TCC Group Holdings Co., Ltd.

Type of Engagement: Annual Review
Date: 27 November 2024
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Introduction

In October 2023, TCC Group Holdings Co., Ltd ("TCC" or the "Company")[1] issued a green bond (the "2023 Green Bond") and raised USD 420 million to refinance projects related to green buildings, energy efficiency, renewable energy, clean transportation, water resource utilization and management, air pollution control, use of alternative raw materials or fuels, management of natural resources and land use. In November 2024, TCC engaged Sustainalytics to review the projects financed with proceeds from the 2023 Green Bond (the "Nominated Expenditures") and provide an assessment as to whether they meet the use of proceeds criteria and whether TCC complied with the reporting commitments in the Taiwan Cement Corporation Green Financing Framework (the "Framework").[2] Sustainalytics provided a Second-Party Opinion on the Framework in September 2023.[3]

Evaluation Criteria

Sustainalytics evaluated the Nominated Expenditures and TCC's reporting based on whether they:

1. Meet the use of proceeds and eligibility criteria defined in the Framework; and
2. Reported on at least one key performance indicator (KPI) for each use of proceeds category defined in the Framework.

Table 1: Use of Proceeds Categories, Eligibility Criteria and Associated KPIs

Use of Proceeds Category	Eligibility Criteria	Key Performance Indicators
Alternative Fuels and Materials	Financing related to the development and acquisition of: - Alternative fuels (such as bioenergy, solid recovered fuel, agricultural residual materials); and - Alternative raw materials (such as calcium fluoride sludge)	- Amount and type of alternative raw materials/ fuels used - Volume of used products collected from customers for recycling - % reduction in carbon intensity in CO_2 emissions intensity
Circular Economy Adapted Products, Production Technologies and Processes	Financing related to the development of waste co-processing and collaboration with industry partners to build a sustainable ecosphere through: - Collection, management and recycling of wastes - Conversion into harmless reusable resources and alternative cement raw materials and fuels	- Amount and type of alternative raw materials/ fuels used - Volume of used products collected from customers for recycling - % reduction in carbon intensity in CO_2 emissions intensity

[1] The Company changed its English name from Taiwan Cement Corporation to TCC Group Holdings Co., Ltd. on 21 May 2024.
[2] TCC, "Taiwan Cement Corporation Green Financing Framework", (2023), at: https://media.taiwancement.com/web_tcc/en/report/greenSustainableFinance/2023%20green%20financing%20framework.pdf
[3] Sustainalytics, "Second-Party Opinion, Taiwan Cement Corporation Green Financing Framework ", (2023), at: https://media.taiwancement.com/web_tcc/en/report/greenSustainableFinance/2023%20green%20financing%20framework%20spo.pdf

Energy Efficiency	- Financing related to equipment and process enhancements, measures to increase energy efficiency that could result in increased energy efficiency based on our best efforts to ensure projects achieve at least a 30% energy efficiency improvement, including investments in energy efficiency systems, lighting upgrades, smart devices to optimize energy consumption, energy efficient ventilation units. - Expenditures related to utilization of heat energy from cement rotary kilns to generate electricity such as installations of waste heat electricity generation systems and flash distillation technology to enhance heat recovery efficiency and reducing purchased electricity.	- Annual energy savings in MWh/GWh (electricity) and GJ/TJ (other energy savings) - Annual GHG emissions reduced/avoided in tonnes of CO_2e
Pollution Prevention and Control	Financing related to investments in technology and related services to create a sustainable environment through reduction of environmental pollution, including: - Technology to eliminate or significantly mitigate environmental pollutants in water, air, and soil (such as NOx control technologies and air quality monitoring stations) - Waste prevention, waste reduction, waste recycling Financing projects aimed at reducing CO_2 emissions and other major air emissions including the R&D and installation of Carbon Capture Utilization and Storage (CCUS) systems in the cement manufacturing process aimed at reducing and controlling GHG emissions.	- Amount of waste that is prevented, minimised, reused or recycled before and after the project in % of total waste and/ or in absolute amount in tonnes per annum - Amount of CO_2 emissions captured/reduced/avoided (in tCO_2 equivalent/year) - Reduction of air pollutants: particulate matter (PM), sulphur oxides (SOx), nitrogen oxides (NOx), carbon monoxide (CO), and non-methane volatile organic compounds (NMVOCs)
Sustainable Water and Wastewater Management	Financing related to sustainable water management projects, including: - Water efficiency and water-saving solutions, such as increasing the amount of wastewater treated and reused, water use control and rainwater harvesting	- Annual water savings (m^3/annum, reduction in water use in %) - Annual volume of wastewater treated, reused or avoided (m^3/annum and population equivalent/annum and as %)
Renewable Energy	Financing related to the construction, development, acquisition, maintenance, and operation of renewable energy including solar, wind, geothermal, biomass, and marine with direct life cycle emissions of less than $100gCO_2e/kWh$. Financing related to the design, development, manufacture, installation and maintenance of the following projects: - Solar-plus storage system which consists of solar PV and battery storage, aimed at transforming intermittent energy generated from solar PV into a dispatchable power supply - Modular utility-scale battery storage systems to provide grid stabilization services and	- Annual CO_2 emissions reduced/avoided (in tCO_2 equivalent/year) - Annual connection of renewable energy generation in MWh/GWh (electricity)

