 Cement Industry Improving Energy Efficiency Seminar” organized by the Industrial Technology Research Institute■ Participation in “Operation Management Planning and Construction Guide-line Amendment Project for the Use of Imported Clinker Ground into Cement Product in Construction” organized by the Taiwan Concrete Institute■ Amendment to “EAF Slag Inspection Methods in the Standard Contracts for Pre-sale Housing” and to the relevant provisions in “Standard Contracts for Pre-sale Housing” together with Taiwan Ready-Mixed Concrete Industry Association as well as government agencies including the Ministry of the Interior, Industry Development Bureau, and Construction and Planning Agency to protect the consumers' rights■ Participation in the national standards conference on cement convened by Bureau of Standards, Metrology, and Inspection (BSMI), MOEA, at which BSMI agreed to adjust the limit of chloride ions in Type-I and Type-IA cement in CNS 61 for cement from 200 ppm to 240 ppm (raised by approx. 20%), so as to improve the waste management capacity of cement manufacturers■ A tour for the 28 students in NCCU's “Corporate Social Responsibility Development Practice in the Chinese Community” course to TCC DAKA and Hoping EcoPort on Nov. 13 for seminars and Cement Handcraft Workshop, guided tour in Hoping Mine, and introduction of the CCS and microalgae cultivation system.</div>	<div>Reflections and Responses</div> <div>Continue to participate in relevant organiza-tions to promote the industry's development as well as communicate and exchange on operational performance and support each other in terms of opera-tional issues</div>	<div>Relevant Section</div> <div>2.2.1 About TCC</div>	

<div>Stakeholder</div> <div>Media</div> <div></div>			
	<div>Significance to TCC</div> <div>A stakeholder that helps TCC disclose sustainability efforts</div>	<div>Areas of Concern</div> <div><ul style="list-style-type: none">■ Operational Performance■ Innovation and Intelligent Optimization■ Circular Economy■ Sustainable Products■ Climate Actions and Science-Based Targets■ Waste Co-Processing■ Management of Raw Materials and Water Resources■ Ecological Restoration■ Human Rights Guarantees and Employee Care</div>	<div>Communication Methods and Frequency</div> <div><ul style="list-style-type: none">■ Media delegation tour■ Communication by phone or email from time to time■ Corporate website■ Facebook fan page/WeChat official account/Instagram</div>
	<div>Communications Performance in 2020</div> <div><ul style="list-style-type: none">■ An TCC DAKA Documentary Premiere Event■ An average of 2 press releases on the corporate website per month■ Social media exposure – 100 Instagram posts; 296 Facebook posts; 25 YouTube videos■ A tour arranged for the 25 media workers from WEALTH MAGAZINE to TCC DAKA■ The first AR technology combined into CSR Report with 8,342 interactions made in total</div>		<div>Reflections and Responses</div> <div>Continue to communicate and exchange with the external media to deepen the society's knowledge on TCC's performances on corporate management and sustainable development</div>
		<div>Relevant Section</div> <div>5.1 Initiate Social Dialogue</div>	
<div>Stakeholder</div> <div>Suppliers /Contractors</div> <div></div>			
	<div>Significance to TCC</div> <div>A business partner to TCC in product manufacturing and quality improvement as well as a stakeholder that shares common interests in terms of environmental sustainability issues</div>	<div>Areas of Concern</div> <div><ul style="list-style-type: none">■ Supplier Management■ Corporate Governance and Ethical Management■ Client Relationship Management■ Operational Performance■ Workplace Health and Safety</div>	<div>Communication Methods and Frequency</div> <div><ul style="list-style-type: none">■ Annual audits■ Tender meetings from time to time■ A supplier suggestion mailbox on the corporate website■ Communication via external mailboxes, phone, and email</div>
	<div>Communications Performance in 2020</div> <div><ul style="list-style-type: none">■ 1 supply chain sustainability conference organized with the attendance of 129 suppliers■ Annual document reviews on 135 suppliers and annual on-site inspections on 16 suppliers■ 244 contractor meetings, safety meetings, and education and training sessions organized■ A total of 826 mails received in the supplier suggestion mailbox in 2020</div>		<div>Reflections and Responses</div> <div>Improve management mechanism for supplier management to build a steady, long-term cooperative relationships that enable the suppliers to continue to grow with TCC</div>
		<div>Relevant Section</div> <div>2.4 Supply Chain Sustainability</div>	

<div>▼</div> <div>Stakeholder</div> <div>Environmental Groups /NGOs</div> <div></div>	<div>Significance to TCC</div> <div>A stakeholder that cares for TCC's efforts in environmental protection, employee care, and communication with neighboring communities while driving TCC's improvements</div>	<div>Areas of Concern</div> <div>■ Legal Compliance ■ Social Participation ■ Ecological Restoration ■ Corporate Governance and Ethical Management ■ Waste Co-Processing</div>	<div>Communication Methods and Frequency</div> <div>■ Communication by phone or email from time to time ■ Corporate website</div>
	<div>Communications Performance in 2020</div> <div>■ Support to Seed Talent Program (STP), assisting 9 students from 7 universities in conducting field research with "community rejuvenation" at Heping as the topic</div>	<div>Reflections and Responses</div> <div>Continue to push for environmental sustainability, reduce damages to the natural environment, restore the natural environment, and explore opportunities for eco-friendly and green energy to help tackle the environmental issues</div>	
	<div>Relevant Section</div> <div>5.1 Initiate Social Dialogue</div>		

<div>Stakeholder</div> <div>Sustainability Associations</div> <div></div>	<div>Significance to TCC</div> <div>A stakeholder that focuses on TCC's awareness of sustainability trends and builds a sustainable future with TCC</div>	<div>Areas of Concern</div> <div>■ Climate Actions and Science-Based Targets ■ Waste Co-Processing ■ Management of Raw Materials and Water Resources ■ Pollution Control and Management ■ Workplace Health and Safety</div>	<div>Communication Methods and Frequency</div> <div>■ Participation in sustainability exchange activities ■ Communication by phone or email from time to time</div>
	<div>Communications Performance in 2020</div> <div>■ Attendance and speech on sustainable development and corporate social responsibility at a sustainable development seminar co-organized by the Center for Corporate Sustainability and National Tsing Hua University ■ A guided tour for 17 individuals in the industry to TCC DAKA with CSRone releasing 2 stories on TCC DAKA's highlights, including circular economy, ecological tour, and community rejuvenation, after the tour ■ A tour for 5 B Lab Taiwan members to TCC DAKA on Dec. 14 with the introduction of the CCS and microalgae cultivation system</div>	<div>Reflections and Responses</div> <div>Keep tabs on the activities, advocacies, and guidelines of sustainability associations so as to exchange on sustainability experiences and jointly strengthen sustainability measures</div>	
	<div>Relevant Section</div> <div>2.2.1 About TCC</div>		

1.2_Identifying Sustainability Issues

TCC considers international trends of sustainable development, ESG principles and standards (DJSI, CDP, GRI Standards, and SASB Standards), industry characteristics, and benchmark corporate practices when compiling a list of sustainability issues covering those of corporate governance, economy, environment, and society. TCC attaches importance to the effectiveness and continuity of the management with material issues, conducting identification once every two years. In 2020, we collected 204 valid questionnaires on the stakeholders' concerning issues, following the 2019 results of material issues identification. Then, four executives of the Company assessed respective issues' levels of financial and non-financial impact on the Company in the short-/mid-/long-term, producing a list of stakeholders' concerning issues and their operational impacts. These are further organized into the Matrix of Material Issues, followed by selecting matters with high degrees of attention and impact as the material issues to TCC. As a result, this Report shall disclose relevant

measures and performances on these aspects. The Corporate Sustainable Development Committee convened a meeting accordingly, determining 13 material issues of TCC in 2020 based on the results of questionnaire analysis combined with stakeholder engagement experiences and the recent sustainable development trends. These include corporate governance and ethical management, climate actions and science-based targets, waste co-processing, pollution control and management, workplace health and safety, circular economy, operational performance, legal compliance, risk management, ecological restoration, sustainable products, human rights guarantees and employee care, and management of raw materials and water resources.

Matrix of Material Issues



Governance Topics	Environmental Topics	Social Topics
<div>1- Corporate Governance and Ethical Management</div> <div>2- Operational Performance</div> <div>3- Risk Management</div> <div>4- Legal Compliance</div> <div>5- Innovation and Intelligent Optimization</div> <div>6- Circular Economy</div> <div>7- Sustainable Products</div> <div>8- Supplier Management</div> <div>9- Client Relationship Management</div>	<div>10-Climate Actions and Science-Based Targets</div> <div>11- Renewable Energy Development and Energy Management</div> <div>12- Waste Co-Processing</div> <div>13- Management of Raw Materials and Water Resources</div> <div>14- Pollution Control and Management</div> <div>15- Logistics Management</div> <div>16- Ecological Restoration</div>	<div>17- Human Rights Guarantees and Employee Care</div> <div>18- Workplace Diversity and Equality of Opportunity</div> <div>19- Workplace Health and Safety</div> <div>20- Talent Cultivation and Development</div> <div>21- Labor-Management Relations</div> <div>22- Open Factories and Community Rejuvenation</div> <div>23- Social Participation</div>

▼

Material Issues and Material Topics

TCC's identified material issues and topics in accordance with SASB and GRI Standards to establish management approaches and evaluation mechanisms. Hence, TCC systematically manages relevant issues to deliver our promises for

sustainable development while disclosing sustainability performances to engage and respond to stakeholders' expectations.

Material Issues		SASB Topics	GRI Topics / Self-Defined Topics	Significance to TCC	Risk Assessment and Management Indicators		Impact Boundaries	Relevant Section
Governance Topics	Corporate Governance and Ethical Management	EM-CM-520a.1 Pricing Integrity & Transparency	GRI- 205 Anti-corruption GRI- 206 Anti-competitive Behavior	Compliance with the Articles of Incorporation and ethical management by all supervisors and employees as the key drivers of TCC's steady growth	■ Preventing graft and corruption within the Company, monitoring the latest information from competent authorities at all times, and evaluating and adjusting policies and regulations pertaining to ethical management to ensure the business activities conducted in line with the highest principles of ethics ■ 100% of all new employees sign the Code of Ethical Conduct		■TCC □Customers □Suppliers	2.2 A Robust Governance Framework
	Circular Economy		Circular Economy	Monitoring the natural resources and energy consumption while developing alternative materials and fuels to reduce natural resource consumption and improve energy efficiency	■ Avoiding unnecessary consumption of natural resources and regularly monitoring resource utilization efficiency ■ Setting indicators for annual energy consumption in products (coal and electricity use)		■TCC □Customers ■Suppliers	3.2 Implementing Environmental Management
	Operational Performance		GRI- 201 Economic Performance	Committing to steady growth for development and advancement through quality excellence and a sound corporate image	■ Fulfilling TCC's responsibilities to shareholders as critical promises in terms of operational performance while creating ceaselessly economic values through comprehensive corporate governance, rigorous risk control, and robust financial planning		■TCC □Customers ■Suppliers	2.2.1 About TCC
	Legal Compliance		GRI- 307 Environmental Compliance GRI- 419 Socioeconomic Compliance	Monitoring updates regarding the latest legal and regulatory changes while abiding strictly by local laws and regulations in operations	■ Strict adherence to domestic laws and regulations with zero violations as the goal		■TCC □Customers □Suppliers	2.2.4 Legal Compliance
	Risk Management		Risk Management	Building a comprehensive risk management system that includes rigorous risk identification, evaluation, monitoring, response, and reporting to protect shareholder value	■ Examining risk control mechanisms on a regular basis for effective implementation		■TCC □Customers □Suppliers	2.1 Comprehensive Risk Control
	Sustainable Products	EM-CM-410a.1 EM-CM-410a.2 Product Innovation	Sustainable Products	Ongoing innovation to raise the added values of products and development of green products to fulfill TCC's social responsibilities	■ Ongoing development of eco-friendly products		■TCC ■Customers □Suppliers	3.1 Stronger Carbon Management
Environmental Topics	Climate Actions and Science-Based Targets	EM-CM-130a.1 Energy Management EM-CM-110a.1 EM-CM-110a.2 Greenhouse Gas Emissions	GRI- 302 Energy GRI- 305 Emissions	Stressing climate change issues and putting climate actions at the core of TCC's future planning of sustainability strategies	■ Responding to climate initiatives by establishing GHG reduction targets in line with international standards, making GHG emission reduction performance part of our appraisal system to engage all-round climate actions		■TCC □Customers ■Suppliers	3.2 Implementing Environmental Management
	Waste Co-Processing		Waste Co-Processing	Active development of waste co-processing to help industrial partners build a sustainable ecosphere	■ Continuing to help the government and industries solve complicated waste issues while tracking our volume of co-processing, effectively leveraging TCC's industrial characteristics for contributions towards sustainability		■TCC □Customers □Suppliers	3.2 Implementing Environmental Management
	Pollution Control and Management	EM-CM-120a.1 Air Quality EM-CM-150a.1 Waste Management	GRI- 305 Emissions GRI- 306 Effluents and Waste	Emissions and wastes produced in the manufacturing processes are important to TCC and external stakeholders	■ Reducing risks of environmental pollution, engaging in pollution and waste control by regularly examining pollution control effectiveness ■ Emissions of dust (10 mg/m³) lower than the regulatory standards		■TCC □Customers □Suppliers	3.2 Implementing Environmental Management
	Ecological Restoration	EM-CM-160a.1 EM-CM-160a.2 Biodiversity Impacts	GRI- 304 Biodiversity	Mine restoration and ecological sustainability are important to TCC's commitment to maintaining the planet's biodiversity	■ Preserving biodiversity while considering ecological balance and reconstruction, carrying out follow-up restoration management to ensure genuine mine regeneration and limestone ecology restoration		■TCC □Customers □Suppliers	4.1 Protecting the Green Environment
	Management of Raw Materials and Water Resources	EM-CM-140a.1 Water Management	GRI- 301 Materials GRI- 303 Water and Effluents	Monitoring of materials used in TCC cement products and manufacturing processes and exploring solutions that can reduce natural resources consumption	■ Monitoring the energy substitution ratio to measure the performance of reducing unnecessary use of natural raw materials used in a circular economy		■TCC □Customers ■Suppliers	3.2 Implementing Environmental Management
Social Topics	Workplace Health and Safety	M-CM-320a.1 EM-CM-320a.2 Workforce Health & Safety	GRI- 403 Occupational Health and Safety	Introduction of occupational health and safety management systems to raise the safety awareness among factory employees and contractors and prevent occupational hazards with safety management	■ Upholding occupational health and safety by regularly convening the Occupational Safety and Health Committee and reporting implementation results ■ In the event of critical occupational accidents, reviewing and tracking of the cause of accidents for improvement, besides reprimanding employees at fault ■ Maintaining zero workplace injuries as our goal		■TCC □Customers ■Suppliers	6.1.1 Workplace Safety
	Human Rights Guarantees and Employee Care		GRI- 401 Employment GRI- 412 Human Rights Assessment	Building a harmonious, friendly, and healthy working environment that protects the rights of employees, as treating all employees with dignity and respect is TCC's most fundamental commitment	■ Monitoring human rights guarantees to avoid any human rights violations and ensure a working environment conducive to employees' physical and mental health		■TCC □Customers □Suppliers	6.1.3 Human Rights Protection

■ Direct impact □ Indirect impact

02

CHAPTER

Governance and Risk Management

TCFD Framework and Strategies for Climate Responses 41

2.1 Comprehensive Risk Control 43

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2.3 Optimizing the Client Experience 55

2.4 Supply Chain Sustainability 58

GRI 201

Economic Performance

Risk Management

Management Policies

“Organic Regulations for the Risk Management Executive Committee,” and “Risk Management Policy and Principles” were stipulated

“Risk Management Executive Committee” was established with the Board of Directors as the highest decision-making body

GRI 205

Anti-Corruption

Anti-Competitive Behavior

“Corporate Sustainable Development Committee” was established for a comprehensive corporate management of sustainable development strategies.

“Corporate Governance Best Practice Guidelines” and “Corporate Social Responsibility Best Practice Guidelines” were stipulated

ISO 37001 Anti-bribery management system was introduced.

GRI 307

Environmental Compliance

Socioeconomic Compliance

Enhancement of legal compliance awareness of staff via education, training, and promotion

GRI 206

Anti-Competitive Behavior

Assessment Mechanisms

Regular risk identification (for risks in operations, finance, legal compliance, HR, state, information security, and ESG) and management

Client satisfaction surveys are conducted annually (a client satisfaction rating of 95.11% in 2020)

100% of all new employees sign the Code of Ethical Conduct

5 penalties in 2020

Objectives

Ongoing risk control and enhancement of corporate risk management constitution

Active deployment worldwide to elevate TCC’s international visibility

Ongoing productivity elevation and cost reduction

Market strategy development and new market exploration to maintain leadership in the industry

Advancing ethical management mechanisms and establishing a model of ethical business conduct

TCC’s goal has always been to establish a corporate culture of ethical management and legal compliance

Ongoing maintenance of the corporate assets and protection of stakeholders’ rights

Ongoing elevation of staff’s legal compliance awareness

Improvement of shortcomings management via internal audit mechanisms

8

DECENT WORK AND ECONOMIC GROWTH

13

CLIMATE ACTION

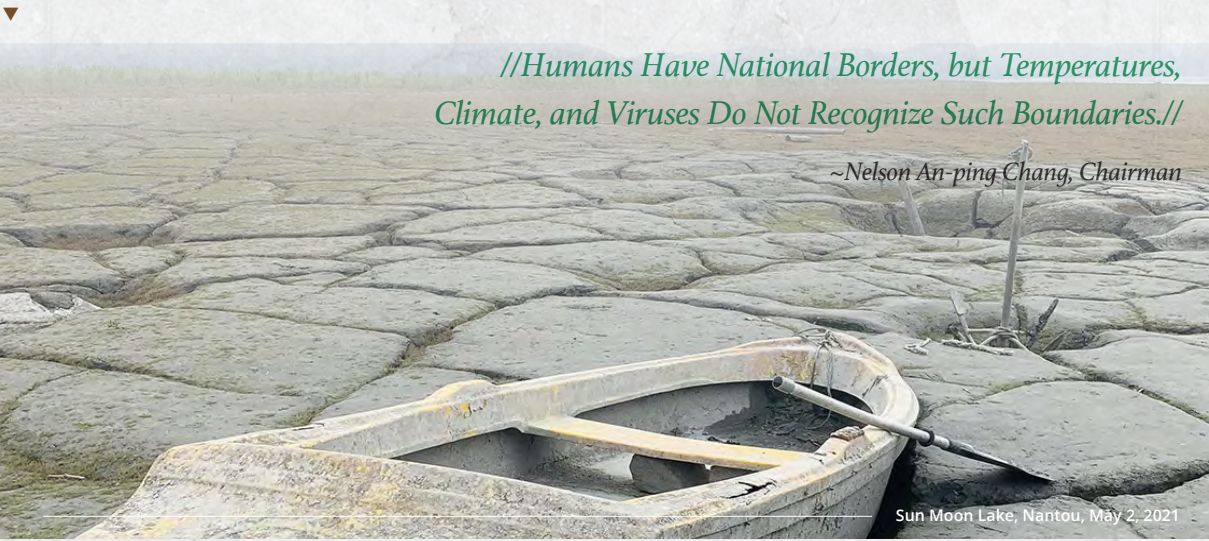
16

PEACE, JUSTICE AND STRONG INSTITUTIONS

17

PARTNERSHIPS FOR THE GOALS

Smart Flower - Solar-Powered Installation Art - at TCC DAKA

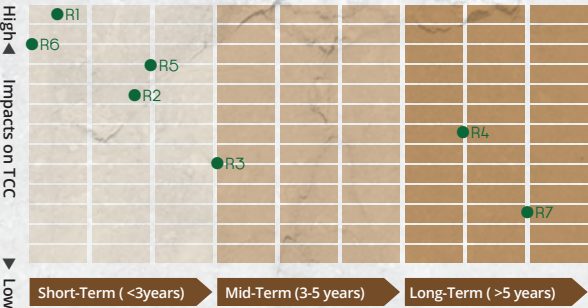


TCFD Framework and Strategies for Climate Responses

Facing the potential operational impacts from global warming and extreme weather, TCC responds with assessment and participation in climate change mitigation and adaptation. In 2020, we voluntarily introduced the recommendation framework of the Task Force on Climate-related Financial Disclosures (TCFD) and formed interdepartmental workgroups to systematically identify TCC's climate risks and opportunities. Integrating the existing risk control protocols, TCC regularly submits reports and statuses of climate change responses to the Board of Directors.

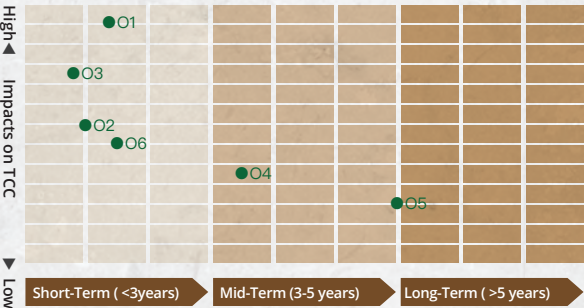
Following the TCFD recommendations and industry-specific guidelines, TCC identified our critical risk factors via analyses of international climate science and low-carbon technology studies, collection of climate-related regulations where TCC operates, and consideration of the industry's characteristics to optimize climate risks and opportunity assessments. Next, through interdepartmental communication and consultation with external experts, it probed into possible scenarios and assessments of impacts on TCC and the time horizon thereof. Finally, focusing on the 7 major climate risks and opportunities derived, formulating specific response strategies.

Climate Risks Matrix



- R 1 Costs of low-carbon technology, equipment, and management investments
- R 2 Total emissions and carbon trading; carbon levy and carbon tax systems
- R 3 Regulations and procurement of renewable energy
- R 4 Decommissioning of Hoping Power Plant
- R 5 Impact on corporate image
- R 6 Increased costs in transportation and equipment maintenance arising from heavy rainfall / flood from strong typhoons
- R 7 Concrete output affected due to drought and water shortage

Climate Opportunities Matrix



- O 1 Smart low-carbon manufacturing and co-processing of wastes
- O 2 Participation in carbon trading / renewable energy markets
- O 3 Competitiveness enhancement through differentiation
- O 4 Expansion of new energy business
- O 5 Development and application of carbon capture technology
- O 6 Securing investors' willingness for long-term investment

Identification Process for Emerging Risks of Climate Change

A Collection of Risk Factors	B Assessment of Impacts on TCC	C Risk Factor Analysis	D Response Strategies
<ul style="list-style-type: none">17 Critical risks with higher relevance to the cement industry10 derivative opportunities with higher relevance to the cement industry <ul style="list-style-type: none">International reports of science and technologyLocal regulatory trendsDisclosures relevant to the industry	<ul style="list-style-type: none">7 Interdepartmental meetings5 questionnaires for assessments <ul style="list-style-type: none">Interdepartmental investigationOperational impact assessmentInput of external experts	<ul style="list-style-type: none">7 critical risks6 derivative opportunities <ul style="list-style-type: none">Impacts on TCCTime of occurrence	<ul style="list-style-type: none">14 response strategies <ul style="list-style-type: none">Setting of mid- and long-term Science-Based TargetsLife cycle carbon footprint managementNew business development

Risks and Opportunities of Climate Change and the Response Strategies

Type Transition Risks					
Key Factors	Impact Level	Impact Time	Risks to TCC	Opportunities Derived	Financial Impacts
<ul style="list-style-type: none">Policy and RegulationsMandatory regulations on GHGs control	High	Short-term	<ul style="list-style-type: none">Costs of low-carbon technology, equipment, and management investmentsTotal emissions and carbon trading; carbon levy and carbon tax system	<ul style="list-style-type: none">Smart low-carbon manufacturing and co-processing of wastesParticipation in carbon trading / renewable energy marketsCompetitiveness enhancement through differentiation	<ul style="list-style-type: none">Capital expendituresOperating costs
<ul style="list-style-type: none">MarketNew low-carbon technologyRenewable energyCCUS	High	Mid-term	<ul style="list-style-type: none">Regulations and procurement of renewable energyDecommissioning of Hoping Power Plant	<ul style="list-style-type: none">Expansion of new energy businessDevelopment and application of carbon capture technology	<ul style="list-style-type: none">Capital expendituresOperating costsRevenue
<ul style="list-style-type: none">MarketESG sustainable investment	Moderate	Short-term	<ul style="list-style-type: none">Impact on corporate image	<ul style="list-style-type: none">Securing investors' willingness for long-term investment	<ul style="list-style-type: none">Investment, capital raising, and solicitation
Type Physical Risks					
<ul style="list-style-type: none">Typhoon, flood	Moderate	Short-term	<ul style="list-style-type: none">Increased costs in transportation and equipment maintenance arising from heavy rainfalls / flood from strong typhoons	<ul style="list-style-type: none">Strengthening operational resilience	<ul style="list-style-type: none">Operating costs
<ul style="list-style-type: none">Change in rainfall parameter: Water shortage	Low	Long, short-term	<ul style="list-style-type: none">Concrete output affected due to drought and water shortage		<ul style="list-style-type: none">Revenue

▲ Impact level" is divided into "High, Moderate, and Low" according to the internal assessment with occurrence likelihood considered.
▲ Impact time" is divided into "short-term" (less than 3 years), mid-term (3-5 years), and long-term (over 5 years)" based on the possible time of occurrence externally.



2.1_Comprehensive Risk Control

2.1.1_Digital Governance and Risk Management

TCC extensively identifies, analyzes and assesses the short-, mid-, and long-term impacts of risk factors of all aspects, prudently managing the internal and external risks while elevating decision-making effectiveness and corporate values. To continue to better risk management mechanisms, TCC systematically assesses risk impacts. Apart from the assessments with regard to finance, operations, and products, we further emphasize risk management for risks such as labor safety and climate change, formulating corresponding strategies and solutions in response. In the face of the ever-challenging environmental risks, TCC introduced digital governance tools while developing applied artificial intelligence (AI) technology. At present, TCC comprehensively utilizes AI in calculating the carbon intensity per product in the manufacturing process and the setting of emission reduction targets for cement plants. Moreover, it is used in warehouse management and procurement process optimization. Furthermore, relevant data are incorporated into each employee's quarterly appraisals. TCC fully handles various issues with regard to strategies, businesses, organization, processes, information, and staff development.

Risk Management Process and Mechanisms

To tackle diverse risk issues, TCC stipulated the "Risk Management Policy and Principles" in August 2020 with the Board of Directors as the highest decision-making body for risk management mechanisms, in charge of approving the overarching risk management policies and overseeing the coordination of risk management. In addition, the Board of Directors approved to upgrade the "Risk Management Team" to "Risk Management Executive Committee" that answers directly to the Board of Directors in May 2020. At present, three members on the Committee have a background in risk management, of whom 2 are Independent Directors and 1 is female. The Risk Management Executive Committee is composed of executives of related departments. The likelihood and impacts of risk factors are assessed in the meetings to identify the risks requiring proactive planning and management. The Committee weighs the impact levels of risks and the internal control strength at present, planning response strategies against risks from short-term to long-term. The Board mainly oversees the progress of execution, deliberates further on material risks, determines response strategies, and approves budgets and relevant resources.



Introduction of AI Technology to Promote Sustainable Supply Chain Development

In addition to efficiency improvement, intelligent management also serves as the opportunity for transformation of the cement industry to join hands with its supply chains and elevate the industry's overall operational efficiency. TCC pushed for the development of the "Procurement Portal" in 2019, using AI technology in supplier rating and selection, e-bidding, and material quality risk control. As of 2020, all plants in Taiwan and Mainland China have 100% introduced the Procurement Portal.

Three Features of the Procurement Portal

Accurate Profiles of Suppliers

The system will determine if the Portal membership profile of the supplier is completed with regard to basic information, operation permits, as well as financial, environmental, safety, and health information provided, reducing the chances of error in written documents.

Open, Transparent, and Fair Procurement Process

The transparent e-bidding process minimizes human factors and prevents risks of fraud in bidding.

Automatic Matching and Risk Control

Procurement Portal automatically matches suppliers based on the procurement needs and suppliers that offer related services/raw materials and forbids high-risk suppliers in bidding, effectively controlling risks on the supply side.

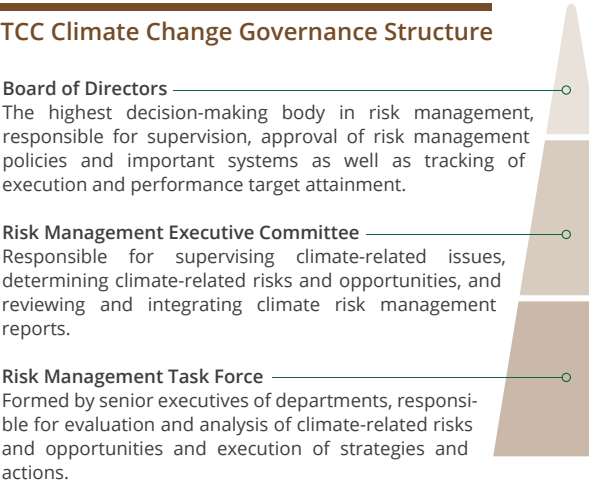
Information Security

TCC is committed to protecting the confidentiality, integrity, and availability of critical information systems and data with the Group. There is one Director on the Board who has a background in information security¹ that prudently oversees information security management efforts. Meanwhile, the "Information Security Management Committee" was established with the President as the Chair, while the Committee is liable to report to the Board of Directors on a regular basis. TCC's IT units have introduced the ISO 27001 information security management system in 2020 to strengthen its information security management. In the event of any information security incident, the person in charge of the IT unit in TCC analyzes the incident in accordance with the "Flow Chart for Notification of Information Security Incidents," determining if there is any misjudgment. Should an incident be verified, the corresponding response strategy will be activated in line with the information security incident level, from 1 to 4. Monitoring, reporting, and improvement will follow after the incident is handled to avoid any reoccurrence. In addition, to raise the TCC employees' awareness of information security, a total of 345 individuals received training regarding information security in 2020 with training time up to 354 hours. E-learning courses are also being evaluated and planned at present. TCC took it further by linking information security management with the employee appraisal as well. Any failure in indicators such as information security training will influence the employees' performance appraisal, so as to enhance the awareness of all employees.

¹Director Jong-Peir Li holds a Ph.D. in Management Information Systems, NCCU, seasoned with an information security background and serves as the Chairman of TCC Information Systems Corp. with the relevant industrial experience.

2.1.2_Emerging Risks with Climate Change

TCC has proactively signed and became one of the TCFD Supporters in 2019. The TCFD framework was further introduced in 2020 to give birth to the inter-departmental workgroups to systematically identify the climate risks and opportunities of TCC. Integrating the existing risk control protocols, it improved the climate change management system.



Disclosures	TCC's Approaches
Governance	
Management Mechanisms	<ul style="list-style-type: none">■ The Risk Management Executive Committee, in charge of the overall planning of risk management and answerable directly to the Board, calls meetings regularly to supervise the executions of the climate change response strategies while reviewing the climate-related risks and opportunities of the Group on a regular basis.■ The Engineering Affairs Department in charge of energy-saving and carbon reduction reports to the Board on the progress of emission reduction performance and environmental improvement as well as relevant major capital expenditures at least once a year.■ Climate change performance indicators are set in connection with the appraisals of carbon management action and performance of personnel in execution; energy saving and carbon reduction progress are reviewed monthly and incorporated in the quarterly bonus assessment so that all staff can commit to emission reduction actions and create a sustainable future together.

Strategies	
Short-/Mid-/Long-term Risks and Opportunities	<ul style="list-style-type: none">■ Pursuant to TCC internal management requirement, the short-term is defined as less than 3 years, the mid-term 3 to 5 years, and the long-term over 5 years. Following TCFD recommendations for types of climate risks and opportunities, TCC analyzes the possible changes in the regulations, policies, markets, and climate patterns occurring to where it operates in the future, identifying the 7 critical climate risks for TCC and the opportunities derived.

