

環境及社會責任報告

ENVIRONMENTAL AND SOCIAL RESPONSIBILITY REPORT

本報告旨在對本集團在環境、社會責任兩個主要範疇的理念、管治、實踐和績效與利益相關方進行公開溝通，以及回應關注問題。

This report aims to enhance open communications with and address the issues concerned by our stakeholders on the Group's philosophy, governance, implementation and performance on the two main scopes of environmental and social responsibilities.

編製基礎

本報告主要參照上市規則附錄二十七《環境、社會及管治報告指引》之原則及條文編製。

BASIS OF PREPARATION

This report is prepared mainly with reference to the principles and provisions of the Environmental, Social and Governance Reporting Guide set out in Appendix 27 of the Listing Rules.

報告範圍

本報告包含截至二零二一年十二月三十一日止年度的統計及資料，以及以二零一九年、二零二零年十二月三十一日止年度比較數據為主，以本集團的97條水泥粉磨線、46條熟料生產線及62座混凝土攪拌站為主要匯報範圍。除另有說明外，本報告基本不包含本集團的聯營公司及合營公司。

SCOPE OF REPORT

This report mainly includes the statistics and information for the year ended 31 December 2021, as well as comparative data for the years ended 31 December 2019 and 2020. The main scope of report covers 97 cement grinding lines, 46 clinker production lines and 62 concrete batching plants of the Group. Unless otherwise stated, this report does not cover the Group's associates and joint ventures.

環境、社會及管治事宜的管治架構及監管

一直以來，本集團將社會責任融入企業經營、根植業務當中，從戰略的高度審視企業社會責任，注重企業履責的長期性、方向性和目標性，從股東、員工、客戶、合作夥伴和社區等利益相關方角度出發，持續推動社會責任工作開展，包括夯實生產基地安全管理、響應「雙碳」戰略、加強環保管理、革新節能減排改造措施、實施健康管理、推廣協同處置項目等，推動企業和社會共同的高質量發展。同時也一直堅持做好與利益相關方的責任溝通。二零二一年，本集團獲MSCI評級上調為BB級。

GOVERNANCE STRUCTURE AND OVERSIGHT OF ESG ISSUES

The Group has always assimilated social responsibility into corporate operations and rooted the same in its businesses. We review corporate social responsibility from the strategic perspective, and pay attention to the directions and targets for responsibility fulfillment in the long term. We persistently advance the launch of social responsibility from the point of view of stakeholders such as shareholders, employees, customers, partners and the community including consolidating the safety management of production plants, responding to the "dual carbon" strategy, strengthening environmental protection management, innovating on upgrade measures for energy-saving and emission reduction, implementing health management and promoting co-processing projects to foster the mutual high-quality development of enterprises and society. At the same time, we have always insisted on maintaining good communications of responsibility with stakeholders. In 2021, the Group's ESG rating was upgraded to BB by MSCI.

為積極履行企業社會責任、切實推進責任實踐等相關工作的開展，於二零二二年三月十八日，董事局修訂風險與合規委員會（前稱企業管治委員會）職權範圍書，新增其環境、社會及管治風險管理職責，負責研究制定、修訂及檢討本公司風險管理的一級管理制度、政策及常規，向董事局提出建議並督導其實施。為確保經理層已履行職責建立有效的風險管理系統，風險與合規委員會需與經理層討論以下事項：

(i) 在與本公司環境、社會及管治表現和匯報相關的資源、員工資歷及經驗，以及員工所接受的培訓課程及有關預算是足夠的；(ii) 自上年檢討後，環境、社會及管治等重大風險的性質及嚴重程度的轉變、以及本公司應付其業務轉變及外在環境轉變的能力；(iii) 經理層持續監察環境、社會、管治風險的工作範疇及素質。此外，風險與合規委員會審閱年度風險管理報告（含重大環境及社會風險評估和管理）以及環境、社會及管治報告內的披露，對不合規情況進行調查並向董事局提出整改建議。

在執行董事率先帶領推動、以及董事局的監督和支持下，本公司自二零一三年成立「企業文化與社會責任指導委員會」，負責社會責任戰略方向的領導、推進、決策。目前總裁擔任委員會主任職務，成員由總部各部室、大區、事業部、專業服務機構的主要領導組成。此外，該委員會於二零一六年下設「社會責任報告編製委員會」，負責編製年度社會責任報告，為本集團開展社會責任工作，有效推動責任管理、融合和傳播奠定紮實的基礎。

In order to actively fulfil corporate social responsibility and launch the firm implementation of relevant works on responsibility practice, on 18 March 2022, the Board revised the Terms of Reference for the Risk and Compliance Committee (formerly known as Corporate Governance Committee) to add its powers and duties for ESG risk management. The Committee shall be responsible for studying, developing, amending and reviewing the primary management systems, policies and practices on risk management of the Company, as well as making recommendations to the Board and monitoring their implementation. To ensure that the management has performed its duty to have established effective risk management system, the Risk and Compliance Committee shall discuss the following matters with the management: (i) the adequacy of resources, staff qualifications and experience, training programmes and budget relating to the Company's ESG performance and reporting; (ii) the changes, since the last annual review, in the nature and extent of significant risks (including ESG risks), and the Company's ability to respond to changes in its business and the external environment; (iii) the scope and quality of the management's ongoing monitoring of ESG risks. In addition, the Risk and Compliance Committee shall review the annual risk management report (including the assessment and management on material environmental and social risks) and the disclosure in the ESG report, investigate on non-compliance matters and make recommendations on rectifications to the Board.

Through the initiative of the Executive Director and with the oversight and support of the Board, the Company had established the "Corporate Culture and Social Responsibility Steering Committee" since 2013, which is responsible for the leadership, promotion and decision-making of the strategic directions with respect to social responsibility. The Chief Executive Officer currently serves as the President of the committee. The committee members comprise of the major heads of all departments at headquarters, operating regions, business divisions and professional service institutions. In addition, the committee established the "Social Responsibility Report Preparation Committee" in 2016, responsible for preparing the social responsibility report. This had laid a solid foundation for the Group to launch its social responsibility work and to effectively promote the management, integration and propagation of responsibility.



本公司於二零二一年發佈社會責任工作管理制度，持續梳理及完善指標體系，推動社會責任工作朝著體系化、規範化方向邁進。

本集團各業務單元EHS組織機構均設有EHS委員會、EHS監督管理部門和EHS保障部門，由業務單元負責人直接管理，承接總部EHS管理要求，組織開展各項EHS工作。總部的EHS管理委員會主任由總裁擔任。總部EHS部通過制定及完善EHS管理制度及標準，監督、評價各級單位EHS工作開展情況及成效，為相關單位提供EHS專業支持與技術服務，不斷創新EHS舉措，防範EHS風險。本集團致力完善EHS責任制度，各總部部門及業務單元簽署《EHS承諾書》或《EHS責任書》，並將相關制度納入年度業績考核。

In 2021, the Company issued the social responsibility management policy and continued to organize and improve the system for indicators to advance social responsibility work towards the direction of systematization and standardization.

EHS organizational institutions at each business unit of the Group set up the EHS Committee, the EHS Supervision and Management Department and the EHS Supporting Department, which are under the direct management of persons in charge of the corresponding business units, undertake EHS management requirements from headquarters and organize the launch of various EHS work. The EHS Management Committee at headquarters is chaired by the Chief Executive Officer. Through formulating and improving EHS management policies and standards, the EHS Department at headquarters supervises and evaluates the progress and effectiveness of EHS work of all levels of units, provides professional support and technical services of EHS to relevant units, and continuously innovates on EHS measures to prevent EHS risks. The Group was dedicated to improving the EHS accountability policies. All departments at headquarters and business units entered into the “Letter of EHS Undertaking” or the “EHS Responsibility Pledge”, and relevant policies had been incorporated in the annual performance appraisal.

重要性議題分析

利益相關方參與

本集團積極關注利益相關方訴求與期望，持續探索與利益相關方有效的溝通方式，通過信息發佈、信息報送、專題匯報、股東會議、參觀考察、公益活動、開放日、員工活動、公司網站、官方微信公眾號等渠道或形式，及時、準確、嚴謹地披露本集團業績、相關動態等信息，及時傳播本集團理念及履責實踐，在增進利益相關方的了解和支持的同時，本集團聽取來自內外利益相關方的合理意見和建議，不斷改善企業經營管理方式，提升企業綜合競爭力。

MATERIALITY ANALYSIS

Engagements with Stakeholders

The Group is proactively concerned with the aspirations and expectations of our stakeholders. We continue to explore effective means of communications with stakeholders through various channels or means including information publication, information reporting, special presentations, shareholders’ meetings, site visits, community activities, open days, staff activities, the Company’s website and official WeChat public account for the disclosure of the Group’s results performance and relevant activities in a timely, accurate and rigorous manner as well as timely propagation of the Group’s philosophy and practice of responsibility fulfilment. While enhancing stakeholders’ understanding on and support, the Group also listens to the reasonable opinions and suggestions from internal and external stakeholders for the continuous improvement of corporate operational management methods and improvement on the comprehensive corporate competitiveness.

序號 No.	利益相關方類別 Types of Stakeholders	訴求與期望 Aspirations and Expectations	溝通與回應 Communications and Responses
1	政府及監管機構 Government and regulatory bodies	<ul style="list-style-type: none"> • 依法規範經營 Regulated operations according to laws • 安全環保 Safety and environmental protection • 職業健康 Occupational health • 區域經濟發展 Regional economic development • 就業稅收 Employment and tax income 	<ul style="list-style-type: none"> • 嚴格執行國家政策 Strict implementation of national policies • 堅持節能減排、推動低碳發展 Insistence on energy saving and emission reduction, and promotion of low-carbon development • 堅持安全生產、加強職業健康防護 Insistence on production safety, and reinforcement on protection of occupational health • 積極參與地方建設，提供就業機會 Proactive participation in local construction and providing employment opportunities • 遵守法律法規、及時繳納稅費 Compliance with laws and regulations, timely payment of taxes • 積極響應政府號召、及時報送企業信息 Active response to the urge from government, and timely submission of corporate information
2	股東及投資者 Shareholders and investors	<ul style="list-style-type: none"> • 企業價值 Corporate value • 提質增效 Enhanced quality and increased efficiency • 公司治理 Corporate governance • 可持續發展 Sustainable development • 風險管理 Risk management • 合規管理 Compliance management 	<ul style="list-style-type: none"> • 提升企業經營管理水平、業績及資產價值 Enhancing standards of corporate operation, results and asset value • 提質增效，提升企業綜合競爭力 Enhanced quality and increased efficiency for improving corporate competitiveness • 規範董事局建設，完善科學、高效的治理體系 Standardizing construction of the Board, and perfecting scientific and effective governance system • 關注環境及社會影響，採取相應舉措，完善相關信息披露及溝通 Paying attention to environmental and social impacts, adopting corresponding measures, and improving relevant information disclosure and communications • 提升防範化解重大風險的能力 Enhancing the strength of preventing and solving substantial risks • 建立合規管理體系、完善合規審查機制、開展商業行為守則宣貫 Construction of compliance management system, improving compliance review mechanism, and rolling out propagation of code of business conduct • 加強投資者關係管理、保護所有股東的合法權益 Strengthening investors relation management and protecting the legal rights and interests of all shareholders
3	客戶 Customers	<ul style="list-style-type: none"> • 產品質量 Product quality • 客戶服務 Customer service • 客戶權益 Rights and interests of customers • 創新 Innovation 	<ul style="list-style-type: none"> • 全方位保障產品質量 Comprehensive guarantee of product quality • 建立健全客戶服務體系、完善客戶意見反饋及投訴處理機制、開展客戶滿意度調研 Establishing sound customer service system, improving mechanism for customer feedback and complaint handling, and launching surveys on customer satisfaction • 履約及保障客戶信息安全，加強客戶管理體系建設 Upholding and protecting security of customer data, and strengthening the construction of customer management system • 推動產品和技術創新 Encouraging innovation of products and technology



序號 No.	利益相關方類別 Types of Stakeholders	訴求與期望 Aspirations and Expectations	溝通與回應 Communications and Responses
4	員工 Employees	<ul style="list-style-type: none"> 員工權益 Rights and interests of employees 薪酬福利 Remuneration and benefits 職業成長 Career development 員工關愛 Care for employees 健康安全 Health and safety 	<ul style="list-style-type: none"> 堅持平等僱傭準則，保障員工合法權益 Adhering to the principle of equal employment, and protecting the legal rights and interests of employees 召開職工代表大會、建立員工交流平台 Holding employees' congress and construction of communications platform for employees 制定有競爭力的薪酬福利體系，完善各項福利待遇 Formulating competitive remuneration and benefits systems, and improving various benefits and treatment 開展員工培訓及評優評先活動，完善激勵及晉升機制 Launching staff training and assessment activities for excellence and advancement, and perfecting incentives and promotion mechanism 開展員工活動、平衡員工工作與生活 Organizing staff activities, and employees' work-life balance 關注職業健康和心理健康，關愛困難員工 Care for occupational health and mental health, and care for employees in need
5	供應商及合作夥伴 Suppliers and partners	<ul style="list-style-type: none"> 及時履約 Punctual fulfillment of agreements 誠信廉潔 Integrity and probity 平等互惠 Equality for mutual benefit 合作共贏 Cooperation for mutual gain 行業進步及轉型升級 Advancement, transformation and upgrade of the industry 	<ul style="list-style-type: none"> 加強供應商及採購訂單管理，重視合同履約 Strengthening the management of suppliers and procurement orders, with strong emphasis on fulfillment of agreements 開展常態化廉潔教育，實施陽光採購 Launching regular probity education and adopting Sunshine Procurement 加強交流與合作，構建平等互利的合作機制與平台 Strengthening communications and cooperation, building equal cooperation mechanisms and platforms for mutual benefits 開展定期會晤、互訪及拜訪交流 Launching regular meetings, mutual visits and exchanges 參與行業標準制定及技術研究 Participating in the formulation of industry standards and technological research
6	社區 Community	<ul style="list-style-type: none"> 生態保護 Ecological protection 社區發展 Community development 公益慈善 Community charity 當地就業及經濟發展 Local employment and economic development 	<ul style="list-style-type: none"> 強化安全生產管理，綠色生產、綠色辦公，提高能源、資源綜合利用效率，發展循環經濟 Reinforcement of production safety management, green production and green office to increase the composite utilization efficiency of energy and resources, and circular economy development 建設綠色礦山、綠色工廠、推廣協同處置項目 Construction of green mines and green factories, and promotion of co-processing projects 積極參與社區共建 Active participation in mutual community construction 積極參與鄉村振興、公益慈善活動及社會志願活動 Active participation in rural revitalization, community charitable activities and social volunteer activities 支持當地教育事業和提供就業 Support for local education business and provision of employment
7	媒體 Media	<ul style="list-style-type: none"> 依法合規 Abiding by laws and compliance 信息披露 Information disclosure 經營業績 Operational results 健康及安全 Health and safety 可持續發展 Sustainable development 	<ul style="list-style-type: none"> 及時準確披露企業資訊 Timely and accurate disclosure of corporate information 接受媒體監督，暢通對外發佈渠道，積極與媒體溝通、及時回應 Welcoming supervision by media, smooth channels of external publication for proactive communications with and timely response to the media

重要性議題識別

通過宏觀政策及行業政策法規分析、國內外權威社會責任標準研究、水泥行業優秀社會責任報告對標，並參考聯交所《環境、社會及管治報告指引》、全球報告倡議組織《可持續發展報告標準》、中國社會科學院《中國企業社會責任報告指南（CASS-CSR4.0）》、中國水泥協會《水泥企業社會責任準則》、《水泥企業社會責任報告編寫指南》、《水泥企業社會責任評價指標體系》，本公司持續完善重大環境、社會及管治議題管理模型，二零二一年，識別了6個責任領域共29項重要性議題。

重要性議題優次排序

為進一步提升重大環境、社會及管治議題的針對性，二零二一年，本公司制定重要性議題調查問卷，通過郵件推送、點對點邀請、官方微信公眾號推送等方式廣泛了解內外部利益相關方對各項重要性議題的關注程度。本公司共計回收有效問卷2,665份，根據問卷調查結果，從「對本公司發展的重要性」與「對利益相關方的重要性」兩個維度進行重要性議題優次排序，製作重要性議題矩陣，並經董事局、高級管理人員、外部專家對重要性議題及優次排序結果的審閱和建議，確認利益相關方關注度高、與本公司可持續發展密切相關的核心重要性議題，作為重點披露內容。

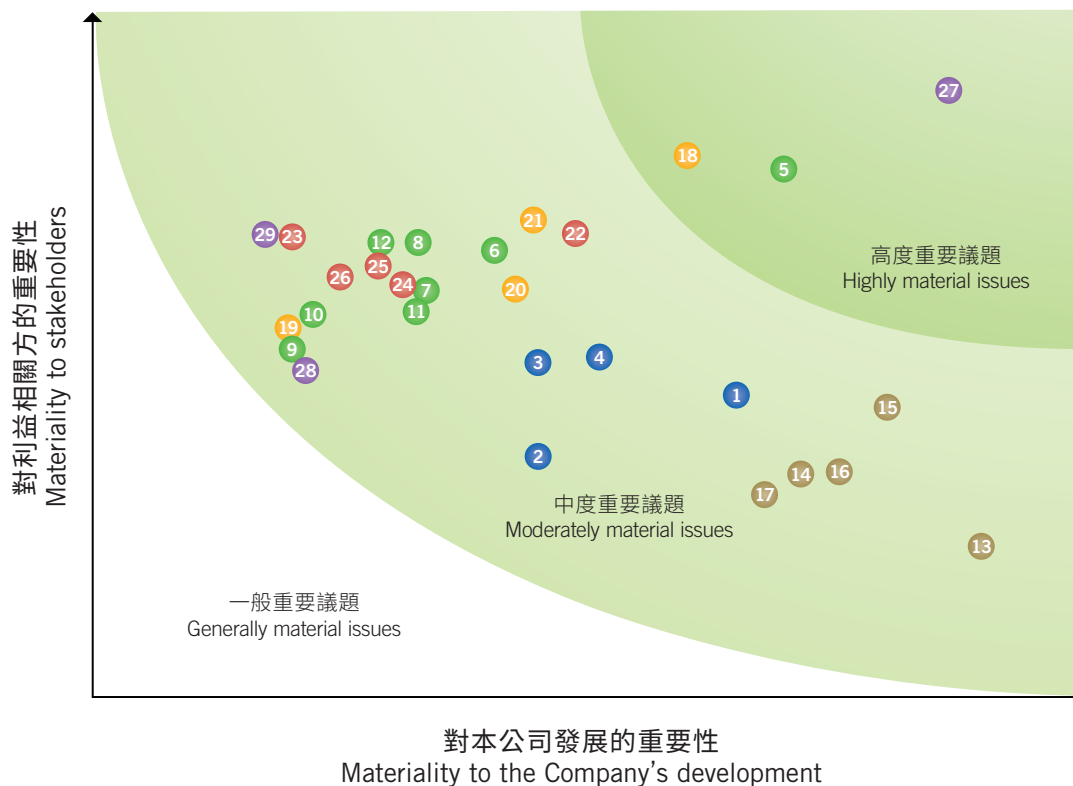
Identification of Material Issues

The Company continued to improve the management model of material ESG issues and identified 29 material issues from 6 scopes of responsibilities in 2021 through analysis on macro policies and industry policies and regulations, research on the domestic and international authoritative social responsibility standards, benchmarking against excellent reports in the cement industry, and with reference to “Environmental, Social and Governance Reporting Guide” of the Stock Exchange, “GRI Sustainability Reporting Standards” of Global Reporting Initiative, “Guidelines on Corporate Social Responsibility Reporting for Chinese Enterprises (CASS-CSR4.0)” of Chinese Academy of Social Sciences, “Guidance on Social Responsibility of Cement Enterprise”, “Guidance on Social Responsibility Reporting of Cement Enterprise” and “Social Responsibility Evaluation Index System of Cement Enterprise” of China Cement Association.

Prioritization of Material Issues

In order to further enhance the specificity of material ESG issues, in 2021, the Company prepared survey questionnaire of material issues, which were sent through emails, peer-to-peer invitations and official WeChat public account to extensively understand the degree of concerns of internal and external stakeholders on each material issue. The Company collected a total of 2,665 valid questionnaires. Based on the survey results, we assessed the priority of material issues from the two dimensions of “materiality to the Company’s development” and “materiality to stakeholders”, and prepared the materiality assessment matrix. Upon the review and recommendation by the Board, the senior management and external consultants on the material issues and their prioritization results, the core material issues closely related to sustainable development of the Company which highly concerned stakeholders were confirmed as the key disclosure contents.