	enable the integration of more renewable energy into the grid - Industrial microgrids that combine distributed renewable energy sources, storage capacity and conventional backup to supplement or replace grid supply for both single and multiple users	
Clean Transportation	Financing related to the design, development, construction, acquisition, operation, maintenance and upgrades of zero-carbon and low-carbon transport vehicles, infrastructure and e-mobility solutions: - Private and public charging solutions for electric vehicles (EV) - Advanced charging technology that enables the use of parked electric vehicles as energy storage systems for grid stabilization - EV charging infrastructure, equipment and stations - Infrastructure projects associated with lower-carbon and electric vehicles - Manufacturing facilities and manufacture of raw materials to produce devices and batteries for electric vehicles - TCC's own low-carbon transport fleet	- Annual GHG emissions reduced/avoided in tCO_2e per annum - Amount of energy saved through production of devices and batteries for electric vehicles - Number of clean vehicles deployed - Estimated reduction in fuel consumption
Green Buildings	Energy-efficient buildings which have obtained or will obtain: - Minimum certification for e.g. "BREEAM Excellent", "LEED Gold", "EEWH Gold" or similar recognized standard Investments and expenditures relating to the renovation of buildings leading to a reduction of primary energy demand of at least 30%; or achieving one of the above-mentioned green building certification levels, as a result of retrofit.	- Certification Standards - Type of scheme, certification level - Annual GHG emissions reduced/avoided in tonnes of CO_2 equivalent/annum - Annual energy use reduced / avoided (kWh/a)

Issuer's Responsibility

TCC is responsible for providing accurate information and documentation relating to the details of the projects, including descriptions, amounts allocated and impact.

Independence and Quality Control

Sustainalytics, a leading provider of ESG research and ratings, conducted the verification of the use of proceeds from the 2023 Green Bond. The work undertaken as part of this engagement included collection of documentation from TCC and review of said documentation to assess conformance with the Framework.

Sustainalytics relied on the information and the facts presented by TCC. Sustainalytics is not responsible nor shall it be held liable for any inaccuracies in the opinions, findings or conclusions herein due to incorrect or incomplete data provided by TCC.

Sustainalytics made all efforts to ensure the highest quality and rigor during its assessment process and enlisted its Sustainability Bonds Review Committee to provide oversight of the review.

Conclusion

Based on the limited assurance procedures conducted,[4] nothing has come to Sustainalytics' attention that causes us to believe that, in all material respects, the Nominated Expenditures do not conform with the use of proceeds criteria and reporting commitments in the Framework. TCC has disclosed to Sustainalytics that the proceeds from the 2023 Green Bond were fully allocated as of September 2024.

Detailed Findings

Table 2: Detailed Findings

Framework Requirements	Procedure Performed	Factual Findings	Error or Exceptions Identified
Use of Proceeds Criteria	Verification of projects to determine alignment with the use of proceeds criteria outlined in the Framework.	The Nominated Expenditures comply with the use of proceeds criteria.	None
Reporting Criteria	Verification of projects or assets to determine if impact was reported in line with the KPIs outlined in the Framework.	TCC reported on at least one KPI per use of proceeds category.	None

[4] Sustainalytics' limited assurance process includes reviewing documentation relating to details of projects, as provided by the issuing entity, which is responsible for providing accurate information. These may include descriptions of projects, estimated and realized costs, and reported impact. Sustainalytics has not conducted on-site visits to projects.

Appendices

Appendix 1: Allocation Reporting

Table 3: Allocation of proceeds for the eligible projects

Use of Proceeds Category	Projects	Amount Allocated (USD million)
Alternative Fuels and Materials **Circular Economy Adapted Products, Production Technologies and Processes**	- DAKA Renewable Resource Recycling Center Construction project - Cement kiln collaborative fly ash disposal project - Alternative raw materials/fuels	92.85
Clean Transportation	- Super battery machine and equipment	40.94
Energy Efficiency - Equipment and Process Enhancements	- Energy-conserving and carbon-reduction equipment - Equipment and process enhancements of kiln and mill systems	92.86
Green Buildings	- E-One Moli Energy Plant construction	130.45
Pollution Prevention and Control	- Technology to eliminate or significantly mitigate environmental pollutants in water, air and soil - Waste prevention, waste reduction, waste recycling	39.67
Renewable Energy	- Solar power project sites, fishery and electricity symbiosis project sites - Wind farm project sites (onshore) - Energy storage project sites - Renewable energy equipment for self-consumption	26.47
Sustainable Water and Wastewater Management	- Water recycling-related facilities - Water reclamation system - Climate resilience enhancing facilities	8.01
Total Amount Allocated		**431.24**
Total Proceeds Unallocated		**0.00**
Total Net Proceeds Raised		**420.00**