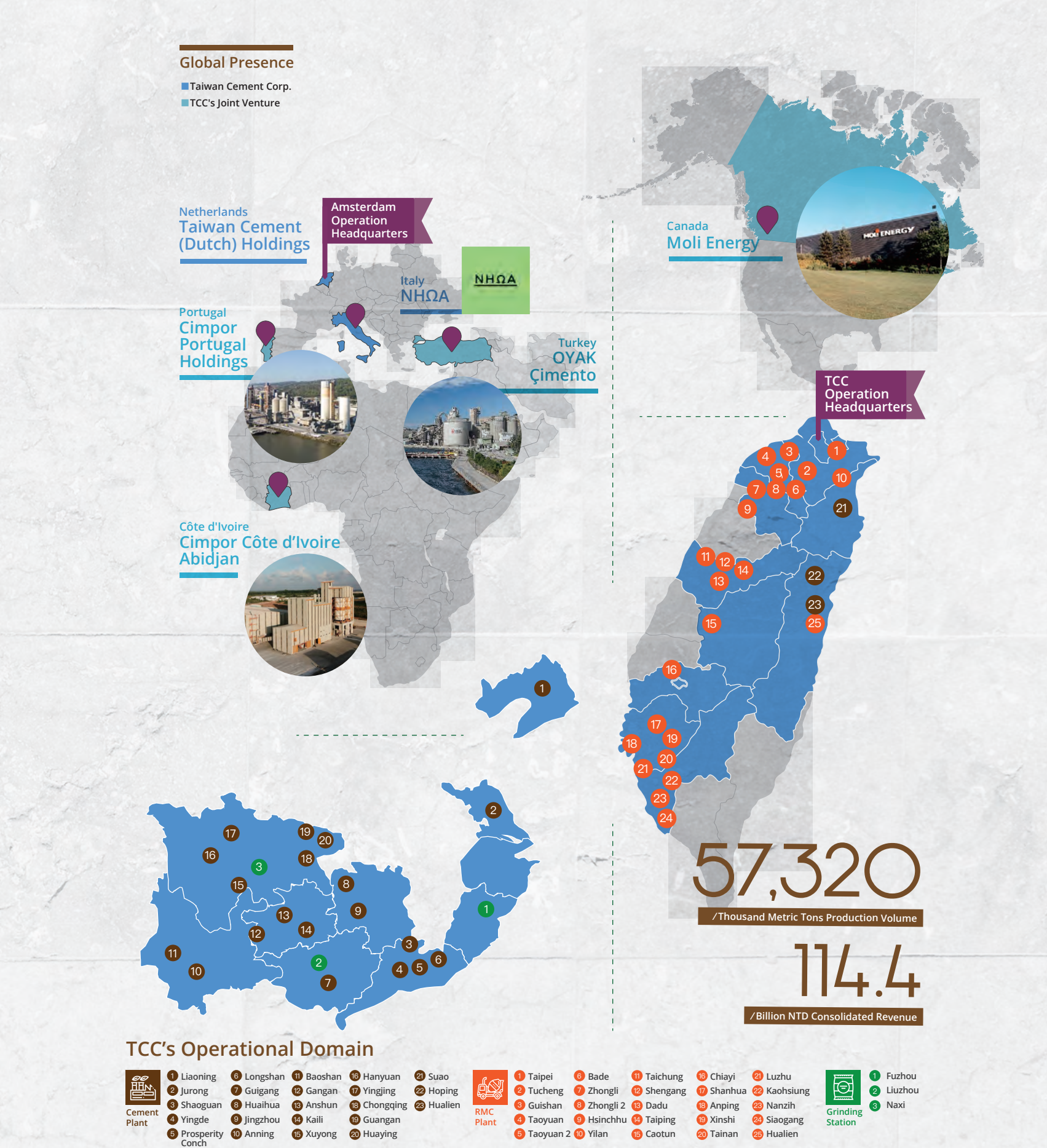
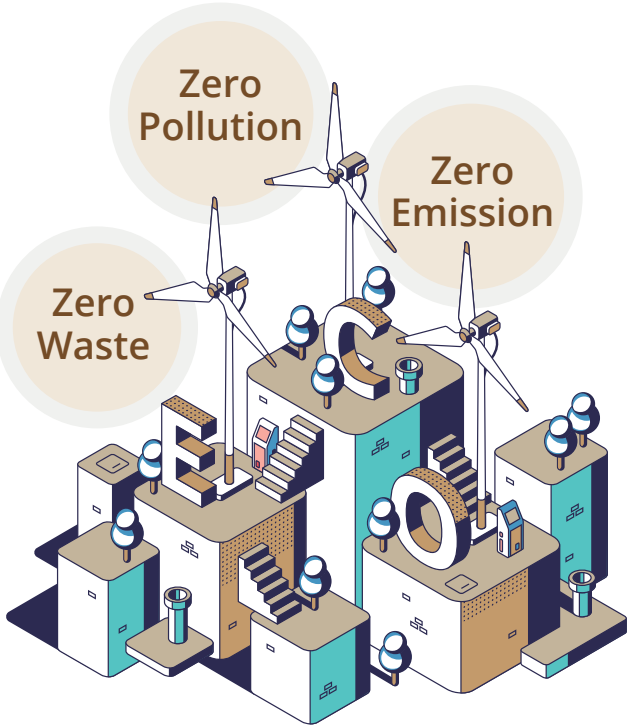
Disclosures	TCC's Approaches
Strategies	
Potential Impacts and Financial Planning	■ The potential financial impacts from critical risks and opportunities are identified via qualitative analyses with ongoing capital investment in equipment renovation, low-carbon product development, and renewable energy business development.
Scenario Analysis	■ Well-below 2°C Scenario: Based on the methodologies of UN IPCC scientists and the International Energy Agency, the required amount of carbon reduced for the Well-below 2°C scenario was calculated for the stipulation of carbon reduction pathway and strategies. ■ RCP 8.5 Scenario: Based on the WRI Aqueduct Water Risk Atlas, the flood assessment with the manufacturing sites in Mainland China was conducted; 2 sites are situated in high-risk areas, of which the emergency response mechanisms have been reviewed and strengthened.
Risk Management	
Assessment and Management Process	■ Members of functional units under the Risk Management Executive Committee conduct assessments on operational impacts and occurrence likelihood through the collection of risk factors, identify material risks and opportunities, and plan for mitigation and adaptation strategies at least once a year, which is supervised, reviewed, and reported by the Committee at least once annually.
Holistic System Integration Involving Risks	■ Climate change risks as well as issues with operations, finance, disasters, information security, and occupational safety and health, have been incorporated in TCC's overall risk management process.
Metrics & Targets	
Emissions and Targets for GHG Scope1, 2, and 3	■ TCC cement plants have achieved 100% ISO 14064 GHG emissions inventory and external verification as well as passed the review of SBTs in accordance with international standards.
Other Climate-related Management Indicators and Targets	■ Stipulation of management indicators and targets for energy use, renewable energy, alternative material/fuels, water resource uses, and obtainment of certifications of products with low impact on the environment, including the Green Mark of Taiwan and Low Carbon Product Certification of Mainland China.

2.2_A Robust Governance Framework

2.2.1_About TCC

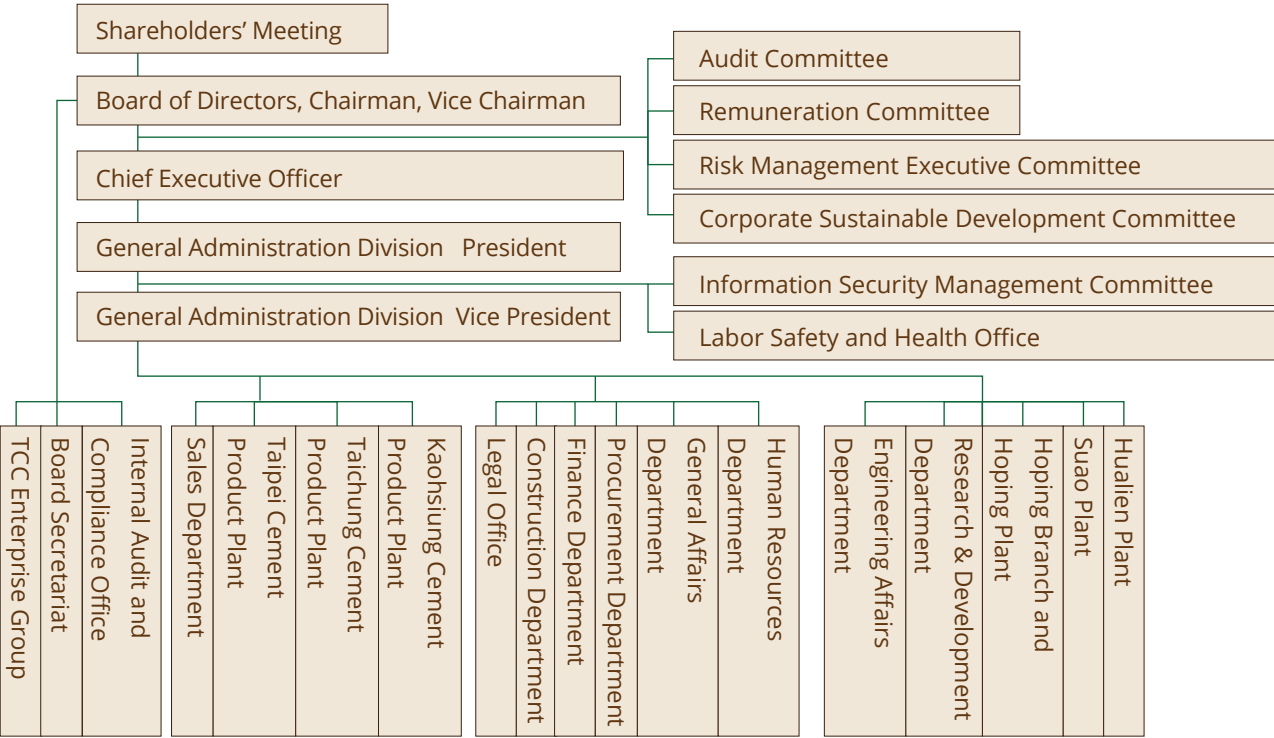
Brief Introduction to TCC

In the face of emerging risks such as global climate change, TCC prides itself as a pioneer of Taiwanese enterprises. As a proactive Eco-Friendly, Eco-Solution Provider, it endeavors to utilize innovative technology and creative thinking in combination with the core businesses to create a circular economy of “zero waste, zero pollution, and zero emission” and the Company’s sustainable values.





Organization Framework



Note1: The Taipei, Taichung, and Kaohsiung cement product plants include 21 branches and 3 distribution stations. **Note 2:** The Hualien Plant includes a ready-mix concrete plant.3.“Risk Management Team” was upgraded to “Risk Management Executive Committee” on May 12, 2020.

Financial Performance in 2020 (Unit: NT\$1,000)

Type	Item	Amount
Economic Value Generated	Operating Revenue	114,367,247
	Income (Loss) from Operations	31,341,817
	Non-operating Income and Expenses	4,011,489
Economic Value Allocated	Operating Costs	76,779,667
	EPS	4.32
	DPS	3.5
	Cash Dividend per Share	3.5
	Stock Dividend per Share	0
	Income Tax (Taiwan)	2,521,365
	Income Tax (Mainland China)	4,799,365
	Income Tax (Others)	41,183
	Employee Salary/Wages and Benefits	7,300,231
	Social Expenditures	328,275
Economic Value Residual	Retained Earnings	10,368,186

Note: The final numbers for DPS, cash dividends, and stock dividends per share are subject to the resolution passed by the 2021 general shareholders meeting.

Financial Performance

TCC endeavors to increase productivity and cost-effectiveness. Through constant adjustment of management strategies and exploration of new markets, it continues to march toward the vision of internationalization, diversification, and a stable financial structure. The year 2020 saw a consolidated revenue of NT\$114.4 billion, an operating income of NT\$31.3 billion, and an EPS of NT\$4.32.

Tax Governance

TCC has stipulated "TCC Group Tax Policy and Management Guidelines" with the Board of Directors as the highest decision-making and supervising body and the Group's Finance Department as the tax management body. The relevant measures are in compliance with tax laws and regulations, so as to: 1) carry out truthful tax reporting and payment with information transparency, mutual trust and honest communication, 2) evaluate tax risks and impacts, 3) elevate the tax professionalism, and 4) cultivate relevant talent.



2019 TCC Group Tax Information (Unit: NT\$1,000)

	Taiwan	Asia	Total
Operating Revenue	49,351,277	73,431,737	122,783,014
Profit before Tax	6,792,426	25,840,993	32,633,419
Income Tax Expenses	1,822,741	5,355,588	7,178,329
Effective Tax Rate	26.83%	20.73%	
Income Tax Paid	1,259,049	5,175,972	6,435,021
Effective Tax Rate of the Income Tax Paid	18.54%	20.03%	
Cost-to-income Ratio	25.39%	74.61%	100.0%

2020 TCC Group Tax Information (Unit: NT\$1,000)

	Taiwan	Asia	Total
Operating Revenue	49,316,294	65,050,953	114,367,247
Profit before Tax	12,916,987	22,436,319	35,353,306
Income Tax Expenses	2,565,217	4,796,696	7,361,913
Effective Tax Rate	19.86%	21.38%	
Income Tax Paid	5,629,885	2,129,022	7,758,907
Effective Tax Rate of the Income Tax Paid	43.59%	9.49%	
Cost-to-income Ratio	34.84%	65.16%	100.0%

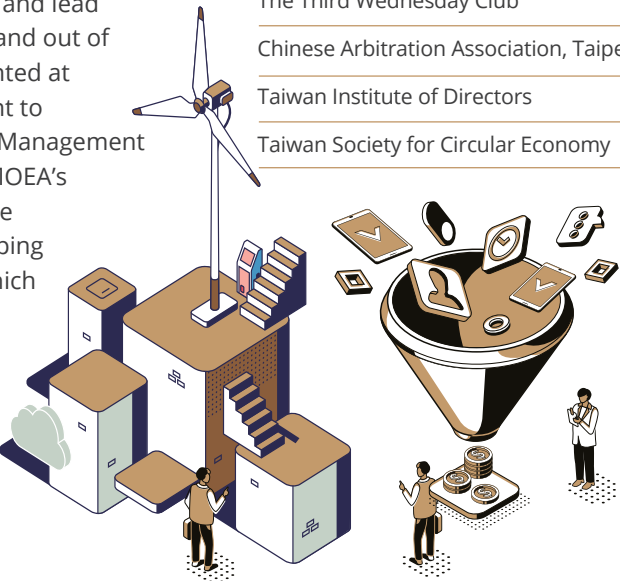
Domestic Industry Associations

To exchange knowledge, information, and practices in the industry and sustainable development, TCC proactively partakes in industry associations in an attempt to leverage its influence and lead the sustainable development in and out of the industry. In 2020, TCC presented at EPA's seminar on the amendment to Greenhouse Gas Reduction and Management Act and the working session of MOEA's CCS R&D Alliance, delving into the viability and prospects of developing and applying CCS technology, which reflects the results of TCC's long-term efforts in low-carbon technologies.

Membership of Associations

• Board Member • Professional Member • Member

Taiwan Cement Manufacturers' Association	V	V	V
Taiwan Ready-Mixed Concrete Industry Association	V	V	V
Taiwan Marble Association	V		V
Chinese Institute of Mining & Metallurgical Engineers			V
Taiwan Concrete Institute	V	V	V
Chinese National Federation of Industries	V		V
Taiwan Accreditation Foundation			V
The Institute of Internal Auditors-Chinese Taiwan			V
Taiwan Carbon Capture Storage and Utilization Association	V		V
Audit Bureau of Certification			V
Bio-App Biotechnology Industry-Academia Research Alliance			V
CNS Certification Mark Association	V		V
Taiwan Institute for Sustainable Energy			V
Center for Corporate Sustainability	V		V
CSRone			V
Chinese National Association of Industry and Commerce, Taiwan	V		V
Taiwan Corporate Governance Association			V
Chinese International Economic Cooperation Association	V		V
Cross-Strait CEO Summit	V		V
Monte Jade Science and Technology Association of Taiwan	V		V
Taiwan Stock Affairs Association	V		V
The Third Wednesday Club			V
Chinese Arbitration Association, Taipei			V
Taiwan Institute of Directors			V
Taiwan Society for Circular Economy	V		V





Promotion and Advocacy of Industry Issues

TCC has been extensively involved in over a dozen sustainability-related associations and organizations at home and abroad, including GCCA's sustainability initiatives, Taiwan Cement Manufacturers' Association, and Taiwan Institute for Sustainable Energy (TAISE), supporting and participating in the stipulation of relevant sustainable development policies like those of climate change, circular economy, and new technology R&D. From 2017 to 2020, the Group did not contribute to any political party or political advocacy group financially, nor fund any act of advocacy.

Expenditures for Public Participation in the Past Four Years

Type	2017	2018	2019	2020
Political Lobbying, Interest Representtion	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)	5,897,552	7,577,545	6,221,351	11,832,811
Matters Related to Election or Referendum	0	0	0	0
Total	5,897,552	7,577,545	6,221,351	11,832,811
Information Coverage	100%	100%	100%	100%

2.2.2_ The Board of Directors

Composition of the Board of Directors

The Board of Directors of TCC stresses diversity, ranging from expertise in various professional areas to seasoned experiences in industries. The Board members are elected in the General Shareholders Meeting in accordance with the Company Act and By-laws of the Corporation with a 3-year tenure. The incumbent Board of Directors of TCC is composed of 19 Directors (4 Independent Directors included), of

which 2 Directors are female. There are 4 Directors aged 31-50 and 15 Directors aged 51 and above. Multiple Board Members are seasoned with experiences as Chairperson or Board Member of listed companies. The profound expertise, knowledge, personal insights, and business judgment they possess are sufficient to contribute brilliantly to the Company's operational strategies. The average attendance rate of the Board of Directors in 2020 was 87%.

Core Competencies of the Members on the Incumbent (23rd) Board of Directors

Industry Experience
■ Finance ■ Legal ■ Business ■ Technology ■ Banking ■ Investment and M&A ■ Information ■ Risk Management ■ OperationalManagement ■ Lecturer ■ Cement Industry

Title	Board Member	Gender	Finance	Legal	Business	Technology	Banking	Investment and M&A	Information	Risk Management	OperationalManagement	Lecturer	Cement Industry
Chairman	An-Ping Chang	M	✓		✓		✓	✓	✓	✓	✓	✓	✓
Director	Jong-Peir Li	M	✓		✓		✓	✓	✓	✓			✓
Director	Kung-Yi Koo	M	✓		✓		✓	✓	✓	✓			✓
Director	Jason Kang-Lung Chang	M	✓		✓			✓	✓	✓	✓		✓
Director	Eric T. Wu	M	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Director	Chi-wen Chang	M	✓		✓			✓	✓	✓	✓		✓
Director	Nan-Chou Lin	M	✓		✓			✓	✓	✓			✓
Director	Kenneth C.M. Lo	M	✓		✓		✓	✓	✓	✓			✓
Director	Tzun-Yen Yu	M	✓		✓	✓		✓	✓	✓			✓
Director	Chi-Te Chen	M	✓		✓			✓	✓	✓	✓		✓
Director	Por-Yuan Wang	M	✓		✓	✓	✓	✓	✓	✓	✓		✓
Director	Chi-Chia Hsieh	M			✓	✓		✓	✓	✓	✓		✓
Director	Chien Wen	M	✓		✓			✓	✓	✓	✓		✓
Director	Chun-Ying Liu	F		✓				✓					
Director	Chih-Chung Tsai	M	✓		✓		✓		✓	✓	✓		✓
Independent Director	Yu-Cheng Chiao	M	✓		✓	✓		✓	✓	✓	✓		✓
Independent Director	Victor Wang	M	✓		✓			✓	✓	✓	✓	✓	✓
Independent Director	Chih-Jen Sheng	M	✓		✓			✓	✓	✓	✓	✓	✓
Independent Director	Lynette Ling-Tai Chou	F	✓		✓				✓				✓

Profiles and Committees of the Members on the Incumbent (23rd) Board of Directors

Title	Name	Time on the Board (Year)	Diversity in Core Items				Functional Committees		
			Nationality	Gender	Age		Audit Committee	Remuneration Committee	Risk Management Executive Committee
					31-50	51(or above)			
Chairman	An-Ping Chang	27	R.O.C	M		v			
Director	Jong-Peir Li	3	R.O.C	M		v			v
Director	Kung-Yi Koo	4	R.O.C	M	v				
Director	Jason Kang-Lung Chang	9	R.O.C	M	v				
Director	Eric T. Wu	15	R.O.C	M		v			
Director	Chi-wen Chang	5	R.O.C	M		v			
Director	Nan-Chou Lin	15	R.O.C	M	v				
Director	Kenneth C.M. Lo	9	R.O.C	M		v			
Director	Tzun-Yen Yu	15	R.O.C	M		v			
Director	Chi-Te Chen	36	R.O.C	M		v			
Director	Por-Yuan Wang	12	R.O.C	M		v			
Director	Chi-Chia Hsieh	18	R.O.C	M		v			
Director	Chien Wen	3	R.O.C	M		v			
Director	Chun-Ying Liu	3	R.O.C	F	v				
Director	Chih-Chung Tsai	3	R.O.C	M		v			
Independent Director	Yu-Cheng Chiao	9	R.O.C	M		v	v	v	
Independent Director	Victor Wang	8	R.O.C	M		v	v	v	v
Independent Director	Chih-Jen Sheng	4	R.O.C	M		v	v	v	
Independent Director	Lynette Ling-Tai Chou	3	R.O.C	F		v	v	v	v

Functional Committees

Item	Audit Committee	Remuneration Committee	Risk Management Executive Committee
Committee Members	4	4	3
Meetings Convened in 2020	9	4	2
Attendance (Presence in Person) (%)	88.88	87.5	100
Attendance (Presence by Proxy included) (%)	100	100	100

Note 1: TCC has set up the Audit Committee in place of Supervisors since 2015, responsible for 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, as well as assistance to the Board of Directors in assessment and supervision of the levels of remuneration for Board Directors and managers.**Note 2:** Remuneration Committee is responsible for formulation and review of policies concerning the performance assessments of the Directors, Independent Directors, and managers as well as their compensation. Also, they evaluate and stipulate the compensation for Directors, Independent Directors, and managers on a regular basis.

Assessment of the Board of Directors' Operation and Performance

Important resolutions adopted by the TCC Board of Directors are released and disclosed faithfully on the Market Observation Post System in a timely manner. When the Board deliberates on matters involving a Director or the legal entity he/she represents, the Director concerned shall recuse him/herself from taking part in



the deliberations and from voting on the matter. “Board of Directors Performance Evaluation Regulations” has been stipulated in TCC to evaluate the Board of Directors and the Functional Committees on a regular basis, fulfilling corporate governance and enhancing the functions and efficiency of the Board. The five facets covered in the evaluation include the involvement in the Company's operation, improvement of the decision-making quality of the Board, composition, and structure of the Board, the election of Board Members and advancement, and internal control. Each Board Member will fill out the “Board of Directors (Functional Committee) Performance Self-evaluation Questionnaire” for self-evaluation. Then, the Board Secretariat will conduct a comprehensive performance evaluation based on the attendance of Directors and their performances at the meetings and report to the Board of Directors. The result of performance evaluations with the Board of Directors and the Functional Committees in 2020 is 4.9 (out of 5), which has been submitted to the Board on March 19, 2021. In addition, pursuant to Article 3, Paragraph 2, of the “Board of Directors Performance Evaluation Regulations,” The execution of performance evaluations of the TCC's Board of Directors is to be carried out once every three years by an external independent professional institution or a team of external experts or scholars,” the evaluation of the Board of Directors in

▼

2020 has been conducted by an external independent professional institution, which submitted the evaluation report on the Board of Directors' performance on February 26, 2021. The overall evaluation is excellent as a whole.

Remuneration Policies

The President's performance as well as related salary and remuneration policies, mechanisms, standards, and structure are evaluated by the Remuneration Committee based on the contributions to the Company's operations before being submitted to the Board for approval. Apart from the linkage to performances, the evaluation scope for salary and remuneration also encompasses the non-financial performances such as corporate governance, green finance, social care, and environmental sustainability. The targets are as follows:

① Earnings-related Performance Indicators

Attainment of targets in revenue and profits as well as budgets

② Talent Cultivation Indicators

Cultivating talent, raising the competency and quality of employees, fostering an international view

③ Risk Indicators

Compliance with laws and regulations

④ Strategy Indicators

Circular economy development, achievement of sustainability and circularity goals

including the deployment in the processing of household and industrial wastes in Mainland China, carbon capture and sequestration with microalgae, green energy generation, etc.

Corporate Governance Evaluation

TCC values corporate governance performance, achieving a result of 21-35% in the seventh Corporate Governance Evaluation. Regarding the issues for improvement, they are constantly brought up on the monthly high-level managers' meetings for the people in charge across departments to plan and execute corrective actions for relevant indicators accordingly. In addition, the set corporate governance evaluation targets are connected with the performances of the responsible unit managers so as to drive the growth of corporate governance performance.

For more information on TCC's corporate governance measures, please visit




Corporate Sustainable Development Committee

To implement TCC's sustainable development plans, TCC established the Corporate Sustainable Develop

ment Committee that answers directly to the Board of Directors. It is a functional committee beyond the regulatory requirement. Composed of a minimum of three members to be appointed by the Board, the Board Chairman serves as the Committee Chair, and the President the Vice Chair. Five functional units, i.e., "ethical governance and risk management," "circular manufacturing," "sustainable environment and products," "care for employees," and "social care," were established under the Committee. Moreover, the Committee will convoke relevant departments to set up ESG task forces. Meanwhile, TCC will examine at regular intervals action plans for the three other facets, i.e., "TCFD for finance," "information security," and "sustainable supply chain," to strengthen the corporate constitution.


Agenda of Corporate Sustainable Development Committee in 2020



Offering a Possible Pathway to Carbon Neutrality by 2050 for the Taiwanese Cement Industry

Attainment of the Goal of Carbon Neutrality


Apart from formulating the 2025 SBTs in line with the SBTi, TCC also acted on the SDG 17 to establish a global partnership. It initiated the 2050 Climate Ambition together with fellow members of GCCA, aiming to achieve carbon neutrality for concrete products by 2050. Hence, an internal carbon management mechanism was created with seven strategies to reduce carbon emissions formulated for the Group.



Establishment of Carbon Emission Standards for the Cement Industry in Taiwan

The First Carbon Footprint Label for Cement Products in Taiwan

Product Category Rules (PCRs) for the cement products in Taiwan were established. Moreover, TCC's Portland cement Type I and 3000-psi concrete that enjoyed the highest market share, passed the carbon footprint certification and acquired the first Carbon Footprint Label for cement products in Taiwan.




Enhancement of Climate Risk Governance

Introduction of the TCFD Evaluation Mechanism

An interdepartmental working group was formed to implement the TCFD disclosure framework.

Risk Management Executive Committee

The Risk Management Executive Committee was established in 2020 to lead the corporate risks identification and responses planning, including climate change risks.



TCC DAKA Innovative Model for Local Inclusion

New Factory-Community Relationship

The project of "Open Eco-Factory" commenced in Heping, Hualien by TCC to redefine the relationship between factory and city while fulfilling the goals of sustainable developments in the environment, economy, and society. As of the first anniversary of TCC DAKA, there were over 2.5 million visitors already. In the meantime, a documentary of TCC DAKA was released, and large events like DAKA Music Village were organized, facilitating the neighboring tribes in developing the possibilities of local featured cultural and ecological tours. The TCC DAKA Phase II development plan includes the Ocean Station, developing new types of maritime services. Meanwhile, the admission fees collected by the TCC DAKA campus are 100% contributed to the Hualien Heping Elementary School Education Fund to support community education development. The total amount contributed to the education fund in 2020 has exceeded NT\$2.3 million.

National Recognition

The first large manufacturer in Taiwan obtaining the Tourism Factory Label and the National Industrial Innovation Award from MOEA in 2020.

Social Impact Evaluation

An SROI evaluation was conducted regarding the three aspects of TCC DAKA, measuring the influences of DAKA's activities on the local communities, females and youngsters in the tribes, and the corporate employees.



All-Round Protection Expanded to Employees' Families and Contractors

TCC Pandemic Response Command Center

Commanded by the Chairman himself, it aggregated real-time information from the Headquarters, subsidiaries, and affiliated enterprises, including pandemic reports, industrial dynamics, and official information from all operation sites as a reference for pandemic response teams to formulate adjustment response plans. Moreover, alternating work schedules and promoting teleconferencing were implemented. Infrared thermal imagers were installed; disinfection was carried out on a regular basis; supplies like face masks were provided regularly; and reassigning and deploying staff for overseas posts.

TCC Talk Mechanism


The high-level managers proactively communicated and interacted with employees to update the pandemic responses of TCC. With Care Platform and social media applications combined, we encouraged staff to care for one another.

Epidemic Care

Flu vaccinations were available for employees and contractors to protect the rights of all TCC employees, partners, and stakeholders.

Employment Counseling

Skill training and employment by TCC were offered to the youth in Hualien that lost their jobs due to the pandemic.




Enhanced Water Management

Water Footprint Inventory and Verification

100% ISO 14046 verification with all cement plants.

Wastewater Management Target


100% wastewater discharge free.



World-Class Biodiversity Management

Biodiversity Management Plan (BMP)


The ecology of mines was managed with international standard systems. An external organization was commissioned to prepare a report on the value of ecological services, in order to promote mine restoration, and a 100% BMP coverage was achieved.



Establishing the Sustainable Management Benchmark for the Supply Chains in Traditional Industries

Supply Chain Sustainability Conference

The sustainable supply chain management project was launched to improve the overall supply chain sustainability performance via audits, visits, and tracking while the 2020 Five Management Targets for Sustainable Supply Chain were set.



Ethical Risk Management

Introduction of ISO 37001 Anti-Bribery Management System

To strengthen TCC's ethical operation management mechanism, TCC introduced ISO 37001 Anti-bribery management system to improve the management of risks of corruption and bribery.

Information Security Upgrade

ISO 27001 Information Security Management System
Committed to the protection of the confidentiality, integrity, and availability of critical information systems and data with the Group, TCC established the "Information Security Management Committee" and introduced the ISO 27001 Information Security Management System to enhance information security management.

2.2.3_ Integrity and Ethics

TCC stresses discipline and integrity. "Ethical Corporate Management Best Practice Principles" and "Code of Ethical Conduct " were adopted by the Board of Directors in 2011, encompassing anti-corruption and anti-bribery, anti-discrimination, information confidentiality, handling of conflict of interest, anti-competition/anti-trust, anti-money laundering, no insider trading, a violation report system, and so on. In 2020, there was one case of embezzlement. After investigations, one individual directly involved was dismissed. Two executives in the chain of command were given demerits. Relevant business management units were required to review the case thoroughly and make improvements in the future. Education and training related to the "Code of Ethical Conduct" shall be enhanced comprehensively.

In 2020, TCC comprehensively promoted the "Code of Ethical Conduct" to the Group's affiliated enterprises in Taiwan with a 100% achievement rate in employees' signing to signify their agreement in hardcopy or online. "Code of Ethical Conduct" was explained on the onboarding date for new employees of the Group. Since 2020, the promotion has turned online with an examination mechanism to ensure employees' full understanding of corporate policies. A total of 3,099 individuals completed reading with an achievement rate of 100%. To learn better the employees' understanding of relevant issues, TCC conducted a survey with the Company itself, its subsidiaries at home and abroad, and affiliated enterprises using a 3-point scale. The result indicates that 96.77% of employees understand, or more or less understand, the Code of Ethical Conduct, with a 96.71% employee coverage rate company-wide.

TCC took it further by introducing the ISO 37001 Anti-bribery Management System in 2020 to better

its management on risks of corruption and bribery. In addition, provisions on anti-corruption, environment, health and safety were added. Meanwhile, the "Reporting Mechanism for Violation of Code of Conduct" was amended to clearly define the scope of application while introducing mechanisms like confidentiality in the investigation process and whistleblower protection.



2.2.4_Legal Compliance

In light of legal compliance requirements and various emerging issues, TCC incorporated anti-money laundering, anti-corruption, and labor safety and health into the standard contracts that became the norm for the cooperation between business partners and TCC. The Legal Office reviews contracts in a prudent manner to ensure the incorporation of relevant provisions in contracts and other documents.

Legal Compliance

- Unit | Legal Office**
Duty/Performance |
- 1_Demanding departments in TCC and subsidiaries to regularly report the progress of litigations and legal disputes to ensure an understanding of important legal disputes and the necessary actions to be taken in a timely fashion.
 - 2_Planning of consultations and cooperation services by external advisors.

- Unit | Human Resources Department**
Duty/Performance |
- 1_Organizing seminars, education and training, and lectures to raise employees' awareness of legal compliance.
 - 2_Planning relevant training with external advisors.



- Unit | Internal Audit and Compliance Office**
Duty/Performance | Implementation of internal audit, prevention of corporate operational risks, and improvement of corporate operational effectiveness

- Unit | All Departments and Subsidiaries**
Duty/Performance | Compliance with relevant laws and regulations, including product marketing and labeling in conformity with relevant regulations in terms of product sales and compliance with relevant environmental regulations such as the Air Pollution Control Act regarding environmental protection.

In 2020, TCC was issued five penalties relating to the environment, community, and economy, two of which were subject to fines over USD \$10,000⁴. The total amount of the fines was NT\$1,599,800. Relevant violations have been corrected, including submission of the reduction plan for runoff pollution caused by wastewater, installing retaining walls at catch drains, renovating concrete retaining walls to prevent sewage seepage, adding checkpoints of runoff wastewater (rainwater) drains to the inspection routes on PDA, as well as the replacement of pumping equipment. Moreover, awareness is built internally to prevent any violations in the future.

Internal Audits

Pursuant to the annual auditing plan, the TCC Internal Audit and Compliance Office carries out internal audit operations, including calling pre-audit meetings, executing audits, compiling recommendations for internal audits, calling closing meetings, and submission of audit reports. The audit reports will be submitted to the Audit Committee for review upon the Chairman's approval before the end of the following month. Then, notices will be issued to the units to be inspected to demand corrective measures in specified periods. Corrective measures will be monitored, and tracking reports will be compiled for the Chairman and the Audit Committee's approval.

In addition, the Internal Audit and Compliance Office will plan and execute project-based audits each year on the ground of the prior experiences and future trends to help all business units to examine nonconformities in the respective internal controls and to

measure the effect and efficiency of operations for a more robust operation of the Company. In 2020, to elevate the flexibility of audits, one auditor was added to the Mainland China operation center to offer direct support in various operations.

⁴Major penalty cases at TCC are cases subject to a penalty amount of US\$10,000 or more.

Key Performances of the Internal Audit and Compliance Office in 2020

Audit Items | Plant Safety Management

For all contracted operations in construction projects, traffic cones are required for high-altitude hanging operations with personnel specifically assigned for traffic control. Operators are required to wear helmets and lifelines. No alcohol consumption is allowed for staff during operations. Upon discovery of any violations, all operations shall cease immediately, and severe penalties will be met out to the staff involved.