責任領域 Scopes of Responsibilities	序號 No.	重要性議題 Material Issues
經濟 Economic	1	管理效益、經營業績及企業價值 Managerial efficiency, operating results and corporate value
	2	公司治理與風險管理 Corporate governance and risk management
	3	誠信經營及反腐倡廉 Integrity management and promotion of anti-corruption
	4	高質量發展與轉型升級 High-quality development, transformation and upgrade
環境 Environment	5	可持續發展 Sustainable development
	6	能源及資源管理 Energy and resources management
	7	環境管理體系 Environmental management systems
	8	污染物、廢棄物管理 Pollutant and waste management
	9	協同處置固體廢棄物 Solid waste co-processing

責任領域 Scopes of Responsibilities	序號 No.	重要性議題 Material Issues
	10	環境修復及綠色礦山建設 Environmental restoration and green mine construction
	11	低碳發展及應對氣候變化 Low-carbon development and response to climate change
	12	清潔技術及綠色建築機遇 Clean technology and opportunities in green building
員工 Employees	13	員工薪酬福利 Compensation and benefits of employees
	14	員工發展與培訓 Development and training of employees
	15	員工職業健康 Occupational health of employees
	16	員工權益 Rights and interests of employees
	17	員工關愛 Care for employees
客戶 Customers	18	產品及服務質量管理 Product and service quality management
	19	知識產權管理及科研成果轉化 Management of intellectual property rights and transformation of achievements in scientific research into practical applications
	20	產品及服務創新 Product and service innovation
	21	客戶權益及滿意度 Rights, interests and satisfaction of customers
伙伴 Partners	22	誠信合規採購 Integrous and compliant procurement
	23	供應鏈責任管理 Supply chain responsibility management
	24	促進公平競爭 Facilitation of fair competition
	25	戰略合作及資源共享 Strategic cooperation and resources sharing
	26	行業交流與發展 Communications with industry players to foster industry development
公共 Public	27	安全生產 Production safety
	28	慈善公益、志願活動及賑災救危 Community charity, volunteering activities and emergency relief
	29	投資與帶動就業、助力鄉村振興 Investment in and drive for employment, assistance to rural vitalization



環境

本集團積極履行企業公民的社會責任，嚴格遵循國家、行業、地方相關法律法規要求，持續開展污染物、廢棄物、碳排放、能源及資源管理，積極應對氣候變化，並通過協同處置項目、綠色礦山建設等工作推動綠色生產，助力環保轉型，實現企業的可持續發展。

1、 污染物管理

本集團嚴格遵守有關廢氣及溫室氣體排放、向水及土地的排污、有害及無害廢棄物產生的法律及規例，其中包括但不限於：《中華人民共和國環境保護法》、《中華人民共和國大氣污染防治法》、《中華人民共和國水污染防治法》、《中華人民共和國固體廢物污染環境防治法》、《中華人民共和國環境噪聲污染防治法》、《中華人民共和國土壤污染防治法》、《中華人民共和國環境保護稅法》、《中華人民共和國環境影響評價法》、《水泥工業大氣污染物排放標準》、《水泥窯協同處置固體廢物污染控制標準》。

ENVIRONMENT

The Group proactively fulfils its social responsibilities as a corporate citizen. In strict compliance with the relevant requirements of national, industrial and local laws and regulations, we continuously launch management on pollutant, waste, carbon emissions, energy and resources management, and proactively respond to climate change. We implement green production and support transformation of environmental protection through waste co-processing and green mine construction, thereby achieving sustainable corporate development.

1. POLLUTANT MANAGEMENT

The Group strictly complies with the laws and regulations relating to air and greenhouse gas emissions, discharges into water and land, and generation of hazardous and non-hazardous waste, including but not limited to: the Environmental Protection Law of the People's Republic of China, the Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution, the Law of the People's Republic of China on Prevention and Control of Water Pollution, the Law of the People's Republic of China on Prevention and Control of Environmental Pollution by Solid Waste, the Law of the People's Republic of China on Prevention and Control of Environmental Noise Pollution, the Law of the People's Republic of China on Prevention and Control of Soil Pollution, the Environmental Protection Tax Law of the People's Republic of China, the Environmental Impact Assessment Law of the People's Republic of China, the Emission Standard of Air Pollutants for Cement Industry, and the Standard for Pollution Control on Co-Processing of Solid Wastes in Cement Kiln.

本集團嚴格參照環境相關法律法規要求，不斷完善EHS管理體系，更新EHS管理制度，二零二一年下發《大氣污染防治管理指引（2021年版）》、《水污染防治管理指引（2021年版）》、《噪聲污染防治管理指引（2021年版）》、《固體廢物污染防治管理指引（2021年版）》、《環保合規性管理指引（2021年版）》等多項環保管理制度。同時，本集團基於行業或內部對標結果，建立卓越運營管理評價體系並設定目標值，對各水泥生產基地在環境、健康和 safety 等方面進行全面評價，從而提升管理水平，推動企業的可持續發展。本集團旗下水泥生產基地全部通過ISO 14001：2015環境管理體系認證。

本集團的主要產品為水泥、熟料及混凝土，生產製造過程中主要產生的排放物為氮氧化物、二氧化硫、顆粒物等。本集團積極推動綠色生產，目前，所有水泥生產基地取得污染物排放許可證，以及配套純低溫餘熱發電設備、脫硝系統及袋式除塵器。

本集團設有環境污染物排放總部監控平台，實現總部對所有生產線污染物排放情況的即時監控，通過平台及時提醒、督促生產基地對異常數據進行核查，進一步提升污染物排放的風險管理能力。本集團為持續提升清潔化生產水平，樹立遵紀守法、和諧社區的良好企業形象，防控環保風險，自二零一九年起主動向社區全面公示所有生產線污染物排放實時數據，主動接受社會各界的監督。

目前本集團各生產基地的氮氧化物、二氧化硫及顆粒物平均排放濃度均低於國家污染物排放標準限值，同時，本集團不斷尋求減排新技術，努力提升環保技術水平和管理水平。本集團目標至二零二五年，所有水泥生產基地窯頭窯尾煙氣的氮氧化物排放濃度力爭達到100毫克／立方米以下、二氧化硫排放濃度達50毫克／立方米以下、顆粒物排放濃度達10毫克／立方米以下。

With strict reference to relevant requirements on environmental laws and regulations, the Group continued to improve the EHS management system and update the EHS management policies. In 2021, various environmental protection management policies were issued, including the “Management Guideline for Prevention and Control of Atmospheric Pollution (2021 Edition)”, the “Management Guideline for Prevention and Control of Water Pollution (2021 Edition)”, the “Management Guideline for Prevention and Control of Noise Pollution (2021 Edition)”, the “Management Guideline for Prevention and Control of Pollution by Solid Waste (2021 Edition)” and the “Management Guideline for Environmental Protection Compliance (2021 Edition)”. Meanwhile, the Group set up the appraisal system for excellent operational management and set targets based on the results of industry or internal benchmarking. Comprehensive appraisal on the environment, health and safety aspects of every cement production plant is conducted, which enhances management standards and fosters corporate sustainable development. All cement production plants of the Group had passed the ISO 14001:2015 Environmental Management System Certification.

During the production and manufacturing process of our main products (namely, cement, clinker and concrete), the Group mainly emits pollutants including nitrogen oxides, sulphur dioxide and particulate matters. The Group proactively promotes green production. Currently, all of our cement production plants have obtained permits for pollutant emissions, and have been equipped with pure low-temperature residual heat recovery generation systems, denitration systems and bag filters.

The Group has a platform at headquarters to monitor the emissions of environmental pollutants, thereby achieving the headquarters’ real-time monitor on pollutant emissions of all production lines. The risk management capability on pollutant emissions has been further enhanced by timely reminders to urge production plants to verify abnormal data through the platform. Since 2019, the Group had taken the initiative to be subject to scrutiny from all sectors of the society by spontaneously making full disclosure on real-time pollutant emissions data of all production lines in order to continuously improve the standards of clean production, build an excellent corporate image of strict legal compliance and harmonious community, prevent and control risks of environmental protection.

Currently, the average emission concentrations of nitrogen oxides, sulphur dioxide and particulate matters of each production plant of the Group are lower than the national standard limits of pollutant emissions. Meanwhile, the Group had been continuously seeking new technology of emission reduction and enhancing technological standards and management standards of environmental protection. The Group targets that, by 2025, the emission concentrations of nitrogen oxides, sulphur dioxide and particulate matters will strive to fall below 100 mg/m³, 50 mg/m³ and 10 mg/m³ respectively from exhaust gases of kiln heads and kiln rears of all cement production plants.



氮氧化物減排方面，本集團積極開展智能高效選擇性非催化還原脫硝（heSNCR）、分級燃燒和選擇性催化還原脫硝（SCR）超低排放技術研究及應用。二零二一年，本集團於廣東封開、惠州，廣西陸川、平南，貴州金沙，山西長治的水泥生產基地完成氮氧化物減排技改項目，並於廣西南寧的水泥生產基地啟動技改，計劃於二零二二年完成。在「十四五」期間，本集團將根據技改經驗推廣應用，進一步降低氮氧化物排放濃度，逐步實現所有生產線氮氧化物排放濃度低於100毫克／立方米。

二氧化硫減排方面，本集團根據各生產線實際運行需要選擇應用脫硫技術，達標排放。年內，本集團在廣西合浦的水泥基地建成濕法脫硫系統，截至二零二一年十二月底，建成4套濕法脫硫系統及11套複合脫硫系統。海南昌江水泥基地擬實施濕法脫硫擴容升級改造，進一步降低二氧化硫的排放濃度。

顆粒物減排方面，本集團持續在各基地推廣不同類型的超低排放高溫濾袋技術，截至二零二一年底，本集團46條熟料生產線中已有42條的年平均顆粒物排放濃度低於10毫克／立方米，實現顆粒物超低排放。

截至二零二一年底，本集團位於廣西田陽、南寧、平南、武宣、貴港、賓陽、富川，雲南鶴慶，貴州金沙，山西長治的水泥生產基地獲列入國家級綠色製造名單中的綠色工廠，位於廣西上思、陸川、合浦，福建龍岩、雁石、曹溪、永定的水泥生產基地獲列入省級或自治區級綠色製造名單中的綠色工廠。

In terms of emission reduction of nitrogen oxides, the Group proactively launched the research and application on intelligent ultra-low emissions technology of highly effective selective non-catalytic reduction denitration (heSNCR), multi-level combustion and selective catalytic reduction denitration (SCR). In 2021, the Group completed technological upgrade projects for emission reduction of nitrogen oxides at its cement production plants in Fengkai and Huizhou of Guangdong, Luchuan and Pingnan of Guangxi, Jinsha of Guizhou and Changzhi of Shanxi, and launched technological upgrade at the cement production in Nanning of Guangxi, which is scheduled to complete in 2022. During the “Fourteenth Five-Year” period, based on the experience of technological upgrade, the Group will promote such application to further reduce the emission concentration of nitrogen oxides, thereby gradually achieving emission concentration of nitrogen oxides of below 100 mg/m³ for all production lines.

In terms of emission reduction of sulphur dioxide, in order to achieve emissions at target levels, the Group selectively applied desulphurization technology according to the actual needs of operation of each production line. During the year, the Group built a wet-process desulphurization system at the cement production plant in Hepu, Guangxi. As of the end of December 2021, the Group completed the construction of 4 sets of wet-process desulphurization systems and 11 sets of composite desulphurization systems. The Group plans to implement upgrade and transformation to increase the capacity of wet-process desulphurization at the cement production plant in Changjiang, Hainan, which will further reduce the emission concentration of sulphur dioxide.

In terms of emission reduction of particulate matters, the Group continuously promoted different types of technologies of bag filters in high temperature for ultra-low emissions at each production plant. As of the end of 2021, 42 out of 46 clinker production lines of the Group achieved an annual average emission concentration of particulate matters of below 10 mg/m³, achieving ultra-low emissions of particulate matters.

As of the end of 2021, the cement production plants located in Tianyang, Nanning, Pingnan, Wuxuan, Guigang, Binyang and Fuchuan of Guangxi, Heqing of Yunnan, Jinsha of Guizhou, and Changzhi of Shanxi had been included as green factories in the register of national-level Green Manufacturing. The cement production plants located in Shangsi, Luchuan and Hepu of Guangxi, and Longyan, Yanshi, Caoxi and Yongding of Fujian had been included as green factories in the registers of provincial-level or AR-level Green Manufacturing.

截至二零一九年、二零二零年、二零二一年十二月三十一日止年度，本集團水泥生產基地主要排放口的污染物排放數據載列如下：

Data of pollutants emitted from the major discharge outlets of the Group's cement production plants for the years ended 31 December 2019, 2020 and 2021 is set out as follows:

		二零二一年 (噸) 2021 (tons)	二零二零年 (噸) 2020 (tons)	二零一九年 (噸) 2019 (tons)
氮氧化物排放量	Emission of nitrogen oxides	30,324	36,194	37,584
二氧化硫排放量	Emission of sulphur dioxide	1,501	1,646	1,824
顆粒物排放量	Emission of particulate matters	1,381	1,777	2,083

截至二零一九年、二零二零年、二零二一年十二月三十一日止年度，本集團水泥生產基地主要排放口的污染物平均排放濃度以及國家相關標準對標載列如下：

The average emission concentrations of pollutants emitted from the major discharge outlets of the Group's cement production plants for the years ended 31 December 2019, 2020 and 2021 as well as the benchmarks of relevant national standards are set out as follows:

水泥工業大氣污染物 排放標準 (GB 4915-2013) Emission Standard of Air Pollutants for Cement Industry (GB 4915-2013)				本集團水泥生產基地 主要排放口的污染物平均排放濃度 Average emission concentrations of pollutants emitted from the major discharge outlets of the Group's cement production plants		
一般排放限值 (毫克/ 立方米) Ordinary emission limits (mg/m ³)		特別排放限值 (毫克/ 立方米) Special emission limits (mg/m ³)		二零二一年 (毫克/ 立方米) 2021 (mg/m ³)	二零二零年 (重列後) (毫克/ 立方米) 2020 (restated) (mg/m ³)	二零一九年 (重列後) (毫克/ 立方米) 2019 (restated) (mg/m ³)
氮氧化物	Nitrogen oxides	400	320	208	221	232
二氧化硫	Sulphur dioxide	200	100	10	10	11
顆粒物	Particulate matters	30	20	6	9	9

2、 碳排放管理

中國政府提出力爭於二零三零年前二氧化碳排放達到峰值的目標，以及在二零六零年前努力爭取實現碳中和的願景。本集團持續深化落實國家「雙碳」目標和能耗「雙控」政策，積極推動節能減碳工作，強化節能減碳考核力度，落實「十四五」規劃目標任務，實施生產線技術升級與低碳轉型。同時對標世界一流企業，持續完善、創新EHS管理體系，優化EHS組織架構，不斷提升EHS智能化管理水平，積極推進「花園工廠」創建，計劃系統開展碳減排技術研發和應用，推動減碳示範項目建設，堅持綠色低碳發展。

本集團高度重視碳排放控制工作，二零二一年，結合自身實際情況及發展戰略，制定了《碳排放控制戰略規劃》，將有助提升碳排放控制管理能力和水平，推動企業綠色低碳和可持續發展。本集團目標於二零二五年二氧化碳排放總量達峰，噸熟料二氧化碳排放量較二零二零年下降2%，努力於二零六零年實現產業鏈碳中和。

根據規劃，本集團將優化碳排放管理模式和制度，強化碳排放控制管理能力；成立碳排放管理領導小組，由總裁任組長，統籌碳排放控制工作開展。EHS部作為碳排放日常管理部門，組織、協調各部門從戰略、項目實施、碳資產管理、技術研發等方面開展碳排放管理工作。同時，本集團加強碳排放專業人才隊伍建設，通過內部專業研究及內外部專業培訓相結合的方式，持續提升專業人才技術能力水平。

2. MANAGEMENT OF CARBON EMISSIONS

The Chinese government proposes to strive for the target of peaking carbon dioxide emissions before 2030 and achieving the vision of carbon neutrality before 2060. The Group continued to deepen the national “dual carbon” targets and the “dual control” energy consumption policy, proactively expedite energy saving and carbon reduction, strengthen appraisal on energy saving and carbon reduction, and implement technological upgrade and low-carbon transformation for production lines in order to implement the targets and missions for the “Fourteenth Five-Year” Plan. At the same time, by benchmarking against global first-class enterprises, the Group continued to improve and innovate on the EHS management system and optimize the EHS organizational structure for the persistent enhancement of EHS intelligent management standards. We proactively rolled out the construction for “garden factories”, planned to launch the R&D and application of emission reduction technologies systemically, and expedite the construction of pilot projects for carbon reduction to insist on green low-carbon development.

The Group attached great importance to the control of carbon emissions. In 2021, the “Strategic Plan for Control of Carbon Emissions” had been formulated in light of our own actual circumstances and development strategies, which will enhance the management capabilities and standards for controlling carbon emissions, and promote the green, low-carbon and sustainable corporate development. The Group targets for peaking its total carbon dioxide emissions by 2025 and reducing carbon dioxide emissions per ton of clinker by 2% compared to 2020, and strives to achieve carbon neutrality in our industry chain by 2060.

According to the plan, the Group will optimize the management model and system of carbon emissions and strengthen the management capabilities on controlling carbon emissions. A leading group for carbon emissions management was established, with the Chief Executive Officer serving as the leader to coordinate the launch of control on carbon emissions. As the department responsible for the daily management of carbon emissions, the EHS department organizes and coordinates the management of carbon emissions of various departments from the aspects of strategy, project implementation, carbon asset management, and R&D on technology. At the same time, the Group reinforces the team building of professional talents for carbon emissions and continuously improves the level of technological capabilities of professional talents through a combination of internal professional research with internal and external professional training.

在「十四五」期間，本集團主要通過降低能耗（具體措施於本報告「能源及資源管理」中闡述）、使用清潔能源、研發低碳水泥、利用工業廢渣替代石灰石、研究及試點替代熟料、替代燃料、碳捕捉與利用等新技術及新工藝等方式降低碳排放。

清潔能源方面，本集團計劃先於廣東封開、羅定，廣西武宣、田陽、陸川、平南等水泥生產基地，以及部份骨料、裝配式建築工廠等條件合適的位置，推動分佈式光伏項目試點，並逐步推廣至其他生產基地。目標至二零二五年，光伏裝機容量超過150兆瓦，年發電量超過1.5億千瓦時。

低碳產品方面，本集團正在研究開發水硬性低鈣水泥和氣硬性低鈣膠凝材料，前者氧化鈣含量較低，主要有高貝利特水泥、硫鋁酸鹽水泥等；後者在水化過程中可以吸收二氧化碳，具有固碳潛力。本集團目前在福建及海南積極推廣核電水泥、道路水泥及高貝利特水泥，降低二氧化碳排放。與普通水泥熟料相比，核電水泥、道路水泥、高貝利特水泥的噸熟料二氧化碳排放量分別減少約1.5%、1.6%、2.2%。截至二零二一年底，位於廣東羅定，廣西武宣、南寧、貴港、田陽、平南、合浦、陸川、富川、賓陽、上思，雲南鶴慶以及山西長治的生產基地的多項水泥及熟料產品已通過低碳產品認證。

替代原料方面，本集團計劃根據水泥生產基地周邊的資源情況，使用電石渣、鋼渣、磷石膏渣等工業廢渣，替代水泥熟料原料部份石灰石，減少石灰石中碳酸鹽分解產生的碳排放。

During the “Fourteenth Five-Year” period, the Group will mainly reduce carbon emissions through reduction of energy consumption (detailed measures are described in “Energy and Resources Management” of this report), application of clean energy, R&D on low-carbon cement, usage of industrial waste instead of limestone, and research and pilot trial on new technologies and new techniques such as alternative clinkers, alternative fuels, carbon capture and utilization.

In terms of clean energy, the Group plans to first roll out pilot projects for distributed photovoltaic power at the cement production plants in Fengkai and Luoding of Guangdong, Wuxuan, Tianyang, Luchuan and Pingnan of Guangxi, as well as some aggregates and prefabricated construction factories where conditions are suitable, which will be gradually promoted at other production plants. It is targeted that, by 2025, the total installed capacity of photovoltaic power generators will exceed 150 megawatt and the annual power generation will exceed 150 million kwh.

In terms of low-carbon products, the Group is undergoing R&D for low-calcium hydraulic cement and low-calcium air-entrained cementitious materials. The former has relatively low content of calcium oxide, and mainly includes high-belite cement and sulfoaluminate cement. With the potential for carbon sequestration, the latter can absorb carbon dioxide during hydration process. Currently, the Group proactively promotes cement for nuclear power plants, cement for roads and high-belite cement in Fujian and Hainan to reduce carbon dioxide emissions. As compared with ordinary cement and clinker, carbon dioxide emissions per ton of clinker from cement for nuclear power plants, cement for roads and high-belite cement decrease by approximately 1.5%, 1.6% and 2.2% respectively. As of the end of 2021, various cement and clinker products of the Group’s production plants located in Luoding of Guangdong, Wuxuan, Nanning, Guigang, Tianyang, Pingnan, Hepu, Luchuan, Fuchuan, Binyang and Shangsi of Guangxi, Heqing of Yunnan and Changzhi of Shanxi had passed the low-carbon product certification.

In terms of alternative raw materials, based on the resources in the vicinity of cement production plants, the Group plans to use industrial wastes such as carbide slag, steel slag and phosphogypsum slag to partly replace limestone as the raw materials of cement and clinker to reduce the carbon dioxide emissions generated from the decomposition of carbonate in limestone.