Appendix 2: Reported Impact

Table 4: Reported impact for the 2023 Green Bond

Use of Proceeds Category	KPI	Reported Impact	2020	2021	2022
Alternative Fuels and Materials and Circular Economy Adapted Products, Production Technologies and Processes	Reduction in carbon intensity	Carbon emission intensity (tCO_2e/tonne of cementitious material)	0.733	0.724	0.709
	Amount and type of alternative raw materials or fuels used	Percentage of use of alternative raw materials	16.40%	18.20%	19.60%
		Use of alternative fuels (GJ)	208,779	1,141,467	6,336,276
		Use of recycled raw materials (tonnes)	2,022,504	2,138,492	2,110,219
	Volume of used products collected from customers for recycling	Waste treatment volume (tonnes)	1,025,000	1,141,000	1,101,000
Energy Efficiency - Equipment and Process Enhancements	Annual energy savings in MWh or GWh, and GJ or TJ (other energy savings)	Total non-renewable energy consumption (MWh)	47,873,363	37,602,863	30,482,10
		Total renewable energy consumption - alternative fuels and renewable energy (MWh)	5,291	129,708	484,417
		Energy recovery and recycling: waste heat to power (GJ)	5,048,625	4,221,277	3,308,400
	Annual GHG emissions reduced or avoided in tonnes of CO_2e	GHG emissions (Kt)	35,240.24	30,618.37	26,084.54
		Carbon reduction with waste heat recovery (tonnes)	843,567	701,411	517,169
Pollution Prevention and Control	Amount of waste that is prevented, minimized, reused or recycled before and after the project in percentage of total waste and/ or in absolute amount in tonnes per annum	Total waste recycled or reused (tonnes)	3,338.61	3,881.23	9,673.86
		Total waste disposed[5] (tonnes)	9,231.89	13,843.49	11,565.38
	Reduction of air pollutants: particulate matter (PM), sulphur oxides (SOx), nitrogen oxides (NOx), carbon monoxide (CO), and non-methane volatile organic compounds (NMVOCs)	Reduction in NOx (tonnes)	3,108	1,872	3,017
		Reduction in SOx (tonnes)	-228[6]	289	-51[7]
		Reduction in Total Suspended Particulate (tonnes)	280	293	308

[5] TCC has communicated to Sustainalytics that waste disposal includes waste intended for recycling or reuse.
[6] TCC has communicated to Sustainalytics that 228 tonnes of additional SOx were emitted in 2020, compared to 2019.
[7] TCC has communicated to Sustainalytics that 51 tonnes of additional SOx were emitted in 2022, compared to 2021.

Clean Transportation	Annual GHG emissions reduced or avoided in tCO_2e per annum	Waste recycling rate	-	-	62%[8]
		Reduction in hazardous waste	-	-	47%
	Amount of energy saved through production of devices and batteries for electric vehicles	Engy saved from annual energy-saving project (%)	-	-	4.06%
Green Buildings	Certification standards: type of scheme, certification level	Gold-level green building certified by LEED and EEWH	-	-	US LEED: Gold
			-	-	Taiwan EEWH: Gold
	Energy-saving design, water-saving design resource recycling and reuse	Energy-efficient air conditioning system[9]	-	-	42%
		Reducing water consumption	-	-	30%
		Resource recycling and reuse of construction waste	-	-	75%
Renewable Energy	Annual connection of renewable energy generation in MWh/GWh	Self-generated and self-used (kWh)	79,358	166,098	1,190,151
		Renewable energy generation volume (kWh)	39,108	44,368	59,000
	Annual CO_2 emissions reduced or avoided (in tCO_2e/year)	Annual CO_2 emissions reduced or avoided (tCO_2e/year)	19,632	22,583	29,205
Sustainable Water and Wastewater Management	Annual water withdrawal intensity (million litres/tonne of cementitious material)	Water withdrawal intensity in Taiwan (million litres/ tonne of cementitious material)	0.000364	0.000300	0.000293
		Water withdrawal intensity in Mainland China (million litres/ tonne of cementitious material)	0.000333	0.000324	0.000308
	Annual volume of wastewater treated, reused or avoided (m^3/annum, p.e./annum and as a percentage)	Process recycled water (megalitres)	109,560	102,560	97,554

[8] TCC has communicated to Sustainalytics that the percentage is based on amount of waste generated in the current year.
[9] TCC has communicated to Sustainalytics that the project has obtained double gold certification and is expected to reduce energy consumption by 42%.

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