Audit Items | Total Reduction Management

It is listed as one of the required items annually for all cement plants. After audits and tracking for three years, the number of nonconformities in total reduction has been falling year by year.

Audit Items | Seals Management

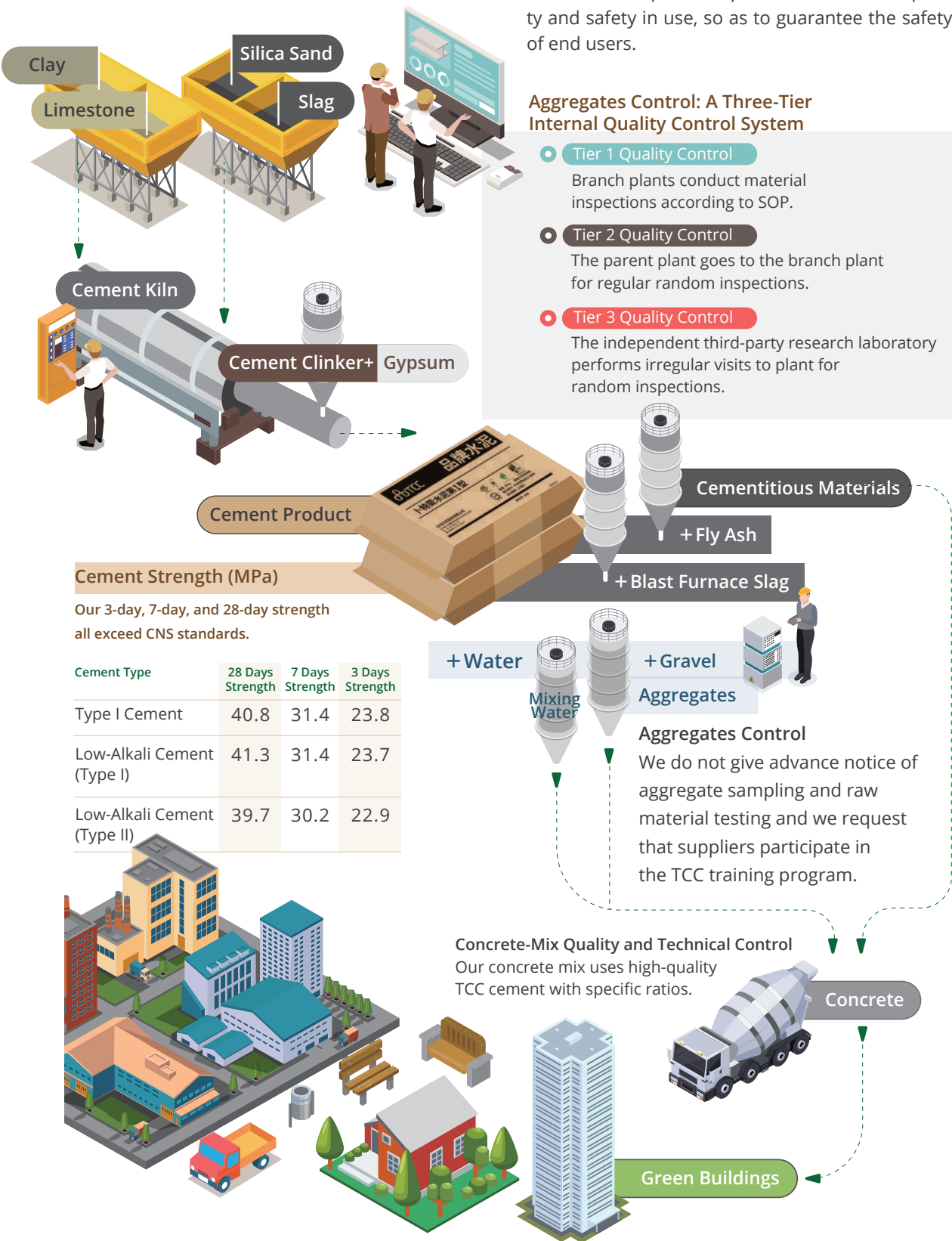
"List of Seal Management" and "Seals Registry" were established for all important seals of the Company, which are updated immediately upon any change of the respective seal keepers. The auditors will check and inventory seals from time to time.

Audit Items | Sales Management

To ensure safe transport of cement to construction sites and stability of sale prices, it is necessary to inspect if the GPS monitoring systems and the anti-channel conflict early warning systems for internal controls function properly across the cement plants in Mainland China and if the electronic fences are set accurately. In addition, security guards are required to check if the connection of GPS systems onboard the vehicles coming in and out of the plants functions properly. The special ad hoc sale prices require the executives' approval.

2.3_Optimizing the Client Experience

2.3.1_Product Quality



Through a comprehensive quality improvement approach, TCC constantly improves the quality of products to ensure they exceed the standards and regulations of major countries worldwide. In terms of cement strength, aggregates control, self-inspection, concrete quality and technology, we ensure that all products pass assessments in quality and safety in use, so as to guarantee the safety of end users.

Over NT\$100 Million Invested to Set Up a TAF-Accredited Concrete Laboratory and Cultivate Professional Talent in the Industry

To remain at the forefront of the cement industry, expand the ready-mix concrete (RMC) market, and strengthen the competitive advantages, TCC invested over NT\$100 million in building a TAF-accredited concrete laboratory. The lab is expected to be completed for inauguration by the end of 2021.

Apart from committed to concrete development and innovation, such as the development of the ratio of ingredients for Ultra High Performance Concrete (UHPC), the lab shall be able to present inspection reports for materials and products of RMC. Thus, it will improve the technical skills and capacities of quality control staffs of TCC RMC plants and further promote the R&D of new products as well as other significant projects.

TCC Promotes Product Traceability, First in the Industry

2019

Promotion of product traceability allows clients to access information regarding raw materials, including cement, sandstone, hearth-stone, fly ash, chemical agents, and mixing water, via TCC's client relationship management system when they use TCC-branded RMC.

2020

The collaboration with Taiwan Construction Research Institute (TCRI) in verification allows us to conduct inspection and verification in terms of quality and processes via an impartial third party.

2021

Content of product traceability information is upgraded to offer quality variation analysis so that clients may access factual information regarding the changes of concrete in terms of quality from the use of TCC-branded RMC to completion of construction. Moreover, TCC conducts monthly quality ratings of the materials and product contents from individual plants.



2.3.2_Client Recognition

Ever since its foundation, TCC has been committed to the provision of products and services that satisfy its clients. In addition, it values technology exchanges and good interactions between both parties in order to create maximum values for clients. With its clients at the core, TCC offers customized products and services, provides on-site services to clients as to cement applications, ready mix concrete proportion adjustments, and resolution of issues during construction. The client service task groups arrange client service schedules on a monthly basis to proactively care for the clients’ use of products in the same period. In addition, “Client Service Planning and Follow-Up Charts” have been created for tracking and improvement.

In addition, as information security issues are ever more critical in these years, TCC takes its clients’ privacy rights to heart. Client data are collected, processed, and used in accordance with the pertaining laws and regulations. There were no complaints pertaining to client privacy in 2020.



Results of Client Satisfaction Surveys Over the Past Four Years

	Importance				Satisfaction			
	2017	2018	2019	2020	2017	2018	2019	2020
Company Reputation	93.78%	92.87%	93.19%	94.13%	90.27%	90.11%	92.31%	93.26%
Cement Brand	92.97%	91.72%	91.65%	93.04%	90.27%	89.89%	91.21%	93.04%
Cement Quality Stability	95.95%	95.63%	95.60%	95.22%	88.11%	87.59%	89.89%	93.26%
Convenience of Consignment Plant	92.70%	91.95%	91.65%	93.26%	78.92%	78.62%	83.08%	86.74%
Service Attitude and Sincerity	92.16%	89.43%	90.55%	91.52%	87.03%	85.98%	88.79%	90.87%
Client Complaint Response Time	91.89%	91.95%	91.43%	90.43%	84.05%	84.14%	87.91%	88.26%
Professionalism of Service Staff	—	—	92.75%	91.74%	—	—	88.35%	89.78%
After-Sales Service	92.16%	91.49%	90.77%	91.96%	83.78%	82.30%	87.47%	89.57%
Total	92.85%	91.34%	92.20%	92.66%	84.35%	82.71%	88.63%	90.60%
Overall Product Satisfaction					85.68%	83.91%	87.03%	89.57%
Overall Service Satisfaction					85.14%	82.99%	86.15%	88.91%
Clients Rating “Satisfied” in the Satisfaction Survey (%)					92.57%	91.38%	96.70%	95.11%
Clients Responding to the Satisfaction Survey (%)					99.52%	99.91%	99.97%	99.90%

2.4_Supply Chain Sustainability

5 Targets for Sustainable Supplier Management



¹The on-site inspections to the Tier 1 Critical Suppliers were scheduled to take place in 2020-2022. Considering the impacts of the pandemic, it was scheduled as 20% completed in 2020 and 40% completed in 2021 and 2022, respectively so as to achieve the goal of 80% on-site inspections in three years. In 2020, TCC completed the on-site inspections to 15 suppliers. Of the 93 Critical Tier 1 Suppliers, the achievement rate was 20.16%, which is higher than the original 20% target.

To ensure product quality and implement operational guidelines, TCC rigorously demands suppliers’ actions in terms of quality, cost, delivery, as well as the environment, safety, and sanitation. In 2020, TCC further amended the “Supplier Management Policy” and “Supplier Code of Conduct” to indicate the management principles and mechanisms for suppliers and to include important policies on legal mineral sourcing, local procurement, and green procurement. In addition, TCC requires all its suppliers to sign

the “Supplier Safety and Health Pledge” while demanding all new suppliers and existing Critical Tier 1 Suppliers in Taiwan to sign the “Supplier Code of Conduct.” It is scheduled to attain the targets of 80% of the existing Critical Tier 1 Suppliers to sign the “Supplier Code of Conduct” by 2021, and 100% by 2022.

In addition, TCC requires all its suppliers to sign the “Letter of Undertaking for Health, Safety, and Environment (HSE)” while demanding all new suppliers in Taiwan to sign the “Supplier Code of Conduct”. As for the existing Critical Tier 1 Suppliers in Taiwan, they are required to sign as well. It is scheduled to attain the targets of 80% of the existing Critical Tier 1 Suppliers to sign the “Supplier Code of Conduct” by 2021, and 100% by 2022.

For details of supplier management, please visit Supply Chain Management section



ESG Evaluation on New Suppliers

On the basis of “Plant Supplier Evaluation Regulations” and “TCC Supplier Sustainability Evaluation Forms”, we probe into suppliers’ governance in terms of labor, health and safety, environment, ethics, and management system through document and on-site reviews, so as to verify if a supplier is in line with the basic requirements of sustainability before being listed as one of the TCC suppliers.

Risk Management on Existing Suppliers

TCC conducts regular risk assessments on the ESG risks of its existing suppliers. Based on the results of supplier assessments, the sustainability risks of suppliers are determined in terms of the likelihood of threats, impact levels, and vulnerabilities so as to prioritize the risks to be addressed.

Incentive and Penalty Mechanisms







Suppliers with excellent performance will be included in the Company’s list of preferred suppliers and will receive public acknowledgment from the Company. High-risk suppliers who fail to improve their performance within the timeframe specified by the Company will have their contracts terminated.



Establishing a Supplier Tier and Type Classification System

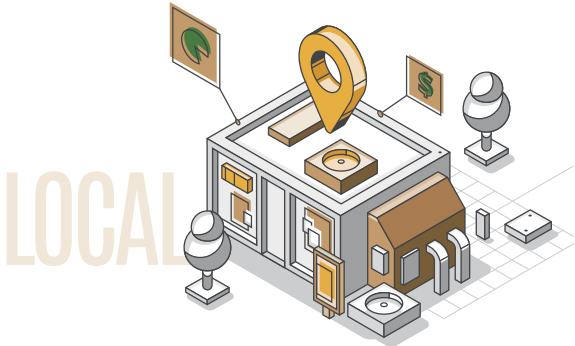
TCC assigns tiers and types to its suppliers for effective management while inventorying step-by-step to capture the overall status of the supply chain. At present, TCC assigns its suppliers into six types on the basis of products and services provided, i.e., raw materials, outsourcing and subcontracting, equipment parts, construction (including goods and services), transport, and explosives.

Furthermore, according to the characteristics of these six types of suppliers, TCC sets bars for tiers to identify critical suppliers. Critical Tier 1 Supplier is defined as a supplier that has a major impact on the Company's production quality or delivery schedule, or that reaches a certain procurement amount or ratio, which requires to be managed and evaluated. As of the end of 2020, there were 993 Tier 1 Suppliers of TCC, of which the Critical Tier 1 Suppliers numbered 93, accounting for 90.38% of the procurement amount.

Supply Chain Procurement Amount in 2020		
(Unit: NT\$)		
Procurement Amount		
	Raw Materials	9,510,315,895
	Outsourcing & Subcontracting	355,751,468
	Equipment & Parts	2,170,075,138
	Transport	1,352,491,178
	Construction	1,066,154,675
	Explosives	73,084,831
Total		14,527,873,185

Local Procurement

Adhering to the principle of local development and local supply, TCC proactively develops local suppliers and implement local procurement. As such, it endeavors to achieve procurement at the right place and the right time to reduce operating costs in management, minimize carbon emissions from long-distance transportation, and create local employment opportunities that foster economic prosperity.



Local Procurement in 2020	Raw Materials		
	Non-Raw Materials		
	Total		
	(Unit: NT\$)		
Local Procurement Amount	8,336,566,269	4,745,387,560	13,081,953,829
Total Procurement Amount	9,510,315,895	5,017,557,290	14,527,873,186
Local Procurement Ratio (%)	87.66%	94.58%	90.05%

Note 1: The suppliers of local procurement in Taiwan are Taiwan-based suppliers. Note 2: Non-raw materials items include spare parts, construction, and on-site labor.

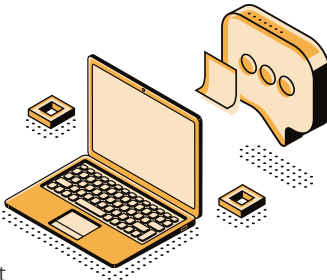
Green Procurement in 2020	Raw Materials		
	Non-Raw Materials		
	Total		
	(Unit: NT\$)		
Green Procurement Amount	781,256,815	7,885,918	789,142,733
Total Procurement Amount	9,510,315,895	5,017,557,290	14,527,873,186
Green Procurement Ratio (%)	8.21%	0.16%	5.43%

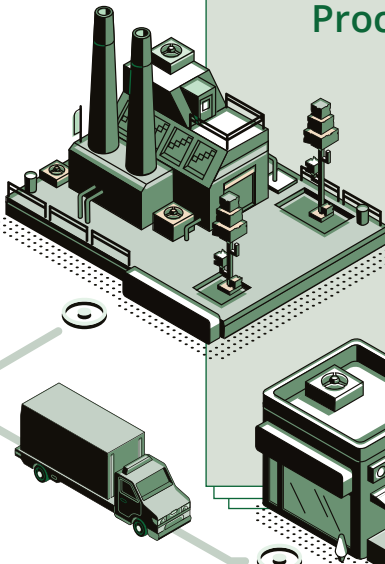
In-depth Sustainability Partnership with Suppliers

While in compliance with environmental laws and regulations, TCC also demands suppliers to implement sustainable management. For instance, the suppliers that provide transport services are required to upgrade their service vehicles to eco-friendly vehicles in conformity to the Phase 4 or Phase 5 Emission Standards in Taiwan. In the case of Phase 3 vehicles, TCC will demand and mentor the suppliers with the installation of Diesel Particulate Filter (DPF). TCC aspires to work hand-in-hand with its suppliers in terms of sustainable management to build a more sustainable future.

Supplier Grievance Mechanism

Any supplier may report any violation of discipline or integrity in work to the grievance mailbox at MP.Buster@taiwancement.com






Green Procurement Policy

TCC concerns itself with issues of global environment and climate change. Hence, it proactively stipulated green procurement policies, incorporating environmental and social factors into the decision-making process for its procurement, to exert the TCC Group's influence to persuade the upstream and downstream vendors in its supply chain to follow suit and create positive impacts on the environment and society, while encompassing items of local procurement and green transportation. Take green transportation for example. The TCC Group gives priority to the use of back-haul trucks/vessels to fulfill green transportation. Moreover, TCC gives priority to suppliers that are able to work with green logistics to reduce greenhouse gas emissions during transportation. In addition, TCC requires that all vehicles used for transportation in and out of its plant must comply with national environmental regulations or be equipped with diesel particulate filters. The use of bunker fuel by the vessels must also comply with international and local regulations where it operates its business.

Learn more about our Green Procurement Policy at





“Humans have national borders, but temperatures, climate, and viruses do not recognize such boundaries.”

After the agricultural revolution about 12,000 years ago, the existence or lifestyle of humans began to affect the ecological environment of the entire Earth. Today, 96% of mammalian life on land is our own or domesticated animals; 70% of birds on Earth are poultry. Owing to the extensive use of fertilizers, pesticides and excessive irrigation, the Earth loses 24 billion tons of arable soil every year.

In the natural world before humans, it was a perfect circular economy, without any waste or rubbish. These two concepts were actually created by human beings. In an ecosystem that could not be classified as human, everything could be recycled or reused. So although the previous Earth would have some fluctuations caused by environmental changes, the Earth at that time could repair itself on its own.

The etymology of the English word “nature” is birth and thus rebirth.

Only since the Industrial Revolution in the 19th century, have humans begun to fully exploit fossil fuels and raw materials, which created some products and by-products that Nature cannot digest or recycle. As a result, the Earth’s ecology has entered an era of crisis. There is inherently a high degree of contradiction between the development of the ecosystem and the existence and progress of human beings. Human nature likes quantity to exceed quality, wastefulness over conservation, and almost always chooses rapid development. When production exceeds demand, it causes the natural environment to be overwhelmed to the extent that it can support and thus needs to be protected. The Paris Agreement hopes that the Earth can keep the temperature rise below 1.5°C to 2°C, but if we continue our current life and production pace, the Earth will surely move towards a temperature rise of 4°C by the middle of the 21st century.



Some recent global ecological reports tell us that in the past thirty years, the rate of ice melting of the Poles and glaciers has accelerated, which is consistent with the worst-case climate change scenarios forecast earlier by scientists. According to “The Cryosphere” magazine, from 1994 to 2017, the Earth lost 28 megatons of ice. This phenomenon has begun to change the natural norms of the two ocean currents, both cold and warm. If we lose the natural norms protecting the Earth’s ecosystems, this result may cause the total extinction of human beings all over the world.

When thinking about these questions, there is a sentence that keeps circling in my mind:

“We did not inherit the Earth from our ancestors, but only borrow it from our children.”

In the Earth’s history, the emergence of human beings approximately one hundred thousand years ago is only a fleeting few nanoseconds in the Earth’s 4.5 billion years of life. In the ecology of Mother Nature, the most terrifying thing is that we are totally ignorant of what we don’t understand! We don’t actually understand Nature. There are about 9 million species of animals and plants in the world, and humans only know about a little over 2 million. About 6,000 new creatures have been discovered every year. But if we include some single-celled microorganisms, such as bacteria or viruses, there may be a trillion species of organisms. In other words, we don’t know over 99% of the organisms on Earth, and we don’t know where to start. The oceans produce half of the oxygen in the Earth’s atmosphere that humans need for survival, but how much do we know about the oceans? We only know how to exploit the oceans unscrupulously. Humans have massively engaged in over-fishing, such that the catch reached its peak ten years ago. Now the annual fish catch is declining rapidly, and fish are still a major source of protein needed by humans. Many countries think nothing of discarding waste into the ocean, so that we can already see discarded plastic products on the deepest seabed. Even the seawater is full of plastic particles, but we still do very little to protect the oceans. We, human beings are only a part of Nature, not the masters of Nature.



Environment and a Low Carbon Supply Chain | Material Topics

GRI 303 Water and Effluents	GRI 305 Emissions	GRI 302 Energy	GRI 306 Effluents and Waste	GRI 301 Materials
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Management Policies

- Introduction of ISO 14001/ISO 50001/ISO 14064/ISO 14046 management systems with effectiveness maintained and a 100% cement plants certification coverage.
- Stipulation of “Environmental Management Policies” with commitments to sustainable management of the environment, circular utilization of resources, promotion of strategic management in terms of air, water, energy, and raw materials, and implementation of legal compliance and self-discipline.

Assessment Mechanisms

- Regular meetings to review the performance of environment management
- Implementation of “internal carbon pricing” with energy-saving and GHG reduction targets as well as environmental protection management indicators incorporated as part of the annual appraisal and quarterly bonus assessment.
- 4.2%¹ reduction in the cement plants’ carbon intensity per metric ton of cementitious materials by 2020 compared to the 2016 level
- 25% reduction in the cement plants’ total water use intensity by 2020 compared to the 2016 level
- 16% reduction in the total NOx emissions of cement plants by 2020 compared to the 2016 level
- 5% reduction in the total SOx emissions of cement plants by 2020 compared to the 2016 level
- 43% reduction in the total TSP emissions of cement plants by 2020 compared to the 2016 level
- Measuring the performance in natural raw materials substitution by monitoring the substitution ratio, which was 20.06% in 2020

Targets

- In 2021, planning for the reclamation engineering for water in vertical shaft tunnels and the MBR wastewater treatment system to reduce water consumption
- By 2025, 50% reduction in NOx emission compared to the 2016 level
- By 2025, 30% reduction in SOx emission compared to the 2016 level
- By 2025, 50% reduction in TSP emission compared to the 2016 level
- By 2025, 11% reduction in the total GHG emission intensity compared to the 2016 level
- By 2030, 1.57 million metric tons of waste co-processed
- Ongoing promotion of business models of the circular economy
- Increased types of alternative raw materials to reduce the environmental impacts

¹ Revised accordingly in June 2022 based on the SBT base year value

03
CHAPTER
Environment and
a Low Carbon Supply Chain

AI Big Data and Carbon Dioxide
Emission Management System 65

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▼
AI Big Data and Carbon Dioxide Emission Management System

Advancing into the Age of Industry 4.0, TCC utilized the big data of plant databases and introduced Artificial Intelligence (AI), machine learning, and “Life Cycle Assessment” (LCA) management system to self-develop a management system of carbon dioxide emission reduction. The system offers individual plants the optimal ratios for processes and carbon dioxide emission reduction approaches, from target-setting, resource inventory for carbon dioxide emission reduction to big data analytics across plants. It accurately executes and manages the carbon dioxide emission reduction targets in phases and tracks progress while taking it further by linking these results with the internal performance-based bonuses for more effective implementation.



Systematic AI Evaluation to Offer Optimal Strategies Across Plants
TCC has combined the Group's cement manufacturing process R&D and IT capacity since 2019 to introduced AI technology and big data computing based on the P-D-C-A concept of the management system. Through the three steps of "current status analysis," "decision-making optimization," and "coordinated execution," it facilitates carbon dioxide emission reduction target-setting across all units, establishes alternative raw materials and fuels databases, analyzes the cost-effectiveness on energy-saving and carbon dioxide emission reduction, plans optimal solutions, and tracks overall progress.

Current Status Analysis
With the Group's Enterprise Resource Planning (ERP) system, all consumption data of alternative raw materials and fuels are pooled in daily to learn about the status of carbon dioxide emission reduction. Meanwhile, the system assists the management and plants in accessing real-time information on the overall performance of carbon dioxide emission reduction.

Decision-making Optimization
The system provides real-time analyses of the current operations and performances of carbon dioxide emission reduction of all plants and kilns. Moreover, it offers recommendations on the alternative raw materials and fuels and the suggested amount to plants according to their temporal-spatial conditions and kiln operation restrictions. Hence, it facilitates optimal production across plants, effectively managing the costs and achieving carbon reduction results.

Coordinated Execution
By analyzing historical data and collecting feedback from plants, the system incorporates each alternative raw materials/fuels access limit in the evaluation benchmark. Then, the computed results are fed back to plants to enable them to more efficiently carry out the system's recommendations to achieve the monthly targets of carbon dioxide emission reduction and make adjustments dynamically in line with the progress made.





War Room System 2.0 – Intelligent Carbon Reduction

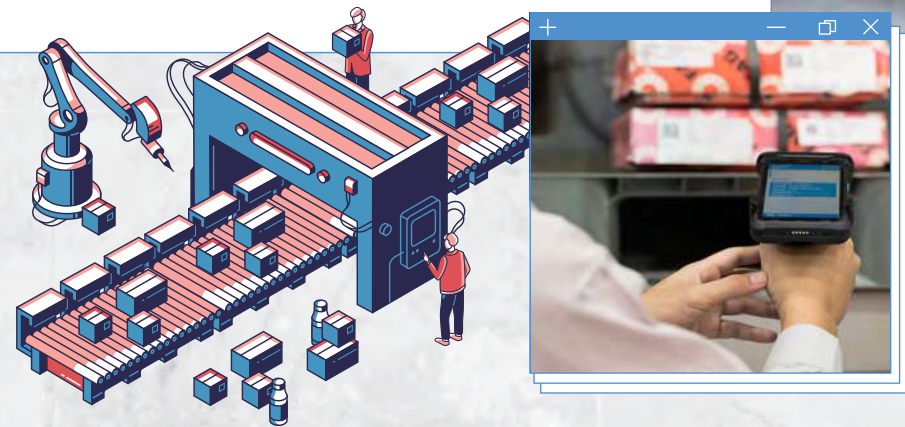
TCC has established the War Room System since 2017. The second generation of the War Room System was promoted in 2020, expanding the system's functions from "automation" to "intelligence," including the following facets:

Management System for Carbon Dioxide Emission Reduction	Intelligent Kiln Operations	Intelligent De-NOx
Aiming to assist TCC cement plants in setting targets, formulating plans, and tracking benefits while taking each plant's carbon dioxide emissions and alternative resources available into consideration. The administrator can regularly collect information through the system, prepare the alternative raw materials/fuels usage assessment, and track execution performances.	Aiming to establish models with a decision-tree-based machine learning algorithm employed by the coal consumption reduction system. It calculates the real-time production data of the cement kilns on-site with models, providing optimal modulation positions and ranges for real-time consumption reduction for the central control personnel.	Aiming to proactively forecast the NOx levels in the cement production lines in real-time, to accurately recommends the minimum spraying volume of ammonia solution with a given NOx control standard. In addition, the system also monitors ammonia escape and corrosion of machinery equipment to comprehensively control the ammonia solution usage.

TCC Intelligent Warehouse with the Efficiency Raised 7 Times

The Intelligent Warehouse at TCC Hoping Plant launched in July 2020. Upon arrival, the materials will be logged in the material management system through mobile devices without paperwork or related carbon footprints. The warehousing is guided by intelligent lighting control, reducing 87% of the working hours and increasing the reception operation efficiency sevenfold.

Moreover, materials are monitored with tracking codes, ensuring first-in-first-out of materials. The warehouse enables accurate material inventory information, realizing the transformation of production and supply chain via intelligent technology.



3.1 Stronger Carbon Management
3.1.1 Science-Based Carbon Reduction Goals and Internal Carbon Pricing

TCC fully recognizes the worldwide impacts of climate change. Hence, it sets its eyes on the world at large, responding to the climate change challenges with more rigorous standards to establish a model for Taiwan's cement industry. While following the Science Based Targets initiative (SBTi) to set its science-based target for 2025, TCC responds to SDG 17 for a global partnership by participating in the Global Cement and Concrete Association (GCCA). TCC joined hands with the leading cement enterprises in the world to launch the 2050 Climate Ambition. Chairman Nelson Chang was invited as the moderator to declare the commitment to deliver society with carbon-neutral concrete by 2050, which can be seen on the GCCA website and prominent media worldwide. In addition, TCC continues to communicate with media worldwide via PR Newswire. First of all, TCC formulated its SBTs pursuant to the well-below 2°C scenario. TCC then pushes for seven strategies to reduce carbon emissions and internal carbon pricing while implementing carbon inventory. In 2020, it took the initiative to establish the product category rules (PCR) for the cement products and obtained the first carbon footprint label for cement products in Taiwan. In 2021, TCC plans to apply for the carbon reduction label and proactively implement the carbon reduction targets.

Internal Carbon Pricing
World Business Council for Sustainable Development



(WBCSD) suggests in a report that carbon pricing is crucial to whether we can implement effective carbon management and limit global warming to well-below 1.5°C. In response, TCC took the trends of external carbon prices and the internal carbon intensity into account, producing an internal carbon price for capital expenditure evaluation. Production equipment at plants 100% adopt the carbon price to evaluate emission reduction performances so as to achieve the 2025 SBT and the ultimate goal of carbon-neutral concrete products by 2050. In addition, TCC incorporated carbon emissions data into the "War Room System," managing the carbon emissions in the manufacturing process and the carbon intensity via AI technology. In 2021, it further plans the carbon reduction management system, linking the quarterly bonuses with carbon reduction and relevant sustainability indicators of the Group and each plant.

GHG Emissions of Cement Plants Over the Past Four Years (Unit: Metric Tons CO₂e)

	2017	2018	2019	2020
Scope 1	4,144,669	4,228,688	4,266,390	4,411,086
Scope 2	241,691	247,702	223,096	202,312
Total (Scope 1 & Scope 2)	4,386,360	4,476,390	4,489,486	4,613,398
Scope 3	8,873	15,041	21,083	22,427

Note 1: The GHG emissions are inventoried in terms of operational control. The formula used is emissions = activity data × emissions factor (EF) × global warming potential (GWP). The EF is subject to the EPA GHG Emissions Factor Management Table (v. 6.0.3), and the GWP is derived from the IPCC Fourth Assessment Report (2007). The GHGs include CO₂, CH₄, N₂O and HFCs with no GHG emissions of PFCs, SF₆, and NF₃. **Note 2:** Since 2017, we measured the main activity associated with Scope 3 emissions: Upstream Transportation and Distribution. We calculate our Scope 3 emissions using the GHG Protocol - Corporate Value Chain (Scope 3) Accounting and Reporting Standard (WRI & WBCSD) with third-party certification. **Note 3:** Based on the cementitious materials yield of 5,673,395 metric tons in 2020, the carbon intensity in 2021 (Scope 1 & Scope 2) was 0.81 metric tons of CO₂e per metric ton of cementitious material. **Note 4:** The base year for GHG inventory is 2016 with the GHG emissions of 4,693,136 metric tons of CO₂e.



GHG Emissions of RMC Plants Over the Past Four Years

(Unit: Metric Tons CO₂e)

	2017	2018	2019	2020
Scope 1	1,762	1,992	2,088	2,059
Scope 2	5,956	6,144	5,010	7,101
Total	7,718	8,136	7,098	9,160

Note 1: The GHG emissions are inventoried in terms of operational control. The formula used is emissions = activity data × emissions factor (EF) × global warming potential (GWP). The EF is subject to the EPA GHG Emissions Factor Management Table (v. 6.0.3), and the GWP is derived from the IPCC Fourth Assessment Report (2007). The GHGs include CO₂, CH₄, N₂O and HFCs with no GHG emissions of PFCs, SF₆, and NF₃. **Note 2:** In the data of 2020, the Scope 1 draws reference from the gasoline EF of 2.263 kg of CO₂/L and the diesel EF of 2.6060 kg of CO₂/L in EPA GHG Emissions Factor Management Table (v. 6.0.3); the Scope 2 draws reference from the electricity EF of 0.509 kg of CO₂e/kWh from the Bureau of Energy, MOEA, in 2019. The Scope 1 data in 2019 is calculated based on the same values. **Note 3:** The data of GHG emissions was rendered from our own inventorying whereas the Scope 1 emissions inventoried only the emissions of gasoline and diesel. **Note 4:** The scope of our own inventorying expanded to incorporate all of our RMC plants in Taiwan; the increase in electricity of 2020 was due to the rise of sales. **Note 5:** Based on the 489 employees at the RMC plants in 2020, the carbon intensity in 2020 was 18.73 metric tons of CO₂e per capita.

GHG Emissions of Headquarters Over the Past Four Years

(Unit: Metric Tons CO₂e)

	2017	2018	2019	2020
Scope 1	-	-	-	12.51
Scope 2	2,172	2,026	1,934	1,756
Total	2,172	2,026	1,934	1,768

Note 1: The Scope 1 emission in 2020 was calculated with the natural gas EF of 1.877719 kg CO₂e/m³; the Scope 2 emission was calculated with the 2019 electricity EF of 0.509kg CO₂e/kWh. **Note 2:** The data of GHG emissions were rendered from our own inventorying. **Note 3:** Based on the 157 employees in the Headquarters building in 2020, the carbon intensity in 2020 was 11.26 metric tons of CO₂e per capita.



Obtainment of the First Cement Carbon Footprint Label in Taiwan

Promotion of Product's Carbon Footprint to Establish the Benchmark of the Industry

Carbon footprints look at the direct and indirect GHG emissions of an activity or a product throughout its life cycle, from raw material acquisition, manufacture, delivery, and sale to use and waste recycling. To effectively learn about the GHG emissions of its products, TCC launched the product carbon footprint project in

2019 and discussed it with the Environmental Protection Administration (EPA) about formulating Product Category Rules (PCR) for cement products.

Through external inventorying and verification, TCC passed the EPA review in July 2020, establishing PCR for cement products in Taiwan. Then, it obtained the first carbon footprint label for cement products issued by the EPA in August. With the carbon footprint labeling system, the GHG emissions throughout the different stages of products shall be more transparent for us to effectively assess solutions for energy saving and carbon reduction while realizing emission reductions of our products.