本集團正在開展替代熟料(如應用高活性混合材燒結黏土、開發新型膠凝材料、混合材的活性激發等)及替代燃料(如生物質燃料、工業廢棄物等)等新技術及新工藝的應用研究。在替代燃料方面,本集團計劃在有條件的水泥基地推廣水泥窯協同處置項目,並研究開發新型協同處置新技術,以增加燃料替代比例。

此外,本集團計劃在「十四五」期間開展二氧化碳捕集與利用技術研究及試點,為未來進一步推廣作準備。同時,本集團計劃推廣低碳物流,探索無人駕駛技術的應用,推廣新能源工程機械和車輛,對礦區、廠區物料輸送路線進行優化,縮短運輸距離、減少傳統燃料消耗。

本集團積極跟進並落實國家碳排放政策,響應建材行業碳達峰、碳中和行動倡議書,計劃修訂及完善本集團的《排放權交易管理辦法》,做好碳排放數據盤查,探索碳資產管理模式,提升碳資產管理能力,為未來全國碳市場統一作準備。自二零一三年開始,本集團積極參與碳市場試點工作,廣東8家工廠、福建5家工廠每年按要求完成碳排放核查、配額清繳工作,履約率達到100%。

二零二一年,本集團水泥熟料的溫室氣體排放量為53,404,000噸二氧化碳當量,同比減少10.4%,其中範圍1溫室氣體排放量為52,203,000噸二氧化碳當量,同比減少10.4%;範圍2溫室氣體排放量為1,201,000噸二氧化碳當量,同比減少11.6%。

The Group has been working on the applied research of new technologies and new techniques for alternative clinker (such as the application of highly active sintered clay with mixed materials, the development of new-type cementitious materials, and the active stimulation of mixed materials, etc.) and alternative fuel (such as biomass fuel and industrial waste). In terms of alternative fuel, the Group plans to promote projects for co-processing by use of cement kilns at qualified cement production plants and conduct R&D of new technologies for new-type co-processing to increase the proportion of fuel replacement.

Besides, during the “Fourteenth Five-Year” period, the Group plans to launch technological research and pilot application of carbon dioxide capture and utilization to prepare for further promotion in the future. At the same time, the Group plans to promote low-carbon logistics, explore the application of unmanned driving technology, promote new-energy engineering machineries and vehicles, and optimize the routes for materials delivery in mining areas and factory areas in order to shorten the transportation distance and reduce the consumption of traditional fuel.

The Group proactively follows up and executes the national policies for carbon emissions and responds to the advocates by the building materials industry on actions for carbon emissions peaking and carbon neutrality. The Group also plans to revise and improve the “Administrative Measures for Emissions Trading”, examine the carbon emissions data thoroughly, explore models for carbon asset management, and enhance capabilities of carbon asset management in preparation for the future unification of the national carbon trading market. Since 2013, the Group actively participated in the pilot trial of the carbon trading market. 8 plants in Guangdong and 5 plants in Fujian of the Group had completed carbon emissions verification and settled the carbon credit quota every year, achieving a 100% contract fulfilment rate.

In 2021, the greenhouse gases emissions of the Group were 53,404,000 tons of carbon dioxide equivalent, representing a year-on-year decrease of 10.4%. Among which, greenhouse gases emissions (scope 1) were 52,203,000 tons of carbon dioxide equivalent, representing a year-on-year decrease of 10.4%, and greenhouse gases emissions (scope 2) were 1,201,000 tons of carbon dioxide equivalent, representing a year-on-year decrease of 11.6%.

未來本集團將把落實碳達峰、碳中和工作作為重要任務，把應對氣候變化作為推動實現高質量發展的重要抓手，實現企業低碳轉型。除了持續推動水泥業務碳減排，本集團沿著上下游產業鏈，拓展骨料、裝配式建築和人造石材等新業務，為實現產業鏈碳中和奠定基礎。

3、 能源及資源管理

本集團嚴格遵守有關能源及資源管理的法律及規例，其中包括《中華人民共和國節約能源法》、《中華人民共和國礦產資源法》、《中華人民共和國資源稅法》。本集團設有能源管理系統及《節能減排監督管理》制度，對生產過程中資源消耗量進行統計，用於評估生產基地的運營表現，提高能源及資源利用率和經濟效益。此外，本集團亦持續推動節約能源工作，通過對標世界一流企業找差距，將持續開展新技術、新裝備、新材料和創新成果推廣、應用，涉及能源的節約和循環利用、節能環保技術投資、減排技術改造及研發與創新等。

節能降耗方面，本集團所有水泥熟料生產基地均配套餘熱發電系統，二零二一年，餘熱發電量約為1,883,800,000千瓦時，佔本集團生產水泥產品所需電耗約31.4%。本集團積極響應國家政策，制定節能減碳行動方案，主要通過增加生料助磨劑、節煤劑，實施替代燃料，推動燒成系統迭代升級，推廣新技術新裝備應用等方式實現能耗水平下降。目標至二零二五年前，單位產品綜合能耗達標桿水平的產能超過30%。

In the future, in order to achieve low-carbon corporate transformation, the Group will treat the implementation of carbon emissions peaking and carbon neutrality as important missions, and regard response to climate change as the important leverage for expediting the achievement of high-quality development. Other than the continuous promotion of carbon emissions reduction from the cement business, the Group will expand new businesses such as aggregates, prefabricated construction and engineered stones along the upstream and downstream industry chain, which lays the foundation for achieving carbon neutrality along the industry chain.

3. ENERGY AND RESOURCES MANAGEMENT

The Group strictly abides by the relevant laws and regulations on energy and resources management, including the Energy Conservation Law of the People's Republic of China, the Mineral Resources Law of the People's Republic of China and the Law on Resource Tax of the People's Republic of China. The Group has an energy management system and the policy "Supervision and Management of Energy Saving and Emission Reduction". All resources consumed during production process are measured for the assessment of operational performance of the production plant in order to enhance the utilization rates of energy and resources as well as economic benefits. In addition, the Group persistently encourages energy saving. Room for improvement is found by benchmarking against global first-class enterprises. We continued to roll out the promotion and application of new technology, new equipment, new materials and innovative achievements, saving and recycled use of energy, investment of environmental protection technologies for energy saving, technological upgrade on emission reduction, R&D and innovation.

In terms of energy saving and consumption reduction, all the cement and clinker production plants of the Group are equipped with residual heat power generation systems. In 2021, approximately 1,883.8 million kwh of electricity was generated from residual heat, representing approximately 31.4% of the Group's electricity consumption required for production of cement products. The Group actively responded to national policies and formulated action plans for energy saving and carbon emissions reduction, mainly by increasing grinding aids of raw materials and coal-saving agents, implementing alternative fuels, promoting upgrade of the firing system and the application of new technologies and new equipment, in order to achieve reduction in energy consumption levels. It is targeted that by 2025, the production capacity with comprehensive energy consumption per unit product that meets the benchmark level shall exceed 30%.



本集團持續推進精益管理，推動節能降耗技改項目，通過綜合利用粉煤灰、煤矸石或電石渣等當地資源優勢，通過熱值貢獻或改善熟料易燒性，實現資源綜合利用，降低煤耗；同時通過推廣高效節能風機、節能空壓機、鼓風機等技術降低電耗。本集團自二零一二年以來已全面推廣使用助磨劑，使用水泥助磨劑可減少水泥生產過程中的熟料和電力消耗，並使水泥質量保持穩定。

本集團積極推動數字化轉型，與西門子合作在廣西田陽的水泥生產基地試點建設數字化智能工廠，一期工程於二零二零年七月上線運行，二零二一年配套實施了視頻監控系統、設備在線監測擴展、數字化礦山系統上線，並正在推進實施自動化實驗室。項目建成將有助提升工廠生產效率。此外，本集團圍繞EHS、運營、生產、設備、質量、礦山及物流等方面開展智能製造建設，並在廣東封開的水泥生產基地開始建設「燈塔工廠」。同時，本集團積極推廣水泥窯協同處置項目，利用生活垃圾、市政污泥、工業危險廢物的熱值替代部份燃料，減少煤耗和碳排放。

在「十四五」期間，本集團計劃升級「二代水泥」技術，如使用高能效預熱預分解先進燒成技術、第四代篦式冷卻機、高性能隔熱材料、立磨節能技術等，實現能源使用效益的提升。此外，本集團計劃於廣西平南的水泥生產基地開展富氧燃燒新技術研發，通過提高燃燒效率，實現節能減排。目標至二零二五年，噸熟料標準煤耗、噸熟料綜合電耗、噸PO42.5水泥工序電耗較二零一五年（107.6公斤、55.1千瓦時、31.2千瓦時）分別下降5%、10%和16%。其中，二零二一年噸熟料標準煤耗、噸熟料綜合電耗、噸PO42.5水泥工序電耗較二零一五年分別下降4%、7%和11%。

The Group continuously implements lean management and technological upgrade projects for energy saving and consumption reduction. Composite utilization of resources and reduced coal consumption had been achieved through composite utilization of local resources such as fly ash, coal gangue or carbide slag, through contribution of heat value or improvement of clinker combustibility. Electricity consumption had been reduced at the same time by promoting the technologies of highly effective energy-saving fans, energy-saving air compressors and air blowers. The Group had fully promoted the use of grinding aids since 2012. Use of grinding aids for cement could reduce consumption of clinker and electricity during the process of cement production and maintain stable quality for cement.

The Group proactively promotes digital transformation. In cooperation with Siemens, a pilot intelligent manufacturing factory is being constructed at the cement production plant in Tianyang, Guangxi. Phase 1 of the project commenced operation in July 2020. CCTV system, expansion of online monitoring equipment and launch of digital mining system had been complemented and implemented in 2021, and automated laboratory is being implemented. Completion of the project construction will be conducive to enhancing production efficiency of the factory. In addition, the Group commenced the construction of intelligent manufacturing centred on the aspects of EHS, operation, production, equipment, quality, mines and logistics and a “lighthouse factory” at the cement production plant in Fengkai, Guangdong. Meanwhile, the Group actively promotes co-processing projects by use of cement kilns, which makes use of the heat value of municipal solid waste, urban sludge and hazardous industrial waste to replace some of the fuel, thereby reducing coal consumption and carbon emissions.

During the “Fourteenth Five-Year” period, the Group plans to upgrade the “second-generation cement” technology for achieving enhancement of energy efficiency, such as by the use of advanced combustion formation technology with energy-efficient pre-heating and pre-decomposition, the fourth-generation grate cooler, high-performance heat insulating materials, energy saving technology for vertical grinding, etc. Furthermore, the Group plans to roll out R&D on the new technology of oxygen-enriched combustion at the cement production plant in Pingnan, Guangxi to achieve energy saving and emission reduction by increasing combustion efficiency. It is aimed to reduce standard coal consumption per ton of clinker by 5%, consolidated electricity consumption per ton of clinker by 10% and electricity consumption per ton of PO42.5 cement processed by 16% respectively by 2025 as compared with 2015 (107.6 kg, 55.1 kwh and 31.2 kwh). Among which, the standard coal consumption per ton of clinker, the consolidated electricity consumption per ton of clinker and the electricity consumption per ton of PO42.5 cement in 2021 decreased by 4%, 7% and 11% respectively as compared with 2015.

本集團積極宣導節約用水、循環用水。在水泥生產基地持續開展工業廢水、生活污水、初期雨水收集回用的全面綜合治理，參考國家一級排放標準制定了嚴格的生活污水處理工序和指標：以分類收集、分質處理、分段回用為設計原則，通過預處理、生化法等工藝處理生活污水，通過預處理（混凝沉澱）、深度處理（砂濾、膜處理等）等工藝處理工業廢水，最終實現廠區雨污分流，生活污水、工業廢水經處理達標後全部回用於廠區，達到廢水零排放。截至二零二一年底，廢水零排放項目在位於廣東封開、廉江，廣西南寧、平南、武宣、貴港、田陽、富川，以及福建龍岩的9個水泥生產基地的推廣實施，在穩定運行前提下，實現了廢水零排放及水資源綜合利用的目標，並在二零二一年內啟動位於廣東、廣西、福建、雲南的6個水泥生產基地的相關項目，未來將逐步推廣至本集團其他水泥生產基地。在混凝土攪拌站，通過推廣應用泥漿壓濾機，提高廢水回收利用，截止二零二一年底，本集團位於中國內地的混凝土攪拌站全面實現廢水零排放目標。本集團主要運營區域均不處於水資源稀缺地區。

二零二一年，本集團的水資源消耗量¹約30,254,000噸，其中生產水泥及熟料的水資源消耗量約28,411,000噸，密度為355.8公斤／噸水泥產量；生產混凝土的水資源消耗量約1,843,000噸，密度為128.4公斤／立方米混凝土產量（二零二零年分別約31,392,000噸、約29,831,000噸、346.7公斤／噸水泥產量、約1,561,000噸、120.2公斤／立方米混凝土產量）。

¹ 統計範圍為本集團付費的購水量。

The Group actively promotes conservation and recycling of water. We continuously initiate the comprehensive composite treatment and management on the recovery and recycled use of industrial wastewater, domestic wastewater and initial rainwater at our cement production plants. Strict procedures and standards for treatment of domestic wastewater were formulated with reference to national first-class emission limits: design principles of collection by type, treatment by quality and multi-phase recycled use were adopted to treat domestic wastewater with techniques such as pre-treatment and biochemical methods and to treat industrial wastewater with techniques such as pre-treatment (coagulation-sedimentation) and intensive treatment (sand filtration, membrane processes, etc.), which finally achieved separation of rainwater and wastewater in the factory zones. Treated domestic wastewater and industrial wastewater which meet the standards are fully recycled for use in factory zones, and zero discharge of wastewater is fulfilled. As of the end of 2021, the project for zero discharge of wastewater was promoted and implemented at 9 cement production plants in Fengkai and Lianjiang of Guangdong, Nanning, Pingnan, Wuxuan, Guigang, Tianyang and Fuchuan of Guangxi, and Longyan of Fujian. The goals of zero discharge of wastewater and composite utilization of water resources had been achieved under the condition of stable operation. Relevant project had been launched at 6 cement production plants in Guangdong, Guangxi, Fujian and Yunnan during 2021. It will be gradually promoted at other cement production plants of the Group in the future. As of the end of 2021, the Group's concrete batching plants located in the Chinese Mainland had fully achieved the goal of zero discharge of wastewater through promoting the application of slurry filter press at concrete batching plants to recover and recycle more wastewater. The major operating regions of the Group are not located in districts of water scarcity.

In 2021, water consumption of the Group¹ was approximately 30,254,000 tons, among which, water consumption for the production of cement and clinker was approximately 28,411,000 tons and intensity was 355.8 kg per ton of cement produced; water consumption for the production of concrete was approximately 1,843,000 tons and intensity was 128.4 kg per m³ of concrete produced (approximately 31,392,000 tons, approximately 29,831,000 tons, 346.7 kg per ton of cement produced, approximately 1,561,000 tons, and 120.2 kg per m³ of concrete produced respectively in 2020).

¹ The scope of statistics covers water purchased by the Group



4、 廢棄物管理

本集團的所有熟料生產線在物料處理、輸送過程中均採用全封閉式運送，各轉運點配置除塵器收集顆粒物，以減少揚塵。本集團將高效袋式除塵器收集的粉塵應用於原料、半成品、成品中，循環利用生產過程中產生的廢棄物。礦區採用無廢或少廢工藝，對剝離土、夾石等無害廢棄物全部綜合利用，實現廢渣零排放。對於廢鐵、廢皮帶等，交由有資質的第三方機構定期回收使用。二零二一年，本集團的無害廢棄物產生量約135,580噸，無害廢棄物處理量約108,220噸，處理率約80%，剩餘無害廢棄物將在倉庫內存放，待回收處理。

在有害廢棄物方面，本集團遵循「無害化、減量化、資源化」原則，將生產製造過程產生的廢油充分循環利用為機械及其他傳動設備潤滑，最大限度減少危廢產生量。對於廢油桶及無法再利用的廢油等其他危險廢物，嚴格執行國家法律法規要求，由原生產商回收或委託有資質的第三方機構進行回收或處理。二零二一年，本集團的有害廢棄物產生量約550噸，有害廢棄物處理量約600噸，處理率約111%，因年內處理了部份往年庫存量。

4. WASTE MANAGEMENT

Fully enclosed delivery is adopted during materials treatment and delivery process at all the clinker production lines of the Group. Each transit point had been equipped with filters to collect particulate matters and minimize dust scattering. The Group applies the dust collected by highly effective bag filters in our raw materials, semi-finished products and finished products in order to recycle the solid waste generated during the production process. Waste-free or less-waste technology has been adopted at mining areas. To achieve zero discharge of waste residue, nonhazardous wastes such as stripped soil and stones are all compositely utilized. Scrap iron and scrap leather belts are recycled and used by qualified third-party institutions on a regular basis. In 2021, non-hazardous wastes produced by the Group amounted to approximately 135,580 tons, approximately 108,220 tons of non-hazardous wastes were processed, and the processing rate was approximately 80%. The remaining non-hazardous wastes will be kept in storage pending recycling and handling.

Regarding hazardous wastes, the Group adequately recycles the waste oil generated in the production process for lubrication of mechanical and other conveying equipment in accordance with the “hazard-free, mass-reducing and recyclable” principle to minimize the production of hazardous wastes. Other hazardous wastes such as oil barrels and non-recyclable waste oil are recycled by the original manufacturers, or recycled or handled by entrusted qualified third-party institutions in strict compliance with the requirements of national laws and regulations. In 2021, hazardous wastes produced by the Group amounted to approximately 550 tons, approximately 600 tons of hazardous wastes were processed, and the processing rate was approximately 111% due to the handling of some inventories of previous years during the year.

5、氣候變化

氣候變化是全人類的共同挑戰，中國政府高度重視應對氣候變化，實施一系列應對氣候變化戰略、措施和行動，參與全球氣候治理。二零二一年一月，中國生態環境部發佈《關於統籌和加強應對氣候變化與生態環境保護相關工作的指導意見》，提出將應對氣候變化作為美麗中國建設重要組成部份，系統謀劃中長期生態環境保護重大戰略，同時推動鋼鐵、建材、有色、化工、石化、電力、煤炭等重點行業提出明確的達峰目標並制定達峰行動方案，加快全國碳排放權交易市場制度建設、系統建設和基礎能力建設，充分利用市場機制控制和減少溫室氣體排放。《碳排放權交易管理辦法（試行）》於二零二一年二月一日開始實施，進一步明確溫室氣體重點排放單位、碳排放配額分配和清繳方式等，有助於規範全國碳排放權交易及相關活動。

十月，中國國務院發佈《關於完整準確全面貫徹新發展理念做好碳達峰碳中和工作的意見》，強調把碳達峰、碳中和納入經濟社會發展全局，以經濟社會發展全面綠色轉型為引領，以能源綠色低碳發展為關鍵，加快形成節約資源和保護環境的產業結構、生產方式、生活方式、空間格局，堅定不移走生態優先、綠色低碳的高質量發展道路。

5. CLIMATE CHANGE

Climate change is the common challenge of all human beings. The Chinese government pays keen attention to responding to climate change by implementing a series of strategies, measures and actions in response to climate change and in participation of treatment and management of global climate. In January 2021, the Ministry of Ecology and Environment of China issued the “Guiding Opinions on Organizing and Strengthening Relevant Works of Responding to Climate Change and Ecological Environmental Protection”, which proposed that responding to climate change will become an important constituent for the construction of a beautiful China and systematically blueprinted major strategies for ecological and environmental protection in the medium to long term. It also gives impetus to key industries including steel, building materials, non-ferrous metals, chemicals, petrochemicals, power and coal industries to set specific targets and formulate action plans for peaking carbon emissions, accelerate the construction of policies, systems and fundamental capability for the national carbon emissions trading market, and control and reduce greenhouse gases emissions by fully utilizing market mechanisms. The “Administrative Measures for Carbon Emission Rights Trading (Trial)” had come into effect on 1 February 2021. It had further specified key emission units of greenhouse gases, allocation of carbon emissions quota and ways of settlement, which will be conducive to regulating national carbon emissions trading and relevant activities.

In October, the State Council of China issued the “Opinions on the Complete, Accurate, Full and Thorough Implementation of the New Development Philosophy for Carbon Emissions Peaking and Carbon Neutrality”, which emphasized on incorporating carbon emissions peaking and carbon neutrality into overall economic and social development. Led by comprehensive green transformation of economic and social development, and with green low-carbon energy development as the key, the government will accelerate the formation of resources-saving and environmentally-protective industrial structure, production means, lifestyles and spatial pattern, on the unwavering way to the path for green low-carbon high-quality development with priority to ecology.



中國國務院印發《2030年前碳達峰行動方案》，目標到二零三零年，非化石能源消費比重達到25%左右，單位國內生產總值二氧化碳排放比二零零五年下降65%以上，順利實現二零三零年前碳達峰目標。

十一月，中國國務院國有資產監督管理委員會印發《關於推進中央企業高質量發展做好碳達峰碳中和工作的指導意見》，把碳達峰、碳中和納入企業發展全局，著力佈局優化和結構調整，深化供給側結構性改革，降強度控總量，推動科技和制度創新，加快綠色低碳轉型和高質量發展。

二零二一年，本公司識別氣候變化帶來的主要風險及機遇，並制定應對氣候變化的有效戰略舉措，未來將持續進行評估和檢討，強化管理成效。

The State Council of China issued the “Action Plan for Peaking Carbon Emissions before 2030”, which targeted that, by 2030, the proportion for non-fossil energy consumption shall reach approximately 25% and carbon dioxide emissions per unit of GDP shall decrease by more than 65% compared to 2005, which will smoothly enable carbon emissions peaking before 2030.

In November, the State-owned Assets Supervision and Administration Commission of the State Council of China issued the “Guiding Opinions on Promoting the Work of State-Owned Enterprises for High-Quality Development, Carbon Dioxide Peaking and Carbon Neutrality”, which incorporated carbon emissions peaking and carbon neutrality into overall corporate development, focused on layout optimization and restructuring, deepened supply-side structural reform, reduce intensity and control quantity, and promoted innovation on technology and system for accelerating green low-carbon transformation and high-quality development.

In 2021, the Company identified the major risks and opportunities of climate change, and formatted effective strategic measures to respond to climate change. In the future, we will conduct ongoing assessment and review to strengthen management effectiveness.



(i) 氣候變化風險

(i) Risks of Climate Change

序號 No.	風險類別 Type of Risks	風險描述 Description of Risks	應對舉措 Response Measures
1	轉型風險： 政策及法律 Transition Risks: Policies and Laws	<ul style="list-style-type: none"> 中國政府的碳排放相關政策、法律法規將漸趨嚴格，全國碳排放權交易市場建設正積極推進。 The Chinese government's relevant policies, laws and regulations on carbon emissions are gradually becoming stricter. The construction of national carbon emissions trading market is being proactively promoted. 	<ul style="list-style-type: none"> 於二零二一年制定了《碳排放控制戰略規劃》，未來將持續完善。 The "Strategic Plan for Control of Carbon Emissions" had been formulated in 2021, which would be continuously improved in the future. 計劃通過降低能耗、使用清潔能源、研發低碳水泥、利用工業廢渣替代石灰石、研究及試點替代熟料、替代燃料、碳捕捉與利用等新技術及新工藝等方式降低碳排放。 It is planned to reduce carbon emissions through reduction of energy consumption, application of clean energy, R&D on low-carbon cement, usage of industrial waste instead of limestone, and research and pilot trial on new technologies and new techniques such as alternative clinkers, alternative fuels, carbon capture and utilization. 積極為未來水泥全國碳市場統一作準備。 The Group is in proactive preparation for the future unification of national carbon market.
2	實體風險： 極端天氣 Physical Risks: Extreme Weather	<ul style="list-style-type: none"> 極端天氣(暴雨、颱風、大雪、洪澇、高溫、嚴寒等)。 Extreme weather (rainstorm, typhoon, heavy snow, flood, high temperature, severe coldness, etc.). 	<ul style="list-style-type: none"> 強化風險分析，組織實施重點區域隱患排查，加強災害防治的統籌協調，制定應急預案並定期組織災害安全演練，增加員工的防範意識及應變能力。 We strengthen risks analysis, organize and execute inspections of latent hazards in key regions, reinforce overall planning and coordination of disaster prevention and treatment, formulate contingency plans and regularly organize disaster safety drills to arouse the staff's precautionary awareness and resilience. 購買保險，保障各類災害、意外所造成的人身傷害及財物損失。 Insurance is taken out to secure personal injuries and property damage caused by various disasters and accidents. 持續拓展多個採購渠道，持續了解運營區域供電、供煤情況，保障供應。 We continue to expand multiple procurement channels and understand the situation of power supply and coal supply to secure supply. 視天氣情況，安排貨物出廠，如遇極端天氣，停止發運，對中轉庫員工進行安全轉移、固定裝卸設備，並提前告知客戶、運輸公司合理安排車輛；協助門店客戶對貨物進行存儲轉置。 Shipping arrangement of goods is dependent on the weather conditions. During extreme weather, shipping is suspended, silo employees are relocated to safe places, loading and unloading equipment are fixed. Customers and transportation companies are also advised in advance for reasonable arrangement of vehicles. Retail customers are offered assistance on storage and transpose of goods.



(ii) 氣候變化機遇

(ii) Opportunities for Climate Change

序號 No.	機遇類別 Types of Opportunities	機遇描述 Description of Opportunities	戰略舉措 Strategic Measures
1	政策及法律 Policies and Laws	<ul style="list-style-type: none"> 中國政府積極推進綠色工廠及綠色礦山建設，對水泥行業的環保要求逐步提升。 The Chinese government proactively promotes the construction of green factories and green mining, and gradually raises the requirements of cement industry on environmental protection. 中國政府積極推進全國碳排放權交易市場建設。 The Chinese government proactively promotes the construction of national carbon emissions trading market. 	<ul style="list-style-type: none"> 持續推動節能減排，提升生產運營效率，推進資源綜合利用，長遠降低運營成本，進一步鞏固在行業中的競爭優勢。 Energy saving and emission reduction are continuously advanced to enhance efficiency of production and operation, promote composite utilization of resources, decrease operational costs in the long run and further consolidate the competitive advantages in the industry. 積極跟進國家最新政策，計劃做好碳排放數據盤查，探索碳資產管理模式，提升碳資產管理能力，助力企業碳資產保值及增值。 We will actively follow up with the latest national policies, plan to examine the carbon emissions data thoroughly, explore models for carbon asset management, and enhance capabilities of carbon asset management to achieve value preservation and value addition of corporate carbon assets.
2	產品和服務 Products and Services	<ul style="list-style-type: none"> 隨著中國政府推動綠色建築，客戶對低碳水泥、綠色建材產品和服務的需求將上升。 Following the Chinese government's promotion of green construction, customers' demand for low-carbon cement, green products and services for construction materials will increase. 	<ul style="list-style-type: none"> 計劃開展低碳水泥和高碳吸收混凝土技術的研發，開展精品骨料研發與應用，從而降低膠凝材料用量，減少碳排放。 It is planned to roll out R&D on the technology of low-carbon cement and high carbon absorbing concrete, launch R&D and application of quality aggregates to reduce the consumption of cementitious materials and reduce carbon emissions. 按客戶個性化需求供應可靠穩定綠色建築材料。 Reliable and stable green construction materials are supplied based on customers' personalized needs. 持續推動水泥及熟料產品的低碳產品認證。 Low-carbon product certification for cement and clinker products is persistently advocated. 發展更低碳環保的無機人造石產品替代高能耗的瓷磚產品。 Lower-carbon and more environmentally-friendly inorganic engineered stone products are developed to replace ceramic tile products of high energy consumption.
3	市場 Markets	<ul style="list-style-type: none"> 中國政府推動綠色建築發展，全國及地方政府陸續推出各項支持裝配式建築發展的政策，並鼓勵建築垃圾資源化利用，改善城市環境。 The Chinese government advocates green construction development. National and local governments successively launch various policies to support the development of prefabricated construction, and encourage the resourceful utilization of construction wastes to improve urban environment. 	<ul style="list-style-type: none"> 與現澆住宅建設方式相比，裝配式住宅擁有材料節約、節能等環保優勢，且有利於提升建築質量及建設效率。 Compared to the existing cast-in-place construction of residence, prefabricated residence has the advantages of environmental protection in terms of materials conservation and energy saving. It is also conducive to enhancing quality of buildings and efficiency of construction. 本集團積極推動裝配式建築項目建設，發展混凝土預制構件以及蒸壓加氣混凝土板材。 The Group proactively promotes the construction of prefabricated construction projects to develop precast concrete components and autoclaved aerated lightweight concrete panels. 本集團在海南昌江的建築垃圾消納場項目已投產，有助減少天然資源消耗，推動行業綠色發展。 The Group's construction waste disposal plant project in Changjiang, Hainan had commenced operation, which will help to reduce consumption of natural resources and promote green development of the industry.



6、 綠色發展

協同處置

本集團積極履行社會責任，助力綠色發展，實現企業的可持續發展。依托自身技術優勢，全面推進城鄉生活垃圾、市政污泥及工業危險廢物三個領域的協同處置項目，打造完整的固廢處置解決方案。

本集團利用水泥窯協同處置固體廢棄物，較傳統填埋方式大幅節約土地資源，減少對環境造成的危害，而且有效利用窯內高溫去除二噁英等有毒污染物，真正實現「無害化、減量化、資源化」處置，成為「城市共同體」，改善當地居民的生活環境，控制和預防各種傳染病、公害病，提高人民的健康水平。

二零二一年，本集團與環保公司合作發展的廣西上思及福建雁石協同處置項目，分別於一月及五月開始試運營。此外，年內，合營公司位於廣東廣州的越堡污泥處置系統清潔化生產改造項目於十月建成試運營，折合濕污泥年處理能力從300,000噸提升至560,000噸。

6. GREEN DEVELOPMENT

Co-Processing

The Group proactively fulfils its social responsibility in fostering green development to achieve sustainable corporate development. In reliance on our own technological advantages, we comprehensively promote co-processing projects in the three scopes of municipal solid waste, urban sludge and hazardous industrial waste to create complete solutions to solid waste processing.

Compared to traditional landfilling, co-processing of solid waste by use of cement kilns enables the Group to substantially save land resources, reduce harm done to the environment, and eliminate poisonous pollutants such as dioxin by effective use of heat inside cement kilns, thereby truly achieving “hazard-free, mass-reducing and recyclable” processing. In the “community of shared city”, co-processing projects improve the living environment for local residents, control and prevent various infectious diseases and pollution-related public diseases, and improve the people’s healthiness.

In 2021, the co-processing projects in Shangsi of Guangxi and Yanshi of Fujian jointly developed by the Group and environmental protection companies commenced trial operation in January and May respectively. In addition, during the year, the Clean Production Upgrade Project of Yuebao Sludge Co-Processing System owned by the joint venture located in Guangzhou of Guangdong completed construction and commenced trial operation in October, with enhanced equivalent annual processing capacity of wet sludge from 300,000 tons to 560,000 tons.



截止二零二一年底，本集團共擁有10個協同處置項目，總年處理能力約171萬噸。具體項目如下：

As of the end of 2021, the Group had 10 co-processing projects in total, with annual processing capacity of approximately 1.71 million tons. Details of the projects are set out as follows:

項目 Project	類型 Type	年處理能力 (噸) Annual Processing Capacity (tons)	狀態 Status
廣西賓陽 Binyang, Guangxi	城鄉生活垃圾 Municipal solid waste	110,000	運營中 In operation
廣西田陽 Tianyang, Guangxi	城鄉生活垃圾 Municipal solid waste	180,000	運營中 In operation
雲南鳳慶 (註1) Fengqing, Yunnan (note 1)	城鄉生活垃圾 Municipal solid waste	110,000	運營中 In operation
雲南彌渡 Midu, Yunnan	城鄉生活垃圾 Municipal solid waste	110,000	試運營 In trial operation
廣西南寧 Nanning, Guangxi	市政污泥 (註2) Urban sludge (note 2)	110,000	運營中 In operation
廣州珠水 (註1) Zhushui, Guangzhou (note 1)	市政污泥 (註2) Urban sludge (note 2)	300,000	運營中 In operation
廣州越堡 (註1) Yuebao, Guangzhou (note 1)	市政污泥 (註2) Urban sludge (note 2)	560,000	試運營 In trial operation
海南昌江 Changjiang, Hainan	工業危險廢物 Hazardous industrial waste	30,000	運營中 In operation
廣西上思 (註3) Shangsi, Guangxi (note 3)	工業危險廢物 Hazardous industrial waste	100,000	試運營 In trial operation
福建雁石 (註3) Yanshi, Fujian (note 3)	工業危險廢物 Hazardous industrial waste	80,000	試運營 In trial operation
	市政污泥 Urban sludge	20,000	建設中 Under construction

註：

notes:

- 位於聯營及合營公司的水泥生產基地。
 - 南寧項目處置含水率80%的濕污泥，珠水、越堡項目處置含水率40%以下的乾污泥。市政污泥協同處置項目的年處理能力均折合為濕污泥的年處理能力計算。
 - 本集團與環保公司合作發展的協同處置項目。
- Located in the cement production plants of our associates and joint ventures.
 - The Nanning project co-processed wet sludge of 80% moisture content. The Zhushui and Yuebao projects co-processed dry sludge of below 40% moisture content. The annual processing capacity of each urban sludge co-processing project is calculated as the annual processing capacity of wet sludge.
 - Co-processing projects jointly developed by the Group and environmental protection companies.

此外，二零二零年四月，本集團取得海南昌江建築垃圾資源化利用特許經營許可，建設建築垃圾消納場項目，設計年處置建築垃圾約250,000噸，配套混凝土年產能約300,000立方米，機制砂及碎石年產能約1,150,000噸，並已於二零二一年底竣工投產。該項目符合本集團產業一體化的發展戰略，建成後將有助改善當地城市環境，促進節能減排，減少天然資源消耗，推動行業綠色發展。

資源綜合利用

本集團致力研究和探索工業廢渣在水泥生產中的應用，通過優化生料配方，開展石灰石廢石資源綜合利用項目，實現礦山廢棄資源利用的產業化，促進資源綜合利用及社會廢棄物處置的資源化，對社區環境保護作出積極貢獻。

7、綠色礦山建設

本集團高度重視礦山治理工作，以生態、環保、安全、資源集約利用為工作主線，確立科學規劃、合理開採、節約資源、促進人與自然和諧發展，以及綠色生態型、環境友好型礦山企業的工作思路，將礦山恢復納入生產運營及長期發展規劃。

In addition, in April 2020, the Group obtained a franchise license for the resourceful utilization of construction waste in Changjiang, Hainan to build a construction waste disposal plant project with design annual processing capacity of approximately 250,000 tons of construction waste, and complemented with annual production capacities of approximately 300,000 m³ of concrete and approximately 1,150,000 tons of manufactured sand and gravel. It had completed construction and commenced operation in late 2021. The project is consistent with the Group's strategy of industrial integrative development and, upon completion of construction, will help to improve the local urban environment, foster energy saving and emission reduction, reduce the consumption of natural resources, and promote the green development of the industry.

Composite Utilization of Resources

The Group is dedicated to research and exploration of the application of industrial waste in cement production. Through optimization of the prescription of raw materials, the project on composite utilization of limestone residue resources was launched to achieve industrialization of utilization of mining waste resources, foster composite utilization of resources and recyclability of social waste processing, which is a proactive contribution of environmental protection to the community.

7. GREEN MINE CONSTRUCTION

The Group places strong emphasis on treatment and management of mines. Ecology, environmental protection, safety and intensive utilization of resources are the primary focus of our work. We confirm the work approach of scientific planning, reasonable mining, resources conservation, promotion of harmonious development between human beings and the nature as well as green, ecologically and environmentally friendly mining enterprise. Restoration of mines is included in the production, operation and long-term development plans of the Group.



針對新項目，本集團必須開展項目環評，並在開發建設過程中盡量避免對生態造成破壞。礦山閉坑前，嚴格按申請辦理採礦許可證時編製並經相關自然資源主管部門批准的《礦山地質環境保護與恢復治理方案》及《土地復墾方案》，對礦山環境進行治理與恢復。

本集團積極落實中國國土資源部發佈的《全國礦產資源規劃》和國家六部門聯合印發的《關於加快建設綠色礦山的實施意見》，根據中國自然資源部發佈的《水泥灰岩綠色礦山建設規範》開展綠色礦山建設。在復綠上，積極引進「生物多樣性」概念，根據礦山所在的自然環境條件種植多類植物並搭配合理，使礦區綠化與周邊自然環境和景觀相協調。

截至二零二一年底，本集團共有14座礦山被列入省級或自治區級綠色礦山，10座礦山通過了國家級綠色礦山遴選，並累計完成礦山復綠面積共約2,820,000平方米（二零二零年度：約2,490,600平方米）。

Environmental assessments must be conducted by the Group for new projects and damages on the ecology in the course of development and construction are avoided to the greatest possible extent. Before closure of a mine, the Group would undergo treatment, management and restoration of the environment at the mine in strict compliance with the “Project of Mining Geo-Environmental Protection and Integrated Renovation” and the “Land Rehabilitation Plans” formulated at the time of applying for the mining permits and approved by relevant competent authorities of natural resources.

The Group proactively implements the “National Mineral Resources Plan” issued by the Ministry of Land and Resources of China and the “Implementation Opinions on Accelerating the Construction of Green Mines” jointly issued by six national departments, and initiated the construction of green mines according to the “Green Mine Construction Specification of Cement Limestone” issued by the Ministry of Natural Resources of China. In terms of ecological restoration, the concept of “biodiversity” has been actively introduced by planting various vegetations with reasonable mix and match according to the natural environmental conditions of the mines for a coordinated landscape of the regreened mining area and the surrounding natural environment.

As of the end of 2021, a total of 14 mines of the Group had been included as provincial-level and AR-level green mines, 10 mines had passed the selection of national-level green mines, and ecological restoration of its mines was completed with a cumulative area of approximately 2,820,000 m² (approximately 2,490,600 m² in 2020).



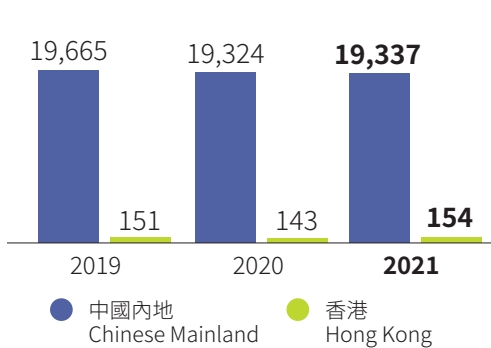
員工

本集團視員工為企業生存和發展最寶貴的資源，為員工提供、創造廣闊的發展平台和施展個人才華的機會。

1、一般資料

於二零二一年十二月三十一日，本集團共聘用19,491名僱員¹（於二零二零年十二月三十一日：19,467名），均為全職僱員。按地區及性別劃分的僱員明細如下：

按地區劃分的僱員 Employees by geographical region



在410名高中級管理人員中，88%為男性及12%為女性，79%持有大學或以上學位，19%曾接受大專教育，且其平均年齡約為48歲（於二零二零年十二月三十一日分別為391名、89%、11%、78%、19%、47歲）。

於二零二一年十二月三十一日，員工整體流失率為7.0%，其中，男性、女性員工的整體流失率分別為6.8%、7.8%；29歲及以下、30至39歲、40至49歲、50歲及以上員工的整體流失率分別為14.0%、6.1%、5.0%、9.7%；中國內地、香港員工的整體流失率分別為6.8%、20.1%（於二零二零年十二月三十一日分別為5.8%；5.6%、6.8%；12.7%、4.6%、3.4%、11.2%；5.7%、17.3%）。

¹ 二零二一年僱員人數統計口徑發生變化，相關數據不包含非頂崗實習生（即實習結束後不僱傭、不佔編制的員工）。

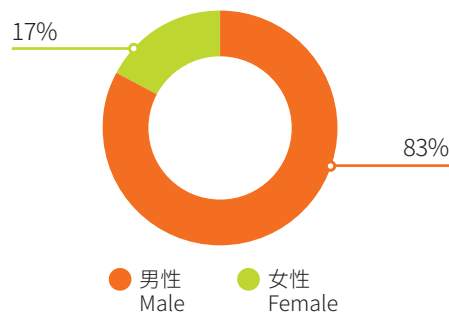
EMPLOYEES

The Group regards our employees as the most valuable resources for our corporate survival and development. We provide and create a broad career development platform and opportunities for the employees to display their individual talents.

1. GENERAL INFORMATION

As at 31 December 2021, the Group employed a total of 19,491 employees¹ (19,467 as at 31 December 2020), all of whom are full-time. A breakdown of our employees by geographical region and gender is set out as follows:

二零二一年按性別劃分的僱員 Employees by gender in 2021



Among our 410 senior and middle-level managerial staff, 88% are male and 12% are female, 79% possess university degrees or above, 19% have received post-secondary education and the average age of managerial staff is approximately 48 (391, 89%, 11%, 78%, 19%, 47 respectively as at 31 December 2020).

As at 31 December 2021, the overall employee turnover rate was 7.0%, among which, the overall turnover rates of male and female employees were 6.8% and 7.8% respectively; the overall turnover rates of employees aged below 29, 30 to 39, 40 to 49 and 50 or above were 14.0%, 6.1%, 5.0% and 9.7% respectively; and the overall turnover rates of the Chinese Mainland and Hong Kong employees were 6.8% and 20.1% respectively (5.8%; 5.6%, 6.8%; 12.7%, 4.6%, 3.4%, 11.2%; 5.7%, 17.3% respectively as at 31 December 2020).

¹ The scope of statistics of the number of employees changed in 2021. Relevant data does not include interns which are not replacement hires (i.e., employees who will not be employed or accounted for as headcount after the end of the internship).