TCC Brand Cement with Carbon Footprint Label Certification

TCC has actively applied with the EPA to establish the PCR for cement products. In August 2020, TCC received the very first cement carbon label issued by the EPA. TCC will continue to contribute efforts to develop environmentally friendly and low-carbon products. Through the carbon label, TCC is looking forward to promoting carbon reduction with society.



3.2 Implementing Environmental Management

Implementing Environmental Management Policies to Foster Sustainable Supply Chains

TCC is involved in three core businesses: environmental protection, energy, and cement, with the circular economy vision of zero waste, zero pollution, and zero emissions. Obtaining international certifications such as ISO 14001, ISO 50001, ISO 14064, ISO 14046, and BS 8001 has further elevated the quality of our products and the effectiveness of our energy, water, wastewater, and waste management performance. With standards higher than the regulatory requirements, TCC assesses enhancements for the eco-friendly and energy-saving manufacturing process.

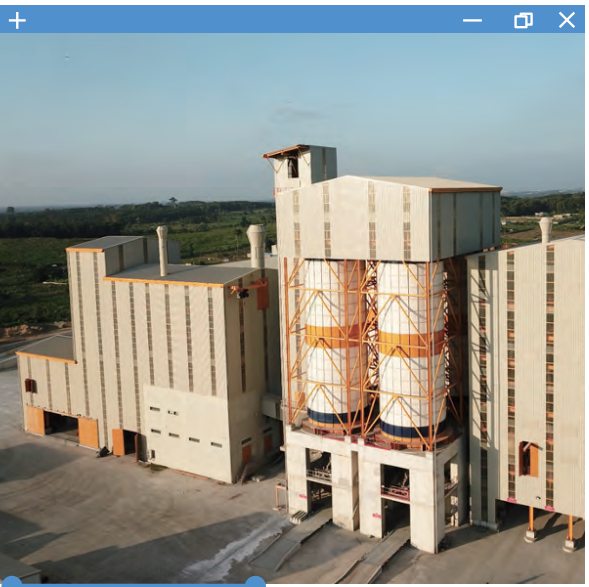
In addition, TCC urges business partners like suppliers, contractors, outsourcing enterprises, and joint ventures to effectively manage the environmental impacts throughout the process of production, manufacturing, transportation, and services. Together, we create sustainable values throughout our industrial supply chain.



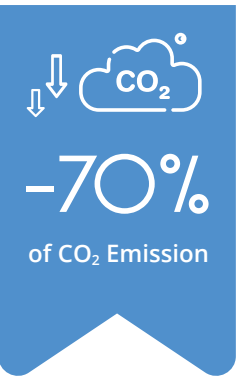
TCC commits to environmental sustainability management and circular utilization of resources. In 2020, cement plants and RMC plants have invested NT\$210 million of environment-related expenditures, proac-

tively searching for innovations and viable solutions with regard to energy, air, water, raw materials, and wastes, to realize the corporate sustainability goal of “zero waste, zero pollution, and zero emission.”

In addition, TCC conducts annual compliance audits to ensure compliance while undergoing certification of ISO management systems, examining management performances, and maintaining the validity of certificates.



The Most Eco-friendly Cement in the World



TCC continues to develop eco-friendly, low-carbon cement materials. Firstly, it established a joint venture with OYAK in Turkey, acquiring Cimpor in 2019 to enter the cement market of Portugal. Then, it established a grinding station in West Africa. The Cote d'Ivoire (Ivory Coast) Plant started the test run for production in October 2020, with an annual output of 800,000 metric tons. The cement it produces is 70% lower in terms of CO₂ emissions compared to conventional cement plants, significantly reducing carbon emission through industrial innovation.

3.2.1_Energy Management

To implement the climate change response strategies, TCC established energy management with energy conservation targets set. Apart from the conformity with the 1% energy-saving requirement set by the Bureau of Energy, TCC systematically controls energy consumption. By presenting information on energy use in the manufacturing process, the War Room System facilitates real-time management and basis for new technology development and process and equipment enhancement.

TCC stipulates product energy consumption (of coal and electricity) targets and formulates energy-saving plans every year, continues to develop alternative raw materials/fuels, and reviews energy conservation and emission reduction improvement plans at its monthly meetings. As for raw materials management, TCC assesses the demands of raw materials through the monthly meetings and pushes for optimization of transportation frequency of raw materials by suppliers. As such, it keeps the production in line with the sales demands while reducing the additional GHG emissions generated from the upstream, i.e., raw materials transportation.

In response to EP100, TCC raises its energy efficiency by installing waste heat recovery system, and introducing flash distillation technology for improved efficiency. The waste heat recovered reached 11,902.4 kWh in 2020, equivalent to 29% of the purchased electricity that year, reducing approximately 60,000 metric tons of CO₂ emissions. In addition, with the waste heat boiler tubes and air compressors replaced, the total energy saved in 2020

Renewable Energy Installations of the Group	
Location	Installed Capacity of Solar (kWp)
TCC Headquarters	43.2
TCC Suao	39.06
TCC DAKA	11.1
TCC Hoping	55.8
TCC Kaohsiung	37.6
E-One Moli Tainan	496.62
Total	683.38

reached 11.57 million kWh, reducing approximately 6,000 metric tons of CO₂ emissions.

Furthermore, TCC aims at EV100 and RE100. Electric vehicles will be procured to replace the corporate vehicles year by year, as charging piles have been installed at the Headquarters. We proactively push for consuming self-generated renewable energy and utilized the available spaces at the plants to install solar panels. The building of TCC Headquarters earned the Diamond Class Green Building certification in the category of old building refurbishment in 2016 with PV systems installed afterward.

In 2020, PV systems were installed in succession at the TCC DAKA Open Eco-Factory, the Hualien Hoping Circular Economy Park, the Suao Plant, the Kaohsiung Plant, and E-One Moli Energy Corp, a subsidiary of the Group, with the capacity totaling 601.12kW. The total capacity grew to 7 times compared with the generating capacity as of 2019 (82.26kW). The accumulated electricity generated amounted to roughly 314,000 kWh as of 2020, reducing 160 metric tons of CO₂e of GHG emissions, equivalent to the annual energy consumption of 90 households.



Energy Consumption of Cement Plants Over the Past Four Years		2017	2018	2019	2020
Energy Consumption					
Coal (kilotonne)		690	679	708	699
Diesel (kiloliter)		1,521	1,307	946	460
Purchased Electricity (GWh)		470	467	433	412
In terms of Gigajoules (GJ)					
Coal (GJ)		17,012,323	15,689,903	16,157,228	16,300,593
Diesel (GJ)		53,482	45,957	33,264	16,168
Purchased Electricity (GJ)		1,692,000	1,681,200	1,558,800	1,481,726
Total (GJ)		18,757,805	17,417,060	17,749,292	17,798,487

Note 1: Calculated based on the calorific values of the respective TCC cement plants. The conversion factor for the heating value of coal the Suao Plant: 5,566.02 kcal/kg; that of coal at the Hoping Plant: 5,575 kcal/kg and of diesel: 8400 kcal/L. **Note 2:** Based on the clinker yield of 5,381,013 metric tons in 2020, the unit energy consumption in clinker production was 3.31 GJ per metric ton of cementitious materials. **Note 3:** The data of energy consumption is subject to the reported data to the Bureau of Energy.

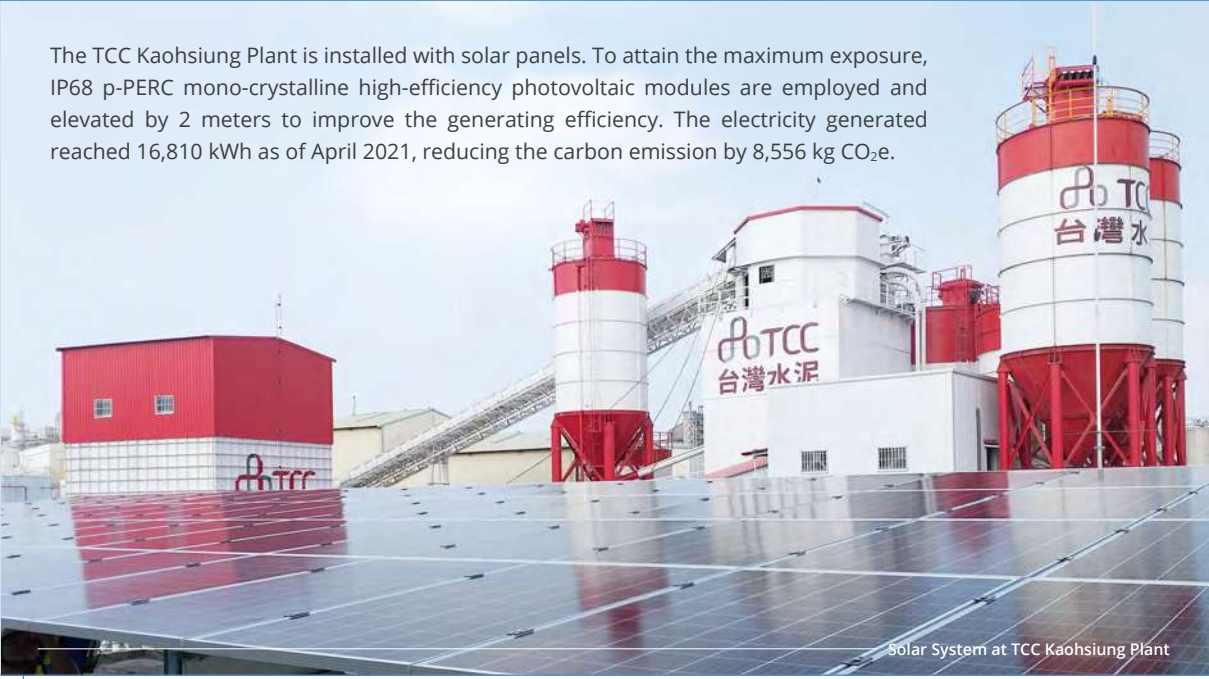
Energy Consumption of RMC Plants Over the Past Four Years		2017	2018	2019	2020
Energy Consumption					
Diesel (kiloliter)		750	657	664	634
Gasoline (kiloliter)		-	120	158	180
Purchased Electricity (GWh)		10.75	11.09	9.36	13.95
In terms of Gigajoules (GJ)					
Coal (GJ)		26,372	23,102	23,348	22,293
Diesel (GJ)		-	3,918	5,159	5,877
Purchased Electricity (GJ)		38,700	39,924	33,696	50,219
Total (GJ)		65,072	66,944	62,203	78,389

Note 1: Calculated based on the heating values in the Emissions Factor Management Table (v. 6.0.3) released on the Bureau of Energy's website. The values are 8,400 kcal/L for diesel, 7,800 kcal/L for gasoline, and 3,600 GJ/GWh for electricity. **Note 2:** The RMC plants started collecting data on gasoline use in 2018. **Note 3:** The scope of our own inventorying expanded to incorporate all of our RMC plants in Taiwan; the increase in electricity usage of 2020 was due to the rise of sales. **Note 4:** Based on the 489 employees at the RMC plants in 2020, the energy consumption per person was 160 GJ per capita.



Energy Consumption of Headquarters Over the Past Four Years		2017	2018	2019	2020
Energy Consumption					
Natural Gas (m³)		-	-	-	6,663.82
Purchased Electricity (GWh)		3.92	3.8	3.63	3.45
In terms of Gigajoules (GJ)					
Natural Gas (GJ)		-	-	-	251
Purchased Electricity (GJ)		14,112	13,687	13,064	12,420
Total (GJ)		14,112	13,687	13,064	12,671

Note 1: The adjustment to the value of 2018 is a result of recalculation on the basis of the full-year electricity usage. **Note 2:** The Headquarters started to disclose the usage data of natural gas in 2020, estimated as the natural gas fee of the year/unit fee per kWh. **Note 3:** Based on the 157 employees at the Headquarters in 2020, the energy consumption per person was 81 GJ per capita. **Note 4:** We are planning to disclose the data of energy consumed by corporate vehicles in the future.

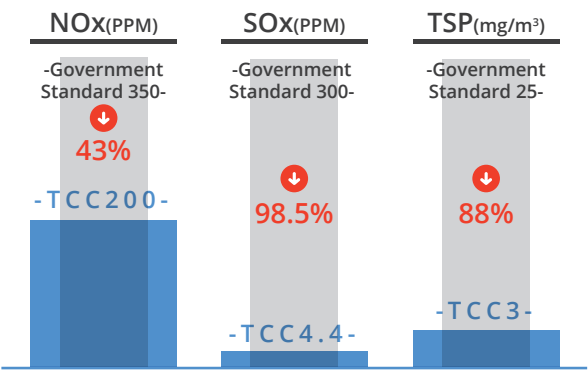


The TCC Kaohsiung Plant is installed with solar panels. To attain the maximum exposure, IP68 p-PERC mono-crystalline high-efficiency photovoltaic modules are employed and elevated by 2 meters to improve the generating efficiency. The electricity generated reached 16,810 kWh as of April 2021, reducing the carbon emission by 8,556 kg CO₂e.

Solar System at TCC Kaohsiung Plant

3.2.2_Air Pollution Management

TCC's Emissions Outperform the Government Regulations



TCC rigorously controls the total suspended particles (TSP), NOx, and SOx from cement plants. The emission data are transmitted online to the Department of Environmental Protection for monitoring. A third-party testing agency is further commissioned to verify the accuracy of the stack emission data quarterly. In addition, TCC incorporated the emission indicators in the internal system for enhanced monitoring and established the early warning mechanism via big data analytics, reducing the environmental impacts on the areas surrounding the plants through the advanced adjustment to the manufacturing processes. The Hoping Plant sits in the Hoping Industrial Park.

With the port, power plant, and cement plant effectively combined, the environmental impacts are minimized. Moreover, pursuant to the EIA commitment, a third party carries out quarterly environmental monitoring. The monitored items include air quality, noise, soil, water quality, marine ecology, land ecology. All the monitored items were in line with the regulatory requirements in 2020. The Suao Plant conducts quarterly environmental monitoring on the plant itself and the neighboring Shih-Min Elementary School every six months, including air quality, noise, soil, and water quality. All the monitored items were in line with the regulatory requirements in 2020.



Pollution Control Measures

Gaseous Pollutants

- SNCR denitrification equipment optimized
- Low-sulfur, sub-bituminous coals used
- Low NOx Burners adopted
- Multi-stage combustion equipment planned

Particulate Pollutants

- Optimization of bag dust precipitators & improvement of dust collecting efficiency of filter bags
- Air-tightness improvement of the corridor belt conveyor systems to reduce dust escape
- Electrostatic dust precipitators in the kiln systems replaced with electrostatic-bag dust precipitators

Air Emissions at Cement Plants Over the Past Four Years

(Unit: Metric Tons)

Item	2017	2018	2019	2020
NOx	7,035	6,744	6,388	6,164
SOx	82	85	79	106
VOC	0.00656	0.00636	0.00616	0.00457
Particulate Matter	587	643	305	249
Total	7,704	7,472	6,772	6,519

Note 1: The Hualien Plant did not operate in 2020 and thus had no air pollutant emissions. **Note 2:** Starting from the third quarter of 2018, heavy metal monitoring data was added at the request of the Environmental Protection Administration. **Note 3:** Starting from the fourth quarter of 2018, our cement plants reported mercury vaporization in accordance with legal requirements. The mercury vaporization in 2020 was 0.27546 metric tons, and there was no mercury vaporization at our RMC plants. **Note 4:** Dioxin emissions at our cement plants in 2020 were 0.256g I-TEQ. (The emissions data is calculated as the average of the monitoring data over 4 quarters.) **Note 5:** The emission of heavy metals in 2020 was 0.0963 metric tons. **Note 6:** The emissions were calculated as the emission factors of the third-party testing multiplied by data being used. **Note 7:** The business of our RMC plants were cement product ingredients mixing and transport and thus had no air pollutant emissions. **Note 8:** The elevated SOx emissions in 2020 compared to that of 2019 was owing to the increased yields.

3.2.3_Management of Water Resources and the Water Cycle

TCC Water Resources Management Policy

TCC seeks a sustainable use of water resources. Based on the water risk assessment internally and externally, it improves management to elevate water use efficiencies by adopting measures like 100% circular utilization of cooling water in the process, promoting 100% water reclamation for reuse, the stipulation of water management measures, and rainwater runoff reclamation. TCC considers water management as one of the critical issues in climate change risk management. TCC comprehensively analyzes and manages water risks. We estimated the impact of future changes in average rainfall on water resources with the Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP). We further conducted scenario analysis to capture the potential operational impacts of water risks and formulated response strategies in advance. While promoting impact engagement, TCC further developed strategies regarding water footprint verification, source management, water resources reclamation, and wastewater treatment.

Hoping Industrial Park, Industrial Development Bureau, MOEA. The treatment plant calls for supervision and management meetings once every three months. In addition, the Hoping Industrial Park Service Center set up a LINE group to receive companies' feedback while holding dialogues from time to time.



Introduction of Water Footprint Verification

All of TCC's cement plants passed the ISO 14046 verification and enhanced water management at the plants, making TCC the first cement manufacturer in Taiwan with a verified water footprint.

Water Risk Assessment

TCC's cement plants introduced ISO 14046 to evaluate the potential impacts of water risks to its operations via scenario analysis. Anticipating a reduction in rainfall in the future, TCC considers the water risks to operation sites as "low" considering the minor water demand from the cement industry (dry process), while the water supply far exceeds the water consumption (a daily supply of 4,000 metric tons to the Hoping Plant based on the minimum treatment requirement of the sewage treatment facility). Moreover, TCC employed the WRI Aqueduct Water Risk Atlas to analyze the distribution of water resources in Taiwan, with no operation sites in Taiwan located in high water stress regions.

Water-related Impact Engagement

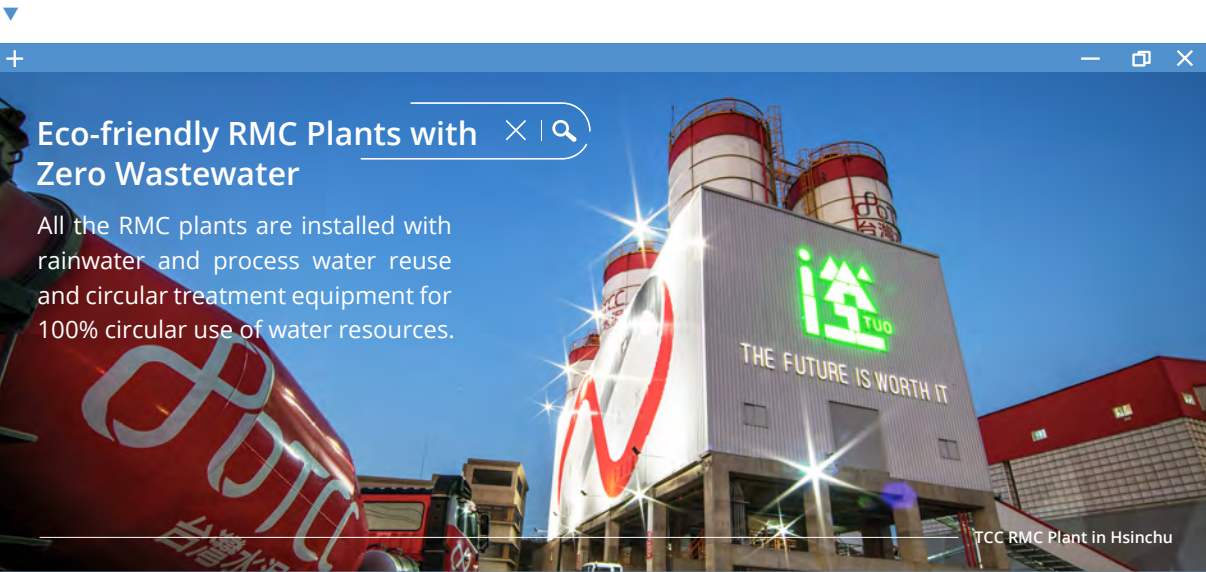
At present, the water used at the Hoping Plant is supplied by the cooling water treatment plant at the

Source Management

We continue to promote water conservation internally, adopting measures of water use management and rainwater runoff reclamation.

Water Resources Reclamation

We push for 100% circular utilization of cooling water in the process and 100% water reclamation for reuse.



Eco-friendly RMC Plants with Zero Wastewater

All the RMC plants are installed with rainwater and process water reuse and circular treatment equipment for 100% circular use of water resources.

Wastewater Treatment

Most wastewater at cement plants comes from cooling water used during production and sewage from employees’ daily living. We treat the water using wastewater collection systems, and desilting basins before converging into the sewage treatment facility for processing and discharge. We conduct quarterly internal self-monitoring, which conform to the relevant standards. External bodies such as the Department of Environmental Protection also collect samples on site to ensure that the water quality at the outfalls is in line with the relevant effluent standards, with no substance that leads to irreversible harm to the water body, ecology, or humans, and are in full compliance with the regulatory standards. At the Hoping Plant, the sewage and process wastewater was treated first with the wastewater treatment equipment. In 2020, 32,271 m³ of wastewater in 2020 was treated to the level in compliance with the regulatory standards before being discharged to the wastewater treatment plant of the Hoping Industrial Park for further treatment and subsequently being discharged into the Pacific Ocean. At the Suao Plant, the process water and rainwater runoff are both directed to the sedimentary pond for treatment to the level within relevant standards

before being discharged into Baimi Creek via the outfall. The total water discharged via the outfall in 2020 was 441,956 m³. Moreover, the water-intake equipment and reclaimed water tanks are installed at the outfall, reclaiming 56,612 m³ in water annually. The reclaimed water is used for sprinkling the plant and garden irrigation by the residents in the neighborhood. In 2021, the cement plants took a further step by planning for a wastewater reuse engineering project, for which an estimated NT\$30 million will be invested in the reutilization of water seepage in mine tunnels, sewage treatment systems of plants (MBR treatment), and the water collecting systems outside of the water cooling towers to push the water management to another level. As for the RMC plants, the water for cleaning truck tires and concrete mixers, and rainwater collected from the surface drains are treated through the buffer pools and sedimentary pond before being resupplied for cleaning purposes. In addition, equipment for recycling and treatment of rainwater and process water is being installed to ensure that no water resources at the plants will be wasted, which are being reused for cleaning the plants, the RMC equipment and vehicles.

Water Resources Use at Cement Plants Over the Past Four Years

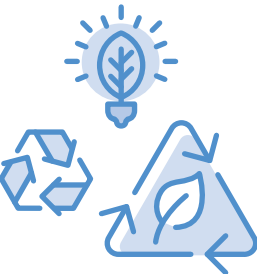
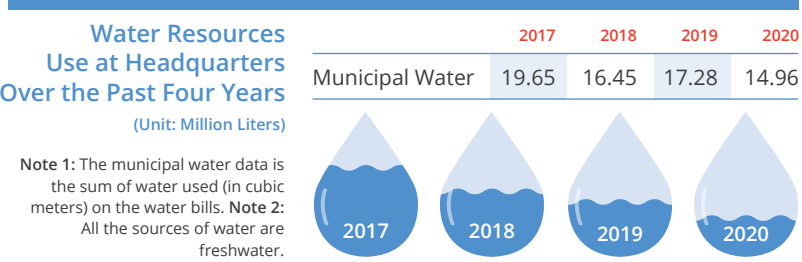
(Unit: Million Liters)	2017	2018	2019	2020
Municipal Water	411.38	0.00	0.00	0.00
Groundwater	1,837.21	1,426.60	1,109.18	1,014.34
Industrial Water	978.63	910.93	991.05	1,051.01
Reclaimed Process Water	595.33	452.68	23.22	93.48
Total	3822.55	2,790.21	2123.45	2,158.83

Note 1: Since the Hualien Plant did not operate in 2020, the scope of data disclosure in 2020 covered only the Suao Plant and the Hoping Plant. **Note 2:** Based on the clinker yield of 5,381,013 metric tons in 2020, the unit water intensity was 0.004 million liters per metric ton of clinker. **Note 3:** The water use data is the sum of the reported data. **Note 4:** All the sources of water are freshwater.

Water Resources Use at RMC Plants Over the Past Four Years

(Unit: Million Liters)	2017	2018	2019	2020
Municipal Water	339.17	247.78	316.83	368.32
Groundwater	N/A	N/A	85.73	212.58
Reclaimed Process Water	203.69	152.13	247.28	307.39
Total	542.86	399.91	649.84	888.29

Note 1: 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 is estimated on the basis of sales. **Note 2:** The municipal water data is the sum of water used (in cubic meters) on the water bills, and the groundwater data is the sum of the reported data. The water use data is subject to the actual months of water use. **Note 3:** All the sources of water are freshwater.



3.2.4_Renewable Raw Materials Management

Limestone, clay, silica sand, iron slag, and coal ash are the primary raw materials of our products. In consideration of environmental protection goals and finite natural resources, TCC proactively reduces mining and procurement of natural raw materials while working on the use of renewable raw materials to reduce the consumption of its natural counterpart in the manufacturing process. The total consumption of raw materials and supplementary materials combined was 10.08 million metric tons in 2020, with clay, iron slag, coal ash, and bottom ash 100% recycled—the ratio of reused cement also reaching 23.05%. TCC shall continue to plan and work on the use of alternative raw materials, improving the waste co-processing capacity of every metric ton of cement and reducing natural raw materials used.

The Raw Materials Consumption in 2020

Category	Raw Material	Consumption (Metric Tons)
Non-renewable Raw Materials	Limestone	7,932,431
	Imported low-alkali sand	124,925
Renewable Raw Materials	Construction waste dirt	1,089,393
	Recycled pellets	1,630
	Calcium fluoride sludge	14,934
	Water purifying plant sludge	40
	Desulfurization gypsum	260,588
	Inorganic sludge	4,907
	Coal ash	393,670
	Waste ceramics	164
	Reduced slag	72,805
	Iron slag	184,373
Total Raw Materials		10,079,860
Proportion of Renewable Raw Materials (Renewable Raw Materials/Total Raw Materials)		20.06%

3.2.5_Waste Management

TCC has realized the vision of a zero-waste circular economy by putting to good use the attribute of high temperature in the manufacturing process of the cement industry. For instance, the wastes from employee activities, waste lubricating oils from maintenance, waste refractory bricks, inorganic sludge from sewage treatment are processed into alternative raw materials or fuels on our own. The general and hazardous industrial wastes are destroyed at high temperatures before recycled back into the manufacturing process for reuse. Valuable industrial wastes such as waste iron are recycled by qualified clearing agencies regularly. The wastes produced in 2020 were 1,726.4 metric tons, in which the valuables sold accounted for 850.62 metric tons, and the remaining non-recyclables 875.78 metric tons.

Treatment of Wastes

Cement Plants	Headquarters	RMC Plants
Category Recyclable	Category Non-Recyclable	Category Non-Recyclable
Total Weight (Metric Tons)	Total Weight (Metric Tons)	Total Weight (Metric Tons)
850.62	33.60	842.18

Note: The disclosure of the total quantity of wastes from our RMC plants started in 2020. More disclosures regarding the total weights of employee wastes and of waste iron commissioned to clearing agencies will gradually be made in the future.



*The classical Greek philosopher Euripides also said:
“The Earth gives birth to everything and takes everything back.”*

A philosopher once asked, “If a tree falls in a forest with no humans present, does it make a sound?” In fact, science has now told us that all living things on the Earth are correlated and connected to each other. Just like the so-called “quantum entanglement” in quantum physics exists, up to now, we do not fully understand why. So when a tree falls, not only will there be a sound, but it will also affect all living things on the Earth, but no one knows precisely the repercussions of the effect of the falling tree. Most human beings don’t know what kind of impact the discarded plastic cups will have on the future environment. But every second, tens of thousands of plastic cups are being discarded. So we are really ignorant of what we don’t understand!! Although we cannot predict the future, we can imagine the problems that may arise in the future.

*Aristotle warned us that Mother Nature would
not behave purposelessly or uselessly.*


In the past 20 years, human beings have conducted many biosphere experiments to study future outer space travel. Scientifically, we now know to create a completely man-made living environment in which people can be self-sufficient with different kinds of animals and plants. At the same time we can live together in a perpetual cycle of life, but the result of these experiments has never been a success. Even if you continue to replenish plants and creatures, there is no way to keep a biosphere closed for too long. Either there is not enough air at some point during the experiment, or there is not enough water or food. That is to say, human beings have not been able to fully understand the blue planet we inhabit now, let alone duplicate it. But many people still arrogantly believe that our destruction of the natural environment will not bring us serious negative consequences.



The main values that society pays attention to in the 21st century are efficiency, development and freedom! In fact, if humans want to successfully realize these three main values, regardless of their order, the most important pre-conditions are discipline and self-control. Human history tells us that without discipline and self-control, it will cause chaos in the society, and ultimately total destruction. Except for occasional accidents, almost all the results of scientific research are developed in a disciplined manner. However, social sciences tell us that the most important factor for social success or market efficiency lies in completely free development.

In the 21st century, human science is the most advanced, and there is also the largest population. At the same time, while the quality of life of most humans is the highest, human beings are still ignorant about nature. Moreover, in a modern society based on laissez-faire thinking and personal self-awareness, human beings also seriously lack the will to control their own desires. Human desire is indeed the driving force behind the development of human civilization, but our endless desire is like the energy produced by nuclear fusion. If it can be controlled, it can become a sustainable force. If it is not controlled, it can become a nuclear bomb, destroying the existing social structure. In fact, progress itself is not a sin, but the harm caused by progress means that we are not progressive enough, so we must reinterpret progress with a more responsible attitude.





Biodiversity and Regeneration

Material Topics

GRI 304 Biodiversity

Management Policies

- Implement biodiversity policies and management guidelines, uphold the use of extraction methods that have a low environmental impact, and promote ecological restoration of mining areas.

Assessment Mechanisms

- Over 4,000 trees planted per hectare at the Taibai Mountains Mine in Suao.
- 77% of area coverage restored at the Hoping Mine in Hualien.
- 33,963 taxa of plant DNA stored by the conservation center to date (as of Dec. 31, 2020).
- Visits to mines and plants regularly arranged for local community residents and educational organizations to enhance the communication with stakeholders.
- Implementation of environment management in accordance with regulations and plans.

Targets

- By 2030, 40,000 taxa of plant DNA stored.
- By 2030, four targets achieved: 16 hectares of mining areas restored, 90% of the ratio of indigenous tree species, 80% of average survival rate for plant and tree taxa, and 25,000 saplings cultivated.
- Implementation of mine ecology restoration that preserves the biodiversity of mining areas and reduces the environmental impacts of mining.

04

CHAPTER

Biodiversity and Regeneration

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13 CLIMATE ACTION

14 LIFE BELOW WATER

15 LIFE ON LAND

Indigenous Species Restoration at the Hoping Mine, Hualien



//It's Just Like Climbing Mountains.
Hold Fast to the Rope. It's Steep
To My Surprise!//

BMP Natural Capital Ecological Afforestation at Mines

Bletilla formosana is a rare endemic orchid in Taiwan. Keen to hill slopes caressed by sunshine, it is also an indigenous species at the TCC Hoping Mine in Hualien. To restore the original ecological landscape of mines, TCC's mine restoration personnel revive *Bletilla formosana* at slopes. Under the guidance of "Dr. Cecilia Koo Botanic Conservation Center" ("KBCC" hereinafter), they conduct the challenging restoration work with ropes.

In 2020, TCC collaborated with KBCC to push for the restoration of the indigenous *Bletilla formosana* in hopes of reviving it at the Hoping Mine in Hualien. First of all, the KBCC cultivated approximately 2,000 seedlings via aseptic planting technology. After repotting, they are moved to the nursery at the Hoping Mine for at least 6 months of cultivation for them to adapt to the local climate. Then, in October 2020, 300 *Bletilla formosana* seedlings in good shape were planted manually back to the rock surface for every 5 meters we mined.

TCC shall continue to work with the KBCC to cultivate more seedlings and transplant them to suitable locations for restoration, to expand the number of populations and areas of *Bletilla formosana* while restoring the original ecological landscape of the mine.

In addition to the restoration efforts on site, TCC DAKA Open Eco-Factory ("TCC DAKA" hereinafter) created new flowerbeds to cultivate *Bletilla formosana* and other plants around the mine. The KBCC researchers will share with the students from the neighboring schools how to grow the local indigenous plants. It offers not only environmental education to the elementary schools nearby, but also the TCC DAKA tours to bridge the distance between the public and the local ecology.



KBCC Environmental Education Session

TCC DAKA Phase II – Mine Rock Garden

TCC also works with the KBCC to create three themed gardens, World Garden, Mine Rock Garden, and Ferns Garden on the platforms over the rooftop of the TCC DAKA Renewable Resources Utilization Center elevated about 20 meters and 35 meters high, respectively. World Garden will grow plants from around the world, while the other two gardens will present the biodiversity of the mine vegetation, serving the purpose of ex situ conservation. All the plants in the gardens will be transplanted from mines or cultivated via careful seeding in our nurseries before being transplanted into the exhibition area for ecological landscaping.



KBCC Cultivating *Bletilla formosana* Seedlings

BUSINESS FOR NATURE

Biodiversity Management Plan (BMP) Stipulated In Response to Business for Nature

In response to the UN's Convention on Biological Diversity, TCC stipulated the Biodiversity Management Plan (BMP) in line with the principles of avoidance, mitigation, and compensation. In 2020, it took a step further by joining Business for Nature with the commitment to reduce the loss of natural capital. With such an international business initiative, TCC joined hands with over 700 international enterprises to urge governments worldwide for more ambitious nature-related policies, which serves as a testimony to TCC's commitment to biodiversity protection.



4.1_Protecting the Green Environment

//During Mine Excavation,
We Must Minimize the Environmental Impacts.
After Mining Is Completed,
We Must Return The Site to
Its Natural State//

~Nelson An-ping Chang, Chairman

Biodiversity Policies

TCC pledges not to engage in exploration or mining activities in World Heritage and IUCN I-IV protected areas. Meanwhile, for the activities in the areas with global or national significance in biodiversity, TCC shall reduce its impact on local biodiversity by means of avoidance, mitigation, and compensation. TCC also categorizes the organisms in the terrestrial ecosystem of mine into flora and fauna, documenting the species, characteristics, distribution, and populations, respectively. A registry is kept, and the diversity index is calculated. In addition, we produce charts of flora distributions and locations of protected animals spotted while concerning ourselves with the changes to the mines' ecosystems. Furthermore, TCC commissions external parties to conduct environmental monitoring quarterly to learn about the outcomes of mine ecology restoration and plan for relevant industry-academia collaboration.

“Mines” are the core asset of the cement industry. TCC insists on eco-friendly mining models and continues to push for mine ecology restoration and indigenous flora conservation. The mine ecology restoration models of TCC are developed with the principles of long-term planning and experimentation. Through the extensive consideration of the indigenous ecological environment, it endeavors to restore the original landscape and biodiversity of limestone mines. All the operation sites of TCC have biodiversity management plans in place.

Implementation of the principles of biodiversity management:

1-Avoidance

Prior to mine development, TCC always conducts an environmental impact assessment (EIA). With the habitats, species, and No Net Loss of ecosystem services at the core, it selects proper locations and avoids special habitats, eco-sensitive, and protected areas. The EIA report is submitted to the competent authority for review in line with the regulations. The mining operation is to be engaged only after the report is approved.

2-Mitigation

Upon the competent authority's approval, TCC will formulate impact mitigation solutions prior to mining, including mitigating the environmental impacts in the process of development and blasting management.

3-Compensation

All the plants and mines of TCC have BMPs in place. It constantly conducts environmental monitoring, covering vegetation profiles, plant species compositions, rare species, and endemic species, and diversity index analysis to effectively monitor and manage impacts of development on the ecosystem.

Ecosystem at Mines

Taibai Mountains Mine, Suao

- Windbreak drywall nets installed
- Precise irrigation with a solar-powered drip irrigation system installed
- Nearly a hundred indigenous vegetation species restored, and crops cultivated successfully

Hoping Mine, Hualien

- Adoption of the low-carbon "Vertical Shaft Transport System"
- Terrestrial ecosystem monitoring by a third party with indigenous tree species up to 81%
- Estimation of the ecosystem service values with an annual investment of at least NT\$5.8 million afterwards

Shoushan Mine, Kaohsiung

- Natural ecology recovered
- A water-retention basin park for citizens' recreation
- Red-brick warehouse and limestone kilns registered as historic building

Hoping Mine of Hualien

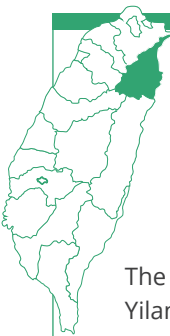
Ecological Afforestation NT\$6 million for Restoration per Year

In response to the UN's Natural Capital Declaration (NCD), TCC commissioned the professional team from National Taiwan University to evaluate the ecosystem service values of Jinchang Quarry in 2020. Covering five aspects of carbon sequestration, water resources conservation, air purification, prevention of soil and sand loss, and biodiversity, we tracked and conserved the ecological resources of the mine. TCC attaches great importance to the mine's natural capital, subsequently planning to invest at least NT\$5.8 million annually. To reduce the impacts of mining on the environment as well as to ensure personnel safety during transportation, TCC has been investing funds totaling NT\$3.75 billion since 1987 to establish the "Vertical Shaft Transport System" at the Hoping Mine, the most advanced one in Asia, making the mining operations entirely underground, automated, and eco-friendly. Meanwhile, we engaged in ecosystem restoration, ushering in triple benefits of carbon reduction, safety, and ecological conservation altogether.

In addition, TCC has been conducting vegetation restoration programs since 1996, **formulating three-phased restoration operation in accordance with the natural evolution of the ecosystem:**

Phase I Preparatory Phase	Phase II Pre-forestation Phase	Phase III Afforestation
Cultivation of pioneer species' saplings; transplantation and seeding nursery of precious, rare plants	Cultivation of the existing dominant yet indigenous tree species of the sites	Ongoing cultivation of saplings of indigenous species, including species of trees, shrubs, herbs, and vines

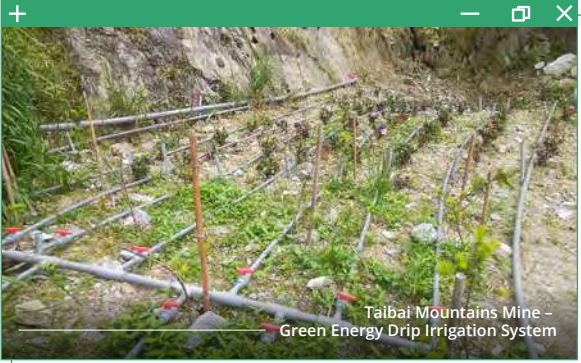
TCC releases the achievement reports on vegetation restoration at the Hoping Mine regularly. The 2020 report suggested that it has completed the planting of 758 trees, 1,516 shrubs as well as 18,249 ground cover herbs and vines, and 5,974 m² of hanging net spray planting area. Moreover, TCC commissioned a third party to conduct terrestrial ecosystem monitoring quarterly to monitor rare species, endemic species, and endemic subspecies of Taiwan. The result uncovered plants of 120 families, 308 genera, and 444 species, in which there were up to 81% of indigenous tree species, indicating an extraordinary result of restoration.



Taibai Mountains Mine of Yilan

New Ecological Method for Restoration

The Taibai Mountains Mine is situated in Suao, Yilan, as the highest peak, facing directly the northeast monsoon from Pacific Ocean, with its original parent material which is lack of weathered topsoil, which renders the soil not suitable for plants to grow and challenging for restoration. To overcome the obstacles in natural restoration, TCC worked with the National Ilan University to promote new ecological methods, installing windbreak drywall nets to ward off the wind. The mine also introduced the green energy drip irriga-



tion system for precise irrigation. Upholding the principles of "habitat restoration" and "ecological recovery," a circular ecosystem is created with the indigenous trees, shrubs, and pioneering species in a manner of multi-level growing.



Green Energy Drip Irrigation System

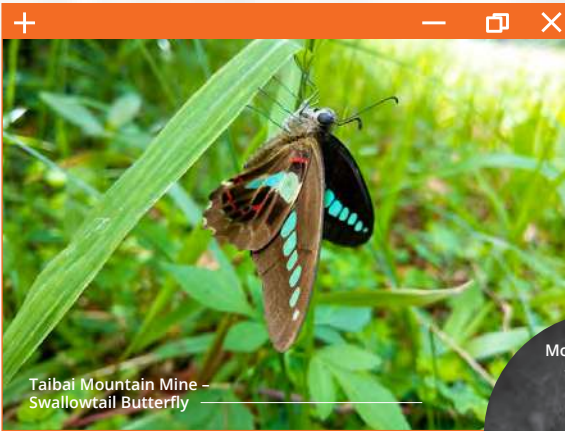
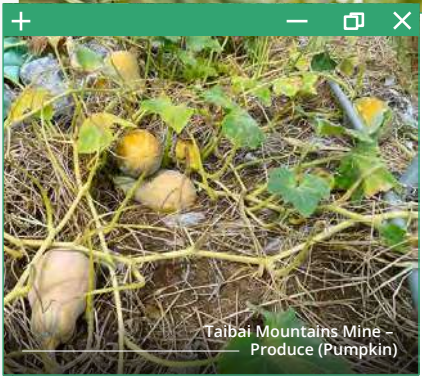
Leveraging the characteristics of high exposure to the morning sun in the mountains, we set up solar panels and energy storage devices at the mine to power the drip irrigation system, pumping water to the high point of the mine (at an elevation of 900 meters) so that we could conduct greening at the mine with the issue of water supply resolved.



Windbreak Nets

60% windbreak nets are used at the restoration site to protect the plants to grow with a drip irrigation hole at an angle no more than 30 degrees for each restoration sapling to ensure an ample water supply for the newly planted.

TCC overcame the environmental difficulties through trial and error, restoring nearly a hundred indigenous plants and successfully growing indigenous trees and shrubs. To mitigate the damage caused by returning wildlife to the restored vegetation, we interspersed planting with crops like pumpkins, sweet potatoes, potatoes, yams, taros, and chayotes, which temporarily diverts the animals and prevents them from nibbling on the saplings, creating a win-win result. In addition, we integrate manual investigation and automated infrared camera recordings to ensure 100% biodiversity of mammals within 3 years.



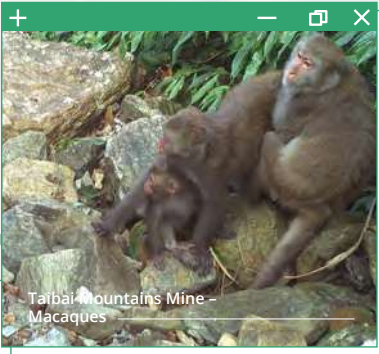
//The Taibai Mountains are the oldest mine area in Taiwan. To date, over 150 tree and herb species were recovered on the restoration platforms, with the majority of which are of the existing vegetation of Taibai Mountains.

Ever since the restoration efforts at the Taibai Mountains Mine, one can feel more vitality during the day than 4 years ago. For instance, we can see or hear the Crested Serpent Eagles soaring in pairs over the platforms, Macaques entering the dormitories, the Formosan Yellow-Throated Martens chasing after Muntjacs nearby, and so on almost every time we go up in the mountains. These encouraging scenes are more than those 2 years ago in terms of frequency and number.

Using automated infrared cameras, the astonishing activities of a family of 5 boars were captured vividly, "feasting themselves" with the plants we restored. What a bittersweet scene it is to us. In March this year, I was conducting ecological checks at the Suao Creek, to which Taibai Mountain and Simao Mountain are the catchment areas. My investigation cages were fully loaded with rich biodiversity: Platyeriocheir Formosa, River Swimming Crab, Dusky Sleepers, Monk Gobies, Taiwan Chubs, Brook Shrimp, Japanese Eel, and so on. The abundance of species was astonishingly rich. It is a testimony to the success of the reforestation in Simao Mountains and the restoration in Taibai Mountains as well as the proof that the original ecological landscapes have returned.//

Professor Huang Ji-Wei,
Sustainable Landscape Laboratory,
National Ilan University

Mar. 30, 2021



4.2 Promotion of Environmental Education

TCC brought the idea of “factory as classroom” to life. Here at TCC DAKA, the Hoping Plant and the Suao Plant, TCC holds themed guided tours and experience courses pertaining to a circular economy and ecological conservation are open for regular appointments or offering customized programs in a joint effort with local schools, institutions, and groups from time to time. In 2021, the personnel at the Hoping Plant shall further engage in qualification trainings for environmental educators so they can obtain certification.

With environmental education as the point of departure, it aims to communicate the true ideas of the circular economy of cement and mine restoration to the general public.

Students to Learn Better Their Hometown Cement Plant Becomes the Venue for Diversified Innovative Education

Yongle Elementary School in Yilan is a mini elementary school adjacent to the TCC Suao Plant with only around 70 students and teachers. The Suao Plant and the Taibai Mountains Mine are the symbiotic outdoor classroom for pupils at Yongle to learn about their hometown's environment, ecosystem, and industry. The innovative course for Yongle Elementary School was led by the plant manager Jin-Yi Chen, to guide the pupils through the cement manufacturing process, circular economy, and the equipment to learn about how limestone can be turned into a life necessity, putting the industrial knowledge into life. We guided the pupils to contem-

plate the possibilities for industrial development and environmental protection to go hand in hand. To “attend the class” at the cement plant, one can appreciate better the local environment and industry, passing on the features of history and humanities via interactions.



Principals Visiting the Mine Limestone Environment and Ecological Restoration

In July 2020, the principal of Yongle Elementary School Wen-Hsien Tseng invited over ten principals from the neighboring elementary and junior high schools of the Suao Plant to Taibai Mountains for an ecological tour. Mr. Ji-Wei Huang, a professor from the Department of Horticulture, National Ilan University, and a Taibai Mountains Mine restoration team member, introduced the restored endemic and

indigenous flora. The Hoping Plant in Hualien also planned various themed guided tours and experience courses through TCC DAKA for visitors to learn about the unique vertical shaft conveying approach and the mine ecology. Moreover, they are led to appreciate the restoration plans and results at the plant nursery with over 4,000 saplings in the mine.



In-depth Interactions with the Environmental Groups Immersive Experiences at TCC DAKA

With the cement plant and mine ecology combined, TCC DAKA offers a comprehensive tour of the circular economy. We keep good interactions with groups concerning the environmental issues as well as clubs and sustainability courses in universities like The Society of Wilderness (SOW), the circular economy community at NTHU, and the “Corporate Social Responsibility Development Practice in the Chinese Community” course at NCCU. The Parent-Child Group of the



Seventh Chapter of Hsinchu, SOW came to TCC DAKA as the first stop of their 2021 winter vacation activity. The group members concerned themselves with the mining of the cement industry. They entered the mining tunnels, discovering that the air was fresh and circulating in the tunnels without dust. The group also went to the sapling nursery of the mine. Keen to the afforestation species in the ecosystem, they also experienced the cleaning capability of Chinese Soap Berry's seed shells.

The largest tropical plant conservation center in Asia opened the Bromeliads Garden at TCC DAKA that housed over a hundred Bromeliads for visitors to have a closer look at these plants 24/7. There are 1,158 Bromeliads of 142 species in the collection at present, and we shall continue to collect more.



Study the Mine Following the Footsteps of the Legendary Plant Hunter

The Hoping Mine is the first open mine in Taiwan. TCC organized the “Summer Excursion to Hoping” in July 2020, inviting Hsin-Chieh Hung, the Plant Hunter working at the KBCC featured on National Geographic, as the guest speaker. The visitors were guided to collect the oldest plant on the planet – ferns – and take physical part in making specimens. Participating parents and children were led into the mine to learn about the indigenous plants in the region.

Principals' Visit to Taibai Mountains Mine



▼

4.3_Building an Interactive EcoPort



Hoping EcoPort Education Programs			
Program	For	Time	Description
Enters the Big Ship	Adults	120min.	Introduce the social missions a port shoulders and consider the environment for both the establishment and operation of port and vessel transportation.
Guests in the Port	Upper Graders at Elementary Level	90min.	Observe the coral ecology in the certified EcoPort, which offers the best environment for coral reef ecology.
Port Guardians	Upper Graders at Elementary Level	120min.	Learn about the EcoPort of Hoping's environment management system and environmental monitoring tasks certified by the EU's EcoPort initiative.

Certified as one of the EcoPorts of ECO Sustainable Logistic Chain (ECOSLC), TCC's Port of Hoping conducts exchanges with world-renowned ports (including the Port of Amsterdam, Port of London, Port of Stockholm, and Port of Oslo) on the environmental information regarding the ecological balance of ports, which makes it a vital port rich in environmental protection awareness. In 2020, bio cubes as well as underwater cameras and lights were installed to build an environmental education venue suitable for interaction with the general public. Meanwhile, TCC treats the EcoPort of Hoping as a venue for environmental education, communicating the ideas of port planning and operations, coral reef ecology, and maintenance of the water quality through education programs. Through the diverse courses and promotions, we constantly convey the idea of environmental protection of EcoPorts. The EcoPort of Hoping is expected to be officially certified as an environmental education facility in the first half of 2021, becoming the first port-based environmental education facility in Taiwan.



Check out more information of the EcoPort of Hoping at



Marine Ecology


The EcoPort of Hoping carries out regular environmental quality monitoring, with primary monitoring items including the pH, biochemical oxygen demand (BOD), and dissolved oxygen (DO), all of which outperform the international requirements. In the clear waters off the port, various fish and corals can be observed, including garfish, long-spine porcupine-fish, staghorn coral, and tree soft coral. As a result, the EPA recognized the port's rich biodiversity and classified it as a Class I surface water body, comparable with that of the Penghu Islands (Pescadores). In 2020, TCC took it further by inviting academic institutes to perform ecological monitoring on the

marine and terrestrial areas near the port, including underwater photography, bottom sampling, and monitoring of water temperature changes. We established the isothermal plot for the water temperature of the nearby marine areas. Combined with the relationships of phytoplankton, zooplankton, larvae, and juvenile fish with their respective distances to the warm-water effluent outlet, we clarified that the impact of warm-water effluents was limited to the outlet only instead of spreading to the Yilan marine area. There are 160 species of coral reefs in the EcoPort of Hoping, featuring a rich biodiversity value.



Installation of HVSC System to Accomplish Energy Saving and Carbon Reduction

To reduce fuel consumption and GHG emissions during ship loading and unloading, TCC invested NT\$162 million to install the high-voltage shore connection (HVSC) system in two phases. Phase 1 was to renovate and add new equipment to TAHO OCEANIA and the Port of Hoping (port for shipment) by 2020. Phase 2 is to complete the equipment addition and modification to TAHO AFRICA and Port of Taichung and Kaohsiung (the port for delivery) in 2021.



Submarine Ecology at the EcoPort of Hoping

Anticipated Environmental Benefits

Assessed Aspects	Generators	HVSC	Results
Energy Saving and Carbon Reduction	Based on the cargo volume loaded and unloaded at the Ports of Hoping, Taichung, and Kaohsiung annually, the fuel demand is 3,894 metric tons, and the CO ₂ emissions are 13,104 metric tons.	After the adoption of the HVSC system, the annual fuel demand is 0; the CO ₂ emissions from electricity consumption are 8,257.6 metric tons.	A total of 3,894 metric tons of fuels are saved annually, reducing emissions by approximately 4,846.4 metric tons of CO ₂ e.
Air Pollution Reduction	The annul emissions of PM ¹⁰ are 14.88 metric tons; that of NO _x is 219.15 metric tons; and that of SO ₂ is 183.3 metric tons.	The annul emissions of PM ¹⁰ are 0.313 metric tons; that of NO _x is 4.33 metric tons; and that of SO ₂ is 4.03 metric tons.	The emissions of pollutants such as SO _x , NO _x , and fine particulate matters are reduced by 93% or above on average.

4.4 Putting Species Protection Into Practice

With the firm supports of Mr. Leslie Koo, the former chairman of the TCC Group, and Ms. Cecilia Koo, the Dr. Cecilia Koo Botanic Conservation Center (KBCC) was established in 2007 with the mission to conserve the tropical and subtropical plants worldwide and maintain the rich biodiversity. Over the span of 14 years, TCC has been investing funds and staffing to support the KBCC's tropical plant conservation projects globally based on their studies on off-site live specimen preservation. With the ArbNet Level 1 accreditation received in 2019, the first in Taiwan, the KBCC shall continue building a world-class botanic conservation base. At present, the KBCC collects a total of 33,963 taxa of

live plants (as of December 31, 2020). The collection ranges from the Orchidaceae, Bromeliaceae, Musaceae, Palmaceae, Camellia, Zingiberaceae, Araceae, Heliconia, Marantaaceae, Asclepiadaceae, Gesneriaceae and Ferns collected initially to the Rutaceae, Begoniaceae, Bambusoideae, aquatic plants, carnivorous plants, succulent plants, and bryophytes added later on. It is estimated to preserve 40,000 taxa by 2030 and 45,000 by 2050, making it the most crucial shelter for the tropical and subtropical plants in the world.



Ark Plan – Building Adaptability to Climate Change

Triangle Rush of Yuanli | The Provenance of the Indigenous Cash Crop



The original landscape of the Triangle Rush at the estuaries along the west coast is disappearing due to the extreme weather events these years. The KBCC works with Providence University and The Society of Wilderness, collecting the provenance of Triangle Rush. In the future, KBCC plans to collaborate with local communities to restore Triangle Rush to the wilderness to preserve the genetic provenance of Triangle Rush, an indigenous cash crop, in response to the impacts of climate change.



Sustainable Plant Conservation Talent Incubation Program



The KBCC collaborates with National Tsing Hua University and National Taiwan University to organize a four-week internship program every summer. Approximately 30 interns are received annually, including the Taiwanese students of life sciences-related background and the summer term students from Xiamen University and Wuhan University. In the first week, the KBCC introduces all the flora taxa in the KBCC collection. In the following weeks, students are involved in greenhouse practices and their research projects. They can participate in the flora taxa caring efforts, propose research topics for further discussion, and conduct experiments with KBCC staff and other students. There is also a winter internship program open to all students.

The KBCC collaborates with the National Pingtung University of Science and Technology during semesters to organize an on-garden internship program. The program is open to the junior students of the Department of Plant Medicine and the Department of Plant Industry to engage in plant care, breeding, management, and plant disease and pest control while partaking in plant conservation works. The internship brings together students from diverse departments and backgrounds and contributes to a profound friendship.

Moss Wall | Biological Nitrogen Fixation to Maintain Ecosystem Stability

Mosses play a crucial role in the nutrient cycle of an ecosystem. Every part of moss can absorb nutrients while accelerating the disintegration of rocks and the formation of soil. The mosses in the cloud forest belt can conserve a plethora of moisture, making them a vast reservoir in the woods. With mosses being extremely sensitive to the environment and good at absorbing various elements, environmentalists have been studying the matters in mosses to monitor the level of heavy metals in the air. Meanwhile, mosses can perform biological nitrogen fixation (BNF) to maintain the stability of an ecosystem, contributing much to humanity.

Nowadays, mosses are also facing threats of climate change worldwide. With the mosses wall as the subject, the KBCC worked with professional artists to produce Ark-like Greenhouse to draw the public's attention to the idea of plant conservation via art. The work has received extensive media attention at "SNAPS OMNI EXPO" of the National Taiwan University of Arts.



Yo-Chang Art Museum website:

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The Greek philosopher Plato once said that “human beings do evil because of their ignorance”.

His disciple Aristotle believed that “people do evil things because they cannot control their desires”. Thomas Aquinas mentioned in his famous theological tome “Summa Theologica” that “the greatest evil of man is that he has one and wants to have more”, which is greed among the three akuśala-mūla in Buddhism, or hatred and delusion. Most religions believe that harming lives, especially human lives, is one of the most evil acts. It logically follows that, harming the natural environment causes the most lives to be harmed.

There are many species in all different ecological environments, including basic species and key species. Basic species provide the ecological structural foundation for the ecosystem, such as natural habitat; key species make the ecosystem continue to operate, such as maintaining the balance of the number of different species. The number of humans makes us feel that humans are the basic species on Earth. We believe that humans can triumph over Nature, and for the ecology on this beautiful blue planet, humans are assumed to be the key species. However, human beings are not a basic species, let alone a key species. Since the emergence of humans, many species have disappeared, and many originally balanced ecological environments have been destroyed. Moreover, the Earth’s species diversity is rapidly declining because of humans! Humans risk to be a relatively very short-lived species.

Today’s corporations are basically a microcosm of contemporary social mentality and values. What most schools teach is still based on efficiency, interest and freedom as main values. Adam Smith’s “survival of the fittest” is considered to be the most important basis for human progress. We already know, as the economist Herbert Spencer said in an article on economics, this has nothing to do with biological development. However, the business world has kept this myth as the primary norm of business operations.

The most important thing for the future of mankind is a balanced and harmonious relationship with Nature. This is the “Sine qua non”, the “necessary condition” for human existence.

The ancient Greek philosopher Protagoras once said:

“Man is the measure of all things.”



In reality, this is completely wrong, but we have been living a human-centered life for more than 5,000 years because many religions believe that God created mankind in His image. Therefore, human beings became the most important and sacred creatures on Earth. Such thinking is also a myth. In fact, the most important thing is the natural environment. All living things have evolved from Nature and will eventually return to the embrace of Nature.

What the Greeks call Eudaimonia, happiness, is actually the feeling of being at home.



We must re-awaken our sense of oneness with Nature, stand with Nature again, as if we are at home, the place of comfort, peace and togetherness. If we always uphold this feeling, we will truly love and care for Nature. We should never think about the benefits of Nature from the perspective of a conqueror. The conqueror’s interest in Nature is for the reward, but this view will change with diminishing resources. The reason why it is difficult for human beings to really change their minds is because of their sense of superiority as the conquerors. If we still commit to the myth of treating the earth as a land of conquest, then the environmental problem will never be solved.

We should regard human beings as a part of Nature. Toward Nature, we should have a sense of kinship. We should keep our "home" clean, and feel as sad as if any injury would come to our loved ones. This is not the feeling of only losing some benefits, but a sense of personal emotional and personal loss.



Society Empowerment | Material Topics

Management Policies

- Open Eco-Factory established to usher in new values of factory-community co-existence
- TCC Cement Handcraft Workshop to facilitate communication with stakeholders
- Ongoing promotion of Cement Academy and learning initiatives for education and cultivation for the future generations
- Promotion of traditional arts and culture; bridging international communication; initiation of dialogues on art; facilitation of cultural exchanges

Assessment Mechanisms

- Regularly track and review the implementation of social participation projects
- SROI evaluation to quantify social impacts

Targets

- Broader promotion for community rejuvenation, circular economy and waste recovery
- Ongoing investment of NT\$6 million per year in the Cement Academy to support in-depth development of education
- Ongoing promotion of various social participation projects for social inclusion

05
CHAPTER

Society Empowerment

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Connects the Society 97

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//A Factory Ought to Be a Symbol Instead of a Burden of Modern Civilization That Destroys the Environment and Leads to Pollution. With This Hoping Open Eco-Factory, We Hope to Initiate Dialogues With the General Public.//

—Nelson An-Ping Chang, Chairman

TCC DAKA - New Dialogue that Connects the Society

“TCC DAKA Open Eco-Factory” (TCC DAKA hereinafter) sits in the TCC Hoping Plant in Hualien. It is the first cement factory in Taiwan that opens to the public as well as a crucial medium for TCC to communicate with society. It began with Chairman An-Ping Chang’s idea of factory-community co-existence: the factory is not only a place to manufacture products but also a leisure park, while being a classroom to pass on knowledge, a museum that collects artworks, and a new starting point for the industry and society to create values together.

TCC DAKA is the starting point to reflect on the relationship between industry, the cement industry, and nature that transparently discloses the TCC’s actions of TCC to the society and its benefits to cities and human civilization. Moreover, it organizes various activities to interact with different populations directly, communicating TCC’s spirit of promoting the sustainable development of industries and cities.



Participation by 2.5 Million People Since Opening in 2020

TCC DAKA was opened to the public since January 9, 2020. The public can pay visits to various facilities, including “TCC Vision House,” “Bromeliads Garden” the first and only conservation garden for bromeliads worldwide, “Smart Flower” the first large-scale solar-powered outdoor installation art, a musical fountain operating with circulating rainwater, and the Cement Design Studio. There are three guided tours and activities available as well. In April 2020, TCC DAKA officially passed the Ministry of Economic Affairs review and obtained the “Tourism Factory Label,” which makes it the first large industrial factory in Taiwan that received such certification.



European Representatives in Taiwan Visiting the DAKA Market

organized church music concerts on the campus. TCC DAKA has even become the ambassador of Heping Village, and also received representatives of the European Office in Taiwan on its visit.

Industrial Innovative Communication Models

TCC DAKA serves as the point of departure, producing an array of activities in hopes of playing a part in a inclusive society. For instance, it presents “Summer Excursion to Hoping” for visitors to engage a 2-day-and-1-night in-depth experience at the Heping Village as well as DAKA Music Village that promotes indigenous musical culture through the indigenous music stage and the Beauty of Hoping Annual Theme Song Competition.



Hoping Cycling Tour by TCC DAKA

The Bicycle Managers Local to Heping Village Leading Travelers to the Gukut Tribe's Entrance to Experience Local Humanities



Check out more about TCC DAKA at

Introducing SROI to Systematically Evaluate DAKA's Social Impacts

TCC DAKA expects to broaden and deepen its impact in 2021, realizing symbiotic prosperity between industry and society. Hence, TCC introduced the Social Return on Investment (SROI) evaluation mechanism in 2020, analyzing three aspects, i.e., community rejuvenation, guided tours on circular economy, and employees of TCC. Judging from the preliminary results of the evaluation, as far as the vendors to the special bazaars along with villagers participating in the bazaar preparations and sales are concerned, the TCC DAKA project not only revitalized the local economy and stabilized people's lives, but also helped them tap into their creative energy and realized self-development and achievements. As for the visitors, they gained a better knowledge of the cement industry and its technological progress, appreciating the efforts of TCC in promoting a circular economy and environmental protection, and the social values TCC brings.





TCC DAKA Phase II & New Sustainable Landmark with Landscape Considered
TCC laid out the Phase II blueprint of DAKA with the “Renewable Resources Utilization Center” at the core, which is projected to be completed by 2023. The center is a multipurpose venue with waste management, environmental education, and tourism combined for the general public to observe the advanced waste management technology that is clean, eco-friendly, and odorless. Featured with open transparency, it conveys TCC’s spirit in promoting sustainable development for industry and city, demonstrating to the world TCC’s endeavors to seek the possibility of an ecology-industry coexistence. Moving forward, we will extend beyond TCC DAKA to the neighboring Aohua Tribe in Yilan, constructing the Hanben Ocean Station rich in unique features together with the Coast Guard Administration. The Station is expected to help the tribe develop marine activities and to demonstrate its concerns for marine debris together with society.



Renewable Resources Utilization Center

TCC Public Welfare Strategies

TCC has been promoting social engagement on the fronts of charitable contributions, community investments, business advocacy, and employee participation. Through TCC DAKA, Hualien Heping Elementary School Education Fund, C.F. Koo Foundation, and interactions of plants with their respective neighborhoods, TCC exercises fully its corporate citizenship. Meanwhile, it ambitiously promotes 7 of the UN’s SDGs, including No Poverty, Good Health and Well-being, Quality Education, Decent Work and Economic Growth, Reduced Inequalities, Responsible Consumption and Production, as well as Climate Action. In particular, we prioritize and focus on the developments centering around SDG 1: No Poverty, SDG 4: Quality Education, and SDG 8: Decent Work and Economic Growth.



2020 Charitable Contributions (NT\$)	
Contribution Type	Amount
Monetary	51,465,083
Volunteering Hours	1,251,050
In-kind (Cement)	2,390,451
Management Costs	3,195,000
Total	58,301,584

Note 1: The volunteering hours is monetized on the basis of the hourly wage of MA.

5.1 Initiate Social Dialogue
5.1.1_TCC DAKA Open Eco-Factory

TCC DAKA Open Eco-Factory was born to facilitate the communication between the industry and society, realizing the shared prosperity of factory and community. It has become the best outdoor classroom of a circular economy as well as a campus for schools at various levels, institutions, groups, and tourists. The DAKA Market works with the neighboring tribe to exhibit and sell crafts rich in the Gukut Tribe’s special features as well as food and beverages made from fresh ingredients in season, while promoting the local culture through integration of local cultural exhibitions and performances. Concerning itself with the sustainable development of the local community, TCC promotes community rejuvenation in the “life” aspect of residents. It takes less than 30 to 40 minutes for the residents to enjoy the conveniences of a township. As for the aspect of “livelihood,” it introduces more job opportunities of various types, contributing to the employment of the Heping Village by 2.5%, and offers the DAKA Market as a startup platform, with an average monthly income of NT\$100,000 per vendor. With the abovementioned efforts, TCC endeavors to bring the factory and community together, creating values and fostering identity together. Once unfamiliar with DAKA, the residents of the Heping Village are now accustomed to it, gradually embracing DAKA as part of their lives at the Heping Village for a prosperous coexistence.

TCC DAKA Impact Mapping

Item	Stakeholder	Results
Community Rejuvenation	TCC Project Coordinator Head of Heping Village Market Vendors Families of the Market Vendors Villagers Assisting the Market Vendors Tourists Campus Cleaner Campus Guides	Days in business for DAKA Market: 357 Booths in DAKA Market: 14 Visitors to DAKA Market: 2,529,576 Average monthly income of DAKA Market: NT\$1.55 million Local employment: 1.Campus Cleaners: 18 2.Campus Guides: 6
	TCC Project Coordinator Employees on the Hoping Plant Guides Participants in the 3-in-1 Tour of Port, Power Plant, Cement Plant: General Tourists Participants in the 3-in-1 Tour of Port, Power Plant, Cement Plant: Competent Authority	Sessions of the 3-in-1 Port, Power Plant, Cement Plant Tour: 65 Online reservations: 28 Group reservations: 37 Total number of participants in the 3-in-1 Port, Power Plant, Cement Plant Tour: 995 Online reservations: 299 Group reservations: 696

Note: Members of the TCC Occupational Safety and Health Committee were involved throughout the SROI project.

TCC DAKA Social Impact Evaluation (SROI)
To measure and enhance the values created by TCC DAKA in terms of society, environment, and economy, TCC introduced the methodology of SROI to evaluate TCC DAKA’s impacts with regard to local employment and social dialogue. Firstly, it identified 12 different stakeholder groups. Then, through interviews in person or via telephone, TCC better understands the changes to the stakeholders produced by their employment on the DAKA campus, participation in the DAKA Market’s operations and tours, as well as involvement in the 3-in-1 Tour of Port, Power Plant, Cement Plant of Hoping. We consulted with the village office in the process and finally produced the impact mapping through questionnaires and engagements, confirming that **for every NT\$1 invested in the TCC DAKA as a whole, it creates social values worth NT\$3.54.**



▼
Improving Stakeholders' Sense of Satisfaction and Effective Promotion of the Circular Economy

The local employment opportunities introduced by TCC DAKA help to improve the working skills in communication and coordination, incident management, personal creativity, verbal and body language while bringing about a sense of achievement at work and satisfaction in mind. The participants believed that the 3-in-1 Tour of Port, Power Plant, Cement Plant helped them learn more about the circular use of natural resources, including the mining of the

cement industry and the circular economy model. To enhance the positive influences, all the income of the DAKA Campus is contributed to the Hualien Heping Elementary School Education Fund. In the future, it shall continue to hire locals first, assist in mentoring the tribal handcraft heritage, allocate resources via cross-industry collaborations, as well as proactively commit to community rejuvenation via TCC DAKA.