2、 員工權益

本集團嚴格遵守《中華人民共和國勞動法》、《中華人民共和國勞動合同法》、《中華人民共和國社會保險法》、《中華人民共和國婦女權益保障法》、《中華人民共和國未成年人保護法》、《職工帶薪年休假條例》、《工傷保險條例》、《女職工勞動保護特別規定》、《未成年工特殊保護規定》及《禁止使用童工規定》等法律法規，堅持平等僱傭的準則，反對一切因性別、年齡、地域、學歷、宗教、國籍、種族、性取向、殘疾與否等不同而存在的歧視行為，反對強迫勞動、超時工作，反對騷擾虐待，切實維護員工權益，支持最低收入，確保員工在招聘、勞動、薪資、培訓、晉升、補償、休假等方面享受公平待遇。截至二零二一年底，少數民族員工比例為20.7%，殘疾人僱傭人數為39人。

本集團堅持合法用工，反對使用童工或強制勞工，依據《中華人民共和國刑法》、《中華人民共和國勞動法》、《中華人民共和國未成年人保護法》、《中華人民共和國民法典》、《未成年工特殊保護規定》及《禁止使用童工規定》，在招聘錄用環節嚴格審查應聘人員年齡，不聘用未滿18歲的未成年人員，不以暴力、威脅或者限制人身自由的方法強迫他人勞動，保護員工合法權益及健康。員工入職時必須如實申報個人信息，入職後必須按照公司有關制度要求開展工作，如持假證件、謊報個人信息、工作造假等一經發現，本集團將按規章制度相關要求處理，情節嚴重、影響惡劣的或按照相關法律規定處理。

2. RIGHTS AND INTERESTS OF EMPLOYEES

The Group is in strict compliance with laws and regulations including the Labour Law of the People's Republic of China, the Labour Contract Law of the People's Republic of China, the Social Insurance Law of the People's Republic of China, the Law of the People's Republic of China on the Protection of Women's Rights and Interests, the Law of the People's Republic of China on the Protection of Minors, the Regulations on Paid Annual Leave of the Employees, the Regulations on Work-Related Injury Insurances, the Special Rules on the Labour Protection of Female Employees, the Provisions for Special Protection of Under-Aged Labour and the Provisions on Prohibition of Using Child Labour. By adhering to the principle of equal employment, we prohibit all discrimination due to differences in gender, age, territory, education, religion, nationality, race, sexual orientation and disability. We also oppose forced labour, overtime work, harassment and abuse. We effectively protect the rights and interests of employees, support the minimum wage, and ensure that employees enjoy fair entitlements in terms of recruitment, labour, salary, training, promotion, compensation and rest periods. As of the end of 2021, 20.7% of employees were of ethnic minorities and 39 employees had disabilities.

The Group insists on legal use of labour and prohibits employment of child and forced labour. We strictly check the age of applicants during the process of recruitment and admission, never employ minors aged below 18, and never force others to work by means of violence, threats or restrictions on their physical freedom, in order to protect the legal rights, interests and health of employees pursuant to the Criminal Law of the People's Republic of China, the Labour Law of the People's Republic of China, the Law of the People's Republic of China on the Protection of Minors, the Civil Code of the People's Republic of China, the Provisions for Special Protection of Under-Aged Labour and the Provisions on Prohibition of Using Child Labour. Employees must truthfully provide their personal data at commencement of employment, and must start to work in accordance with the requirements of relevant policies after commencement of employment. Cases of holding forged identification documents or providing false personal data or false work experience, once found, will be handled according to the relevant requirements of the Group's policies. Serious cases with detrimental effects might be handled according to relevant legal requirements.

我們注重員工的多元化，結合崗位要求及人才供需特點確定對應的選拔渠道，招聘渠道包括校園招聘、社會招聘、內部招聘等，多措並舉引進各類人才，提高人才供給保障。招聘過程中一視同仁，基於崗位要求進行招聘，不設置針對性條件。本集團按照勞動合同法要求，遵循公正平等、協商一致的原則，與員工簽訂勞動合同，明確勞資雙方的權利和義務。我們不斷完善及時有效的協商溝通機制和渠道，積極推進民主管理，暢通員工意見反饋渠道，員工可通過員工代表大會、信訪舉報電話、信訪舉報郵箱、OA論壇等多元化渠道實時反饋意見和訴求；在制定涉及員工切身利益相關制度和政策時，廣泛徵求員工意見和建議。

3、 員工薪酬福利

本集團構建以崗位價值為基礎，與業績貢獻、個人能力、人才發展相結合的薪酬分配機制。堅持在企業效益增長的同時實現員工收入同步增長、在勞動生產率提高的同時實現勞動報酬同步提高。本集團分業態建立與企業經濟效益和勞動生產率掛鈎的總額管控機制，利用總額槓桿提升企業運營效能；同時分層分類實施精準激勵，樹好薪酬激勵導向標，激勵政策向基層和核心崗位傾斜。

We put strong emphasis on the diversity of our employees. Corresponding selection channels are confirmed having regard to requirements of the roles and features of supply and demand of talents. Our recruitment channels include campus recruitment, social recruitment, internal recruitment, etc. Multiple measures are adopted to introduce various types of talents for enhancing the security of talent supply. The recruitment process is equal and impartial based on requirements of the roles without any pertinent conditions. Abiding by the principles of fairness, equality and negotiation for unanimous consensus, the Group enters into employment contracts with employees in accordance with the requirements of labour law to specify the rights and obligations of both employers and employees. We continuously improve the timely and effective mechanism and channels for negotiation and communication to actively promote democratic management. Smooth feedback channels are opened for employees to provide real-time feedback opinions and aspirations through diversified channels such as employees' congress, whistle-blowing hotlines, whistle-blowing emails and OA forum. Opinions and suggestions from employees are extensively sought when formulating systems and policies involving vital interests of employees.

3. COMPENSATION AND BENEFITS OF EMPLOYEES

The Group has established a remuneration allocation mechanism based on job value and combined with performance contribution, personal ability and talent development. We insist on achieving simultaneous increase of employees' income whilst increasing corporate efficacy and achieving simultaneous increase of labour compensation whilst increasing labour production rate. The Group established a mechanism for managing and controlling total remunerations, which is linked with corporate economic efficacy and labour production rate by different business segments. The Group aimed to increase corporate operational efficacy by using the leverage on total remunerations. At the same time, targeted incentives are implemented by levels and by categories to build a proper beacon for compensation incentives, and incentive policies are inclined to junior and core roles.



本集團持續優化和落實員工的各項福利待遇，按時足額為內地員工繳納「五險二金」，為香港員工繳納強積金；持續為員工提供有針對性的體檢套餐，為員工及其兩位直系親屬購買商業保險並提高保額標準，做好員工關懷和完善員工保障。我們反對任何形式的強制勞動，在法定年假的基礎上設置公司年假，提供加班調休和值班調休政策保障員工休息。新增彈性工時制，一定程度提高作息的靈活性。持續完善員工休假制度，積極響應國家號召，新設育兒假，保障員工休息權益。

本集團為員工創造廣闊的發展平台和施展個人人才華的機會，積極優化高中級管理人員崗位職級體系，優化人才成長路徑；組織優秀高中級管理人員進行跨單位、跨業態、跨區域交流，以擴大專業視野、錘煉商業思維、提升管理技能；高度重視年輕高中級管理人員選拔及培養工作，形成約佔本集團高中級管理人員數量二分之一的優秀年輕高中級管理人員人才庫（218人），並配套設計了正職高中級管理人員培養項目和優秀年輕高中級領英管理進階培養項目，加速高中級管理人員的成長，推進人才梯隊建設。修訂專業技術類人才任職標準體系，發佈技能類人才任職標準，定期開展任職評價；大力開展技能實操培訓、技術大比武、技能競賽等「卓越工匠」系列項目，積極培養「知識型、技能型、創新型」人才，為推進本集團高質量發展提供人才保障。

The Group continued to optimize and offer various benefits and entitlements to its employees. Timely and full contributions to the “Five Social Insurances and Two Funds” and the Mandatory Provident Fund are made for Mainland employees and Hong Kong employees respectively. Targeted body check packages were continuously provided to employees. Commercial insurances were taken out for employees and their two close family members and levels of sums assured were raised, which offered good care for employees and improved protection to employees. We oppose any form of forced labour, implement annual leave on top of statutory annual leave, offer holiday adjustment policies for overtime work and duty shift to secure adequate resting period for employees. Flexitime was newly adopted to increase the flexibility for work and break times to a certain extent. Employees’ paid leave policy is continuously improved in active response to national advocate by adding parental leave for securing employees’ rights and interests to rests.

The Group creates a broad career development platform and opportunities for the employees to display their individual talents. We proactively optimized the system for ranking the roles of senior and middle-level managerial staff to create a better growth path for talents. Cross-unit, cross-business and inter-regional exchanges were organized for excellent senior and middle-level managerial staff to broaden professional horizon, sharpen business acumen and polish managerial skills. Keen attention was paid to select and cultivate young senior and middle-level managerial staff. A talent pool with 218 excellent young senior and middle-level managerial staff was formed, which represented approximately half of the Group’s senior and middle-level managerial staff. A complete set of cultivation projects for official senior and middle-level managerial staff and advanced cultivation projects for excellent young senior and middle-level elite and young management had been designed in support to accelerate the growth of senior and middle-level managerial staff and promote the construction of talent ladders. The appointment standard system for professional technical talents was modified to develop the standards for appointment of technical talents, and job appraisal was conducted on a regular basis. We vigorously organized a series of “Excellent Craftsmen” programmes such as vocational practical skill training, technology competitions and talent shows to actively cultivate “knowledgeable, skillful and innovative” talents in order to ensure the secured supply of talents for the Group’s high-quality development.

4、 員工發展與培訓

人才是企業發展的重要資源，本集團高度重視人才隊伍建設，持續完善人才發展機制，設立專業培訓中心。二零二一年，為服務戰略發展要求，強化與人力資源體系的業務銜接，圍繞「三個全覆蓋」目標，本集團在人員群體全覆蓋上精心設計並實施高層培訓、領英青英等管理進階培養項目；統籌各部室、大區、事業部、專業服務機構開展各類專業技能培訓；聯合海南大區順利承辦二零二一年未來之星訓練營。在專業領域全覆蓋上常態化開展線上、線下學習，新開發涵蓋審計、戰略、EHS、財務等面授專業課程30餘門，新撰寫組織與個人案例100餘篇，線下培訓時長約110,600小時，培訓員工約1,900人次。在培訓管理全覆蓋上總結培訓實踐經驗，編製培訓項目開發和項目交付操作指引；開展潤學堂試點，搭建培訓積分管理功能，為實現全員培訓檔案數字化管理打下基礎。

本集團大力推動員工培訓線上化，推動線上學習資源庫的建設，內部自主開發創新類、通用類、專業類微課300餘門，新上線50餘門在線課程，累計線上課程2,000餘門。此外，本集團推動線上培訓新技術的運用，初步建設領導力、新員工、財務等專業系列微課，開展專題線上學習51次；重點推動認證考試，組織線上考試4,701次。二零二一年，線上培訓時間約92,000小時，線上培訓員工約18,900人次。

4. DEVELOPMENT AND TRAINING OF EMPLOYEES

Talent is an important resource for corporate development. The Group puts very strong emphasis on building teams of talents, continuously improves the mechanism for talent development and establishes professional training centres. In 2021, in order to serve the requirements for strategic development and strengthen business connection with human resources system, the Group meticulously designed and executed training for senior management and cultivation projects for elite and young management pursuant to the targets of “three full coverage” in terms of full coverage of employees. Each department, operating region, business division and professional service institution was organized to launch various types of professional skills training. Hainan Region smoothly co-organized 2021 Future Star boot camp. Regarding full coverage in the professional scope, online and offline learning are regularized. Over 30 face-to-face professional courses covering audit, strategy, EHS and finance were newly developed. Over 100 articles of organizational and personal case studies were newly drafted. Approximately 1,900 participants attended offline training for a total duration of approximately 110,600 hours. Upon conclusion of practical experience in training regarding full coverage on training management, operational guidelines for training project development and project delivery were prepared. Pilot online Run Class was launched to build the functions for training score management, which will lay the foundation for achieving digital filing management of all-staff training.

The Group vigorously encouraged online staff training and advanced the construction of online learning resources database. Over 300 short courses on innovation, general and professional categories were self-developed internally and over 50 online courses were newly uploaded in total, and there were over 2,000 online courses in total. In addition, the Group initiated the application of new technology for online training. Professional series of short-courses on leadership, new employees and finance were initially constructed, and 51 special-themed online training sessions were organized. We focused on promoting certification examinations, and organized 4,701 online examinations. In 2021, the total duration of online training was approximately 92,000 hours, and approximately 18,900 employee participants were in attendance of online training.





華潤水泥(平南)有限公司 2021 年「藍士官」班組長賦能培訓班
2021 “Blue Sergeant” empowerment training for foremen at China Resources Cement (Pingnan) Limited



2021 年華潤「未來之星」新員工訓練營
2021 China Resources “Future Star” New Employee Orientation

根據本集團內部人力資源系統統計，二零二一年，本集團與員工發展相關的線上及線下總培訓時間約202,600小時，按二零二一年受訓人員總數計算，人均受訓時間約10.7小時（二零二零年分別為281,000小時、14.5小時），其中，男性、女性員工的人均受訓時數分別為10.0小時、14.0小時（二零二零年分別為14.5小時、14.6小時）；管理層、財務、行政及其他、生產人員、技術人員、營銷人員的人均受訓時數分別為24.7小時、17.4小時、5.6小時、17.7小時、10.4小時（二零二零年分別為40.2小時、18.5小時、7.4小時、28.3小時、11.6小時）。

5、員工關愛

本集團致力提升員工工作環境和組織氛圍，積極開展觀影暨員工生日會活動、書畫大賽和讀書月等有益員工身心健康的集體活動。持續深入開展全員健身活動，舉辦羽毛球比賽、各類體育興趣小組活動，強健員工體魄，進一步提升了員工的凝聚力和歸屬感。

本集團一向重視員工關懷，定期走訪慰問困難員工及家屬，在節日送上問候與祝福，了解他們實際困難與需求，關心及跟進其生活改善的情況，體現公司人文關懷的精神。二零二一年，用於關愛及幫助困難病患員工的「華潤水泥感恩之心基金」，共籌得本集團及員工的捐款約人民幣1,400,000元，資助困難員工50人，發放救助款約人民幣2,600,000元。

According to the statistics of the Group's internal human resources system, in 2021, the total duration of online and offline training relating to the Group's staff development was approximately 202,600 hours and the average training duration per employee was approximately 10.7 hours, calculated from the total number of employees trained in 2021 (281,000 hours and 14.5 hours respectively in 2020). Among which, the average training durations per male and female employees were 10.0 hours and 14.0 hours respectively (14.5 hours and 14.6 hours respectively in 2020), and the average training durations per employee from management, finance, administration and others, production staff, technical staff and sales and marketing staff were 24.7 hours, 17.4 hours, 5.6 hours, 17.7 hours and 10.4 hours respectively (40.2 hours, 18.5 hours, 7.4 hours, 28.3 hours and 11.6 hours respectively in 2020).

5. CARE FOR EMPLOYEES

The Group is dedicated to enhancing the working environment and team ambience for its employees. Various group activities were proactively organized for better physical and mental wellness of our employees, such as movie watching cum staff birthday party activities, painting and calligraphy competitions, and reading month. All-staff gymnastic activities continued to be deeply launched by organizing badminton competitions and various types of sports interest group activities, which had strengthened our staff's physical fitness and further enhanced their cohesion and sense of belonging.

The Group has always paid keen attention to caring for employees. We regularly visit employees in need and their families with solicitude, and send regards and blessings to these employees during festivals in order to understand their practical difficulties and needs, care for and follow up with the improvement on their living conditions, and reflect our corporate spirit of humanity and care. In 2021, the Group and its employees donated a total amount of approximately RMB1,400,000 to the "China Resources Cement Gratitude Fund", which aims at caring for and helping the employees in need and illness. 50 employees in need were subsidized. Subsidies in the amount of approximately RMB2,600,000 were distributed.





廣西華潤紅水河水泥有限公司舉辦中秋節籃球比賽
Guangxi China Resources Hongshuihe Cement Co., Ltd. held the Mid-Autumn Festival basketball competition

6、 職業健康與安全生產

本集團嚴格遵守《中華人民共和國安全生產法》、《中華人民共和國礦山安全法》及《中華人民共和國職業病防治法》，並制定《華潤水泥管理手冊》「EHS管理篇」及相關制度規範，嚴格執行、監控及持續完善員工職業健康及安全管理體系，維持相關方健康安全政策與員工一致，加大相關方安全管理，積極開展監督檢查工作。本集團的健康安全目標是死亡事故為零、重傷事故為零、確診職業病為零。二零二一年，本集團頒佈執行《EHS專項獎勵評選工作方案》、《EHS事故事件管理指引》等14項健康安全制度或規程，持續完善EHS責任考核制度，並邀請第三方單位對總部進行安全評估。截至二零二一年底，本集團共有EHS專職管理人員260人，其中專職安全管理人員198人（含註冊安全工程師78人）。

6. OCCUPATIONAL HEALTH AND PRODUCTION SAFETY

The Group is in strict compliance with the Production Safety Law of the People's Republic of China, the Law of the People's Republic of China on Safety in Mines and the Law of the People's Republic of China on the Prevention and Treatment of Occupational Diseases, and promulgated the "EHS Management Series" in the "Management Manual" and other relevant policies and regulations of the Company for stringent implementation, monitor and continuous improvement on the staff occupational health and safety management system to ensure that the health and safety policies of counterparties remain consistent with those of employees, reinforce safety management on counterparties and proactively launch supervisions and inspections. The Group's health and safety targets are zero fatality, zero serious personal injury and zero confirmed case of occupational disease. In 2021, the Group promulgated and implemented 14 health and safety policies or regulations including the "Proposal for EHS Special Award Selection" and the "Management Guidelines for EHS Incidents and Events". Our EHS accountability appraisal policies were continuously improved. Third-party units were invited to conduct safety assessments on headquarters. As of the end of 2021, the Group had a total of 260 specialized EHS management personnel, among which, 198 were specialized safety management personnel (including 78 registered safety engineers).

疫情防控

本集團始終把員工的生命安全和身體健康放在首位。二零二一年，本集團及時、主動了解和學習國家、各地政府的疫情防控政策、制度、要求，及時調整疫情防控工作小組，積極應對疫情，持續做好常態化疫情防控工作，積極引導員工接種新冠疫苗，目前已基本完成疫苗應接盡接工作，有效構築了免疫屏障，履行了社會責任，為國家防疫工作大局貢獻了力量。

本集團積極配合企業所在地政府對於疫情防控的要求，做好重點疫區人員排查、防控工作，發揮主體責任，確保各項防控措施落實到位。通過持續向員工提供口罩、醫用酒精等防疫物資，定期對辦公室、通勤車等進行嚴格環境衛生消毒，有效防止病毒傳播風險。同時，為保障員工安全，「彈性工時」和「移動打卡」已成為常態化制度，個別疫情突發地區的員工可安排居家遠程辦公，有效降低了疫情對日常工作開展的影響。

職業健康

本集團嚴格遵守《中華人民共和國職業病防治法》，針對性制定了《職業健康管理規定》，二零二一年頒佈執行《勞動防護用品管理規定》，向所有員工發放《員工健康知識手冊》，組織專業管理人員參加中國職業安全健康協會主辦的註冊職業衛生師培訓，年內共有41人通過考核並取得註冊職業衛生師證書。目前，ISO 45001：2018職業健康安全管理体系覆蓋率100%，員工健康體檢率100%。

Epidemic Prevention and Control

The Group always gives the highest priority to the safety and health of its employees. In 2021, we understood and learnt the policies, systems and requirements of national and local governments for the prevention and control of Epidemic in a timely and proactive manner, and made timely adjustments to the working group for Epidemic prevention and control to actively respond to the Epidemic. We continue to strengthen the work on regular Epidemic prevention and control by actively recommending employees to receive novel coronavirus vaccines. At present, all employees eligible for receiving vaccines had basically completed vaccination, which had effectively built an immunity barrier and fulfilled the social responsibility for contributing to the overall national anti-Epidemic work.

The Group proactively cooperates with the requirements for Epidemic prevention and control of local governments at which the enterprises are located by accomplishing the work for screening employees from key epidemic areas, as well as Epidemic prevention and control. We play the main role of responsibility for ensuring various measures for Epidemic prevention and control are in place. The risks of virus spreading had been effectively prevented through continuously providing anti-Epidemic materials such as masks and alcohol for medical use to employees and strict disinfection of the working environment including offices and commuter vehicles. At the same time, in order to secure staff safety, we set “flexitime” and “mobile clock-in” as regular policies. Employees from individual Epidemic outbreak regions could work from home, which has effectively reduced the impact of Epidemic on daily routine work.