Milestones

2020

Over 2.5 million visitors to the factory throughout 2020, ranked No.2 in the number of visitors to non-business districts of the Tourist and Recreational Areas in Hualien

JAN

Official inauguration of TCC DAKA

MAR

Outdoor church music concert

APR

TCC DAKA as the first large industrial factory certified as a tourist factory by the Industrial Development Bureau, MOEA

MAY

Premiere of TCC DAKA's documentary

JUN

"Cement Handcrafts for Soccer Dreams" charity event

JUL-AUG

Females in the tribe trained as guides to develop the tribe and the featured tourism

AUG-OCT

"DAKA Music Village" activity

DEC

Christmas parade activity

2021

FEB | GEMMA "Recycle with Peace (Hoping) Now!" campaign







Summer Excursion to Hoping X | Q

"Summer Excursion to Hoping" is a 2-day-and-1-night community rejuvenation tour project. Working with 10 females, including mothers, in the tribe, it advocates the idea of sustainable tourism that respects local humanities. It is also the result of the Seed Talent Program (STP) TCC team, TCC's industry-academia collaboration, and a manifestation of its investment of manpower and resources, which has become one of the TCC DAKA guided tours since July 2020.



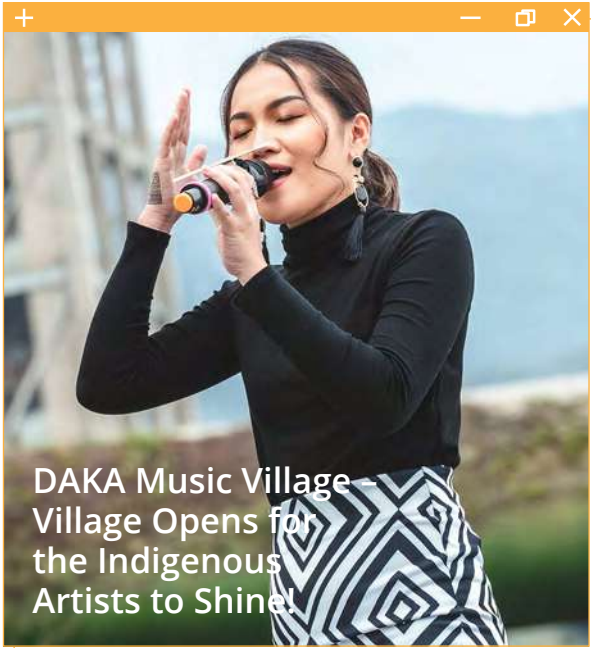
Engaging in the cross-industry cooperation with LDC Hotels & Resorts Group, TCC works with females, including mothers, in the tribe to offer training on guided tours and reception. They experienced many "first times" from their exchanges with travelers, reaffirming themselves while exploring their potentials. "Summer Excursion to Hoping" demonstrates support for the hard-working tribal females, including mothers, as well as for the tribal culture.

There were three sessions organized in 2020 with 60 travelers involved, who gave ratings and feedbacks of high satisfaction with regard to the in-depth sustainable tour infused with the tribal culture.



Three highlights

- Highlight 1: The First Open Mine in Taiwan | Overnight Stay at Cement Plant
- Highlight 2: Tour of the Coral Reefs in the Hoping EcoPort | Mystic Beach
- Highlight 3: Tribal Life Experience | Gukut's 3-flavored BBQ



TCC DAKA organized its first indigenous music concert, opened the "DAKA Music Village" stage, and called for entries for the Beauty of Hoping Theme Song Competition in 2020 to promote indigenous culture and music art. In the two-month duration, the indigenous music stage livestream events drew over 100,000 viewings and over 16,000 interactions on the posts on the Facebook fan page, while the performing artists gained more visibility via their participation on the indigenous music stage and opened up more opportunities for performances in schools and for businesses.

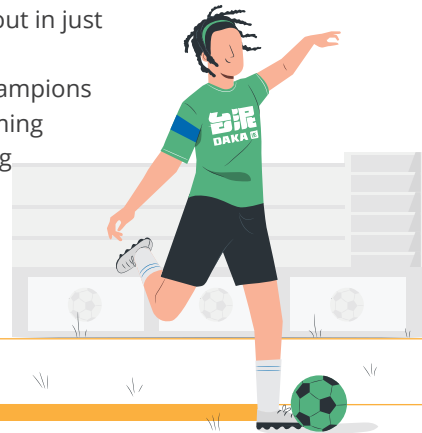
TCC DAKA will not stop in its efforts to promote indigenous music. It shall present more indigenous music promotion activities in 2021, opening up more possibilities.



Cement Handcrafts for Soccer Dreams Program

TCC DAKA sits at the Heping Village in the northernmost region of Hualien. The only and century-old elementary school in the village, Heping Elementary School, organized a soccer team in 1989 which has remained active since then, cultivating numerous soccer players for the national team. Despite its location in a rural area, the kids on the Heping Soccer Team keep charging forward on the field for over 32 years. In the summer of 2020, the little champions of the Heping Gukut Tribe Soccer Team aimed to earn more opportunities for practice during the summer vacation and participate in the friendly matches in Taipei on their own. The little soccer players spent their spare time in between classes and the soccer practices over a span of two weeks, to produce 70 cement pots by themselves. They promoted and sold them at TCC DAKA, which sold out in just 40 minutes.

The little champions were screaming and cheering out of joy.



Tourists from around Taiwan were moved by the passion of these little soccer players and became fans of the soccer team. They not only bought the cement pots produced by these kids with heart, but also cheered for them to focus on playing soccer and realizing their dreams. To our surprise, the anchor couple of Yong-Kang Cen and Pei-Shan Chang showed up at TCC DAKA and bought a set of cement owls to show their support for the kids in action. The kids were also packing the owls with the bubble wrap in excitement and took group photos with the anchor couple for a lovely memory!

TCC DAKA GEMMA of the Circular Economy

Gemma means "gem" in Italian, which is pronounced close to "decoding" in Mandarin and "today" in Minnan. Gemma came from a blue planet like Earth with the magical power that can polish wastes into gems to power Earth with the energy of circulation and regeneration. GEMMA shall guide you to learn about wastes and implement sorting, recycling, and circular regeneration at TCC DAKA.



GEMMA "Recycle with Peace (Hoping) Now!" Campaign

Mother Nature has no waste. To promote waste recovery, TCC encourages the recycling of plastic bottles, beverage cups, aluminum cans, and batteries. It works and advocates with Uni-President Group and LDC Hotels & Resorts Group and collaborates with the social enterprise For Next Generation (FNG) Design. The plastic bottles collected by TCC DAKA are designed and manufactured into eco-friendly jerseys, towels, and bags for the 25 soccer team players from the Gukut Tribe at the Heping Village, so that the team could play in matches and exercise environmental protection, becoming the little vanguards for waste recycling and carbon reduction for the planet. Meanwhile, TCC DAKA also works with Starbucks to organize coffee grounds potting lectures to promote the awareness of sustainable living.

In addition, the TCC Hoping Plant was installed with the first "kitchen waste recycling equipment" in Taiwan, collecting the kitchen wastes produced at TCC DAKA and the Heping Village for processing via



decomposition by probiotics and turn them into soil compost for the villagers in the neighborhood to use in their planting, free of charge, so as to incorporate the act of resource recycling and reuse into the everyday life of the public.

Kitchen Waste Reuse to Cultivate Happy Farm



"Happy Farm" opens at the Hoping Plant to invite several mothers in the tribe to utilize the soil compost made from recycled kitchen wastes to grow vegetables and fruits. It turned out to create a new trend of becoming the "farm ladies" to grow produce at the cement plant to our surprise.

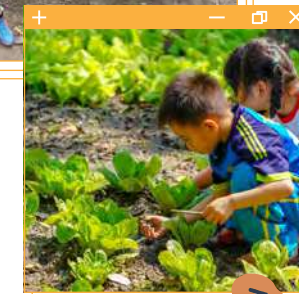
There are delicious bok choy, romaine lettuce, maize, pumpkins, tomatoes, as well as shallots, coriander, and leeks that mothers cannot cook without. These self-grown "demo produce" are so good that they are all pre-ordered by the villagers

themselves.

The participating mothers from the tribe said that the fertilizers of kitchen wastes in their houses used to smell and sour with poor performance. To their surprise, they can use the recycled kitchen wastes from the cement plant to grow vegetables today, which is clean, natural, and odorless, producing quality produce in good shape.



Kitchen Waste-Based Soil Compost



“Hanben Ocean Station” of Aohua, Yilan – Open the Factory Doors to Embrace the Communities for Growth Together as Neighbors

In 2021, the Hoping Power Plant under the TCC Group worked with the Coast Guard Administration to revitalize the space on the first floor of the Inspection Office by the Hanben Beach at the Aohua Village. Travelers will be able to have a place to unwind, get close to the ocean, and care for marine conservation and the worsening ocean waste issue with us. Here, it is also an exchange hub for local culture promotion that connects with the Aohua tribe to help the youth to engage in water activities and develop eco-tour of the tribe so as to do better together for a friendly planet and community rejuvenation!



Schematics of Hanben Ocean Station of Aohua

5.1.2_Community Engagement

TCC values communication and interaction with stakeholders across all sectors in the society. Targeting the competent authorities, colleges and universities, and local community residents, it regularly arranges visits to the Hoping Plant, Hoping Mine, the

shaft tunnel system, and the microalgae cultivation system, with over 8,543 visits in 2020. Through the visits, stakeholders observed the plant's environmental management, compliance, and relevant plans and the mine management in line with the soil and water conservation plan, finding the good restoration result on the slope of the developed mine. While removing the stakeholders' doubts regarding the environmental risks, it also facilitates the interactions with the neighboring communities.

5.2_Publicizing Conduct and Promoting Education

5.2.1_Young Hearts for the Environment and Dreams for the Hometown

The Cement Academy project launched in 2012 by TCC supports local children who encountered issues of household income, grandparenting, culture and language barriers in the New Immigrant family, single-parent family, or orphans, as well as the potential unbalanced diet and malnutrition. By providing resources like after-school education and nutritious food, Cement Academy enables the children to move away from poverty for a second chance in life. It has benefited a total of 8,211 children since 2012.

In 2020, TCC expanded the social impacts of the Cement Academy project by adding Yongle Elementary School in Suao Township, Yilan County, and Zhongyun Junior High School in Linyuan District, Kaohsiung. Upholding the philosophy of “taking from society and giving back to society,” the Cement Academy project is promoted with “character, conduct, and quality” at the core, realizing TCC's emphasis on Quality Education in the UN SDGs.

In the plan for 2020, TCC combined the Cement Academy mentoring class with the theme of “Young Hearts for the Environment and Dreams for the Hometown.”

Through immersive storytelling, board games, and cement painting, the students in the Cement Academy followed in the footsteps of the Giant (TCC) to take environmental actions. While getting the idea of “it will impact us if we don't manage wastes,” the game also inspired the children's dreams to protect their hometown together.



For more information on the Cement Academy website



Cement Academy Facebook page

As Taiwan is entering an aging society, maintaining the elderly's health and dignity while allowing them to access good welfare service locally is ever more critical. TCC concerns itself with the social trends in Taiwan, proactively shoulders social responsibilities, and partakes in relevant charitable programs.



“Happy Mealtime Program” Invites the Elderly to Take Meals Together!

The 38 TCC volunteers worked with Daya Love Angel Station of Huashan Social Welfare Foundation in Taichung for two sessions of four-hour happy meal time activity for 43 disadvantaged elderly that lived in solitude to prepare and take meals together. From the purchase of foodstuff, selection, washing and cleaning, chopping, cooking with special emphasis on nutrition, the TCC volunteers served delicious dishes in the end while singing, celebrating birthdays, and playing games with the elderly.

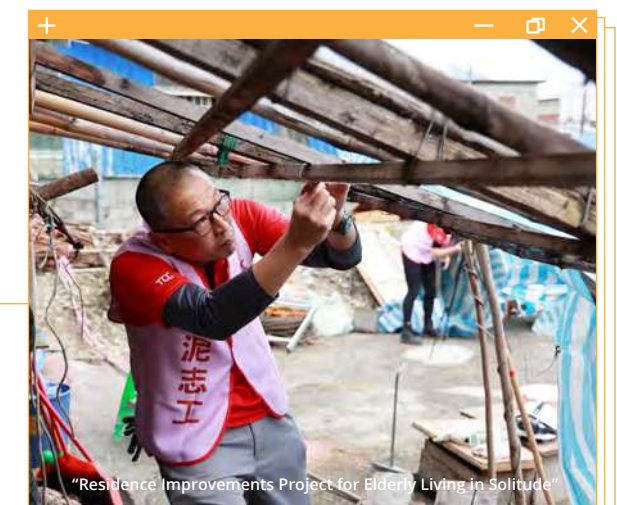


Heart-Warming Mission on Dragonboat Festival: Collecting Supplies for the Elderly

Huashan Social Welfare Foundation received less charitable supplies due to the epidemic. TCC called on its employees to collect supplies for the elderly together. A total of 486 packages were collected, including cereal, ESL milk, eight-treasure porridge, soda crackers, noodles, canned food, and tissues to meet the needs of the elderly.

5.2.2_Care for the Disadvantaged

TCC proactively partakes in community development and charitable activities, manifesting TCC's care for the local communities through diverse forms and channels. TCC continues to care for the homeless through the “Food Donation Plan,” bringing its employees and charitable groups in partnership. Aside from employees donating their meal vouchers, the surplus cooked food at the Employee Cafeteria on the event day is put to good use to regularly donate 50 servings of box meals to the neighboring charitable groups for the homeless, the households with low income, and the disadvantaged not yet being supported. Numerous friends supported by the charitable organization have now joined employment training, fueling the society with positive energy.



“Residence Improvements Project for Elderly Living in Solitude”



"Heart-Warming Home Visits: Let Us Do More Meaningful Things Together"

Joining hands with the Huashan Social Welfare Foundation, TCC visited a total of 504 households of the disadvantaged elderly in 6 townships across 5 counties/cities in 11 days, including Xiulin in Hualien, Suao and Nanao in Yilan, Luzhu in Taoyuan, Rende in Tainan, as well as Renwu in Kaohsiung. During the visits, 170 TCC volunteers assisted the elderly in checking their blood pressure and filling out health visit forms. The volunteers also presented care gifts and celebrated birthdays with the elderly while teaching them the 7 steps of handwashing to raise their health awareness in response to the pandemic.



"Residence Improvements Project for Elderly Living in Solitude"

TCC mobilized 60 volunteers to put their expertise to good use, assisting two households of the elderly living in solitude in Jiamin and Chongde in Hualien to improve their residences in 6 days, including indoor repairs and renovations, so that they could enjoy a comfortable living environment.



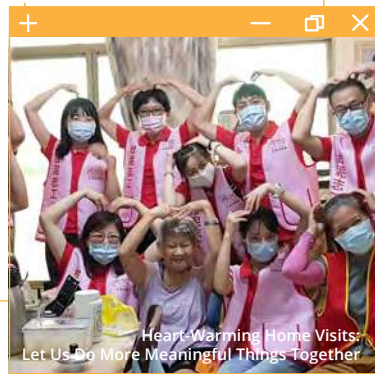
"Timely Heart-Warming Help at Year-End"

In the face of COVID-19's impact, many social welfare groups also encountered "the harshest winter," with the charity funds raised decreasing by 20% to 60%. TCC donated NT\$200,000 to the Taiwan Fund for Children and Families (TFCF) Yilan Branch for the "Timely Heart-warming Help at Year-end" campaign to provide year-end gifts like New Year's Eve dishes for the families, as well as the children and youth in poverty and disadvantaged conditions TFCF served.



"Caring & Heart-Warming Companionship"

TCC invited 20 elderly living in solitude in Suao, Yilan County to pay a visit to the Suao Plant of TCC. 14 TCC employees guided the elderly in producing heart-warming cement pots while keeping them company and sharing tips for health and exercise with the elderly.



arranged to Mainland China each year to greet friends with opera.

In "theater management," the Foundation adhered to the spirit of theatre talent cultivation and serving the greater audience of performing arts. Working on the two projects in 2020, i.e., "Technical and Service Management for the Front and Back Stages of Family Theater" and "Dadaocheng Theater Profound Art Education & Technical Theater and Stage Management", the Foundation assisted the Taipei City Government in managing theaters, serving audiences and performing art groups while improving the utilization of relevant facilities with its seasoned experiences in theatre management.

In "cultural tourism," the Taiwanese cultural tourism hub, TaipeiEYE, planned to present performances of puppetry theater, acrobatics, lion dances, indigenous singing and dancing, as well as the Peking Opera at the Cement Hall on Mondays, Wednesdays, Fridays, and Saturdays. Prior to the opening performance for the Lantern Festival of the year, it had received 25 block bookings and 45 group reservations.

addition, performance tours are held across 185 major cities and 50 countries as well as the overseas offices of the Ministry of Culture and the respective international networks of the teams, it successfully drew nearly 500,000 viewings in total. Thus, it contributed unprecedented publicity benefits for the Taiwanese works with potential in international development, breaking free from the limit on the benefits of physical conferences.

In the face of the pandemic, leveraging its Taipei Li-yuan Peking Opera Theatre and the library of Peking Opera productions over more than 30 years, the Foundation curated the whole new online opera channel in Taiwan for the first time, i.e., "Koo Cloud Theater." The channel presents contents in two ways. One is the live broadcast of the performances in Taipei Li-yuan Peking Opera Theatre with one live broadcast on a monthly basis; the other is the screening of featured productions of the Peking Opera in the collection of the C.F. Koo Foundation for 30 years with the playbill updated on a weekly basis for screening over a span of one week. The promo-



In "international exchange and promotion," the impact of COVID-19 forced the ISPA 2020 Taipei Congress to cancel the physical event. With the firm support from the Ministry of Culture and the ISPA Headquarters in New York, the "TaiwanEYE Online Showcase" project was presented. The project took the Foundation's website as the portal and YouTube as the video platform, showcasing amazing videos of 10 performing art groups in Taiwan in less than 30 minutes each. In the duration of the online showcase, through the communication of the ISPA memIn

tion of Peking Opera is extended to the international stage via the Internet. As of December 2020, "Koo Cloud Theater" had put on 39 plays, including 7 live broadcasts of Peking Operas and screenings of 20 classic productions, drawing nearly 400,000 viewings in total.



5.3_Promoting Cultural Conservation

Culture is the lifestyle, values, and beliefs of a people. It is the manifestation of social inclusion that may not be quantifiable. Yet, it carries the same weight as a clean hometown to the local people. For three decades, the C.F. Koo Foundation has upheld cultural conservation as its mission. Be that traditional dramas of all kinds or other traditional performing arts on the verge of disappearing, it conserves them in their original forms, while repairing the old, introducing the new, and cultivating talents for them to pass on the ultimate bliss of spiritual well-being for humanity. In recent years, the Foundation has also shared the cultivated fruits across the Strait and on international stages to expand the cultural identity of the country. In 2020, in line with the strategy of "interdisciplinary integration", the Foundation aimed to "activate the energy of the traditional performing arts in Taiwan and expand the cultural identity of the country." It ceaselessly expanding its performances on four

fronts, i.e. "program production", "theater management", "cultural tourism" and "exchange and promotion"

In "program production," the Foundation presents two Peking Opera productions each year. In 2020, in the creative spirit of "crossover fusion," it presented the Peking Opera production adapted from Verdi's opera Rigoletto with the same title. The opera in the West tends to mobilize "the plot" with "arias," whereas the one in the East stresses on the balanced development of various techniques of "sing, chant, perform, fight, and dance." Leveraging the Peking Opera's advantage, it adjusted the ratio of "singing" and "acting" to present a new face for the century-old masterpiece. Taipei Li-yuan Peking Opera Theatre under the Foundation continued to present "Youth Showcase." Meanwhile, the Foundation established "The Koo Company," an experimental theater platform for young artists, through entry calls to encourage young artists to create across disciplines.

Although I have run many different businesses, my role as Chairman of TCC, is still my number one priority. In this capacity, I would like to talk to you about natural sustainability, which is particularly hard, but also particularly practical. The relationship between myself and the cement industry is so close to me. It is a special industry. You rarely see an industry that is so important to civilization. 90% of the weight accumulated by human civilization has relied on cement. However, when facing the field of ecology, many people's first impression is that the cement industry is standing on the opposite side of the issue.

According to data from the International Energy Agency in 2018, the cement industry is the world's third largest industrial energy consumer, accounting for 7% of global industrial energy consumption. In addition, it is the second largest producer of CO₂ emissions in the industrial sector, accounting for approximately 7% of global emissions. Cement is the most serious of heavy industries, and should face these environmental issues with the most courage.

*As modern industrialists,
facing the issue of climate change,
we should shoulder these great responsibilities.
We can't avoid the carbon emission problem brought about
by industrial development.
Rather, we must look for solutions to this issue.
TCC is ready to spend more than our other industrial peers
trying to resolve these problems.*



*The current situation
is like playing four or five different chess games
at the same time.*

*It is like a game of chess against the increasing speed
of global warming, another challenge is the energy crisis,
and all while trying to maintain economic growth.*

Only with multi-sector reforms, long-term planning and execution solidly at every single step of the way, can the complex problem structure be resolved, albeit slowly. Especially at the core of traditional industries, with the pre-existing negative impression of the public, it is not easy to implement these changes, but it is the only path for the survival of our industry.

These changes must be treated rigorously and put into practice. It is not only about the future of our industry, but also a future in which Nature and mankind can coexist in harmony. In 2020, the "TCC DAKA-Open Ecological Circular Factory" opened peacefully in Hualien is an attempt by TCC to change the traditional practices in many ways. Every change means a complete redefinition. A factory can be a classroom for transferring knowledge, a large park for leisure and recreation, or a purifier of urban waste. The business policy adopted by TCC DAKA: openness, transparency, sharing, and integration are keywords that were difficult to find in the industrial factories of the past.

In the future, energy and waste will be the biggest issues that human beings must face for survival and development. New technologies and new ways of living have created a rapid and massive demand for energy. However, current energy production is still dominated by fossil fuels, causing a large amount of exhaust gas, carbon dioxide, and other toxic emissions. Even though the amount of energy that hits the surface of the Earth from the Sun every hour and a half could cover the energy needs for all human civilizations for a year, solar energy is only a small part of the power generation we use now. Therefore, society must change. In particular, the business community must not only urgently and massively reduce polluted waste and carbon dioxide emissions, but also actively help the Earth to repair the damage humans have caused to Nature over the past few hundred years. An important example is that the world now produces nearly 400 million tons of plastic products every year, and currently only less than 10% is being recycled. These by-products of petrochemical raw materials cannot be digested by the land and the sea. If we do not take the initiative to dispose correctly of these wastes, we will leave unimaginable burdens and malaise for our future children and grandchildren.



Employee Benefits | Material Topics

GRI 401 Employment | GRI 412 Human Rights Assessment

Management Policies

■ Implementation of “TCC Human Rights Policies” in line with the human rights conventions of the UN and International Labour Organization

Assessment Mechanisms

- Regular human rights due diligence; analysis and handling of potential human rights risks based on the investigation results
- 100% of employees trained on human rights policies or procedures relevant to operational activities
- A total of 1,199.5 hours of education and training related to human rights issues conducted in 2020

Targets

■ Ensuring no human rights violations at TCC

GRI 403 Occupational Health and Safety

Management Policies

■ Implementation of ISO 45001 and CNS 15506 management to ensure the effectiveness of the system

Assessment Mechanisms

- Implementation of hazard identification and risk assessments
- Supervision of occupational safety and health management performance of plants by the Headquarters that is linked with performance management
- Regular convention of Occupational Safety and Health Committee meetings to investigate the true causes of incidents and follow up on improvements
- No occupational diseases reported in 2020

Targets

■ Dedicated effort in building a friendly, safe workplace with the aim of zero work-related workplace injuries throughout the year

06 CHAPTER

Employee Benefits

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-Building a Safe Workplace 113

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//A Sustainable Earth Prioritizes Humanities as the Happiness of Mankind Is Held as the Highest Criterion for All Values.//

~Nelson An-Ping Chang, Chairman



In-Depth Development of ESG Culture - Building a Safe Workplace

Employee Stock Trust Program Being Promoted

“Human capital” is the bedrock for the sustainable operations of an enterprise. TCC promotes the Employee Stock Trust Program (ESTP) to all employees in TCC and affiliated enterprises, retaining talent along with special features for savings and assets management. Where an employee contributes a certain amount from his/her monthly salary to procure shares of TCC, TCC will disburse an equal amount for rewards to the dedicated trust account thereof. Apart from providing long-term protection, it facilitates our employees to have stable planning for retirement life. Participation in the ESTP in 2020 was 96.95% (including employees assigned abroad), underscoring their support and recognition of this Program.

Remuneration Linked to Sustainability Performance

To cultivate a sustainable corporate culture, TCC links remuneration to the indicators of sustainable performance. In addition to conventional financial indicators, the President’s performance indicators also include non-financial performance aspects such as corporate governance, green finance, social care, and a sustainable environment. As for all employees, the incentive compensation TCC provides, like the quarterly bonus and performance bonus, also take the performances on sustainability indicators like occupational safety, environmental protection and emissions, and energy-saving as well as carbon reduction into account, which underscores TCC’s culture of sustainability.



Quarterly Bonuses

The quarterly bonus has come into force since 2018 to share the yields as an effective incentive. Apart from the quarterly EPS and key financial indicators, the quarterly bonus is also linked to sustainability-related indicators.

Performance Bonuses

The performance appraisal of an employee is conducted on the basis of his/her working performance over the year, which can be divided into quantitative working targets and qualitative functional behaviors, while taking indicators pertaining to risks and sustainability management into consideration.

ESG Lectures to Build the Sustainability DNA of TCC Employees

Whereas a corporate’s sustainable development relies heavily on all employees being identified with and their support for the corporation, and ongoing and in-depth communication is the key. The monthly decision-making meetings of TCC are presided over by Chairman An-Ping Chang himself and attended by nearly 40 individuals, including the President, Vice President, senior and mid-level executives of departments, and all plant CEOs in Taiwan and overseas.

The monthly meetings cover issues ranging from the enterprise’s operational development strategies as well as issues of CSR and sustainable development, which is a crucial means for the enterprise to reach an internal consensus on sustainability. In addition, the Chairman and executives of all levels will listen to employees’ thoughts and feedbacks through the quarterly Town Hall Meetings, labor-management meetings, labor union meetings, and employee welfare meetings, among others.

TCC Family Day - X | Q

TCC New World to Have Fun with YA

Family Day has been a significant event at TCC organized for years. The Family Day in 2020 “TCC New World to Have Fun with YA” was organized at the Hoping Plant in Hualien in recognition of our employees’ hard work throughout the year. Elements of knowledge, culture, and recreation were introduced on-site to conduct the 3-in-1 Tour of Port, Power Plant, Cement Plant of Hoping in the form of education in entertainment. While enhancing the bond between our employees with their families, it also deepened our employees’ and their families’ understanding and support for TCC’s concept of a circular economy and shared the joy of the 20th anniversary of the Hoping Plant.



Work-Life Balance - All-Round Care for Employees and Families X | Q

The year 2020 was a year of changes. Under the impact of COVID-19, the enterprise shouldered the critical mission of caring for its employees in spirit, mind, emotion, and health. TCC renovated the 7th floor of its Headquarters for employees and their families to relax and unwind. Spaces were available for the temporary care of employees’ children, office space for employees assigned abroad returning for home consultations, and employees’ club activities. In addition, breastfeeding rooms, nursing rooms, and a medical consultation service station were established to expand our care for our employees’ families and contractors.

An Employee's Feedback

“In response to the delayed school opening day in 2021, TCC Headquarters provided family support solutions, allowing employees to take their kids to the company and have someone care for them on the 7th floor. It felt nice and relaxing, and the children were having fun. I hope that there will be handcraft workshops for kids, story-telling, or family activities like a half-day tour and games in the future.”

An TCC Group Employee
Mar. 15, 2021

HIGHLIGHTS

- Medical Consultation Center: Dedicated venue for on-site service by professional medical staff and as a lounge for employees in need
- Breastfeeding Room: Hot & cold water fountain, refrigerator, sink, and diaper changing table
- Children Game Room: Facilities like slides, a rock climbing wall, ball pit as well as a children’s library available
- VR Game Quarter



Total Care Commitment-
Renovated Space at 7th Floor, Headquarters

▼

6.1_Building a Happy Workplace

6.1.1_Workplace Safety

TCC attaches great importance to the safety of the working environment for employees with the aim of zero work-related injuries among its employees and contractors. All the cement plants were certified with ISO 45001:2018 occupational health and safety management systems to systematically protect the safety of our employees. In 2020, contracted medical staff provided health services on-site in accordance with relevant laws. The Hoping Plant went beyond the statutory requirements, recruiting one full-time nurse to enhance the workers' health and reduce occupational risks. The health checkup rate in 2020 reached 100%. Moreover, TCC further pushed for health promotion measures, including organizing health lectures, education, and training for work overload and human-factor injuries.

Occupational Safety and Health Management System

Labor Safety and Health Office (LSH Office hereinafter) established at TCC is in charge of occupational safety and health (OSH) matters. One Occupational Safety and Health Committee meeting is organized on a quarterly basis to track the progress of various objectives and their progress. Meanwhile, the Quality Assurance (QA) Section has been established at all cement plants to coordinate the management and promotion of environment, safety, and health, supervised by the Headquarters for the performance thereof. All plants regularly report the outcomes of OSH improvement plans, including the handling and preventing of accidents and safety management of contractors in construction, for the review of the current status and ongoing improvements.

Occupational Safety and Health Committee

	Head-quarters	Cement Plants	RMC Plants
Chairperson	1	2	3
Number of Supervisors and Professionals	5	21	28
Number of Labor Representatives	3	15	17
Percentage of Labor Representatives	33%	39%	35%

The safety management regulations in force at TCC include the "Occupational Safety and Health Manage-

ment Regulations," "Occupational Safety and Health Management Plan," "Occupational Safety and Health Code of Practice," "Human Factor Hazard Prevention Program," and "Prevention Plan for Ailments Induced by Unusual Workload." In addition, "On-Site Health Service" has been available since January 2020 with contracted medical staff to perform services and health evaluations at TCC regularly. The number of people served in 2020 totaled 211. Moreover, plans of human factors engineering, work overload, workplace violence, and maternal health protection were executed. The health conditions of employees were rated via health checkups and questionnaire surveys. Recommendations were offered to employees with mid-to-high health risks during the interview evaluation. No reported workplace violence occurred in the same period. Employees that fit the definition of maternal health protection regulations were also cared for.

To implement its occupational safety policy, meet targets, and tighten the management of contractors, TCC further launched the "Occupational Safety Monthly" report mechanism in 2021. All the cement plants and RMC plants in Taiwan and Mainland China are required to report monthly, followed by the formulation of recurrence prevention strategies. The report includes contents as follows:

- ☑ Data of work-related injuries
- ☑ Description of the nonconformities in safety and health audits and of the improvements
- ☑ Description of violations by contractors, as well as the handling and results
- ☑ Content of safety and health education and training



In addition, TCC worked with the Taiwan Cement Manufacturers' Association and Occupational Safety and Health Administration, Ministry of Labor in drafting the "Formulating Safety Partnership Implementation Plan" to raise the safety awareness of workers in the cement industry. The original schedule was two years starting from 2019 to raise the safety awareness of workers in the cement industry through the on-site mentoring directly by the government and demonstration among peers to produce the Guidelines for Safety and Health at Work for the Cement Industry in Taiwan. In the meantime, the TCC Hoping Plant was to serve as the demo site in 2020, offering experiences for exchange with regard to cement transport safety issues. Nevertheless, the plan schedule was hindered due to COVID-19 in 2020. Hence, the partnership was extended for 2 more years. In addition to the original objectives, new additions and amendments to "the manual for labor safety operations at RMC plants" were incorporated.

Safety Management of Contractors

The target of zero occupational injuries among contractors is set at TCC. The contractors are liable to abide by the relevant laws and regulations of occupational safety and health as well as the management regulations of TCC, including "Contractor OSH and Environmental Management Rules and Punishment Guidelines". Before entering a TCC plant, contractors are required to organize OSH education and training and fill out the Workplace Environmental Hazards Notice and the Workplace Environmental Hazards Advice to ensure that they understand TCC's environmental safety and health guidelines. Contractors also need to sign the OSH Letter of Undertaking to

pledge that their workers will abide by OSH rules when working at TCC plants.

One work-related employee injury incident occurred in 2020 due to an employee falling down some stairs. Subsequently, warning signs, handrails, and anti-slip stair treads were added to the stairs. In addition, a contractor traffic fatality incident occurred in 2020. Safety promotion was enhanced afterward to avoid recurrence.