Occupational Health

The Group is in strict compliance with the Law of the People’s Republic of China on the Prevention and Treatment of Occupational Diseases, and had formulated the targeted “Rules of Occupational Health Management”. In 2021, we promulgated and executed the “Rules for Management of Labour Protection Materials”, distributed the “Employee Health Knowledge Handbook” to all employees, and organized professional management staff to participate in the training for registered occupational hygienists held by the China Occupation Safety and Health Association. During the year, a total of 41 employees passed the assessment and obtained the certificates for registered occupational hygienists. Currently, the coverage rates of the ISO 45001:2018 Occupational Health & Safety Management System and staff body checks are both 100%.



本集團各基地結合實際情況繼續深化落實粉塵治理成果，並推動自動化包裝、裝車技改工作。本集團已於二零二一年完成安裝使用28台自動插袋機、17台自動裝車機，其他水泥生產基地生產線也正在持續推廣中，致力於構建更加健康的工作環境；鼓勵各基地採用降噪新技術，廣東封開、廣西田陽及武宣的噪聲治理項目取得良好效果，有效降低現場噪聲危害。

本集團高度重視員工健康管理，位於雲南鶴慶的水泥基地已建成「健康小屋」示範項目，可加強員工基礎疾病及重症風險的篩查，待項目驗收後投用，並適時推廣。截至二零二一年底，本集團共有12個水泥生產基地及混凝土攪拌站通過各省、市、縣的衛生健康委員會的「健康企業」評審和驗收，27名員工被評選為「健康達人」。

本集團圍繞以「共創健康中國，共享職業健康」為主題，通過職業衛生研討會、主題報告會、員工座談會、知識講座、知識競賽等系列活動，廣泛宣傳職業病防治法律知識、防治技術和健康工作方式理念，提高各級管理者的法律責任意識和廣大員工的自我防護意識。

Each plant of the Group persistently deepened the achievements for dust treatment and management and rolled out technological upgrade for automatic packaging and loading upon integrating their actual situation. In 2021, the Group had completed the installation and use of 28 automatic bagging machines and 17 automatic loading machines. These are being continuously promoted at other cement production plants and production lines for dedication to build a healthier working environment. Each plant is encouraged to adopt new technology for noise reduction. The project for noise treatment and management at Fengkai of Guangdong and Tianyang and Wuxuan of Guangxi achieved good results, which had effectively minimized the hazard of on-site noise.

The Group places strong emphasis on employee health management. “Health Cottage” pilot project had completed construction at the cement production plant in Heqing, Yunnan, which can strengthen the screening of risks of basic diseases and serious illness of employees. The project will commence operation upon acceptance of completion and will be promoted in due course. As of the end of 2021, a total of 12 cement production plants and concrete batching plants of the Group passed the assessment and acceptance of completion of “Healthy Enterprises”, and 27 employees were selected as “Health Experts” by the Health Commission of respective provinces, cities and counties.

Through series of activities around the theme of “Mutual Creation of Healthy China, Mutual Sharing of Occupational Health” including occupational health seminars, keynote presentations, staff forums, lectures and knowledge competitions, the Group extensively propagated the legal knowledge for prevention and treatment of occupational diseases, preventive technology and healthy workstyle concepts to arouse the awareness of managers at each level on legal responsibilities and the self-protection awareness of all staff.

安全管理

本集團建立安全生產事故隱患排查治理長效機制，持續加強總部部室、大區、基地等多層次安全隱患排查、監督與治理，防止和減少人身傷害事故，保障員工生命和財產安全。年內，本集團員工因工傷損失工作日數為412日。年內，本集團持續推進安全生產三年專項整治行動工作，督促基地在隱患整治的基礎上，動態更新隱患整改清單和制度清單，不斷建立健全安全風險分級管控和隱患排查治理體系，加大專項整治攻堅力度，並將整改完成情況納入年度考核，以提高整體安全管理水平。

本集團致力於安全生產標準化建設，不斷加強基礎管理和創新管理模式，提升總體安全管理水平。截至二零二一年底，本集團位於廣西南寧、田陽的水泥生產基地通過安全生產標準化進行現場評審，成為《安全生產法》和《企業安全生產標準化建設定級辦法》修訂發佈後首批通過安標一級現場評審的企業，21家水泥生產基地的石灰石礦山通過了國家安全生產標準化二級企業評審，並在廣西田陽、南寧、貴港、上思、平南，雲南鶴慶和貴州金沙的水泥生產基地開展安全生產標準化一級礦山創建諮詢工作。

Safety Management

The Group had established long-term effective mechanism for the inspection, treatment and management of latent hazards of production safety incidents. Multi-level inspections, supervision, treatment and management of latent safety hazards were continuously reinforced at departments at headquarters, major operating regions and production plants to prevent and minimize incidents of personal injuries and secure the safety of our employees' lives and properties. During the year, there were 412 lost days due to work injury of employees of the Group. During the year, the Group continued to promote the three-year action works for special rectification of production safety. On the basis of rectifications of latent hazards, production plants are urged to dynamically update the list of rectifications of latent hazards and list of policies, continuously construct the sound systems for classified management and control of safety risks as well as inspection, treatment and management of latent risks and strengthen special rectification. The status of completing rectifications is incorporated into annual appraisal for raising the overall standards of safety management.

The Group is committed to production safety standardization and raising the overall standards of safety management through continuous improvement on fundamental management and innovative management models. As of the end of 2021, the Group's cement production plants at Nanning and Tianyang, Guangxi had passed the on-site assessments of production safety standardization and became the first batch of enterprises that had passed the on-site assessments of production safety standardization since the promulgation of amendments to the "Production Safety Law" and the "Measures for the Rating of Work Safety Standardization for Enterprises". The limestone mines of 21 cement production plants have passed the assessments as the Second-Class Enterprise in National Production Safety Standardization. Consultancy work for the construction of First-Class Mines of Production Safety Standardization commenced at the cement production plants in Tianyang, Nanning, Guigang, Shangsi and Pingnan of Guangxi, Heqing of Yunnan and Jinsha of Guizhou.



本集團開展年度卓越運營管理評價監督考核，先後安排安全環保專家38人次，參加7批次年度卓越運營管理評價，共評價水泥（粉磨站）生產基地37個，混凝土基地站點55個。本次評價發現，各基地逐步重視安全管理智能化工作，充分利用視頻監控等手段提高安全管理水平，在檢維修管理、堆場管理、粉塵治理等方面有所提升及改善，未來將着力提高相關方安全管理水平。

安全檢查

本集團開展EHS調研檢查、專項檢查，共檢查基地31次，包括水泥基地、混凝土基地、裝配式建築及骨料等業務；開展EHS管理要素體系內部審核工作，對總部、廣東羅定水泥生產基地等單位EHS工作開展情況進行審核檢查，深挖管理問題原因，促進完善管理制度，規範管理流程，加強安全風險管理，推動安全管理提升。全年各基地開展疫情防控、EHS綜合檢查、EHS專項檢查共計約700餘次。

安全培訓

本集團積極落實安全培訓工作，結合線上及線下培訓方式，將安全應急演練視頻置入本集團線上學習平台華潤學習與創新中心，鼓勵員工自主學習。二零二一年，本集團員工安全培訓累計約381,300學時，相關方培訓累計約79,100學時；年內，本集團在廣州學習與發展中心舉辦了二零二一年水泥基地健康安全管理培訓班、混凝土及新業務基地健康安全管理培訓班，來自各業務單位的共98位專兼職安全管理人員、部門經理和生產一線工段長參加了此次培訓。

The Group launched annual evaluation and supervision appraisal for excellent operational management. 38 safety and environmental protection experts were successively arranged to participate in 7 batches of annual appraisal for excellent operational management. A total of 37 cement (grinding stations) plants and 55 concrete batching plants were evaluated. These assessments found that every plant had gradually put strong emphasis on the intelligent work of safety management and raised the safety management standards by full use of various means such as video surveillance. The management aspects of inspections and repairs, storage yards and dust emissions had been enhanced and improved. We will focus on raising the safety management standards of counterparties in the future.

Safety Inspections

The Group conducted EHS research study inspections and special inspections of production plants for 31 times, covering cement plants, concrete plants, the businesses of prefabricated construction and aggregates. Internal audit on factors for EHS management systems were conducted to review and check the execution of EHS works at headquarters, the cement production plant in Luoding, Guangdong and other units, and drill comprehensively on the reasons for management issues, which had enhanced improvement on management systems, standardized management process, strengthened safety risk management and promoted better safety management. Throughout the year, a total of approximately over 700 sessions of Epidemic prevention and control, EHS comprehensive inspections and EHS special inspections were conducted.

Safety Training

The Group actively implemented safety training and combined online and offline training methods. Videos of safety emergency drills were uploaded on the Group's online learning platform, China Resources Learning and Innovation Center, to encourage our staff to self-study. In 2021, the aggregate duration of safety training for the Group's staff amounted to approximately 381,300 hours, whereas that for counterparties amounted to approximately 79,100 hours. During the year, the Group had organized training courses on health and safety management of cement production plants and training courses on health and safety management of concrete and new business plants for 2021 in the Guangzhou Learning and Development Center. 98 specialized and acting safety management personnel, department managers and frontline supervisors at production plants from various business units had participated in this training.

本集團積極推動EHS管理要素全面運用，先後兩次組織專業人員參加EHS管理體系內部審核員培訓，共有6人獲得內審員證書，促進EHS管理系統化。本集團督促各基地按照EHS管理體系進行自查自糾，並將EHS管理要素融合到卓越運營管理評價中。

安全創新

本集團積極推廣科技興安項目。年內，本集團於廣東封開，廣西田陽、貴港，以及福建曹溪的水泥生產基地建成健康安全體驗館。其中，封開水泥安全培訓體驗館包括VR安全體驗區、有限空間及高處墜落體驗、安全急救、消防虛擬滅火體驗、健康體檢等體驗區，以先進技術防範安全風險，推進本集團安全、持續發展。

此外，本集團全面推廣可視隔離開關箱，降低安全風險，進一步提高設備本質安全水平；全面推廣使用預熱器內筒物體防墜裝置，避免發生安全生產事故；在廣東江門試點的攪拌車智能交通安全風控項目運行良好，駕駛員違章行為大幅減少，車隊管理效率提升；推廣混裝炸藥爆破作業，已有16個基地礦山使用現場混裝炸藥開展爆破作業，有12個基地礦山持續保持混裝炸藥量使用率達90%以上，提升礦山爆破本質安全水平。

The Group proactively advocated the full application of factors for EHS management. Professional personnel were organized to successively participate in the training on EHS management system for internal auditors twice. A total of 6 participants obtained the certificates of internal auditors, which fosters systematization of EHS management. The Group urges each production plant to conduct self-investigation and self-rectification according to the EHS management system, and assimilate the factors for EHS management into the annual appraisal for excellent operational management.

Safety Innovation

The Group proactively promoted safety enhancement projects by use of advanced technology. During the year, the cement production plants of the Group at Fengkai of Guangdong, Tianyang and Guigang of Guangxi, and Caoxi of Fujian had completed the construction of health and safety experience halls. Among which, the safety training experience hall of the cement production plant in Fengkai includes experience areas such as VR safety experience area, experiences of limited space and fall from height, safety first aid, virtual experience of fire fighter for fire extinguishing, and body checks. Safety risks are prevented with advanced technology, which propels the safe and sustainable development of the Group.

In addition, the Group fully promoted visible and isolated switch boxes to reduce safety risks and further increase the intrinsic safety standards of equipment. Devices for preventing object falling in the inner pre-heater were fully promoted to prevent the occurrence of production safety incidents. The pilot project of intelligent traffic safety risk control for mixer trucks in Jiangmen, Guangdong operated well. Drivers' acts in violation of regulations had substantially reduced, and the efficiency of fleet management had been raised. Blasting of mixed explosives was promoted. The mines of 16 plants had been using on-site mixed explosives to initiate blasting. 12 mines had maintained a consistent utilization rate of mixed explosives at above 90%, which had increased the intrinsic safety standards of mine blasting.



安全活動

本集團開展豐富多樣的安全活動，以推動全員參與安全管理，提升企業安全文化，將安全管理理念深入員工、家庭及社會。年內，本集團組織開展應急演練1,333次，19,455人次參加；其中交通應急演練34次，635人次參加。安全開放日39場次，3,591人次參加；安全警示教育20,197人次，舉辦知識競賽89場次，6,141人次參加。

Safety Activities

The Group organized a wide variety of safety activities to promote all-staff participation in safety management, arouse corporate safety culture and implant the concept of safety management in staff, families and society. During the year, the Group organized 1,333 emergency drills with 19,455 participants in attendance, among which, there were 34 traffic emergency drills with 635 participants in attendance. 39 sessions of safety open days with 3,591 participants in attendance, safety alert education sessions with 20,197 participants in attendance, and 89 sessions of knowledge competitions with 6,141 participants in attendance were organized.



華潤水泥(貴港)有限公司開展邊坡坍塌事故應急演練
China Resources Cement (Guigang) Limited conducted emergency drills for slope failure incidents

相關方管理

本集團嚴格要求相關方安全生產管理，通過制定《華潤水泥控股有限公司承包商安全管理制度(2021年版)》，明確相關方安全管理責任。截至二零二一年底，工程建設項目承包商、設備維護檢修方、交通運輸商、勞務承攬方、供應商、廢棄物處置方、承租方、技術服務方等均納入相關方範疇。

Counterparty Management

The Group has strict requirements on counterparties for production safety management. Counterparties' responsibilities for safety management had been specified through the formulation of the "Contractor Safety Management Policy of China Resources Cement Holdings Limited (2021 Edition)". As of the end of 2021, Contractors of construction projects, service providers for maintenance and repairs of equipment, transportation providers, headhunters, suppliers, waste handlers, tenants and technical service providers are all included in the scope of counterparties.

客戶

本集團以客戶至上為原則，秉承誠實守信的核心價值觀，嚴守商業道德，竭誠為客戶提供優質服務。通過加強客戶溝通，悉心維護客戶和消費者權益，滿足並超越客戶期望，提升客戶滿意度。

1、 質量管理

本集團嚴格遵守《中華人民共和國產品質量法》，另外，《華潤水泥管理手冊》「質量管理篇」對生產流程各細節管理均有清晰及嚴格要求，內容涵蓋原料管理、煤炭管理、生料及熟料管理等質量標準，《華潤水泥助磨劑管理辦法》、《華潤水泥煤炭採樣制樣管理標準》規範進廠原燃材料的質量驗收和使用，化驗室設備維修保養、檢定要求、操作指引、環境配置、檔案紀錄亦一概標準化列入管理手冊。年內，為更好適應水泥產品的變化和滿足市場需求，本集團對質量標準進行修訂並形成了《產品質量標準》、《原料、燃料、半成品控制標準》。本集團旗下生產基地全部通過ISO 9001：2015質量管理體系認證，覆蓋率100%。

年內，本集團在廣東、廣西、福建、貴州等9家水泥生產基地推廣生料、石灰石在線分析系統，實現自動配料，提升配料合格率，進一步穩定熟料質量。其中，在廣東封開、廣西合浦、福建雁石的水泥基地推廣應用了石灰石在線分析系統，依靠先進設備可對礦山最大限度的資源綜合利用，延長礦山使用壽命，進一步提升了質量控制水平。

CUSTOMERS

We wholeheartedly provide quality service to our customers based on the customer-oriented principle, whilst upholding the core values of honesty and trustworthiness and strictly abiding by business ethics. By improving communications with customers and taking the utmost care of the rights and interests of our customers and consumers, we have met or even exceeded our customers' expectations for enhancing our customer satisfaction.

1. QUALITY MANAGEMENT

The Group is in strict compliance with the Product Quality Law of the People's Republic of China. In addition, pursuant to the "Quality Management Series" in the "Management Manual" of the Company, there are clear and stringent requirements on managing every detail of production process, including the management quality standards of materials, coal, raw materials and clinker. The "Management Measures for Grinding Agents" and the "Management Standards of Coal Sampling and Preparation" of the Company standardize the quality acceptance inspection and use of incoming raw fuel materials. Repairs and maintenance, inspection requirements, operating guidance, environmental configuration and filing records of laboratory equipment are all standardized and covered in the management manual. During the year, in order to better adapt to the changes of cement products and meet the market demands, the Group had revised the quality standards and formed the "Product Quality Standards" and the "Control Standards for Raw Materials, Fuel and Semi-Finished Products". All production plants of the Group had passed the ISO 9001:2015 Quality Management System Certification. Coverage rate was 100%.

During the year, 9 cement production plants in Guangdong, Guangxi, Fujian and Guizhou promoted online analysis system of raw materials and limestone, thereby achieving automatic prescription, improving the passing rate of prescription and further stabilizing clinker quality. Among which, the cement production plants in Fengkai of Guangdong, Hepu of Guangxi and Yanshi of Fujian had promoted the application of online analysis system of limestone. In reliance on advanced equipment, composite utilization of mining resources can be maximized and the service life of mines can be extended, which have further improved the standards for quality control.



本集團持續開展質量提升行動，於二零二一年每個季度持續推進水泥、混凝土質量專項抽查，內容涵蓋水泥、混凝土進廠原材料及成品，強化對生產線各環節原材料的驗收和產品質量的管控；並對本集團和競品水泥進行水泥性能和質量控制指標進行對比，將評比結果反饋生產相關部門，有助改進本集團產品性能及質量，提升產品競爭力。

本集團已建立覆蓋原材料、過程控制、產品出廠、售後的全生產流程質量控制體系，嚴格按原材料輔助材料標準、工藝標準、半成品標準、產成品標準、包裝標準、檢驗標準等標準組織生產，環環控制投入各工序物料的質量，24小時對熟料、水泥的生產過程進行監督檢測，實行全面質量管理。本集團依托完整有效的質量管理體系對產品質量進行管理和評價，將生產過程及產品的關鍵質量指標納入大區、基地業績考核範疇，以績效管理不斷推動各單位的質量建設，為消費者提供優質產品。本集團還通過開展多項精益改善項目，持續提升質量、工藝等方面的管理水平。

本集團的質量檢定過程如下：

質量計劃

- 根據市場需求生產水泥產品，合理安排混合材資源。
- 每批進廠原材料檢測。
- 對生產基地原材料資源質量情況進行普查，建立完善的資源檔案。

The Group continuously takes action for quality enhancement. Special sample checks on quality of cement and concrete were being performed in every quarter of 2021, covering incoming raw materials and finished products of cement and concrete, to strengthen acceptance inspections of raw materials throughout the process of production lines and management and control of product quality. Comparison on the Group's and competitors' cement was done in terms of cement performance and quality control indicators, and the comparative results were feedbacked to relevant production departments, which facilitated improvement on the performance and quality of the Group's products and enhancement on product competitiveness.

The Group had established a system for quality control throughout the whole production process covering raw materials, process control, product delivery and after-sales service, which organized production in strict compliance with standards including those for auxiliary materials of raw materials, techniques, semi-finished products, finished products, packaging and inspection. Quality of input materials was controlled in every connected step of production. The production process of clinker and cement was supervised and tested on a 24-hour basis for implementing comprehensive quality management. The Group relies on a comprehensive and effective quality management system to manage and evaluate the quality of our products. Key quality indicators of production process and products had been incorporated into the scope of performance appraisal of the major operating regions and production plants as a continuous drive for better quality across all units through performance management, so as to provide consumers with products of excellent quality. The Group also continuously enhances its management standards in terms of quality and techniques through the implementation of various lean improvement projects.

The Group's process of quality check is as follows:

Quality Planning

- To produce cement products according to market demand, and reasonably arrange resources of mineral admixture.
- To test each batch of incoming raw materials.
- To carry out general surveys on the quality of raw material resources at the production plants, and build a comprehensive record of resources.

質量控制

- 質管部24小時對熟料、水泥的生產過程進行監督檢測。
- 生產過程層層把關，實行質量考核。

質量保證

- 與國家水泥質量監督檢驗中心合作，對比驗證。
- 每年組織兩次從原料到產品全覆蓋的質量專項抽查，重點排查和治理氯離子、六價鉻、放射性等毒害物質。

質量改進

- 市場調研，為生產提供前端服務。
- 根據客戶使用反饋，不斷改善產品。
- 技術研發中心開展創新研究。

本集團設有質量事故管理標準，對事故作出判定，提供不合格產品處理方案、賠償標準、召回機制及處理流程等。當發現並經確認不合格產品出廠或產品在使用過程中出現嚴重質量問題，須立即通知相關客戶停用或隔離該批次產品，組織對該批次未使用產品進行召回，同時對客戶損失進行確認和賠償；並組織對質量事故進行調查分析，制定整改措施及責任認定，並對整改效果進行確認。

截至二零一九年、二零二零年及二零二一年十二月三十一日止年度，本集團並無已售或已運送產品因安全與健康理由而須回收。

Quality Control

- To supervise and test the production process of clinker and cement on a 24-hour basis by quality management department.
- To monitor each step throughout the production process, and implement quality assessments.

Quality Assurance

- To conduct comparative tests in cooperation with the National Quality Supervision and Testing Center for Cement.
- To conduct special sample checks on quality with full coverage from raw materials to products twice every year, and focus on investigation, control and management of toxic substances including chloride ions, hexavalent chromium and radioactive substances.

Quality Improvement

- To conduct market research for providing front-end services for production.
- To continuously improve the products based on customers' feedback after use.
- To roll out innovative research at the Technology Research and Development Centre.

The Group had set up standards for managing quality incidents, which identify and diagnose the incidents, provide solutions to handle substandard products and offer compensation standards, recall mechanism and process flow. Once discovered and confirmed that substandard products have left our factories or there are serious quality issues in the process of using the products, we would immediately inform the relevant customers to stop using or isolate that batch of products, organize recall on that batch of products if unused, confirm and compensate damages to customers. We will also conduct investigation and analysis on the quality incidents, formulate rectification measures and account for responsibilities, and verify the rectification results.

No products sold or shipped were subject to recalls for safety and health reasons for the years ended 31 December 2019, 2020 and 2021.



2、 知識產權

本集團高度重視知識產權保護和自主創新，通過持續貫徹實施本公司《知識產權管理制度》，遵循「統一協調、分類負責、集中管理、雙線匯報」的機制，高效、有序開展知識產權管理工作。同時本集團有效執行本公司《專利管理制度》和《品牌維權指引》，不斷推進本集團內部知識產權運營管理機制，加強對產品研發、技術改造過程中的知識產權成果保護和產權歸屬，為本集團在研發、生產、經營、銷售過程提供有力的保障和服務。

在商標管理與保護方面，本集團持續推進「潤品」、「潤豐」、「王牌工匠」等商標的註冊、確權及保護工作。此外，本集團收集其重要商標在水泥行業、銷售區域內的使用情況，全面配合行政機關開展商標維權打假行動。二零二一年，廣西玉林市市場監督管理局受理一起侵權「王牌工匠」商標事件，並已責令相關涉事單位禁止侵權行為。

在軟件著作權方面，二零二一年，本集團取得大水泥應用程式司機版、賣家版、買家版軟件、大水泥軟件等四項計算機軟件著作權並獲得著作權登記證書，促進營銷模式數字化平台工作的快速穩定開展。

在專利管理、挖掘與創新方面，繼二零二零年首次將專利技術納入卓越運營管理評價體系，本集團專利申請數量持續上升。於二零二一年十二月底，本集團共持有專利證書237項，其中發明專利32項，實用新型專利205項。

2. INTELLECTUAL PROPERTY RIGHTS

The Group pays keen attention to the protection of intellectual property rights and independent innovation. Through the continuous and thorough implementation of the “Policy on Management of Intellectual Property Rights” of the Company, the Group launched intellectual property management in an effectively and orderly manner following the mechanism of “unified coordination, classified responsibility, centralized management, double-line reporting”. Meanwhile, the Group effectively executed the “Policy on Management of Patents” and the “Guidelines for Brand Protection” of the Company to continuously promote the Group’s internal mechanism for operational management of intellectual property and strengthen protection on the achievements and ownership of intellectual property rights during the processes of product R&D and technological upgrade, which provided strong security and service to the Group during the processes of R&D, production, operation and sales.

In terms of management and protection of trademarks, the Group continued to work on the registration, right confirmation and protection of trademarks including “Runpin”, “Runfeng” and “Wang Pai Gong Jiang”. In addition, the Group collected information on the use of its important trademarks in the cement industry and sales regions, and fully cooperated with the administrative authorities in the defense of our trademark rights and crackdown on counterfeit goods. In 2021, the Administration for Market Regulation in Yulin City, Guangxi accepted one trademark infringement incident of “Wang Pai Gong Jiang”, and had ordered the relevant units involved to be prohibited from the infringement act.

In terms of software copyrights, in 2021, the Group obtained four computer software copyrights and received copyright registration certificates for the driver version of big cement application, the seller version and buyer version of software, and the big cement software, which had fostered the speedy and stable launch of the digital platform for sales and marketing model.

In terms of patent management, discovery and innovation, following the incorporation of patent technology into the annual appraisal for excellent operational management for the first time in 2020, the number of patent applications of the Group continued to increase. As of the end of December 2021, the Group held 237 patent licenses, including 32 inventions and 205 utility models.

3、 客戶服務及權益

本集團秉持以客戶為中心，主動關注客戶訴求，積極響應客戶投訴。根據線下統計²，二零二一年，關於產品及服務的客戶投訴58例，同比減少7例。我們在收到客戶投訴後24小時內響應，並安排專人負責跟進處理，確保投訴處理率達100%。同時，我們每月跟蹤統計客戶回訪、客戶投訴處理明細，以及客戶對本集團產品的反饋意見，每季度組織大區開展本集團和競品水泥產品質量盲測對比分析，實時了解本集團產品與競品的差異及客戶最新訴求；重點跟蹤產品指標波動、包裝袋質量問題、客戶保供等方面，持續落實整改，不斷提升產品及服務質量。

年內，本集團繼續組織各大區開展客戶滿意度調查，從銷售團隊、銷售支持、投訴處理、發運保供、產品質量、產品品牌這六個維度18個問題設計問卷，收回有效問卷4,796份，通過分析調查問卷，深入了解客戶差異化訴求，並在運營過程中持續改善產品和服務質量，為客戶提供更優質的產品與服務。二零二一年，本集團客戶滿意度達97.8%，較二零二零年提升1.3個百分點。

² 現有統計已覆蓋本集團所有運營區域，未來計劃通過建設客戶服務平台，系統化全面統計客戶投訴信息。

3. SERVICES, RIGHTS AND INTERESTS OF CUSTOMERS

The Group upholds customer-oriented value, takes the initiative to concern on customers' aspirations, and proactively responds to customers' complaints. According to offline statistics², in 2021, there were 58 cases of customers' complaints about products and services, representing a year-on-year decrease of 7 cases. We designated staff to handle customers' complaints within 24 hours, and had achieved a handling rate of 100%. At the same time, we followed up on customer visits and details of customer complaint handling every month, as well as customers' feedback comments on the Group's products. Regions organized blind examinations and comparison analysis on the cement products of the Group and its competitors every quarter to understand the differences between the products of the Group and its competitors as well as the latest aspirations from customers on a real-time basis. We focused on following up with the issues on fluctuations of product indicators and quality of packaging bags, as well as secured supply to customers. We continued to implement rectifications to persistently improve the quality of products and services.

During the year, the Group continued to organize each operating region to launch customer satisfaction survey and designed questionnaires with 18 questions from the six dimensions of sales team, sales support, complaint handling, delivery and secured supply, product quality and product brand. 4,796 valid questionnaires were collected. Through the analysis on survey questionnaires, we deeply understood the differentiated aspirations of customers and continuously improved the quality of products and services during the operation process to provide products and services of better quality to customers. In 2021, the Group's customer satisfaction rate reached 97.8%, which was 1.3 percentage points higher than that of 2020.

² The existing statistics had covered all operating regions of the Group. It is planned to construct customer service platform in the future to systematically and comprehensively collect customer complaint information.



本集團將客戶信息納入公司核心商業秘密範疇，依據本公司《保密工作管理規定（2021年版）》及《商業秘密管理辦法》等相關管理要求，嚴格保密客戶信息及獨立建檔，由專人負責信息的收集、歸檔、更新，並設定相應的信息查詢和導出權限，確保客戶信息安全。

本集團執行《信息安全管理办法》和《网络安全技术规范》等管理標準和技術細則，按照藍圖規劃穩步推進防禦能力建設，安全管理和技術防護並重。年內，本集團強化信息系統縱深防禦能力，開展網絡安全攻防演練，構建常態化監測、預警、分析和處置能力，提升網絡安全風險識別和應急處置能力，加強數據傳輸和終端數據保護，保障業務及客戶數據安全可用。年內，本集團未發生網絡安全事件或侵犯客戶隱私權利的案例。

The Group treats customer data as core trade secrets. Customer data is in strict confidence and independent files pursuant to the relevant management requirements including the “Regulations on Managing Confidentiality Work (2021 Edition)” and the “Management Measures on Trade Secrets” of the Company. Designated staff are in charge of data collection, filing and update. We also set up corresponding access rights for inquiry and export of data to ensure security of customer data.

The Group implemented management standards and technical specifications including the “Measures on Cyber-Security Management” and the “Regulations on Cyber-Security Technology” to steadily advance the construction of protection capability according to the blueprint plans with balanced emphasis on security management and technical protection. During the year, the Group strengthened the width and depth in protection capability of information system, conducted drills of cyber-security attack and defense, and construct the capabilities for regular monitor, early alert, analysis and handling to enhance identification of cybersecurity risks and capability on emergency handling. We reinforced protection on data transmission and terminal data to secure safe and useable data of business and customers. During the year, there was no occurrence of cyber-security incidents or cases of breach of customers’ privacy rights.



供應鏈

1、 供應商聘用慣例

本集團建立透明、動態和可追溯的供應鏈，致力於打造高效的採購管理體系，並注重採購合規性管控。

本集團致力於構建「開放、協作、共贏」的供應鏈生態系統，將誠信合規經營理念融入到企業文化與業務發展中，將商業道德、規範管理、安全環保、員工健康安全、數據隱私等理念推廣至供應鏈上下游企業，攜手共進，共同打造可持續發展能力。通過制定和實行本公司的《採購管理制度》、《供應商管理辦法》、《合同管理制度》，規範招採程序，提升公開招標比例，建立可持續供應商准入及評價指標體系，規範供應商開發、選擇、合作、評價等全過程，針對在本集團所轄基地廠區內有作業行為的供應商，還需嚴格開展《相關方安全預評價》，以確保供需雙方的員工安全。在合同履約過程中，本集團要求供應商簽署並嚴格執行《安全環保協議》、《陽光宣言》，提升企業效益的同時也提高供應商的整體質量。本集團高度重視與合作夥伴培養共同的價值觀，通過加大對供應商開展的國家法律法規、《華潤集團商業行為守則》、採購管理制度等培訓力度，幫助供應商提升合規意識及社會責任，從而增強供應鏈的整體競爭力。

SUPPLY CHAIN

1. PRACTICE FOR ENGAGING SUPPLIERS

The Group had established a transparent, dynamic and traceable supply chain. We are dedicated to creating an effective procurement management system and focus on the management and control of procurement compliance.

The Group is devoted to building an “open, collaborative, win-win” supply chain ecosystem. We incorporate concepts of integrity and compliant operation into corporate culture and business development, and promote concepts of business ethics, standardized management, safety and environmental protection, employee’s health and safety, and data privacy to upstream and downstream enterprises along the supply chain to grow hand in hand together and mutually create the capability of sustainable development. Tender procurement process had been standardized and the proportion of public tender increased through formation and implementation of the “Policy on Procurement Management”, the “Measures on Supplier Management” and the “Policy on Agreement Management” of the Company. Sustainable system for indicators of admission and evaluation of suppliers was established to regulate the whole process of development, selection, cooperation and evaluation of suppliers. Suppliers which had operating behaviors in the factories of the Group’s plants were further required to strictly complete the “Safety Pre-Assessment on Counterparties” to ensure the safety of the employees of both parties. During the process of fulfilling the agreements, suppliers were required to sign and strictly implement the “Safety and Environmental Protection Agreement” and the “Sunshine Declaration”, which enhanced corporate profitability whilst improving the overall quality of suppliers. The Group pays keen attention to cultivating shared values with partners through reinforcing suppliers’ training on national laws and regulations, the “China Resources Group Code of Business Conduct” and procurement management policies. These are conducive to arousing the compliance consciousness and social responsibility of our suppliers and strengthen the overall competitiveness of the supply chain.



本集團嚴格遵從公開、公平、公正原則，通過供應商關係管理系統實施採購，實現從准入、合作、評價、退出的全生命週期供應商管理，通過供應商准入、評價體系進行即時、動態管理，持續優化供應商管理制度，規範供應商考察報告，明確關聯企業管理要求，不斷優化供應商結構。本集團以市場和需求為導向，深入開展市場調研，分析採購需求，指導採購決策，選擇資質齊全、環保達標、注重安全管理等符合國家政策要求的合作方；發揮技術與業務的融合作用，推進性價比採購，降低物資消耗成本；踐行公開、競爭性採購理念，持續提高招標佔比，通過核查關聯關係杜絕供應商圍標串標行為，努力打造公平公正的競爭環境，促進供應商良性競爭。

本集團通過加大尋源範圍，挖掘和培育潛在供應商，通過供應商准入不斷充實合格供應商庫；優秀供應商在符合目標成本的前提下優先採購；對待整改供應商及時跟蹤待整改問題，給予相應協助，限期核查整改結果；對不合格的供應商及時移除合格供應商庫，實行動態管理機制；若出現供應商涉及違規或不誠信行為等情形將列入供應商黑名單庫。

In strict compliance with the principles of openness, fairness and impartiality, the Group implemented procurement through the supplier relationship management system, achieved full-lifecycle supplier management on admission, cooperation, evaluation and exit, continued to optimize the supplier management system, standardized supplier examination reports, specified the management requirements for associated enterprises, and persistently optimized the supplier structure through the real-time and dynamic management on admission and evaluation of suppliers. Driven by market forces and demand, the Group conducted in-depth market research and analysis on procurement needs for guidance in the decision making on procurement. We select counterparties which are consistent with the requirements of national policies, have complete qualifications, comply with environmental protection standards, and concern safety management. We unleash the integrative effect of technology and business for promoting procurement of good value for money to reduce the costs of materials consumption. In striving to build a fair and impartial competitive environment and foster healthy competition among suppliers, the Group puts the concept of open and competitive procurement into practice, continuously increases the proportion of tenders, and prevents behaviours of bid rigging and collusive bidding of suppliers by checking associated relationships.

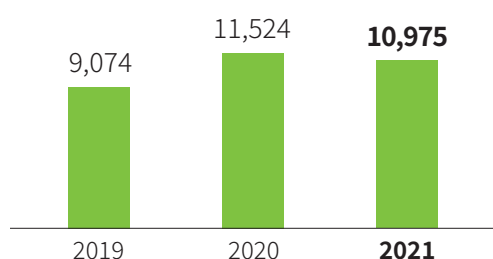
The Group discovers and cultivates potential suppliers through expanding the scope of sourcing. More suppliers are admitted to continuously enrich the eligible supplier database. We would procure from the outstanding suppliers on a priority basis provided that their prices are consistent with our target costs. Suppliers which require rectifications would be provided with our timely follow-up on their weaknesses, offered relevant assistance and examined on their rectification results upon the deadline. Substandard suppliers would be removed from our eligible supplier database in a timely manner in executing the dynamic management mechanism. Suppliers involving violations of regulations or dishonest behaviors will be added to our blacklisted supplier database.



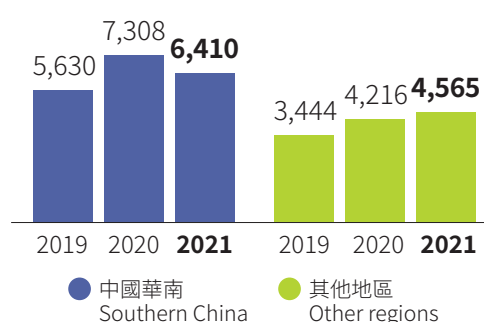
此外，本集團持續優化供應商庫，二零二一年，對過去曾准入的供應商進行評估，剔除長期未合作供應商，提升供應商管理效率。根據本集團供應商關係管理系統統計，本集團供應商數目及按地區劃分的供應商明細載列如下：

In addition, the Group continued to optimize the supplier database. In 2021, assessments were made on suppliers previously admitted, and those suppliers which had not been in cooperation for a long time were removed to raise the efficiency of supplier management. According to the statistics of the Group's supplier relationship management system, the number of suppliers and a breakdown of suppliers by geographical region are set out as follows:

供應商數目 Number of suppliers



按地區劃分的供應商數目 Number of suppliers by geographical region



2、誠信合規採購

本集團堅持用制度管事，加強對重點領域關鍵環節的監管，強化制度執行力，築牢拒腐防變的制度防線。本集團制定採購類制度21套，涵蓋計劃、招採、庫存、驗收等採購業務全流程管理。通過輪崗交流制度，明確崗位職責，對關鍵崗位嚴格實行不相容崗位分離，形成崗位間的相互制衡機制；通過工程和非工程採購管理制度，明確採購方案、資格審查、評標、定標等關鍵環節的審批流程；遵循管理制度化、制度流程化、流程信息化的理念，通過建立水泥電子採購平台SRM和ERP與其他信息系統的集成，對採購業務全流程和供應商生命週期進行管控，實現採購過程公開、透明，提升監督管理效果和監督效率。

2. INTEGRIOUS AND COMPLIANT PROCUREMENT

The Group adheres to manage business by use of policies and systems, reinforces the supervision of key steps in core scopes, strengthens the execution of policies and systems, and builds a line of defense against corruption and deterioration according to policies and systems. The Group had formulated 21 procurement policies and systems, covering the whole process of procurement business management including planning, procurement, inventory and acceptance of completion. Through policies and systems on job rotation and exchange, powers and duties of each role are specified, separation of incompatible roles is strictly implemented for key roles, and mutual check and balance mechanism between roles is formed. Approval process for key steps including procurement proposal, qualification review, bid evaluation and bid determination are specified in the management policies for construction and non-construction procurement. Following the concept of management systemization, process-oriented system and process informatization, the whole process of procurement business and the lifecycle of suppliers are controlled and managed through the integration of online cement procurement platforms SRM and ERP with other information systems, thereby achieving open and transparent procurement process and enhancing the results of supervision management and supervision efficiency.

本集團通過開展36輪次覆蓋法律法規、內部規定等高質量專業培訓，提高員工對制度理解和執行力。通過月度抽查、半年度專項檢查、年度管理評價、審計監督以及不定期的自查自糾等方式，加強對制度執行情況的監督檢查，用督查傳導壓力，用壓力推動落實；同時通過督查，及時發現制度可能存在的問題或缺陷，定期修訂完善。本集團堅持有責必問、問責必嚴，切實維護制度的嚴肅性和權威性，不斷增強制度的執行力。

3、 供應鏈責任管理

本集團持續帶動供應商成長，不定期舉辦供應商培訓活動，向供應商傳遞環保、安全、健康等方面的社會責任理念，提升供應商的社會責任意識。

通過推動源頭直供，本集團與工程機械廠家直接合作，簽署合作協議，由廠家對代理商進行管理，統一服務標準、協調產品供應、規避假冒偽劣配件，提升代理商的服務能力。

在安全運輸方面，從源頭開始，所有涉及運輸到廠的供應商在准入或者參與採購項目的資格預審中均需要進行相應的安全預評價，不符合安全要求的供應商一律淘汰，從而促使供應商提升對自身資質的要求，直接或間接履行相應的社會責任。此外，本集團持續推進原材料進廠汽車標重運輸，要求各基地開展駕駛員安全環保培訓，提高駕駛員安全意識，經培訓合格的司機方可領取基地入廠准駕許可證。

The Group enhanced employees' understanding on and execution of policies and systems by launching 36 high-quality professional training sessions covering laws, regulations and internal regulations. Supervision and inspection on implementation of policies and systems are strengthened through monthly sample checks, semi-annual special inspections, annual management evaluations, audit supervision, self-examination and self-rectification on an irregular basis. Execution is driven by pressure, which in turn is transmitted from supervision and inspection. At the same time, potential issues or loopholes of the existing policies and systems can be discovered in a timely manner through supervision and inspection, which enable regular revisions for improvement. The Group insists that responsibility must be answerable and accountability must be strict in order to effectively maintain the seriousness and authority of policies and systems and to continuously strengthen the executing force of policies and systems.

3. SUPPLY CHAIN RESPONSIBILITY MANAGEMENT

The Group persistently drives for the growth of suppliers by organizing training activities for suppliers from time to time to deliver social responsibility concepts in the aspects of environmental protection, safety and health and to enhance the suppliers' awareness on social responsibility.

By promoting direct supply from the source, the Group directly cooperates with construction machinery manufacturers, enters into cooperation agreements and assigns the manufacturers to manage the distributors. This unifies service standards, coordinates product supply, avoids counterfeit and shoddy accessories, and improves the distributors' service capability.

In terms of safe transportation, all suppliers involved in transportation to the factory are required to undergo corresponding safety pre-evaluation during preliminary review of qualification upon admission or participation in procurement projects, and suppliers which fails to meet the safety requirements will all be eliminated. This will prompt suppliers to improve requirements of their own qualification, and directly or indirectly fulfill corresponding social responsibility. In addition, the Group continued to promote transportation of raw materials into the factory with vehicles of standard loading weight, and required all production plants to roll out safety and environmental protection training for drivers for arousing the drivers' safety awareness. Only drivers who have passed the training can receive the permit of production plant for driving into the factory.