Incident Investigation Process

Incident Occurrence

A report is to be submitted to the LSH Office and the superiors immediately after the occurrence of a material occupational disaster. Also, the contractor is to report to the supervising unit via phone in 30 minutes and inform the firefighting department and medical services for backup in line with relevant regulations, such as inform the local labor inspection institution within 8 hours after a material occupational disaster.

Incident Cause Investigation

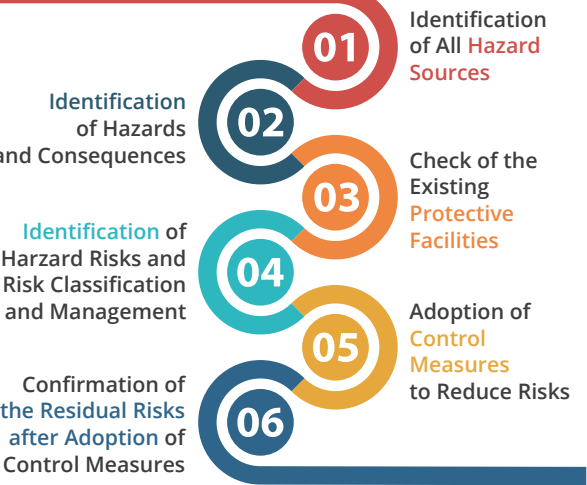
The LSH Office is to set up the "Occupational Disaster Investigation and Handling Taskforce" after a material occupational disaster. The supervisor of the respective unit or designated personnel serves as the convenor. Together with department supervisors, it goes immediately to the site for investigation and inspection. After compiling the "Incident Prevention Report" to the President, a material occupational disaster investigation report review meeting is called within a week. The LSH Office supervisor serves as convenor to invite managers of departments and labor representatives to the meeting. The LSH Office shall describe the process and handling of the material occupational disaster.

Incident Review and Improvements

Based on the improvement items on the investigation report submitted by "Occupational Disaster Investigation and Handling Taskforce," all units are to track and manage the progress of improvement until completion thereof while to review for improvement comprehensively to prevent a recurrence of a similar incident.

Photos of the scene of the material occupational disaster should be taken. Together with the investigation report, the materials are submitted to the LSH Office as case studies materials for education and training to prevent the recurrence of similar incidents.

Hazard Identification and Risk Assessment Process



Health and Safety Education and Training

In alignment with the regulatory landscape of the government each year, TCC organizes lectures on the Labor Incident Act and courses for labor safety and hazard prevention training, while arranging for employees to receive new training and retraining for

certificates related to first aid personnel, hypoxia treatment, hazardous equipment, or occupational safety and health business supervisor in accordance with the relevant laws. 1,003 individuals received education and training in labor safety in 2020 with training hours up to 5,196 hours in total. In addition, TCC inventoried the potential safety hazard factors in the working environment, organized safety promotions and firefighting drills, while attending seminars for various disaster prevention and training certificates organized by the government. These include air pollution prevention and control seminars, training for fire prevention managers, and seminars for the diagnosis and case studies of pneumoconiosis. 197 individuals received education and training in terms of environmental safety, with 1,385 total training hours. No occupational diseases were reported in 2020.



Health Promotion Programs on the Plants

Hoping Plant

- Health lectures
- Education and training for operations
- Education and training for work overload or musculoskeletal injuries
- Community medical stations

Suao Plant

- In-service education for occupational safety and health
- On-site health services provided by contracted medical staff monthly
- Personnel health checkups by commissioned medical institution

Headquarters

- Monthly provision of on-site services
- Influenza vaccination for all employees

Work-related Injuries of Employees in 2020

Item	Occupational Accidents											
	Work-related Mortality	Work-related Injuries	Recordable Incidents	Near Misses	Fatality Rate	Work-related Injury Rate	Recordable Incident Rate	Near Misses Rate	Lost Days	Lost Days Rate	Stipulated Working Hours	Actual Working Hours
HQ Plants	F	0	0	0	0	0	0	0	0	0	144,000	147,395
	M	0	0	0	0	0	0	0	0	0	170,000	171,204
	F	0	0	0	0	0	0	0	0	0	234,000	253,668
	M	0	1	1	0	0.11	0.11	0	41	5.08	1,614,000	1,814,194

Note 1: Work-related injuries are based on the monthly occupational accident reports submitted by each plant. **Note 2:** Mortality Rate = (total number of mortality / total actual working hours) × 200,000. **Note 3:** Work-related Injury Rate = (total number of injuries – number of mortality / total actual working hours) × 200,000. The criteria for work-related injuries are subject to the "Regulations of the Examination of Injuries and Diseases Resulting from the Performance of Duties by the Insured Persons of the Labor Insurance Program". **Note 4:** Recordable Incident Rate = (number of recordable incident / total actual working hours) × 200,000. **Note 5:** Near Misses Rate = (number of near misses / total actual working hours) × 200,000. **Note 6:** Lost Days Rate = (lost days due to work-related injuries / stipulated working hours) × 200,000.

Work-related Injuries of Contractors in 2020

Item	Occupational Accidents									
	Work-related Mortality	Work-related Injuries	Recordable Incidents	Near Misses	Mortality Rate	Work-related Injury Rate	Recordable Incident Rate	Near Misses Rate	Stipulated Working Hours	Actual Working Hours
Contractors	1	0	1	0	0.13	0	0.13	0	1,551,445	1,551,445

Note 1: Work-related injuries are based on the monthly occupational accident reports submitted by each plant. **Note 2:** Mortality Rate = (total number of mortality / total actual working hours) × 200,000. **Note 3:** Work-related Injury Rate = (total number of injuries – number of mortality / total actual working hours) × 200,000. The criteria for work-related injuries are subject to the "Regulations of the Examination of Injuries and Diseases Resulting from the Performance of Duties by the Insured Persons of the Labor Insurance Program". **Note 4:** Recordable Incident Rate = (number of recordable incident / total actual working hours) × 200,000. **Note 5:** Near Misses Rate = (number of near misses / total actual working hours) × 200,000. **Note 6:** Part of the stipulated working hours and actual working hours are estimated based on the number of people entering the factory multiplied by 8 hours.

safety, with 1,385 total training hours. No occupational disease was reported in 2020.

Employee Health Promotion and Management

Labor Health Checkup and Management
TCC regularly provides employee health checkups with special checkup items like hearing loss, pneumoconiosis (lung disease caused by inhalation of dust), and ionizing radiation, and covers the checkup fees. In addition, the TCC Headquarters regularly tracks the employees' health conditions and adjusts the nature of their work in line with their health conditions to enhance protection.

Employee Health Promotion Activities
TCC encourages employees to cultivate good exercise habits, raises the overall interest in sports, and provides annual subsidies up to NT\$50,000 for relevant clubs to hire professional coaches in order to attract employees with similar interests to set up new clubs or join existing clubs. Moreover, health promotion lectures regarding physical health, psychological well-being, and work overload are organized.

6.1.2_Salary and Benefits

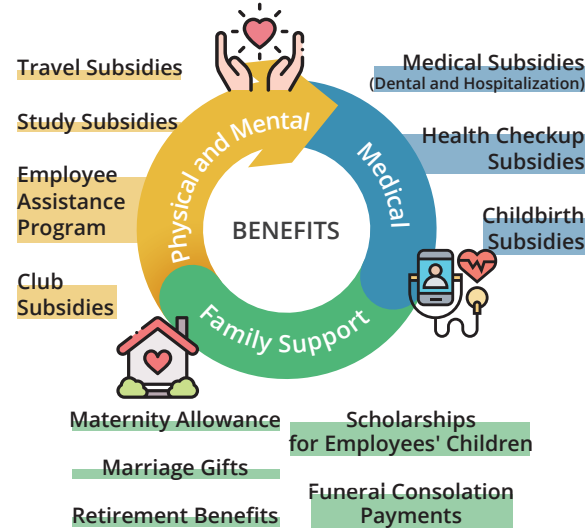
TCC offers competitive salaries and generous performance bonuses. With quantitative work targets and qualitative functional behaviors, the overall operating benefits of the enterprise are linked fully to the individual performance of employees to reward those with outstanding performances. The percentage of employees appraised in 2020 is 100%⁵. On one hand, TCC continues to optimize its remuneration system. Using the industry standard salary reports to review salary levels of employees and the bonus mechanisms as a reference for salary adjustments and employee promotions. On the other hand, the corporate treasury stock plan is promoted at TCC as long-term incentives for employees who meet years of service requirements or with outstanding performance. Moreover, the performance appraisal indicators are linked to the Company's short-, mid-, and long-term sustainable development goals, taking into account performances in executing initiatives such as carbon capture, fixation by microalgae, and strategic development of green energy generation.

⁵The appraisal scope does not include new employees during their probationary period, employees with fixed-term contracts, and those participating in MAP.

Number of Full-Time, Non-Managerial Employees and Their Total Salary, Average Salary and Median Salary			
Item	2019	2020	Difference
Total Number of Full-Time, Non-Managerial Employees (People)	965	1,068	+103
Total Salary of Full-Time, Non-Managerial Employees (NT\$1,000)	981,532	1,169,106	+187,574
Average Salary of Full-Time, Non-Managerial Employees (NT\$1,000)	1,017	1,095	+78
Median Salary of Full-Time, Non-Managerial Employees (NT\$1,000)	876	946	+70

Non-salary Benefits

TCC offers benefits to employees and cares for their families to the best of its ability. The non-salary benefits for all full-time employees include group insurance, medical subsidies, employee health checkups, scholarships for their children, and study subsidies. In addition, various activities are organized from time to time, such as the Family Day, Year-End Banquet, company trips, as well as club and volunteering activities, etc.



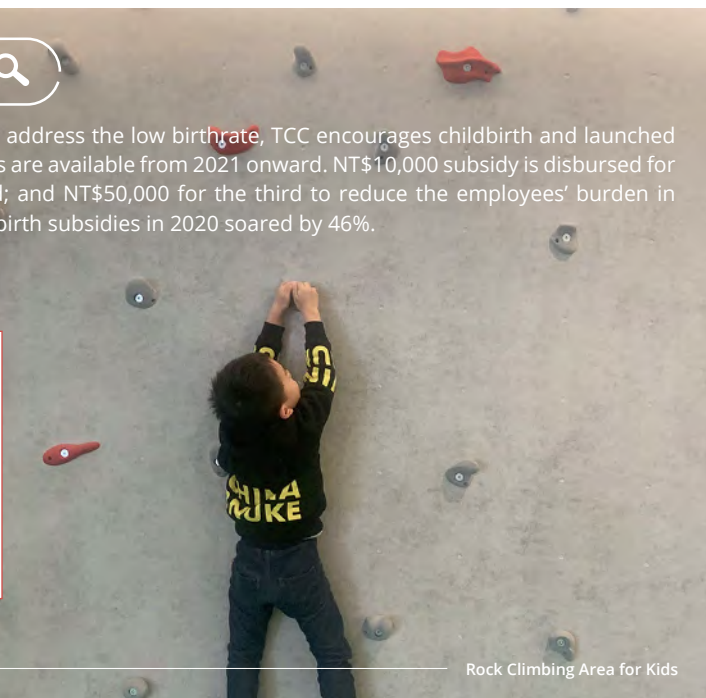
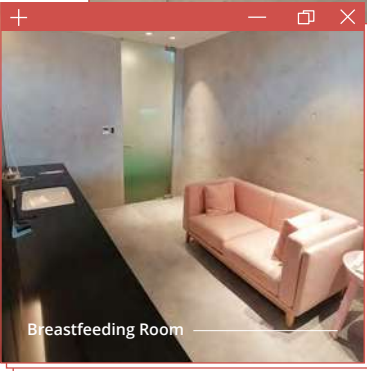
The First Two-track Retirement Benefits System

TCC takes the issue of the aging society in Taiwan seriously and offers a two-track retirement benefits system. Employees aged 60 or above will enjoy an extra percentage in ESOT to add more to their retirement fund. In addition, the retired employees are offered one health checkup every 3 years, along with medical, accident, and life insurance coverage. Events like retiree reunion banquets will be organized as well to embody our corporate philosophy of employees as our family.



Parenting Support Plan

In response to the government's measures to address the low birth rate, TCC encourages childbirth and launched the parenting support plan. Childbirth bonuses are available from 2021 onward. NT\$10,000 subsidy is disbursed for the first childbirth; NT\$20,000 for the second; and NT\$50,000 for the third to reduce the employees' burden in parenting. The number of applicants for childbirth subsidies in 2020 soared by 46%.



Parental Leave over the Past Four Years

Item	2017		2018		2019		2019	
	F	M	F	M	F	M	F	M
Employees Qualified for Parental Leave Without Pay in the Year (A)	8	58	13	58	18	59	16	73
Employees Applying for Parental Leave Without Pay (B)	1	3	4	0	1	0	2	1
Employees Scheduled to Resume Work in the Year (C)	1	2	3	1	1	0	3	0
Actual Employees Resuming Work (D)	0	2	3	1	1	0	3	0
Employees Continuing Work at TCC after Resumption of Work for 12 Months (E)	0	1	0	2	3	1	1	0
Resumption Rate After Parental Leave Without Pay (D/C)	-	100%	100%	100%	100%	-	100%	-
Retention Rate One Year After Resumption of Work (E/D in Previous Year)	-	100%	-	100%	100%	100%	100%	-

Note: Full-time employees who have been on the job for at least six months in the year are qualified to take parental leave without pay.

Family Cultural Event – “Traditional Opera Promotion”

Working with the C.F. Koo Foundation and the LDC team, TCC has been committed to promoting various art and cultural activities. The personnel of TCC and their families are invited to events such as opera performances and music concerts from time to time to promote the traditional culture and grand music concerts.

6.1.3_Human Rights Protection

To maintain a healthy working environment with equal rights, implement gender equality in employment, and respect personal dignity, TCC organizes courses on sexual harassment prevention and complaint mechanisms for new recruits to proactively protect human rights and safety. Moreover, dedicated measures for sexual harassment prevention in the workplace and complaint channels are established at TCC. In the event of workplace sexual harassment, complaints can be filed with the Human Resources Department through the complaint hotline, online care platform, or email box, with the filed case processed with dedicated personnel in confidence to protect the rights of employees.

To fully communicate TCC's protection and commitments to the rights of employees, TCC puts the “Human Rights Policy,” “Statement of Integrity and Ethical Conduct,” and “Sexual Harassment Prevention Policy” in the required courses in the Group's annual education and training. Apart from promotion and elaboration of the abovementioned policies to the new recruits on the date of starting on the job, the Group further demands that all employees at TCC and its subsidiaries as well as affiliated enterprises at home and abroad read carefully the policy documents to confirm that they have a full understanding of the relevant policies of the enterprise. The online reading rate achieved 100% in 2020.

In addition, TCC stipulated the Supplier Corporate Social Responsibility Code of Conduct to demand suppliers to commit to respecting and protecting human rights. To further human rights practices, TCC also organized lectures regarding the labor laws and regulations, physical and mental well-being, and employee care and benefits, inviting internal and external experts to share on the topics with 1,199.5 total training hours.⁶

⁶The hours of education and trainings include those of the lecture on the Labor Incident Act, the lecture on the right means to unwind and recharge, and the ESG Series – Human Resource and General Affairs & the 2020 New Recruits Orientation. The ESG lectures include personnel in the Mainland China participating via videoconferencing.



Human Rights Due Diligence

Purpose

TCC endeavors to create a supportive, friendly, healthy working environment. Moreover, it has been conducting human rights due diligence for two years in a row since 2019, surveying employees' experiences regarding the human rights policy. In 2020, TCC widened the scope to 19 operation sites with 2,818 personnel responding to the questionnaires and a response rate of 97.37%.

Scope of Investigation

TCC as well as its subsidiaries and joint ventures

Methodology

The analysis is conducted in line with “the occurrence frequency of human rights risks” and “the impact levels to the enterprise and its employees” to identify potential human rights issues, assess risks, and develop measures for mitigation and compensation, so as to fulfill our commitment and responsibilities in human rights protection.

Results

The 2020 human rights risk issues investigation concluded that there were no material risks nor nonconformities.

Measures for Remediation and Mitigation

We continue to push for measures for remediation and mitigation with regard to welfare policy implementation, lounge area improvement, and working environment education and training in order to eliminate the incident of human rights violations in the workplace and effectively protect human rights.



▼
6.1.4_Labor-Management Relations

The labor-management meeting and collective bargaining agreements help TCC in legal compliance, stipulation of better labor terms and benefits, and exercise of its duty to care for employees, so as to elevate the socio-economic development. All the plants in Taiwan have labor unions in place and signed collective bargaining agreements therewith. 100% of employees are covered by collective bargaining agreements.

Meanwhile, it proactively adjusts the provisions in the agreements in line with the relevant laws and regulations that contribute to the improvement of labor terms and thereby effectively protect the employees' rights. The personnel can join the labor union in accordance with the labor union by-laws on a voluntary basis. The percentage of TCC employees joining the labor union in 2020 accounted for 96.2% of the total personnel.



2020 Christmas Banquet

Employee Engagement Survey to Gain Insights into the Employees' Needs

TCC carries out an annual employee engagement survey in the form of a questionnaire. The 15-item questionnaire covers four facets, including organization identification, working environment, working development, and working relations. Compared with that of 2019, the 2020 survey was expanded to the Yingde, Guigang, and Anshun Cement Plants in Mainland China, covering 6,320 employees with a 96.71% coverage rate. The result of the engagement survey is 96.1%, in which the coverage rate of Taiwan (the affiliated enterprises included) is 95.97% with an engagement level of 94.3%, whereas the coverage rate of Mainland China is 97.30%, with an engagement level of 97.5%. Diving further with the gender difference, the recognition rate is 96.0% among all male employees and 96.1% among female counterparts across the Group. The survey results reveal that both male and female employees highly identify with TCC.

In addition, TCC also carried out the multi-faceted difference analysis with regard to factors including job levels and seniority. We use the results to communicate with managers and employees, which are to be tracked in the report on the regular meetings before assessing and stipulating improvement and optimization solutions for the head of the Human Resources Department to approve for implementation.

6.2_Cultivating a Sustainable Workforce
6.2.1_ Youth Cultivation

TCC concerns itself with the practice of a circular economy, developing the three core businesses, i.e., cement, energy, and environmental protection. In terms of the deployment in the renewable energy and energy storage industry, TCC actively recruits international talents with expertise in civil engineering, electrical engineering, mechanical engineering, geology, and even aquaculture to push for the

diverse and sustainable vision of new energy. Furthermore, in alignment with the Group's intelligent development, TCC also actively recruits professionals in information engineering, electrical engineering, and information management. Through the introduction of AI management and smart manufacturing solutions, TCC seeks to secure the optimal advantage to create values to the fullest.

TCC Management Associate Program - the First in Taiwan in Collaboration With the MIT

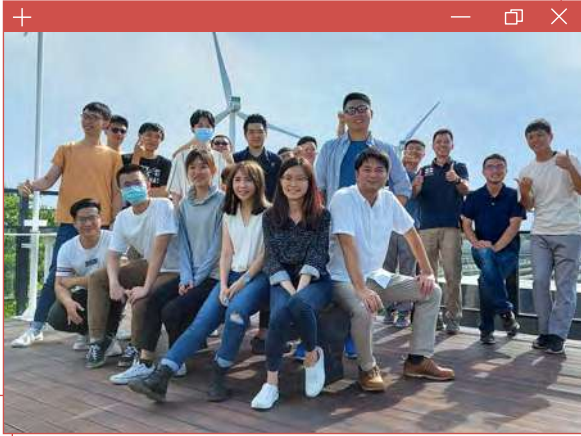


experience. Meanwhile, with executives were assigned as mentors, they shared their practical experiences in management and organizational communication skills, broadening their innovative thinking and management competencies via the monthly 1-on-1 dialogue. The MAP in 2020 took it further by introducing the MIT Industrial Liaison Program (ILP), which made it the first Taiwanese enterprise to incorporate the MIT program.

Aside from the cultivation of professional competencies, TCC also attaches importance to the CSR awareness of the MAs. During the training, MA trainees are arranged to serve as "MA Volunteers", who take part in the public cause projects of the Group, e.g., the education for students in rural areas of the Cement Academy, caring for the elderly, and house repairs. Those who pass the evaluation are now serving at the operation sites in Taiwan or Mainland China, participating or even leading the operational optimization for the Group and playing a key role in carbon reduction strategies, becoming outstanding management elites.

TCC has initiated its Management Associate Program (MAP) since 2007. Cross-factory learning, management and application, learning outcomes evaluation, horizontal and vertical connections, and business thinking are arranged to actively cultivate young talent with an international vista and huge ambitions. TCC recruited 402 MAs as of 2020 with a retention rate of 59%.

In 2020, in line with the Group's operational planning and the trend of intelligent development, the 14th class of the MAs came from different professional backgrounds, ranging from engineering, business, financial management to information. With the realization of "cultivating management elites with sustainable thinking" at the core, TCC formulated the five training focuses, including circular economy practice, innovative topical research, foreign language proficiency improvement, professional competencies enhancement, and overseas internship



NTHU Circular Economy Club

In Taiwan, it is not just TCC that is proactively implementing a circular economy, but also a group of college students “in search of knowledge” through autonomous learning and visits to explore the possibilities for a circular economy in Taiwan. The 10 students in the NTHU Circular Economy Club came from various departments, including science and technology, law, and humanities. They paid a visit to TCC DAKA Open Eco-Factory and had the 3-in-1 Tour of Port, Power Plant, Cement Plant of Hoping, the CCUS, and mine restoration. While the students diligently took notes in the process, they had further exchanges with TCC regarding the perspectives toward a circular economy. These young friends were convinced that it was not just a symbiotic relationship between humans and the environment. Furthermore, economic development and environmental protection can go hand in hand via the interdisciplinary thinking of a circular economy to help each other prosper. TCC also learned a great deal from the students’ feedbacks and appreciated the involvement of young people in actions related to the circular economy while doing better things together!



Hsing Academy



TCC worked with National Chung Hsing University for the “Hsing Academy – Corporate Mentor Project.” Through the 2-day activity, 24 students visited TCC DAKA to learn about the mine restoration and the operational model of a circular economy while experiencing the ecological tour and cement handcrafts on the DAKA Campus.



Through the visits, hands-on work, and project reports, the students offered their observations and ideas about TCC, while exchanging with the executives across different areas of expertise at TCC on corporate sustainability practices and their perspectives on social responsibilities. The professional supervisors at TCC all encouraged the students to actively acquire expertise linked with corporate sustainability operations in their future careers, doing something better for the environment and society with professionalism and passion.

CFA Institute Research Challenge

TCC worked with CFA Society Taiwan to organize the 12th CFA Institute Research Challenge - Taiwan Competition, to accomplish the integration of academic and practical knowledge, guiding the students to conduct in-depth industrial analysis as the core of investment decision-making. A total of 150 students on 30 teams from 12 schools participated in this year's competition. The CFA Institute Research Challenge this year took Taiwan Cement Corporation Limited as the target company. Unlike the research target companies in previous years, TCC assisted the participating students in delving into the business philosophy, operation strategies, and ESG promotion results of TCC. In the preliminary, TCC President Jong-Peir Li exchanged with the 30 competing teams via online video conferencing and invited the students to the corporate briefing for institutional investors. As for the 16 teams entering the semi-finals, they were invited to pay a visit to TCC DAKA and have exchanges with Chairman An-Ping Chang. Students thus learned that TCC is more than a cement company. It is more of a green engineering company and idea that address the complex relationship between human civilization and Mother Nature.



Seed Talent Program (STP)

The Taiwan Institute of Directors launched the Seed Talent Program (STP) in 2013, aiming to provide an environment close to the workplace, training courses, and opportunities for acquiring practical experiences, so that the students can obtain the necessary soft/hard powers prior to employment in corporate internship projects while bridging the gap between industry and academia. TCC has been involved in cooperation and mentoring since the 13th class of STP. For over a hundred students coming from different schools and departments, the President serves as the corporate mentor, together with the President Office and the top executives of the Human Resources department, jointly planning the STP activities and interacting with the students.



In addition to facilitating the students in setting the business-related topic for competition, TCC also offers internship opportunities for the STP students, including in-field participation in the events like the Taroko Gorge Marathon and the production of websites and CSR Reports, so that students can learn in depth the various business operations and the corporate culture of TCC.

▼
6.2.2_Talent Development

TCC set out to become a team that is professional, passionate, inter-reliant, and supportive to each other. The training on functional competencies required across employees' careers was designed based on the framework of "fundamental knowledge," "core abilities," and "professional competencies" to promote functional development and efficiency improvement of work skills, project communication, and innovative adaptability. TCC formulated the "Sustainability Talent Incubation Program" and "Digital Intelligence Development Program" that incorporate its talent development strategies with the sustainable business objectives, digital technological applications, and training demand surveys. The "Sustainability Talent Incubation Program" considers the three facets of awareness, analysis, and resolution of sustainability issues in its planning to broaden employees' connections to the environment, society, and corporate spirits beyond functional competency. The "Digital Intelligence Development Program" aims at providing curriculum and tools that enable digital application and AI competitiveness to elevate the employees' operational efficiency and reduce the costs of manual works. The employees trained at the subsidiaries and affiliated enterprises were 1,129 with training hours of 2,030.5 in total. Facing the impact of the pandemic in 2020, the course design adopted small class teaching. Employees maintained proper social distancing indoor and wore masks. The time per class was shortened. Combined with multiple sessions or multipoint video

conferencing for education, the employees could enjoy a safe and healthy learning environment with the risk of cluster infection among employees reduced. The total training hours in 2020 at TCC were up to 87,606 hours (including programs for overseas MAs). The funds invested in education and training totaled NT\$20,555,109 (covering expenses of course execution as well as the hours of internal lecturer instructions invested and learning outcomes evaluations in terms of salary costs.) The employees trained at the subsidiaries and affiliated enterprises were 1,129 with training hours of 2,030.5 in total.

Performance Appraisal

TCC employed the four levels of Response, Learning, Behavior, and Results proposed by Donald L. Kirkpatrick to examine the performance of talent development. The percentage of employees appraised in 2020 reached 100%, with new recruits having worked for TCC for less than 3 months during the probationary period excluded.

Evaluation results of all the external management training courses organized by Headquarters:

Reaction

Average course satisfaction: 92.82%
Average lecturer satisfaction: 93.47%

Learning

Professional certificate retraining rate at the plants: 97.3%
Completion rate of the training courses of the year: 94.74%
Employee attendance rate: 99.46%

Behavior

"Work development" identification level: 94.3%

Results

High-performance Employee Retention Rate: 100%

TCC Development Program

Description	Courses	Expected Benefits	Talent Development Indicators
Program_Sustainability Talent Incubation Program			
[Awareness] Awareness of TCC's corporate philosophy in environment, social, and corporate governance as well as its protection for employees' rights	<ul style="list-style-type: none">■ New recruits orientation■ Town Hall Meeting■ Online policy reading■ Lectures on laws and regulations from time to time■ Regular organization of occupational safety exercises, lectures, and training	<ul style="list-style-type: none">■ Construct sustainability ideas and risk awareness for all employees; foster corporate culture and safe workplace	<ul style="list-style-type: none">■ 6,597 training hours in labor safety and environmental risks prevention at TCC in 2020

Description	Courses	Expected Benefits	Talent Development Indicators
Program_Sustainability Talent Incubation Program			
[Analysis] Planning solution strategies for sustainability issues through issue investigation and evaluation and elevation of domain knowledge	<ul style="list-style-type: none">■ ESG Series Lectures topical courses are opened by departments to exchange on the development and innovation in sustainability issues through the respective functions and expertise	<ul style="list-style-type: none">■ Build a friendly environment and humanistic action plans; increase energy saving and carbon reduction performance■ Develop functions and cultivate the thinking and practices that combine the core expertise and circular economy	<ul style="list-style-type: none">■ 3,539 employees attending the ESG Series courses in 2020 with 5,977.5 hours in total■ Exceptional Achievement: Recognition by the TCSA Talent Development Award in 2020
[Resolution] Demonstration of the corporate actions for sustainability via the real actions in ESG	<ul style="list-style-type: none">■ Environment – LCA Team study of the optimization solutions for operation and environmental impacts and the implementation thereof■ Social – Diversified volunteering activities to go into local communities to care for the disadvantaged elderly and school children with provision of relevant supports and services■ Corporate governance – Functional training programs for talents at various levels/positions to support talent to promote themselves<ul style="list-style-type: none">■ MA/Soaring Eagle Program■ Annual meetings of managers■ English training program for key positions		
Program_Digital Smart Development Program			
[Digital Application] Cultivation of digital knowledge; utilization of digital tools to optimize operation efficiency; and understanding the information security risks involved	<ul style="list-style-type: none">■ Zoom/Teams operation instructions■ VPN operation and authentication instruction■ Information security education and training■ APT attack case studies and means for prevention	<ul style="list-style-type: none">■ Utilize digital tools to elevate operational efficiency and reduce labor costs■ Provide AI talent supply chain for all levels and positions■ Leverage data analytics and AI to help business decision-making and improve operation performance■ Reduce the risks in occupation safety, environmental safety, information security, and manual works via digital tools and AI	<ul style="list-style-type: none">■ 354 training hours in information security at TCC in 2020■ 937 hours in education and training for smart technology at TCC in 2020■ 92.4% of identification with the enterprise's digitization level and operational efficiency improvement in the employee due diligence in 2020
[AI Competitiveness] Construction of AI function and development of smart tool utilization in production and operation to realize the sustainable development goals of efficiency improvement, energy-saving, and consumption reduction, and emission reduction	<ul style="list-style-type: none">■ Smart technology education and training internally and externally■ Smart Group: thinking comprehensively the innovative measures of AI regarding sustainable development by means of topic investigation and study groups		

Internal Sustainability

Awareness Exchange

LCA Team

To facilitate Group-wide low-carbon production and sustainable development, TCC organized the LCA Team to comprehensively inventory the Group's carbon emissions with the concept of life cycle assessment, utilizing the Group's carbon emissions data with systematic computational thinking and comprehensive data analytics management.

The LCA Team releases “Carbon Emissions Weekly” on the War Room Dashboard real-time monitoring system developed internally by TCC to gain knowledge of the progress made for the objective of energy saving and carbon reduction while presenting news on carbon reduction internationally and regionally to march toward the carbon reduction targets.

The LCA Team convenes biweekly to review carbon reduction performances. Apart from presenting the carbon intensity calculation results, it evaluates benefits and offers feedbacks via cross-departmental brainstorming to build more efficient carbon reduction solutions.

Education and Training Hours by Job Levels and Gender

(Unit: Hours)

Job Levels	Trained Hours(F)	Trained Hours(M)	Total Hours	Average Hours
Executives	63.5	188	251.5	15.7
Senior	520.5	1625	2,145.5	25.2
Supervisors				
Junior	518	1542	2,060	25.1
Supervisors				
Professionals	14,845	61,965	76,810	413.0
Direct Labor	559	5,780.5	6,339.5	8.9
Total Hours	16,505	71,100.5	87,606.5	
Average Hours	87.3	79.7	81.0	

Note 1: Executives are the Assistant Vice President or above. Senior Supervisors are Managers or Deputy Managers. Junior supervisors are Assistant Managers or Section Chief. Professionals are Engineers, Officers, or Management Associates. Note 2: Education and training hours include those of personnel stationed overseas.

6.3_Promoting Diversity and Inclusion

Total Number of Employees by Contract and Gender

	Female	Male	Total
Employees with an Open-Ended Contract (Includes Employees on Leave Without Pay)	189	892	1081
Employees with a Fixed-Term Contract	1	1	2
Temp Workers (Outsourced)	2	0	2
Interns	0	0	0

Note 1: There were 16 individuals with disabilities employed in 2020 in line with relevant laws and regulations. Note 2: There were 66 individuals with indigenous background employed in 2020.

Total Number of Employees by Age and Gender

Employees	Female	Male	Total
30 or under	28	98	126
31-50	140	510	650
51 or above	21	284	305

Supervisors	Female	Male	Total
30 or under	1	4	5
31-50	36	87	123
51 or above	6	49	55

Note: A supervisor is defined as an Assistant Manager, Section Chief or above.