本集團將綠色、安全、發展要求融入供應商甄選，開發和使用節能環保的新材料、新技術；大力宣導綠色採購，推廣使用當地工業廢渣，如銅尾渣、硫鐵渣、轉爐渣、鐵合金爐渣、鉛鋅尾渣、粉煤灰等，替代原礦類資源原材料，在擴大本地化採購的同時，減少工業污染，帶動當地運輸等業務發展，為周邊居民創造新的就業環境，實現共同發展。其中，二零二一年，位於雲南彌渡的水泥生產基地協助當地政府，綜合利用早期土法煉鋅產生的廢渣，改善地方「寸草難生」的土壤情況，為當地環境做出突出貢獻。

The Group incorporates green, safety and development requirements into supplier selection. Energy-efficient and environmentally-friendly new materials and new technology are developed and used. We vigorously advocate green procurement and promote the use of local industrial waste such as copper slag, pyrite slag, converter slag, iron ferroalloy slag, lead and zinc slag, fly ash, etc., to substitute raw mineral resources in raw materials. Industrial pollution is reduced at the same time of expanding localized procurement, driving for local business development such as transportation and creating new job environment for residents in the vicinity to achieve mutual development. Among which, in 2021, the cement production plant in Midu, Yunnan assisted the local government in the composite utilization of wastes generated from the previous traditional method of zinc production to improve the local soil condition “without any grass growth” and to make outstanding contribution to the local environment.

公共

PUBLIC

1、誠信經營及反腐倡廉

1. INTEGRITY MANAGEMENT AND PROMOTION OF ANTI-CORRUPTION

本集團嚴格遵守《中華人民共和國刑法》、《中華人民共和國反不正當競爭法》、《中華人民共和國反洗錢法》，任何人不得利用職權索賄、受賄，以不正當手段謀取私利，不得進行勒索、欺詐及洗黑錢活動。

The Group strictly complies with the Criminal Law of the People's Republic of China, the Anti-Unfair Competition Law of the People's Republic of China and the Anti-Money Laundering Law of the People's Republic of China. No person is allowed to take advantage of their position to demand and receive bribery or obtain benefits by improper means. It is also forbidden to blackmail, conduct fraud or launder money.

二零二一年，本集團修訂並頒佈本公司的《領導幹部廉潔意見回覆指引》、《失實檢舉控告澄清工作指引》等4項廉政制度，進一步建立健全廉政規章制度，深化廉潔企業建設。

In 2021, the Group revised and promulgated 4 probity policies including the “Guidelines for Reply of Upright Comments to the Senior and Middle-Level Managerial Staff” and the “Work Guidelines for Clarifications on Whistle-Blowing and Prosecution of False Cases” of the Company to further construct sound probity policies and systems for deepening upright corporate building.



本集團致力維護良好的企業管治，持續在各級企業暢通來電、來訪、網絡等舉報渠道，鼓勵員工及與本集團有往來者（如客戶、承辦商、供應商、債權人、債務人等）對本集團內的不當行為作出舉報，依據本公司的《信訪件和問題線索集中管理指引（試行）》等制度對違紀違規問題嚴肅查處。

本集團一貫重視並持續強化董事及員工誠信建設和廉潔教育工作。本公司法律合規部向董事定期提供反貪污法律信息，以確保董事掌握適用法律法規的最新要求。二零二一年，本集團各級單位共開展警示教育162場次，受眾共計7,515人次，開展廉潔教育236場次，受眾共計7,659人次，其中，組織供應商、經銷商、合資公司等合作方開展4次廉潔警示教育，受眾共計1,294人次，持續深化廉潔警示教育效果；開展日常談心談話377人次；組織高中級管理人員及敏感崗位人員簽署《廉潔自律承諾書》1,877份；出具廉潔意見回覆620人次。

截至二零一九年、二零二零年及二零二一年十二月三十一日止年度，本集團或其僱員並無涉及任何貪污訴訟案件。

2、 慈善公益及社區投資

本集團根據《中華人民共和國慈善法》、國務院國有資產監督管理委員會關於中央企業履行社會責任、實施對外捐贈相關規定等法律法規和政策文件，以及《慈善公益活動實施細則》，持續推動慈善公益事業，開展慈善公益活動及中央企業扶貧領域監督執紀的審批、操作及問責管理，體現本集團慈善公益事業的社會效益。

The Group is committed to maintaining sound corporate governance. We maintain smooth whistle-blowing channels including telephone hotlines, in-person visits and online reporting at each level of enterprises to encourage our employees and parties who deal with us (including customers, contractors, suppliers, creditors and debtors) to report any misconducts within the Group. All investigations on non-compliance issues are handled seriously according to the policies including the “Guide for Centralized Management of Whistle-Blowing Letters and Clues to Issues (Trial)” of the Company.

The Group always places strong emphasis on and continuously strengthens the work for integrity cultivation and probity education of the Directors and employees. The Legal and Compliance Department of the Company regular provides anti-corruption legal information to the Directors to ensure the Directors grasp the latest requirements of applicable laws and regulations. In 2021, various units of the Group organized 162 sessions of alert education, reaching 7,515 participants in total. 236 sessions of integrity education were conducted, reaching 7,659 participants in total. Among which, 4 sessions of integrity alert education were organized for counterparties in cooperation including suppliers, dealers and joint ventures, reaching 1,294 participants in total to continuously reinforce the effects of integrity alert education. Daily confiding conversations were initiated with 377 staff. Senior and middle-level managerial staff and staff involved in sensitive roles were organized to sign 1,877 sets of the “Commitment Letter on Integrity and Self-Discipline” in total. 620 responses to opinions on integrity cultivation were issued.

None of the Group or its employees were involved in any corruption litigation cases for the years ended 31 December 2019, 2020 and 2021.

2. COMMUNITY CHARITY AND COMMUNITY INVESTMENT

The Group continuously promotes charitable community business according to the Charity Law of the People's Republic of China, relevant laws, regulations and policy documents issued by the State-owned Assets Supervision and the Administration Commission of the State Council regarding fulfillment of social responsibilities of state-owned enterprises and implementation of external donations, as well as the “Enforcement Regulations for Charitable Community Activities”. Review, implementation and accountability management were conducted on charitable community activities, supervision and discipline of state-owned enterprise in the aspects of poverty alleviation to reflect the social benefits of the Group's charitable community business.

二零二一年，本集團積極響應全國救災工作部署，組織員工開展「心繫河南-馳援災區」募捐活動，共募捐約人民幣800,000元，全數捐予河南省紅十字基金會；給雲南地震災區捐贈約人民幣73,000元災後生活用品。

此外，本集團積極參與社區公益服務工作，通過捐贈水泥及混凝土產品，幫助周邊村鎮修橋築路，改造老舊房屋，完善當地基礎設施，並為貧困地區、困難戶捐贈現金或實物解決其實際困難。本集團重視對特殊群體的關愛，定期組織各部室、大區及基地（含香港）慰問走訪周邊村鎮的敬老院、孤寡老人、嚴重智障或殘疾人士及有困難群眾，並非常關注貧困地區青年及兒童的教育與發展，通過捐贈衣物、文具、書本、教學設備、獎助學金、開展助學公益活動，協助創造良好學習環境及氛圍。二零二一年對外捐贈數據詳載於董事局報告內慈善捐助一節。

In 2021, in proactive response to the national deployment of disaster rescue, the Group organized its employees to launch fund-raising activities of “Heart Connection to Henan – Speedy Support to Disaster Areas”. Approximately RMB800,000 was raised, and the entire amount was donated to Henan Red Cross Foundation. Approximately RMB73,000 was donated to Yunnan earthquake disaster areas for buying post-disaster daily necessities.

Besides, the Group proactively participates in community service work. Through donations of cement and concrete products, we help neighbouring towns and villages in the construction of roads, repairs of bridges, renovation and upgrade of old houses, and improvement of local infrastructure. We also make donations in cash or in kind to underprivileged regions and families in need to solve their practical difficulties. The Group pays keen attention to caring for special groups and regularly organizes all departments, major operating regions and production plants (including Hong Kong) to visit and express solicitude to elderly care institutions, the elderly without family, people with serious intellectual disabilities or the disabled, and the general public in need in the neighbouring towns and villages. We are very concerned regarding education and development for teenagers and children in the underprivileged mountainous regions and help to create a better learning environment and ambience through donations of clothes, stationery, books, teaching equipment, scholarships, study grants and launch of charitable subsidized schooling. Data of external donations in 2021 is set out in the charitable donations section of the Report of the Directors.



本集團於福建携手經銷商開展助學活動
The Group cooperated with distributors to launch student aid events in Fujian



附錄一：關鍵績效指標

APPENDIX 1: KEY PERFORMANCE INDICATORS

		二零二一年 2021	二零二零年 2020	二零一九年 2019
環境指標	Environmental Indicators			
氮氧化物排放量 (噸)	Emission of nitrogen oxides (tons)	30,324	36,194	37,584
氮氧化物排放密度 (公斤/噸熟料產量)	Emission intensity of nitrogen oxides (kg per ton of clinker produced)	0.4810	0.5146	0.5439
氮氧化物排放濃度 (重列後) (毫克/立方米)	Average emission concentration of nitrogen oxides (restated) (mg/m ³)	208	221	232
二氧化硫排放量 (噸)	Emission of sulphur dioxide (tons)	1,501	1,646	1,824
二氧化硫排放密度 (公斤/噸熟料產量)	Emission intensity of sulphur dioxide (kg per ton of clinker produced)	0.0238	0.0234	0.0264
二氧化硫排放濃度 (重列後) (毫克/立方米)	Average emission concentration of sulphur dioxide (restated) (mg/m ³)	10	10	11
顆粒物排放量 (噸)	Emission of particulate matters (tons)	1,381	1,777	2,083
顆粒物排放密度 (公斤/噸熟料產量)	Emission intensity of particulate matters (kg per ton of clinker produced)	0.0219	0.0253	0.0301
顆粒物排放濃度 (重列後) (毫克/立方米)	Average emission concentration of particulate matters (restated) (mg/m ³)	6	9	9
溫室氣體排放量 (千噸二氧化碳當量)	Emission of greenhouse gases (‘000 tons of carbon dioxide equivalent)	53,404	59,605	58,710
溫室氣體排放密度 (噸二氧化碳/噸熟料產量)	Emission intensity of greenhouse gases (tons of carbon dioxide equivalent per ton of clinker produced)	0.8470	0.8472	0.8497
耗電量 (百萬千瓦時)	Electricity consumption (million kwh)	6,017	6,518	6,426
水泥及熟料耗電量 (百萬千瓦時)	Electricity consumption of cement and clinker (million kwh)	5,980	6,489	6,398
混凝土耗電量 (百萬千瓦時)	Electricity consumption of concrete (million kwh)	37	29	28
噸水泥電耗 (千瓦時)	Electricity consumption per ton of cement (kwh)	72.5	72.2	72.9
每立方米混凝土電耗 (千瓦時)	Electricity consumption per m ³ of concrete (kwh)	2.6	2.2	2.1
耗煤量 (千噸)	Coal consumption (‘000 tons)	8,918	9,943	10,033
噸熟料單位煤耗 (公斤)	Unit coal consumption per ton of clinker (kg)	141.4	141.3	145.2
噸熟料標準煤耗 (公斤)	Standard coal consumption per ton of clinker (kg)	103.8	104.4	105.5
綜合能源消費量 (千噸標煤)	Consolidated energy consumption (‘000 tons of standard coal)	7,190	7,917	7,915
萬元產值可比價綜合能耗 (噸標煤/萬元人民幣)	Consolidated energy consumption per RMB10,000 output (ton standard coal per RMB10,000)	2.09	2.60	2.65
萬元增加值可比價綜合能耗 (噸標煤/萬元人民幣)	Consolidated energy consumption per RMB10,000 value addition (ton standard coal per RMB10,000)	5.27	5.58	5.85

		二零二一年 2021	二零二零年 2020	二零一九年 2019
包裝材料消耗量 (噸) (註1)	Consumption of packaging materials (tons) (note 1)	50,170	60,276	63,765
包裝材料消耗密度 (公斤/噸袋裝水泥產量) (註1)	Consumption intensity of packaging materials (kg per ton of cement packed in bag) (note 1)	2.19	2.08	2.17
工業廢渣綜合利用量 (千噸) (註2)	Industrial waste utilized ('000 tons) (note 2)	20,490	21,010	21,080
城鄉生活垃圾協同處置量 (噸)	Municipal solid waste co-processed (tons)	207,700	183,100	162,700
市政污泥協同處置量 (噸) (註3)	Urban sludge co-processed (tons) (note 3)	44,800	52,800	56,500
工業危險廢物協同處置量 (噸)	Hazardous industrial waste co-processed (tons)	19,600	6,100	7,200
節能減排技術改造投入 (百萬元人民幣)	Investment in technological upgrade for energy saving and emission reduction (RMB million)	147	123	120
環保總投入 (百萬元人民幣)	Total investment in environmental protection (RMB million)	508	441	443
社會指標	Social Indicators			
僱員總數 (人) (註4)	Total number of employees (note 4)	19,491	19,467	19,816
中國內地僱員 (人) (註4)	Number of employees from the Chinese Mainland (note 4)	19,337	19,324	19,665
香港僱員 (人) (註4)	Number of employees from Hong Kong (note 4)	154	143	151
男性僱員 (人) (註4)	Number of male employees (note 4)	16,153	16,187	16,474
女性僱員 (人) (註4)	Number of female employees (note 4)	3,338	3,280	3,342
管理層 (人) (註4)	Number of employees from management (note 4)	410	391	402
財務、行政及其他 (人) (註4)	Number of employees from finance, administration and others (note 4)	2,813	2,498	2,485
生產人員 (人) (註4)	Number of production staff (note 4)	11,048	11,198	11,627
技術人員 (人) (註4)	Number of technical staff (note 4)	4,318	4,517	4,420
營銷人員 (人) (註4)	Number of sales and marketing staff (note 4)	902	863	882
29歲及以下僱員 (人) (註4)	Number of employees aged below 29 (note 4)	2,041	2,439	3,023
30至39歲僱員 (人) (註4)	Number of employees aged 30 to 39 (note 4)	8,226	8,395	8,450
40至49歲僱員 (人) (註4)	Number of employees aged 40 to 49 (note 4)	6,841	6,731	6,697
50歲及以上僱員 (人) (註4)	Number of employees aged 50 or above (note 4)	2,383	1,902	1,646
總體受訓僱員百分比	Percentage of employees trained	99.2%	99.5%	97.3%
受訓男性僱員百分比	Percentage of male employees trained	99.6%	99.5%	98.1%
受訓女性僱員百分比	Percentage of female employees trained	97.0%	99.5%	93.7%
受訓管理層人員百分比	Percentage of employees from management trained	99.3%	96.9%	97.5%
受訓財務、行政及 其他人員百分比	Percentage of employees from finance, administration and others trained	99.6%	99.9%	97.9%
受訓生產人員百分比	Percentage of production staff trained	98.9%	99.5%	96.8%
受訓技術人員百分比	Percentage of technical staff trained	99.7%	99.6%	99.6%
受訓營銷人員百分比	Percentage of sales and marketing staff trained	98.9%	99.9%	90.5%



		二零二一年 2021	二零二零年 2020	二零一九年 2019
供應商總數 (個)	Total number of suppliers	10,975	11,524	9,074
中國華南供應商數量 (個)	Number of suppliers from Southern China	6,410	7,308	5,630
其他地區供應商數量 (個)	Number of suppliers from other regions	4,565	4,216	3,444
員工工傷事故發生數 (人)	Number of staff injured at work	11	13	13
一般及以上事故發生數 (宗)	Number of incidents of general or above level	–	1	2
事故死亡數 (人)	Fatalities	–	1	2
事故員工千人死亡率(‰)	Fatality rate (‰)	–	0.051	0.099
安全培訓人次	Number of participants in safety training	277,607	257,902	245,398
安全培訓覆蓋率	Safety training coverage rate	100%	100%	100%
安全應急演練次數	Number of safety emergency drills	1,333	1,228	1,135
專職安全管理人員 (人)	Number of specialized safety management personnel	198	200	192
安全管理人員持證人數 (人)	Number of licensed safety management personnel	1,254	1,943	1,277
安全生產投入 (百萬元人民幣)	Investment in production safety (RMB million)	210	152	156

註：

- 1、 包裝材料指用於袋裝水泥的包裝。
- 2、 工業廢渣統計範圍包括煤矸石、廢石、脫硫石膏、粉煤灰、高爐礦渣等。
- 3、 折算為80%含水率濕污泥。
- 4、 二零二一年僱員人數統計口徑發生變化，相關數據不包含非頂崗實習生（即實習結束後不僱傭、不佔編制的員工）。

notes:

1. Packaging materials refer to the packaging for cement sold in bags.
2. Scope of statistics of industrial waste includes coal gangue, stone residue, de-sulphur gypsum, fly ash and blast furnace slag.
3. 80% moisture content for wet sludge.
4. The scope of statistics of the number of employees changed in 2021. Relevant data does not include interns which are not replacement hires (i.e., employees who will not be employed or accounted for as headcount after the end of the internship).

附錄二：排放及能耗數據收集及匯報方法

APPENDIX 2: COLLECTION AND REPORTING METHODS OF EMISSIONS AND ENERGY CONSUMPTION DATA

1、 污染物排放

污染物排放的統計範圍為本集團附屬公司擁有的水泥生產基地的主要排放口。根據《固定污染源煙氣(SO₂、NO_x、顆粒物)排放連續監測系統技術要求及檢測方法(HJ76-2017)》，各基地安裝煙氣排放連續監測系統(CEMS)，監測數據在線實時傳輸至政府環保主管部門。政府環保主管部門對CEMS系統設備的數據有效性進行審核及驗收，並於每個季度對系統準確性進行比對監測。通過該系統監測煙氣中污染物的實時排放情況，計算出污染物排放量，歸集並整合至本集團自有的數據管理系統中。本集團於二零二一年完善了整體污染物排放濃度的計算方法，並相應重列二零二零年及二零一九年的數據。

1. EMISSIONS OF POLLUTANTS

The scope of statistics of emissions of pollutants includes the major discharge outlets of all cement production plants owned by the Group's subsidiaries. According to the "Specifications and Test Procedures for Continuous Emission Monitoring System for SO₂, NO_x and Particulate Matter in Flue Gas Emitted from Stationary (HJ76-2017)", a continuous emission monitoring system (CEMS) is installed at each production plant, and the monitoring data is transmitted to the governmental department of environmental protection in a real time manner. The governmental department of environmental protection will review and accept completion of the validity of data from the CEMS equipment, and compare and monitor the accuracy of the system every quarter. Real-time emissions of pollutants in flue gas are monitored through the system. Pollutants emissions are calculated, collected and consolidated into the Group's own data management system. In 2021, the Group had improved the calculation method of overall pollutant emission concentrations, and restated the data in 2020 and 2019 accordingly.

2、 溫室氣體排放

溫室氣體排放的統計範圍為本集團附屬公司擁有的水泥生產基地的主要排放口。範圍1溫室氣體排放源主要包括燃料燃燒及工業生產過程；範圍2溫室氣體排放源主要包括淨購入電力。數據計算的標準、方法參考中國國家發展和改革委員會發佈的《中國水泥生產企業溫室氣體排放核算方法與報告指南》及中國生態環境部發佈的《水泥生產企業溫室氣體排放補充數據表》，總部EHS部收集及整合相關年度數據。

2. EMISSIONS OF GREENHOUSE GASES

The scope of statistics of emissions of greenhouse gases includes the major discharge outlets of all cement production plants owned by the Group's subsidiaries. Greenhouse gases emissions (scope 1) mainly include fuel combustion and industrial production processes. Greenhouse gases emissions (scope 2) mainly include net purchase of electricity. The standards and methods of data calculation are referenced by the "Guidelines for Accounting and Reporting Greenhouse Gas Emissions for Cement Enterprises" issued by the National Development and Reform Commission of China and the "Supplement Data Sheet for Greenhouse Gas Emissions for Cement Enterprises" issued by the Ministry of Ecology and Environment of China. The EHS Department at headquarters collects and consolidates relevant annual data.



3、電耗

電耗的統計範圍包含本集團附屬公司擁有的水泥生產基地、獨立水泥粉磨站、境內混凝土攪拌站。各基地根據電費單每月統計用於生產的外購電量，歸集並整合至本集團自有的數據管理系統中。

4、煤耗

煤耗的統計範圍為本集團附屬公司擁有的水泥生產基地。各基地使用盤煤儀測量煤炭庫存，或以堆料的體積乘以容重推算煤炭庫存，使用地磅測量地採煤的進廠量，使用貨物交接清單或卸貨港水尺計量確定下水煤的採購量，與到廠量對比統計損耗，從而推算月度煤耗數據，歸集並整合至本集團自有的數據管理系統中。

3. ELECTRICITY CONSUMPTION

The scope of statistics of electricity consumption includes all cement production plants, independent cement grinding stations and onshore concrete batching plants owned by the Group's subsidiaries. Each production plant counts the electricity purchased externally for production on a monthly basis according to electricity bills, which is collected and consolidated in the Group's own data management system.

4. COAL CONSUMPTION

The scope of statistics of coal consumption includes all cement production plants. Each production plant measures coal inventories by use of coal meters, or estimates coal inventories by multiplying the volume with the volumetric weight of piles. Weighbridges are used to estimate the quantity of mining coal entering the factory. Cargo handover receipts or gauges at the unloading port of destination are used to measure and confirm the purchase quantity of coal transported by shipping. Wastage is counted by comparing with the quantity of coal entering the factory in order to estimate monthly coal consumption data, which is collected and consolidated in the Group's own data management system.