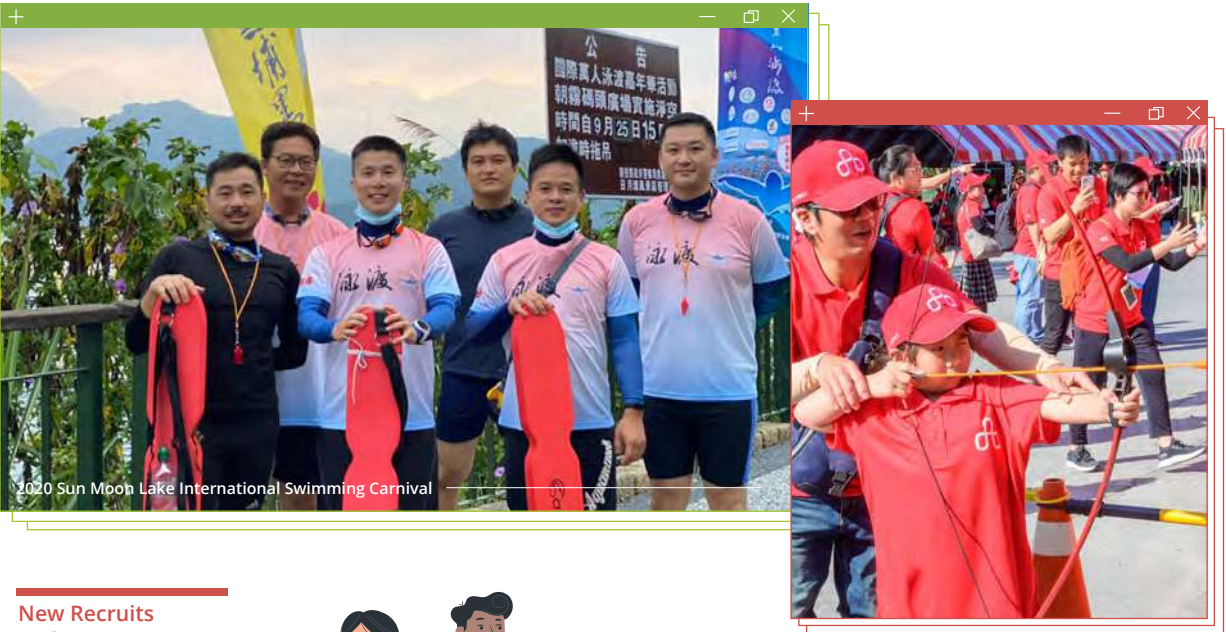
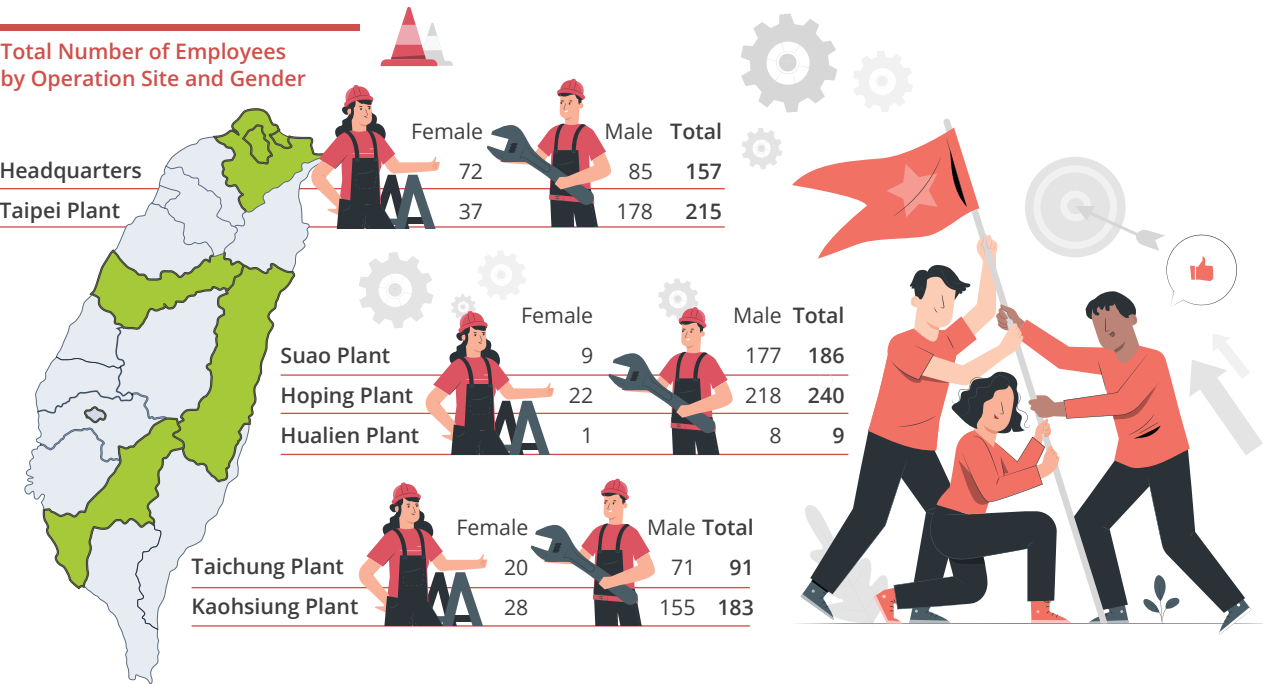
Total Number of Employees by Job Levels and Gender

	Female	Male	Total
Executives	4	12	16
Senior Supervisors	17	68	85
Junior supervisors	22	60	82
Professionals	64	122	186
Direct Labor	82	630	712

Note: Executives are the Assistant Vice President or above. Senior supervisors are Managers or Deputy Managers. Junior supervisors are Assistant Managers or Section Chief. Professionals are Engineers, Officers, or Management Associates.

Total Number of Employees by Education and Gender

	Female	Male	Total
Ph.D.	0	2	2
Master's Degree	30	74	104
Bachelor's Degree	111	324	435
Associate Degree	26	158	184
Senior High School, Vocational School, or Below	22	334	356



New Recruits and Termination of Employment by Gender and Age

Item		Gender	Age				Total
New Recruits	No.	Female	Male	30 or under	31-50	51 or above	128
	Ratio	20	108	56	66	6	11.84%
Termination of Employment	No.	1.85%	9.99%	5.18%	6.11%	0.56%	76
	Ratio	6	64	16	39	15	6.48%
Voluntary Termination of Employment	No.	0.56%	5.92%	1.48%	3.61%	1.39%	52
	Ratio	5	47	16	36	0	4.81%

Of course this will be a very arduous journey. Not only do we have to achieve carbon neutrality for emissions as stipulated in the Paris Agreement by 2050, but also pollution in the natural environment on land or in the sea. We have to help repair and restore Nature's biological developments in the future, promoting them to be more pluralistic and diversified. A pluralistic natural environment is healthy, lasting and sustainable. We must invest in technology to overcome our ignorance of the natural environment, more efficiently use renewable energy and recycle the waste that we produce but that Nature cannot digest. In addition, we must also have a great awakening and great enlightenment in order to completely change our current living habits to reduce waste and the squandering of natural resources.

To do these things is not protecting Nature, nor protecting the Earth. We are actually protecting ourselves. The Earth is not fragile, it is us who are fragile. No matter how great our effort is, it will become very small if it is divided by the world's 7.8 billion people. But, if a tiny harm is multiplied by 7.8 billion, it will become a major disaster. In the short human history of only tens of thousands of years, human beings have always been a part of Nature, from awe to worship to borrowing the power of Nature to elevating ourselves, and forgetting that Nature and Man are one. It is a symbiotic relationship, and we also have forgotten that humans are only forms temporarily borrowed from the eternal cycle of Nature.

Going back to the topic of today's speech,

*Sine Qua Non,
“the prerequisite for accomplishing things”
is a single phrase which cannot be interpreted
without specific context.*

What exactly Sine Qua Non is in life, can only be answered by putting it in the context of life. As a decision maker of TCC, inheriting the spirit of our enterprise is the most important Sine Qua Non of TCC.

What I want to talk about is actually a group practice, a way of life.

*I want to explore “What is the Sine Qua Non
where humans live in the world and ‘Live’ with Nature.”
Action is our only answer to Sine Qua Non.*



TCC is a green environmental engineering company dedicated to handling the complex relationship between human civilization and Nature. We work tirelessly to find "the Sine Qua Non where mankind and Nature coexist".

The survival and future happiness of mankind depend on a healthy and complete Nature. The rhythm of Nature's self-regulation also requires human awakening and friendly treatment of the environment in order for nature to recover. We must rely on our human conscience as the Sine Qua Non to have a better life on Earth in the future for mankind.

To answer the problems of life and the problems of the environment, there is never a simple answer.

But we can see in the sun, the wind, and ocean tides, the earth's cycle of life and conversion of energy. Together, let us show our children and grandchildren live with the right decisions we make today!

In conclusion,

*“The autumn leaves fall on the ground,
Wind blows round and round,
Shame that humans don't understand Nature:
With no patience to wait for
them to reborn into spring flowers,
Just raking them into piles of garbage.
Recycling is the source of everything;
It's futile to lament about resources
not returning with a sigh.”*





GRI Standards Reference Table *Voluntarily disclosed

GRI Standard	Disclosure	Corresponding Section	Page No.	Explanatory Notes
GRI102 : General Disclosures 2016				
Organizational Profile				
102-1	Name of the organization	About the Report	14	The subsidiaries are not included in the scope of disclosure of this Report.
		2.2.1 About TCC	45	The major brands and products of TCC are not banned in specific markets.
102-2	Activities, brands, products, and services	2.2.1 About TCC	45	
		2.3.2 Client Recognition	57	
102-3	Location of headquarters	2.2.1 About TCC	45	
102-4	Location of operations	2.2.1 About TCC	45	
102-5	Ownership and legal form	2.2.1 About TCC	45	
102-6	Markets served	2.2.1 About TCC	45	
102-7	Scale of the organization	2.2.1 About TCC	45	
		6.3 Promoting Diversity and Inclusion	127	
102-8	Information on employees and other workers	6.3 Promoting Diversity and Inclusion	127	
102-9	Supply chain	2.4 Supply Chain Sustainability	58	
102-10	Significant changes to the organization and its supply chain			No major change to the organization or supply chain of TCC in 2020.
102-11	Precautionary Principle or approach	2.1 Comprehensive Risk Control	43	
102-12	External initiatives	2.2.1 About TCC	45	
102-13	Membership of associations	2.2.1 About TCC	45	
Strategy				
102-14	Statement from senior decision-maker	Chairman's Address	6	
Ethics and Integrity				
102-16	Values, principles, standards, and norms of behavior	Chairman's Address	6	
		2.2.2 The Board of Directors	49	
		2.2.3 Integrity and Ethics	53	
Governance				
102-18	Governance structure	2.2.2 The Board of Directors	49	
Stakeholder Engagement				
102-40	List of stakeholder groups	1.1 Sustainability Dialogues with Stakeholders	30	
102-41	Collective bargaining agreements	6.1.4 Labor-Management Relations	121	
102-42	Identifying and selecting stakeholders	1.1 Sustainability Dialogues with Stakeholders	30	
102-43	Approach to stakeholder engagement	1.1 Sustainability Dialogues with Stakeholders	30	
102-44	Key topics and concerns raised	1.1 Sustainability Dialogues with Stakeholders	30	

GRI Standards Reference Table *Voluntarily disclosed

GRI Standard	Disclosure	Corresponding Section	Page No.	Explanatory Notes
GRI102 : General Disclosures 2016				
Reporting Practice				
102-45	Entities included in the consolidated financial statements	About the Report	14	
		2.2.1 About TCC	45	
102-46	Defining report content and topic Boundaries	About the Report	14	
		1.1 Sustainability Dialogues with Stakeholders	30	
		1.2 Identifying Sustainability Issues	35	
102-47	List of material topics	1.2 Identifying Sustainability Issues	35	
102-48	Restatements of information			Comments are provided in line with the content of the respective chapter.
102-49	Changes in reporting			No major changes
102-50	Reporting period	About the Report	14	
102-51	Date of most recent report	About the Report	14	
102-52	Reporting cycle	About the Report	14	
102-53	Contact point for questions regarding the report	About the Report	14	
102-54	Claims of reporting in accordance with the GRI Standards	About the Report	14	
102-55	GRI content index	Appendix	131	
102-56	External assurance	About the Report	14	
GRI 200: Economic Topics				
GRI 201: Economic Performance 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH2 Governance and Risk Management	40	
103-3	Evaluation of the management approach	CH2 Governance and Risk Management	40	
201-1	Direct economic value generated and distributed	2.2.1 About TCC	45	
GRI 205: Anti-corruption 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH2 Governance and Risk Management	40	
103-3	Evaluation of the management approach	CH2 Governance and Risk Management	40	
205-3	Confirmed incidents of corruption and actions taken	2.2.3 Integrity and Ethics	53	
GRI 206: Anti-competitive Behavior 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH2 Governance and Risk Management	40	
103-3	Evaluation of the management approach	CH2 Governance and Risk Management	40	
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	2.2.4 Legal Compliance	53	



GRI Standards Reference Table

*Voluntarily disclosed

GRI Standard	Disclosure	Corresponding Section	Page No.	Explanatory Notes
GRI 300: Environmental				
GRI 301: Materials 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH3 Environment and a Low Carbon Supply Chain	64	
103-3	Evaluation of the management approach	CH3 Environment and a Low Carbon Supply Chain	64	
301-1	Materials used by weight or volume	3.2.4 Renewable Raw Materials Management	76	
301-2	Recycled input materials used	3.2.4 Renewable Raw Materials Management	76	
GRI 302: Energy 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH3 Environment and a Low Carbon Supply Chain	64	
103-3	Evaluation of the management approach	CH3 Environment and a Low Carbon Supply Chain	64	
302-1	Energy consumption within the organization	3.2.1 Energy Management	71	A total of 1,130 GJ of renewable energy were consumed by TCC in 2020.
302-3	Energy intensity	3.2.1 Energy Management	71	
GRI 303: Water and Effluents 2018				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH3 Environment and a Low Carbon Supply Chain	64	
103-3	Evaluation of the management approach	CH3 Environment and a Low Carbon Supply Chain	64	
303-1	Interactions with water as a shared resource	3.2.3 Water Resources and Water Cycle Management	74	
303-2	Management of water discharge-related impacts	3.2.3 Water Resources and Water Cycle Management	74	
303-3	Water withdrawal	3.2.3 Water Resources and Water Cycle Management	74	
GRI 304: Biodiversity 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH4 Biodiversity and Regeneration	80	
103-3	Evaluation of the management approach	CH4 Biodiversity and Regeneration	80	

GRI Standards Reference Table

*Voluntarily disclosed

GRI Standard	Disclosure	Corresponding Section	Page No.	Explanatory Notes
GRI 300: Environmental				
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	CH4 Biodiversity and Regeneration	80	
GRI 305: Emissions 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH3 Environment and a Low Carbon Supply Chain	64	
103-3	Evaluation of the management approach	CH3 Environment and a Low Carbon Supply Chain	64	
305-1	Direct (Scope 1) GHG emissions	3.1.1 Science-Based Carbon Reduction Goals and Internal Carbon Pricing	68	
305-2	Energy indirect (Scope 2) GHG emissions	3.1.1 Science-Based Carbon Reduction Goals and Internal Carbon Pricing	68	
305-4	GHG emissions intensity	3.1.1 Science-Based Carbon Reduction Goals and Internal Carbon Pricing	68	
305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	3.2.2 Air Pollution Management	73	
GRI 306: Effluents and Waste 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH3 Environment and a Low Carbon Supply Chain	64	
103-3	Evaluation of the management approach	CH3 Environment and a Low Carbon Supply Chain	64	
306-1	Water discharge by quality and destination	3.2.3 Management of Water Resources and the Water Cycle	74	
306-2	Waste by type and disposal method	3.2.5 Waste Management	76	
GRI 307: Environmental Compliance 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH2 Governance and Risk Management	40	
103-3	Evaluation of the management approach	CH2 Governance and Risk Management	40	
307-1	Non-compliance with environmental laws and regulations	2.2.4 Legal Compliance	53	
GRI 400: Social				
GRI 401: Employment 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH6 Employee Benefits	112	
103-3	Evaluation of the management approach	CH6 Employee Benefits	112	
401-1	New employee hires and employee turnover	6.3 Promoting Diversity and Inclusion	127	



GRI Standards Reference Table *Voluntarily disclosed

GRI Standard	Disclosure	Corresponding Section	Page No.	Explanatory Notes
GRI 400: Social				
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	6.1.2 Salary and Benefits	118	
401-3	Parental leave	6.1.2 Salary and Benefits	118	
GRI 403: Occupational Health and Safety 2018				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH6 Employee Benefits	112	
103-3	Evaluation of the management approach	CH6 Employee Benefits	112	
403-1	Occupational health and safety management system	6.1.1 Workplace Safety	115	
403-2	Hazard identification, risk assessment, and incident investigation	6.1.1 Workplace Safety	115	
403-3	Occupational health services	6.1.1 Workplace Safety	115	
403-4	Worker participation, consultation, and communication on occupational health and safety	6.1.1 Workplace Safety	115	
403-5	Worker training on occupational health and safety	6.1.1 Workplace Safety	115	
403-6	Promotion of worker health	6.1.1 Workplace Safety	115	
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	6.1.1 Workplace Safety	115	
403-9	Work-related injuries	6.1.1 Workplace Safety	115	
403-10	Work-related ill health	6.1.1 Workplace Safety	115	
GRI 404: Training and Education 2016*				
404-1	Average hours of training per year per employee	6.2.2 Talent Development	125	
GRI 405: Diversity and Equal Opportunity 2016*				
405-1	Diversity of governance bodies and employees	2.2.2 The Board of Directors	49	
		6.3 Promoting Diversity and Inclusion	127	
GRI 412: Human Rights Assessment 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH6 Employee Benefits	112	
103-3	Evaluation of the management approach	CH6 Employee Benefits	112	
412-2	Employee training on human rights policies or procedures	6.1.3 Human Rights Protection	120	
GRI 413: Local Communities 2016				
413-1	Operations with local community engagement, impact assessments, and development programs	5.1.1. TCC DAKA Open Eco-Factory	100	The Hoping Plant has conducted comprehensive communication with the local communities and impact assessments, accounting for 50% of the cement plant operation sites.

GRI Standards Reference Table *Voluntarily disclosed

GRI Standard	Disclosure	Corresponding Section	Page No.	Explanatory Notes
GRI 400: Social				
GRI 419: Socioeconomic Compliance 2016				
103-1	Explanation of the material topic and its Boundary	1.2 Identifying Sustainability Issues	35	
103-2	The management approach and its components	1.2 Identifying Sustainability Issues	35	
		CH2 Governance and Risk Management	40	
103-3	Evaluation of the management approach	CH2 Governance and Risk Management	40	
419-1	Non-compliance with laws and regulations in the social and economic area	2.2.4 Legal Compliance	53	

Sustainability Accounting Standards Board (SASB) Reference Table

Topic	Code	Category	Accounting Metric	Page No.	Comment
GHG Emission	EM-CM-110a.1	Quantitative	■ Gross global Scope 1 emissions (t-CO2e) ■ Percentage covered under emissions-limiting regulations	68-69	No operation sites of TCC are located in areas under emissions-limiting regulations
	EM-CM-110a.2	Qualitative	■ Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	18-22	
Air Quality	EM-CM-120a.1	Quantitative	■ Air emissions of the following pollutants: (1) NOx (excluding N2O), (2) SOx, (3) particulate matter (PM10), (4) dioxins/furans, (5) volatile organic compounds (VOCs), (6) polycyclic aromatic hydrocarbons (PAHs), and (7) heavy metals	73	The scope of disclosure is primarily based on the stationary sources.
Energy Management	EM-CM-130a.1	Quantitative	■ Total energy consumed ■ Percentage grid electricity ■ Percentage alternative ■ Percentage renewable	71-72	
Water Management	EM-CM-140a.1	Quantitative	■ Total fresh water withdrawn, ■ Percentage recycled ■ Percentage in regions with High or Extremely High Baseline Water Stress	74-75	The percentage recycled is 13% in 2020, with the amount of reclaimed process water divided by the total water use
Waste Management	EM-CM-150a.1	Quantitative	■ Amount of waste generated ■ Percentage hazardous waste generated ■ Percentage waste recycled	76	
Biodiversity Impacts	EM-CM-160a.1	Qualitative	■ Description of environmental management policies and practices for active sites	81	
	EM-CM-160a.2	Quantitative	■ Terrestrial acreage disturbed ■ Percentage of impacted area restored		111.91 ha. of mined area; 56.86 ha. of restored mined area, equivalent to 51%
Work-force Health & Safety	EM-CM-320a.1	Quantitative	■ Total recordable incident rate (TRIR) for fulltime employees and contract employees ■ Near miss frequency rate (NMFR) for fulltime employees and contract employees	117	
	EM-CM-320a.2	Quantitative	■ Number of reported cases of silicosis		No cases of silicosis was reported at TCC in 2020.

▼ Sustainability Accounting Standards Board (SASB) Reference Table

Topic	Code	Category	Accounting Metric	Page No. Comment
Product Innovation	EM-CM-410a.1	Quantitative	■ Percentage of products that qualify for credits in sustainable building design and construction certifications	The sales from the concrete products of TCC sold to clients that were used on green building accounted for 7% of the total revenue.
	EM-CM-410a.2	Quantitative	■ Total addressable market and share of market for products that reduce energy, water, and/or material impacts during usage and/or production	28.78%*
Pricing Integrity & Transparency	EM-CM-520a.1	Quantitative	■ Total amount of monetary losses as a result of legal proceedings associated with cartel activities, price fixing, and anti-trust activities	No involvements of TCC in legal proceedings associated with cartel activities, price fixing, and anti-trust activities in 2020.
Activity	EM-CM-000.A	Quantitative	■ Production by major product line	The production volume of cementitious materials in 2020 is 5,673,395 metric tons.

* The sustainable products defined at TCC are the cement products certified as Gold-rated of Green Mark, and the percentage is the revenue from the Gold-rated cement products / the total revenue from TCC cement, clinker, and RMC products in Taiwan, while the cement used by the RMC plants themselves is not included.

Mining and Metals Sector Supplement

Aspect	Indicator	Commentary	Corresponding Sections or Note (including omissions)	Page
Biodiversity	MM1	Amount of land (owned or leased, and managed for production activities or extractive use) disturbed or rehabilitated.	Biodiversity and Regeneration	80
Biodiversity	MM2	The number and percentage of total sites identified as requiring biodiversity management plans according to stated criteria, and the number (percentage) of those sites with plans in place.	Biodiversity and Regeneration	80
Emissions, Effluents, and Waste	MM3	Total amounts of overburden, rock, tailings, and sludges and their associated risks.	Biodiversity and Regeneration	80
Labor/Management Relations	MM4	Number of strikes and lock-outs exceeding one week's duration, by country.	No related incident was reported in 2020	
Community	MM6	Number and description of significant disputes relating to land use, customary rights of local communities and Indigenous Peoples.	No related incident was reported in 2020	
Artisanal and Small-scale Mining	MM8	Number (and percentage) of company operating sites where artisanal and small-scale mining (ASM) takes place on, or adjacent to, the site; the associated risks and the actions taken to manage and mitigate these risks.	No related incident was reported in 2020	

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Accountant’s Independent Assurance Report



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INDEPENDENT AUDITORS' LIMITED ASSURANCE REPORT

The Board of Directors and Stockholders
Taiwan Cement Corp.

We have performed a limited assurance engagement on the selected subject matter information (see Appendix A) in the Corporate Social Responsibility Report (“the Report”) of Taiwan Cement Corp. (“the Company”) for the year ended December 31, 2020.

Responsibilities of Management for the Report

Management is responsible for the preparation of the Report in accordance with Taiwan Stock Exchange Corporation Rules Governing the Preparation and Filing of Corporate Social Responsibility Reports by TWSE Listed Companies and GRI Standards and Sector Guidance published by the Global Reporting Initiatives (GRI) and other applicable rules according to its sector features, and for such internal control as management determines is necessary to enable the preparation of the Report that are free from material misstatement.

Auditors’ Responsibilities for the Limited Assurance Engagement Performed on the Report

We conducted our work on the selected subject matter information (see Appendix A) in the Report in accordance with the International Standard on Assurance Engagements 3000 (revised) (ISAE 3000 (revised)) to issue a limited assurance report on the preparation, in all material respects, of the Report. The nature, timing and extent of procedures performed in a limited assurance engagement are different from and more limited than a reasonable assurance engagement and, therefore, a lower assurance level is obtained than a reasonable assurance.

We applied professional judgment in the planning and conduct of our work to obtain evidence supporting the limited assurance. Because of the inherent limitations of any internal control, there is an unavoidable risk that even some material misstatements may remain undetected. The procedures we performed include, but not limited to:

- Obtaining and reading the Report.
- Inquiring management and personnel involved in the preparation of the Report to understand the policies and procedures for the preparation of the Report.
- Inquiring the personnel responsible for the preparation of the Report to understand the process, controls, and information systems in the preparation of the selected subject matter information.
- Analyzing and examining, on a test basis, the documents and records supporting the selected subject matter information.



Inherent Limitations

The subject information included non-financial information, which was under inherent limitations than financial information. The information may involve significant judgment, assumptions and interpretations by the management, and the different stakeholders may have different interpretations of such information.

Independence and Quality Controls

We have complied with the independence and other ethical requirements of the Norm of Professional Ethics for Certified Public Accountant in the Republic of China, which contains integrity, objectivity, professional competence and due care, confidentiality and professional behavior as the fundamental principles. In addition, the firm applies Statement of Auditing Standard No. 46 “Quality Control for Public Accounting Firms” issued by the Accounting Research and Development Foundation of the Republic of China and, accordingly, maintains a comprehensive system of quality controls, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

Conclusion

Based on the procedures performed and evidence obtained, nothing has come to our attention that causes us to believe that the selected subject matter information in the Report are, in all material respects, not prepared in accordance with the above mentioned reporting criteria.

Other Matters

We shall not be responsible for conducting any further assurance work for any change of the subject matter information or the criteria applied after the issuance date of the Report.

Deloitte & Touche

Deloitte & Touche
Taipei, Taiwan
Republic of China

May 26, 2021

Notice to Readers

For the convenience of readers, the independent auditors’ limited assurance report and the accompanying summary of selected subject matter information have been translated into English from the original Chinese version prepared and used in the Republic of China. If there is any conflict between the English version and the original Chinese version or any difference in the interpretation of the two versions, the Chinese-language independent auditors’ limited assurance report and summary of selected subject matter information shall prevail.

APPENDIX

SUMMARY OF SELECTED SUBJECT MATTER INFORMATION

#	GRI Number	Descriptions of Indicators	Corresponding Section	Applicable Criteria
1.	GRI 205-3: 2016	Confirmed incidents of corruption and actions taken	2.2.3 Integrity and Ethics	Total number of confirmed corruption incidents related to the organization, its employees or business partner.
2.	GRI 302-1: 2016	Energy consumption within the organization	3.2.1 Energy Management	Amount of energy consumed from coal, gasoline, electricity sold, and natural gas.
3.	GRI 303-3: 2018	Water withdrawal	3.2.3 Water Resources and Water Cycle Management	A breakdown of water withdrawal from produced water, groundwater and industrial-use water.
4.	GRI 305-7: 2016	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	3.2.2 Air Pollution Management	Air emissions of nitrogen oxides, sulfur oxides, particulate pollutants, and volatile organic compounds.
5.	GRI 306-2: 2016	Waste by type and disposal method	3.2.5 Waste Management	Total weight of non-hazardous waste (both recyclable and non-recyclable)
6.	GRI 403-9: 2018	Work-related injuries	6.1.1 Workplace Safety	The number and rate of fatalities as a result of work-related injury; the number and rate of recordable work-related injuries.
7.	GRI 403-10:2018	Work-related ill health	6.1.1 Workplace Safety	The number and rate of fatalities as a result of work-related ill health; the number of cases of recordable work-related ill health.
8.	GRI 413-1: 2016	Operations with local community engagement, impact assessments, and development programs	5.1.1 TCC DAKA Open Eco-Factory	Percentage of operations with implemented local community engagement, impact assessments, and development programs.
9.	SASB EM-CM-110a.1	1) Gross global Scope 1 emissions 2) percentage of emissions covered under emissions-limiting regulations	3.1.1 Science-Based Targets for Carbon Reduction and Internal carbon pricing Appendix: Sustainability Accounting Standards Board (SASB) Reference	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations.
10.	SASB EM-CM-120a.1	Air emissions of the following pollutants: (1) NOx (excluding N2O), (2) SOx, (3) particulate matter (PM10), (4) dioxins/furans, (5) volatile organic compounds (VOCs), (6) polycyclic aromatic hydrocarbons (PAHs), and (7) heavy metals	3.2.2 Air Pollution	Air emissions of nitrogen oxides, sulfur oxides, particulate pollutants, and volatile organic compounds.



#	GRI Number	Descriptions of Indicators	Corresponding Section	Applicable Criteria
11.	SASB EM-CM-140a.1	1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress	3.2.3 Water Resources and Water Cycle Management Appendix: Sustainability Accounting Standards Board (SASB) Reference	Total amount of water withdrawal from produced water, groundwater and industrial-use water, percentage recycled, and percentage in regions with High or Extremely High Baseline Water Stress.

Independent Assurance Opinion Statement



INDEPENDENT ASSURANCE OPINION STATEMENT

Taiwan Cement Corporation 2020 Corporate Social Responsibility Report

The British Standards Institution is independent to Taiwan Cement Corporation (hereafter referred to as TCC in this statement) and has no financial interest in the operation of TCC other than for the assessment and verification of the sustainability statements contained in this report.

This independent assurance opinion statement has been prepared for the stakeholders of TCC only for the purposes of assuring its statements relating to its corporate social responsibility (CSR), more particularly described in the Scope below. It was not prepared for any other purpose. The British Standards Institution will not, in providing this independent assurance opinion statement, accept or assume responsibility (legal or otherwise) or accept liability for or in connection with any other purpose for which it may be used, or to any person by whom the independent assurance opinion statement may be read.

This independent assurance opinion statement is prepared on the basis of review by the British Standards Institution of information presented to it by TCC. The review does not extend beyond such information and is solely based on it. In performing such review, the British Standards Institution has assumed that all such information is complete and accurate.

Any queries that may arise by virtue of this independent assurance opinion statement or matters relating to it should be addressed to TCC only.

Scope

The scope of engagement agreed upon with TCC includes the followings:

- 1. The assurance scope is consistent with the description of Taiwan Cement Corporation 2020 Corporate Social Responsibility Report.
- 2. The evaluation of the nature and extent of the TCC's adherence to AA1000 AccountAbility Principles (2018) in this report as conducted in accordance with type 1 of AA1000AS v3 sustainability assurance engagement and therefore, the information/data disclosed in the report is not verified through the verification process.

This statement was prepared in English and translated into Chinese for reference only.

Opinion Statement

We conclude that the Taiwan Cement Corporation 2020 Corporate Social Responsibility Report provides a fair view of the TCC CSR programmes and performances during 2020. The CSR report subject to assurance is free from material misstatement based upon testing within the limitations of the scope of the assurance, the information and data provided by the TCC and the sample taken. We believe that the 2020 economic, social and environmental performance information are fairly represented. The CSR performance information disclosed in the report demonstrate TCC's efforts recognized by its stakeholders.

Our work was carried out by a team of CSR report assurors in accordance with the AA1000AS v3. We planned and performed this part of our work to obtain the necessary information and explanations we considered to provide sufficient evidence that TCC's description of their approach to AA1000AS v3 and their self-declaration in accordance with GRI Standards: Core option were fairly stated.

Methodology

Our work was designed to gather evidence on which to base our conclusion. We undertook the following activities:

- a top level review of issues raised by external parties that could be relevant to TCC's policies to provide a check on the appropriateness of statements made in the report.
- discussion with managers on approach to stakeholder engagement. However, we had no direct contact with external stakeholders.
- 24 interviews with staffs involved in sustainability management, report preparation and provision of report information were carried out.
- review of key organizational developments.
- review of the findings of internal audits.
- review of supporting evidence for claims made in the reports.
- an assessment of the organization's reporting and management processes concerning this reporting against the principles of Inclusivity, Materiality, Responsiveness and Impact as described in the AA1000AP (2018).



Conclusions

A detailed review against the Inclusivity, Materiality, Responsiveness and Impact of AA1000AP (2018) and GRI Standards is set out below:

Inclusivity

This report has reflected a fact that TCC has sought the engagement of its stakeholders and established material sustainability topics, as the participation of stakeholders has been conducted in developing and achieving an accountable and strategic response to sustainability. There are fair reporting and disclosures for economic, social and environmental information in this report, so that appropriate planning and target-setting can be supported. In our professional opinion the report covers the TCC's inclusivity issues.

Materiality

TCC publishes material topics that will substantively influence and impact the assessments, decisions, actions and performance of TCC and its stakeholders. The sustainability information disclosed enables its stakeholders to make informed judgements about the TCC's management and performance. In our professional opinion the report covers the TCC's material issues.

Responsiveness

TCC has implemented the practice to respond to the expectations and perceptions of its stakeholders. An Ethical Policy for TCC is developed and continually provides the opportunity to further enhance TCC's responsiveness to stakeholder concerns. Topics that stakeholder concern about have been responded timely. In our professional opinion the report covers the TCC's responsiveness issues.

Impact

TCC has identified and fairly represented impacts that were measured and disclosed in probably balanced and effective way. TCC has established processes to monitor, measure, evaluate and manage impacts that lead to more effective decision-making and results-based management within the organization. In our professional opinion the report covers the TCC's impact issues.

GRI Sustainability Reporting Standards (GRI Standards)

TCC provided us with their self-declaration of in accordance with GRI Standards: Core option (For each material topic covered by a topic-specific GRI Standard, comply with all reporting requirements for at least one topic-specific disclosure). Based on our review, we confirm that social responsibility and sustainable development disclosures with reference to GRI Standards' disclosures are reported, partially reported or omitted. In our professional opinion the self-declaration covers the TCC's social responsibility and sustainability topics.

Assurance level

The moderate level assurance provided is in accordance with AA1000AS v3 in our review, as defined by the scope and methodology described in this statement.

Responsibility

The CSR report is the responsibility of the TCC's chairman as declared in his responsibility letter. Our responsibility is to provide an independent assurance opinion statement to stakeholders giving our professional opinion based on the scope and methodology described.

Competency and Independence

The assurance team was composed of Lead auditors experienced in relevant sectors, and trained in a range of sustainability, environmental and social standards including AA1000AS, ISO 14001, ISO 45001, ISO 14064 and ISO 9001. BSI is a leading global standards and assessment body founded in 1901. The assurance is carried out in line with the BSI Fair Trading Code of Practice.

For and on behalf of BSI:


Peter Pu, Managing Director BSI Taiwan



...making excellence a habit.™

Statement No: SRA-TW-2020053
2021-05-14



TCC Official Website



CSR Section



FACEBOOK Page



WeChat Public Account



TCC Instagram

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